

# Health informatics: a review of clinical applications essay sample

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The process of healing and health care is as old as the human civilization itself. The field of medical science have got a new look after every revolution no matter whether it had been the first industrial revolution making an end to dark age or the . second industrial revolution of 20<sup>th</sup> century. People started using medicines and the doctors came into existence. Medical Scientists invented many equipment to make the processes of healing and consultancy better and fast through the use of information technology.

Scientists have developed some very intelligent systems that would help them in supporting their decisions. These decision making devices rely on set of data and logic based on facts of medical science and have been termed as a very important part of the whole section of Health Informatics. In the language of Paul Taylor “ Health informatics helps doctors with their decisions and actions, and improves patient outcomes by making better use of information—making more efficient the way patient data and medical knowledge is captured, processed, communicated, and applied” (2006, 1).

Considering the utility of the intelligent devices developed for the purpose of supporting doctor and patient, this paper is actually concentrating on a DSS based clinical applications i. e., Computer-Aided Clinical Diagnostic Decision Support Tool also known as CACDDST.

### CACDDST

CACDDST has been designed for being used as a tool for Computer-Aided Clinical Diagnostic Decision Support and the prototype has been developed in the year 2004 by Dept. of Medical Informatics Okayama Univ. Hospital;

Kumamoto National College of Technology; Fuji Toranomom Health Promotion Center, Shizuoka, Japan (CACDDST).

The system is available at this URL *http://60.32.120.*

*74/examples/en/syoujou1.jsp* and depends on the set of database of diseases with access through queries involving inputs which can be entered through an interactive mouse interface system. The program is a master piece if viewed with the eyes of normal science enthusiast or a computer engineer. Basically it's a DSS serving as an intelligent device solving the purpose of diagnosis through the symptom listing. The input selected works as a key for retrieving information from the database. The system can be called as a front end with access to any database technology enabled backend.

The input is submitted according to the sequence given below:

Input of the clinical manifestations by making selection through mouse and clicking the links available.

After making an option from common clinical manifestation, clinical manifestation of that particular case will be made available and selecting items from the new list requires checking of boxes through mouse. After checking of boxes bar button responsible for selection and addition of clinical manifestation is clicked through the mouse.

Now the window will demonstrate the list of selected manifestation in left column of the page. The list can still be modified through the delete links activated through the mouse click. .

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On clicking the Recall Disease bar button, a new page demonstrating the set of result obtained from the database through queries. The result are sometimes very big but the same can be reduced through clicking the mouse on the “ To narrow the search” link.

The clicking of “ To narrow the search” link will give another option of making some change in the right column comprising of clinical manifestation. The new selection for items can be made with checking the boxes present in the right column. The drop down list with options of YES and NO will help in selecting or deselecting the manifestation..

New selection has been added. Once the user is ready with the new list, he simply clicks the “ Narrow the Search” bar button given just below the list of right column

Now the new page will show the narrowed list.

Again if the customer wants to go to the beginning of the whole process with new list of symptoms, he simply has to click the start link. This can be done even when any particular selection is going on i. e., in between the phases demonstrated above.

### System Evaluation

Any system developed in the field of Health Informatics is actually meant for all sorts of users. It can be an educated patient who has lots of information about diseases and symptoms and at the same time can be a qualified doctor. Some users may not have sufficient knowledge of medical science

but can be a qualified engineer or academician or scientist. Since the system is for the purpose of use in medical science so there are users who will not be fully aware of critical technical details of it. In the same way the system is a computer program so how the whole process is working and what possible queries might have been used and what are the entities used to maintain the database and the primary keys for searching it.

CACDDST when used by an educated patient with the knowledge of both medical science and proper use of information system devices will find it very simple in entering the input. He can easily select entries meant for types of problems and symptoms and finally getting the list of possible disease. There might be a chance he can make an assumption of the disease but at the same time he may get over raw with the large list. Instead of getting any solution, he will get confused.

The option of narrowing the list is not as simple as that of entering the input for symptoms and even after narrowing process the patient's problem will remain the same. The question of this system being used by a normal patient will never occur. He will never be able to figure out the disease he is suffering with. The other point is related to patient's psychology. In many cases it has been seen that the sight of a doctor gives strength to the patient. The patient feels much comfortable only when he is being diagnosed by the doctor himself. A simple assurance from the doctor is sufficient enough to reduce the pain to half. The system will have to build that much level of confidence and faith among these common users. This psychological barrier has to be over ridden to make this system successful.

Now for a qualified doctor it might be very helpful. The approach of doctor is very much different. He is qualified for not only providing medicine but is also well aware of proper understanding of symptoms. His selection of inputs will be very specific and might be very much accurate. This accuracy will itself achieve a reduced list. Even if the list is not appreciably short, the narrowing process can well be utilized by the doctor to get more specific result. But the thing which has to be considered is whether the system can convince the doctor and at the same time how can a doctor rely on the results which have been given just through few inputs and no physical verification.

The system will appear as a great creation if the whole thing is looked as development of science or as amalgamation of medical science and information science. It will herald a new field where a computer with simple database soft wares and appropriate hardware can make a way to reduce the gap between the fast development in the field of medical science and the knowledge of common people. The other possibility is that some people once finding it very useful, may think of having a course or introductory training of diseases, symptoms, possible cures and the use of CACDDST for achieving the same. The inception of this system will give way to further research in the field of database system as well as data retrieving queries. This may one day help in the creation of artificially intelligent virtual doctors or health advisors. The same can be used by hospitals and doctors to take care of patients with simple and non lethal diseases.

One point which must have been considered while developing and using CACDDST, that it will require the knowledge of medical science as well as computers and information system including HCIs (Attfield, 2004). This system doesn't involve too much use of HCI devices. A simple mouse and keyboard is good enough to use the system. It's not just easy to use but also prevents any possibility of wrong input often get into when data is entered through keyboard incase of a form filling interaction style (Attfield, 2005). The web page depicting all the phases has been made through the same set of colours i. e., brownish yellow for the list present in right while white and light pink for the selected options in the left.

The layout is simple with all options in the common clinical manifestation serving as linked commands which displays the symptoms related to the problem only when clicked. The default setting is the list of symptoms of all possible common diseases. The system is a GUI based program and for every step instructions have been well mentioned. At the same time the program, its functions and technical intricacies are not going to bother any current as well as possible user. The other part that may cause some error is the technical terms from the world of . medical science. The system relies on simplest of the possible to create option list. Every options of the common clinical manifestation is just been explained through a single line and can be understood and the same can be said for the options selected through check box.

These check boxes are for self explanatory one sentenced symptoms. So here also it's not going to be a great problem. But at the same time there

are precautions which have to be taken. Most of the symptoms have been mentioned with their technical name, so there can be a possibility of wrong selection of symptom because of users' unawareness. These mistakes may result in wrong diagnosis. Actual cure of a disease requires comprehensive diagnosis of both system and the affected part. This process ensures perfect curing process and fast relief to the person who is suffering. So no artificial device no matter how intelligent it may be can be fully relied upon. The society will always need a doctor and his emotional and psychological soothing.

### Conclusion

CACDDST is a revolutionary product. It's a very good way to amalgamate the power of medical science and the robustness of information system devices and techniques. The doctors will certainly find it as a very useful assistant. But again there is a question, are devices of these types will really be needed by the doctors. It is for sure that a doctor will personally meet the patient to diagnose the disease. These systems can be used for the training purpose only. Their test of knowledge of diseases and symptoms can be done through this system. But still this device will make a way to achieve a machine based system with capability of making accurate assumptions based on symptoms and tested information.

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