ANALYSIS OF ELECTRONIC PATIENT RECORD SYSTEMS ON DECISION SUPPORT CAPABILITIES

Pirkko Nykänen

Department of Computer Sciences, University of Tampere (Finland)

Pirkko.Nykanen@uta.fi

Introduction

Information technologies change the way how health care services are provided and used. These changes create new opportunities for applications and for the use of these applications. eHealth concept refers to all those applications, services and information that can be delivered and used via the Internet and information technologies to improve health and provision and delivery and health care servuces [1,2]. eHealth creates a knowledge sharing environment for the health care professionals. Enablers for eHealth systems are Internet technologies and electronic patient records. The electronic patient record presents probably the most relevant change factor in medical practice and it forms the basis for many innovative tools, e.g. data analysis and decision support systems. In this paper we analyse the possibilities of electronic patient records as aHealth applications to provide decision support for medical professionals.

Materials and methods

Our analysis materials consist of electronic patient record systems that are used in our country by medical professionals and that are accessible via the Internet or telecommunication networks. These systems have a long history and they have been gradually updated to cover the needs of the networked environment. These systems differ in functionalities, in scope, in use modalities and in technologies used. The systems are very heterogenous, they also lack a uniform infrastructure for data representation and exchange and agreed and shared vocabularies.

In our analysis we have studied these electronic patient records from the viewpoint of decision support possibilities. Therefore we have prepared an evaluation grid which represents the decision support criteria. The grid covered the following criteria. First, health professionals needs for decision support which were derived from the decision support literature and from the known models of decision support systems. The major model used was the well-known environment and process model of decision support systems, table 1 [3,4]. Second, health care infrastructure characteristics were covered with special emphasis on eHealth environment aspects.

Results

Decision support systems have been majorily developed with technological and implementation orientation [5]. The contextual aspects and the environment variables have not been much considered with decision support systems [4,6]. Our analysis of electronic patient records emphasise the importance of environment variables if the electronic patient record is supposed to be able to provide decision support for a health care professional. Awareness of the context, and the domain, allows the change in focus from task-oriented electronic patient record systems to domain-oriented systems.

Table 1: Environment, process and IS system variables for a decision support system

Environment	Process	Information system
External environment	Development process	Content
Organisational environment	Use process	Scale
Development environment		Representation
User environment		Knowledge
		Application

Conclusions

Electronic patient records are widely used and they are largely developed to support health professionals in patient care and especially in documentation of patient data and information. There systems are much task-oriented. Our analysis revealed that electronic patient records can provide medical professionals with decision support when developed with domain-orientation. The analysis results are presented in detail in the paper in the described evaluation grid framework.

References

[1] SILBER D, The case of eHealth. European Commission, IST, eHealth Conference 2003, Atlanta, Belgiumm 2003.

[2] WILSON P, LEITNER C AND MOUSSALLI A, Mapping the potential of eHealth. eHealth

Conference 2004. European Institute for Public Administration, The Netherlands, 2004

[3] IVES B, HAMILTON S AND DAVIS GB, A Framework for in research in computer-based management information systems. Management Science 26 (9), 1980, 910-934.

[4] NYKÄNEN P, Decision support systems from a health informatics perspective. Tampere University, Research report A-2000-10, Tampere University, 2000

[5] TURBAN E AND ARONSON J, Decision support systems and intelligent systems. Prentice Hall,USA, 1998

[6] HEATHFIELD HA AND WYATT J, Philosophies for the design and development of clinical decision support systems. Meth Inf Med 32, 1993, 1-8.