Diagnosis Through Secured eHealth Expert System

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Abstract-- **Expert systems are computer applications that combine computer equipment, software, and specialized information to imitate expert human reasoning and advice. eHealth is the single-most important revolution in healthcare since the advent of modern medicine, vaccines, or even public health measures. We are concentrating on to develop secured eHealthExpert System through which various chronic diseases like HIV/AIDS, Diabetes's (Type-II,GDM) and Breast cancer are diagnosed , provide security to the Electronic Patient Record(EPR) as well as online services such as teleconsultation (second medical opinion), e-prescription, e-referral, telemonitoring and telecare.**

Keywords-- eHealth, Expert systems, knowledge representation, Diagnosis, eHealth data exchange

I. INTRODUCTION

Usually **Health services research** (HSR) is a multidisciplinary scientific field that examines how people get access to health care practitioners and health care services, how much care costs, and what happens to patients as a result of this care and quantity and quality of life. HSR is a relatively young science that developed through the bringing together of social science perspectives with the contributions of individuals and institutions engaged in delivering health services.

eHealth is a relatively recent term for healthcare practice supported by electronic processes and communication. Since about 2011, the increasing recognition of the need for better cyber-security and regulation may result in the need for these specialized resources to develop safer eHealth solutions that can withstand these growing threats.

The term eHealth has been in use since the year 2000. eHealth encompasses much of medical informatics but tends to prioritize the delivery of clinical information, care and services rather than the functions of technologies. No single consensus, all-encompassing definition of eHealth exists - the term tends to be defined in terms of a series of characteristics specified at varying levels of detail and generality.

Throughout many western national healthcare services, extensive eHealth infrastructures and systems are now viewed as central to the future provision of safe, efficient, high quality, citizen-centered health care.

eHealth is now a global topic. It was discussed at the United Nations World Summit on the Information Society in December 2003 and at the World Health Assembly in May 2005. The World Health Organisation has established various e-Health initiatives, such as the WHO Global Observatory for eHealth (GOe) in 2005 which aims "to provide Member States with strategic information and guidance on effective practices, policies and standards in eHealth". The World Summit on the Information Society (WSIS), held with the participation of 175 countries (second phase, 16-18 November 2005, Tunis), affirmed its commitment to "improving access to the world's health knowledge and telemedicine services, in particular in areas such as global cooperation in emergency response, access to and networking among health professionals to help improve quality of life and environmental conditions". The World Health Organisation offers the following more detailed definition:

"eHealth is the cost-effective and secure use of information and communications technologies in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research"

Claudia Pagliari and colleagues, in a very detailed discussion of the field of eHealth, offer the following wider definition which also covers human and organisational factors:

"e-health is an emerging field of medical informatics, referring to the organisation and delivery of health services and information using the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a new way of working, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology".

Gunther Eysenbach offers the following succinct definition on his homepage:

"eHealth = Medicine + Communication + Information + Society"

eHealthExpertSystems are expected to improve various aspects of healthcare like quality, cost-efficiency, accessing by

Improving diagnostic accuracy and treatment appropriateness;

- Improving access to effective healthcare by reducing barriers created, for example, by physical location or disability;
- Facilitating patient empowerment for self-care and health decision making;
- Supporting the delivery of care tailored to individual patients, which enables more informed decision making based both on evidence and patient-specific data;
- Improving transparency and accountability of care processes and facilitating shared care across boundaries;
- Aiding evidence-based practice and error reduction;
- Improving cost-efficiency by streamlining processes, reducing waiting times and waste.

II. ABOUT EXPERT SYSTEMS

Expert systems are computer applications that combine computer e0quipment, software, and specialized information to imitate expert human reasoning and advice. As a branch of **artificial intelligence,** expert systems provide discipline-specific advice and explanation to their users. Typically, expert systems function best with specific activities or problems and a discrete database of digitized facts, rules, cases, and models. Expert systems are used widely in commercial and industrial settings, including medicine, finance, manufacturing, and sales.

Four interactive roles form the activities of the expert system:

- diagnosing
- interpreting
- predicting
- instructing

The systems accomplish each of these by applying rules and logic specified by the human expert during system creation or maintenance or determined by the system itself based on analysis of historical precedents. Instruction, in particular, emerges as a result of the expert system's justification system. Synthesizing feedback with various combinations of diagnostic, interpretative and predictive curriculum, the expert system can become a finely tuned personal tutor or a fully developed and standardized group class.

III. PROPOSED WORK

Through the proposing system, the patient interacts with Rule based expert system tool and enters symptoms/sufferings related to health.

In the Secured eHealth Expert system the patient data is stored in the form Electronic patient record (ERP). eHealth data exchange which is one of the factors blocking the use of e-Health tools with more concern about privacy issues regarding patient records, most specifically the EPR (Electronic patient record). This main concern has to do with the confidentiality of the data with various coding schemes.

Our proposed system defines set of terms and actions, which makes standard communication exchange between the tool and patient. The guideline-based decision support systems aim to enable the latest clinical knowledge to be accessible and usable to the patient at the point of care and so make significant contributions to quality and safety in healthcare.
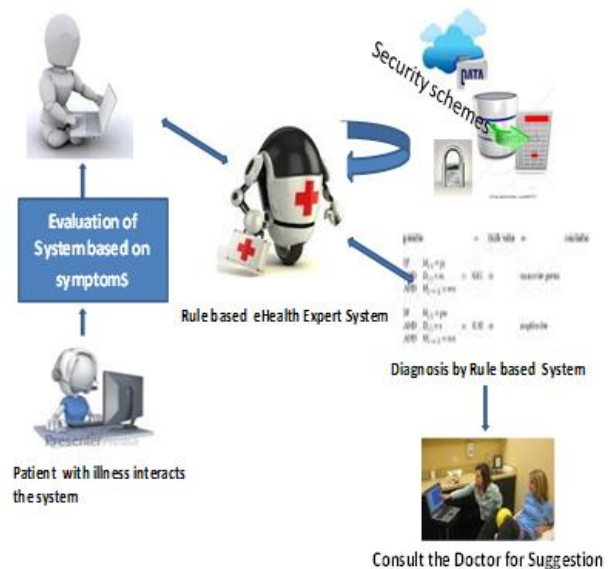

Fig: Secured eHealth Expert system

Based on the symptoms/ERP the evaluation takes place by the tool. The disease is diagnosed by the rules framed and stored within the data base/evaluation engine and provides appropriate treatment to the patient. Finally suggests the patient to consult the doctor if necessary. For this various guideline models which are capable of formalizing medical knowledge as electronic applications that can be executed to generate patient-specific recommendations for clinical decisions and actions. Such methods employ different representation formalisms and computational techniques. For our proposing work we choose Rule–based(Arden Syntax) mechanism.

IV. Conclusion

eHealth Expert Systems have a significant future impact on patient care include Internet-enabled applications for chronic diseases which could help to increase citizen empowerment in health maintenance and decision making, self-care towards health. Actually e-Health system covers virtual reality, robotics, digital imaging and computer assisted surgery. Now our proposing eHealth Expert System provides services to identity the chronic diseases like HIV/AIDS, Diabetes and Breast Cancer and provide security to the Electronic patient record. In future we extend our work to provide portable monitoring systems, health portals include health applications and links on mobile phones, referred to as mHealth Expert Systems.

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