Literature Review:

Advanced Health Informatics



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The importance of Health Informatics has been recognized in many studies and health facilities since it was first discovered. It has significantly improved healthcare and developed drastically throughout the years due to its wide range of applications. However, it has many issues associated with it. Consequently, researchers have been interested in examining those challenges and making the consumer more targeted in health information systems.

The field of health informatics has had a lot of issues associated with its discovery and growth; therefore, studying those challenges became an active area of research. The most prominent challenges that were targeted by authors were both ethical issues and issues limiting the efficiency of health informatics systems. In terms of ethical issues, health data is very sensitive due to effects on a person’s employment or societal image. Patients mainly fear the process of storage of their data on internet-connected computers because they doubt the control of accessibility in comparison to a paper-based system where folders of data are stored in a room with controlled access [1]. Health professionals are very likely to doubt a new system’s efficiency, which poses an issue because the new system may be ignored due to the health managers not understanding its usage and going back to the old system [1]. A major challenge is to design a system that caters to both the needs of health professionals and patients [2]. Moreover, [3] discusses that difficulties faced by health employees as a result of a new system include complexity and time consumption, and difficulties faced by patients include reduction in face-to-face communication. This might lead to further resistance to health IT systems. Furthermore, this causes a bigger issue, which is a lack in financial investments needed to implement, sustain, and improve health IT systems. Researchers [1, 4] both argue that evidence is required to improve existing systems. They mention that failure to report failed medical interventions in publications restricts the ability to repair failed health IT systems and poses an issue on system development. (Hanin Abu Alrub 43084, Meera Al Suwaidi 42747)

An area of interest researchers have been examining is the applications of health informatics. Most developments appear to focus on investigating diseases through data mining and clinical diagnostics. [5] Claims that by data mining, we can find ways to identify and prevent diseases. This is done by analyzing trends from acquired data in different health databases which results in improving health care standards [5]. Another study shows that clinical diagnostics is used to investigate diseases such as cancer; this is done by using tools such as microarray which is basically comparing different samples of tissues [6]. The two studies emphasize the importance of investigating diseases using different applications. Developments also focus on enhancing health care using portable devices, which can be done by gathering data using smartphones and its features specifically social media. Social media applications, such as Twitter, can be used to obtain a real-time analysis of patients’ expressions and their feelings [5]. Information can be gathered from different social media platforms for research purposes, valuable information such as suicide and anxiety rates can be obtained using different communication sites [5]. However, other researchers think that obtaining information from smartphones and social media sites may give rise to privacy issues [7]. Another application of bioinformatics is discovering new drugs, which requires a good understanding of genes and proteins and is done by examining the interactions between proteins [6]. Health informatics applications play an important role in enhancing health care when utilized efficiently. [5, 6, 7] emphasized the importance of health informatics applications and how beneficial they can be to both medical and clinical fields. (Khalid 42526)

Another important area of study in health informatics is consumers’ interest. A general agreement exists between the authors, that is, a system could be valuable if consumers can use it efficiently and hence maximize its utility [2, 3, 8]. It is mentioned by [8] that when you give people specific information about their health, along with consequences and areas of improvement, behavior change may result. For instance, [8] decided to take a look at blood test reports as he believed that blood test reports are packed and are not used efficiently, to the extent that even doctors are not able to fully comprehend them. Consequently, [8] created a new report and improved many features. This was done by decreasing the number of pages and making the report look colorful so patients can easily interpret them. Moreover, the bottom section of the report includes a personalized descriptive recommendation of useful procedures. Overall, patients mainly want to know their results, their meaning, available options, and most importantly, the upcoming steps [8]. According to a study conducted by [2], consumers want a system that can undo their mistakes. The system should be convenient for different types of consumers who may use it and comprehendible. Also, [3] believes that consumers that care about their health may ask for the medical report. They can be granted access to all their data by allowing them to read it electronically via OpenNotes and the blue button programs. (Rashid Hassan 42998)

After studying what researchers examined regarding the issues, applications, and consumers interest in health informatics, it can be seen that improving the health information system is essential and will grow rapidly in the future. A well-integrated, highly efficient, and fully functioning health information system seems feasible but is not yet common. We believe based on research that risk analysis and successful integration of the health system is required, both from technical, ethical, and social perspectives.

**References:**

[1] P. Bath, "Health informatics: current issues and challenges," *Journal of Information Science*, vol. 34, no. 4, pp. 501-518, 2008. Available: http://eprints.whiterose.ac.uk/78563/8/WRRO\_78563.pdf.

[2] G. Larry et al, "Usability and accessibility in consumer health informatics current trends and future challenges," *American Journal of Preventive Medicine*, vol. 40, no. 5, pp. 187-197, May 2011. Available:

https://www.sciencedirect.com.libconnect.ku.ac.ae/science/article/pii/S0749379711000869

[3] C. M. Kathrin and S. Aziz, “Health information technology in hospitals: current issues and future trends,”*Future Healthcare Journal,*vol. 2, no. 1 pp.50-56, February, 2015.Availabe: <http://futurehospital.rcpjournal.org/content/2/1/50.full>.

[4] E. Ammenwerth, "Evidence-based health informatics: how do we know what we know?," *Methods of Information in Medicine*, vol. 54, no. 04, pp. 298-307, 2015. Available: https://www.researchgate.net/publication/280241014\_Evidence-based\_Health\_Informatics\_How\_Do\_We\_Know\_What\_We\_Know.

[5] A.A Roa and A.Sriastava, "Big data in health informatics," *ASCI Journal of Management*, vol. 47, no. 2, pp. 36-46,2018. Available: http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=135729143&site=eds-live&scope=site

[6] M. A. Mahdavi, "Medical informatics: transition from data acquisition to data analysis by means of bioinformatics tools and resources," Int. J. Data Mining and Bioinformatics, vol. 4, no. 2, pp. 158-174, 2010. Available: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.474.3218&rep=rep1&type=pdf.

[7] D. B. Baker, "Health information privacy and security," in*Health Informatics: A Systems Perspective,* Chicago, Ill: Health Administration Press. 2012, pp. 261-280. Available: http://libconnect.ku.ac.ae/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=643664&site=eds-live&scope=site.

[8] T. Goetz. "It’s time to redesign medical data," YouTube, Jan. 27, 2011. [Video file]. Available: https://www.youtube.com/watch?v=bCGlWQnzDVE. [Accessed: June 15, 2019].