The Internet in Connecting Electronics Health Record Mobile Clients

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Abstract:

The European Center for Medical Informatics, Statistics and Epidemiology - Cardio (the EuroMISE Center - Cardio) was focused on new approaches of designing of electronic health record (EHR). In the first EHR pilot application - MUltimedia Distributed Record (MUDR) we include the possibility of mobile patient data accessing by physicians outside of their consulting rooms. The development of new advantages is mostly based on experience gathered in the European project I4C-TripleC. The two-layer architecture used in the "Open Record for Care" (ORCA) developed within this project was in the MUDR extended to a three-layer architecture consisting of a data layer, an application layer and user interfaces. By virtue of the defined communication interfaces based predominantly on HTTP, HTTPS, XML and WAP protocols, it is possible to use clients for various purposes like medical data entering and their visualization, statistical data processing or mobile data accessing. These clients may be connected over the Internet from anywhere in the World which enables easy sharing of patient data. In the MUDR we are using an extensible set of services at the application layer, which transforms the command-response based XML to documents conforming the HTML or WML language. These utilities are mostly implemented as preprocessors in form of programs conforming to the "Common Gateway Interface" (CGI) or as HTTP Server modules.

Using this facility, more application complexity can be moved to the second layer of the MUDR, which simplifies the user interfaces and enables to communicate with clients in form of web browsers, Pocket, Handheld or Tablet PCs, PDAs or mobile phones. It is important to conform to special conditions of these devices. Compared to personal computers we have to adapt to smaller and often just monochrome display, aggravated controlling possibilities, lower memory and computing power, slower data transfer etc. Taking note of these constraints we are preparing a solution, where the patient data will be pre-selected at the application layer using physician's specifications together with the semantic knowledge about the stored patient data. Using this technique just the selected relevant data will be transformed according to the needs of the mobile clients. The other attributes will be enabled on a special demand. Therefore the required amount of transferred data will be lowered which will lower the needed communication speed as well.

As the first MUDR mobile module we are developing a special utility at the application layer, which transforms the MUDR application interface (MUDR API) to a special form of HTML. This HTML must conform to the limited possibilities of small web browsers used internal in mobile devices. This portable and universal solution we are testing by using the Nokia Communicator as the MUDR Client, whose browser does support neither tables nor frames.

Keywords:

distributed electronic health record, mobile health data access