

Roy Rada, Claude Ghaoui, Ray Paton, Malcolm Taylor



Medical Knowledge and Hypermedia

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This position paper describes the history of the University of Liverpool research group and its vision. The vision is to merge medical knowledge and hypermedia so as to produce more powerful information creation and access tools for all players on the health care scene. This vision corresponds with the GALEN vision in that it seeks to improve ways of building the appropriate knowledge bases which must underlie such information spaces and it relates to the major demonstrator of the GALEN effort, namely, the user interface to medical information.

(Authors)

1. Introduction

Change is based on gradually building on existing structures so as to get functions similar to current functions. In the area of health care, the education of the population and the training of the health care deliverers are improving with new information and new media. For people to deal with this information effectively, they need readily understandable abstractions of the information.

2. History

The researchers in the Many Using and Creating Hypermedia (MUCH) group at the University of Liverpool have been working with medical applications for 15 years. The first applications were to the coding of patient records by the mapping of problem statements to terms in a classification of problems in primary care. (1) That work showed the power of simple analyses of terms. In subsequent work, knowledge extracted from medical textbooks was placed in rules of a medical diagnostic expert system and the rules were refined by consulting a semantic net for the domain. (2)

To get to an appropriately large medical semantic net which was routinely maintained and used, the MUCH group next looked at the Medical Subject Headings and ways in which it could be extended and exploited. One application of such semantic nets is to the manipulation of documents or other information sources (3).

3. Plans and Relation to GALEN

The MUCH group builds tools with applications in the health care area. Tools are being built to support the:

- * automatic entry of information from both medical classifications and documents.

- * finding of this information through various intuitive means, such as browsing of outlines and string search.
- * generation of multiple, dynamic views to suit individual needs. As these views amount to a reorganization which is, in turn, a kind of reuse of information, the access method is also a creation method.

These tools will be applied to the dissemination of knowledge for training and education in health care.

In the first steps of this information dissemination, the classifications of health care are the target information. This target for MUCH coincides with the target for GALEN.

GALEN will use existing classifications to boot-strap a knowledge base from which multiple views can be generated. In the immediate future, the MUCH group will develop methods for working with medical informatics classifications and will then apply these methods to other classifications.

4. Conclusion

The most fundamental needs for improved health include patient education and training of health care professionals. This education and training depend on people accessing and creating information flexibly. This flexibility depends on the ready recognizability of knowledge which underlies the information.

The MUCH group will show through simple prototypes that knowledge of an atomic character can successfully support flexible interfaces to medical information. The results of GALEN are needed for the progress intended with hypermedia and the MUCH system. At the same time, the experiences with MUCH will provide feedback for the work of GALEN.

References:

- (1) Rada, R., Evans, L.: Automated problem encoding system for ambulatory care. *Computers and Biomedical Research* 12(1979)p.131-139
- (2) Rada, R., Rhine, Y., Smallwood, J.: Rule refinement. In: *Proceedings Society Computer Applications Medical Care*. IEEE Press 1984. p.62-65
- (3) Hafedh, Mili, Rada, R.: Medical Expertise as regularity in semantic nets. *Artificial Intelligence in Medicine*, 2(1990)No.4, p.217-229

Address: Prof. Roy Rada, M.D., Ph.D., The University of Liverpool, Department of Computer Science, Liverpool L69 3BX, England