Abstract

Medical learning objects deviate from traditional notion of learning object in that it is always in a digital form and relates to medication. They may include text, images, sound and video. They are introduced in order to facilitate the employees of healthcare sector and patients. In this article, we illustrate how medical learning objects can be personalized according to the user knowledge and adapted according to the working process in which the learning object is invoked. We believe that by introducing personalized and adapted medical learning objects we can optimally develop e-learning processes for healthcare sector that are just-in-time and are tailored to their specific needs. A problem of this approach is that the system has to support many variations of a medical learning object. We have solved this problem by producing the variations by the XSLT-transformations of the learning objects, which are processed when the learning object is invoked.

1. Introduction

Medical knowledge is expanding every day. As a result no physician can keep up without the help of modern information and communication technology [1]. Ideally by integrating high-performance computers, high resolution video and fiber-optic information highways we could put the entire world of medical science at the fingertips of even the most isolated nurse and patient.

An interesting question arising from this vision is how medical knowledge should be organized and retrieved. In this article we focus on this problem.
This kind of personalization requires that the system has different variations of the medical learning objects. For example a medical learning object focusing on diabetes should have at least the following variations:

- The **expert variation** includes the newest medical knowledge of diabetes.
- The **professional variation** includes useful information for all professionals of the healthcare sector whose work somehow relates to diabetes.
- The **general variation** includes information about diabetes that is understandable for an average patient.

It has turned out that in many cases that the variations developed for personalization is not enough but also some kind of adaptation is needed. By adaptation we mean that the system is context-aware of the working process in which the learning object is invoked, and the returned learning object is adapted according to the working process. For example, if the diabetes learning object is invoked by a pharmacist in drug invoicing process, then the returned diabetes learning object should include information about the constraints under which the healthcare authority is obliged for paying antidiabetic drugs.

A consequence of introducing adaptation is that the number of required variations still increases giving rise for more complex management of learning objects. However, in our approach there is only a need for one physical copy of each topic (e.g., on diabetes) because its variations are produced on fly from it by the XSLT-transformations. An important gain of this approach is that the updates of a learning object have to be done only on the physical learning object but not on its variations.

2. The Medical Learning Object Server

The Medical Learning Object Server (Figure 1) that we are developing provides an interface

- for the content provider for the creation and updates of medical learning objects
- for the user the taxonomy- and ontology based searching interface.
- for the medical applications an API (Application Programming Interface) for searching medical learning object.

3. Conclusions

By using traditional information retrieval methods retrieving medical information is frequently a long lasting and frustrating process because the returned medical information is not relevant, is overly superficial or overly specific.

We believe that by introducing personalized and adapted medical learning objects we can optimally develop e-learning processes for healthcare sector which are just-in-time and are tailored to their specific needs.

In our solution medical information is personalized according to user background and adapted according to the working process in which the information is invoked. We believe that in this way we can avoid many of the problems related to the quality of medical information retrieval. A drawback of our approach is that style sheets have to be produced for each variation of a medical learning object.

References


