

Chapter 22

Establishing Synergy Between Cloud Computing and Collaborative Technology in Medical Informatics

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ABSTRACT

The Health care sector needs information driven service. Information is a major resource which is important to health of individual patient and the success of hospitals. The understanding between medical professionals and software professionals can be a main force behind the design, management and use of health care data and information. Health care information systems need to move from traditional integrated database to knowledge based database. Generally, data in health care sector is available as disperse elements; when it is compiled into a meaningful pattern, then it becomes information. And as information is converted into valid basis for action, then it becomes knowledge. This chapter explains making use of the concepts such as cloud computing, pervasive computing, virtual reality along with the other collaborative technology which will facilitate to create knowledge based health care system.

INTRODUCTION

Health has been a concern of major importance across the world. The kind and amount of resources available now are increasing day by day. Technology has been the most important new resource in the present century. Emergence of new tools and devices has been helping the medical profession. Further it is enhancing the medical professionals to offer better service to their patients. Advancements in information and communication technology have been making medicine and medical information systems integrated (Sunitha, & Preethi, 2013). Electronic health or e-health is the result of the above integration. Most of the hospitals in the world have reasonably good information systems to manage the internal administrative and clinical processes for their patients (Vijayrani, 2013). Exchange of information in the above infrastructure is mostly confined to their hospital and the hospitals attached to them.

DOI: 10.4018/978-1-5225-5469-1.ch022

Now it has become a necessity to integrate geographically distributed and organizationally independent organizations for medical information system. This integration gives a scope for designing a knowledge based system for health care sector. The present information and communication technology provides several concepts that enable to develop a health care information system more effectively.

Cloud Computing, Pervasive computing, Virtual Reality and other collaborative technologies are among a number of other concepts provided by information and communication technology. There are two types of approaches prevalent in health care sector. They are 'Conservative approach' and 'Adaptive Change Approach'. The elements in the latter approach are reasoning knowledge based understanding and enlightened creative wisdom blended with professional values. Implementation of emerging concepts in information and communication technology is possible under the latter approach.

NEED FOR KNOWLEDGE BASED SYSTEM

Due to the change in the life style of the people across the Globe, the nuclear family has become the order of the day. There used to be a doctor for each family when the joint family was prevalent. Most of these doctors knew the entire medical history of all the members of the family. These doctors used to organize all the medical services through their professional contacts whenever the family needed their services. The family doctor was considered as a part of the family, philosopher, and guide. The concept of 'Family Doctor' has disappeared today. In the present scenario hospitals are the most important element in health care delivery system. Every time a patient or patient's relative approaches a hospital, he or she comes with an expectation. What happens next will form an experience. A good experience may increase one's confidence in the hospital and he/she recommends the same hospital to friends and relatives. But a bad experience may dissuade probable patients not to make use of the services provided by a hospital. Health problems and needs are increasing and becoming more complex. The demands and pressures on the hospitals are also increasing. Providing timely service and care is the primary responsibility of all the hospital authorities. The ability to recognize this process and to actively manage it, forms the basis for "Knowledge Based Health Care System".

Health care organizations have a large volume of data which is generated by the number of transactions that take place during the services rendered to patients. One of the greatest difficulties in health care organizations is not so much in gathering data but deciding what needs to be gathered to provide the necessary information and making sure that it is distributed to the right people at the right time and in the right form. "Knowledge Based Health Care System" will be useful in taking care of the above requirements.

Innovative Approach

Globalization has been forcing health care sector to focus on the need for innovative approach in designing and developing knowledge based health care system. The World is poised to take a huge leap at the rate innovation is gaining importance. This is the result of use of enhanced sharing of information and collaborative possibilities provided by cloud computing. Cloud computing (Buyya, Vecchiola, & Selvi, 2013) provides infrastructure for creation of virtual hospitals with knowledge based health care system. The following case illustration gives an idea of developing knowledge based health care information system by a hospital in India.

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