

WebOnCOLL: An Open Platform Enabling Collaborative Information Sharing and its Application in Medicine*

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Abstract: *WebOnCOLL* is an open web-based collaboration environment, which has been used in the design of a virtual medical office. It employs the Healthcare Information Infrastructure of regional networks to support teamwork through integrated services that provide access to regional resource, information, and collaboration facilities including personalized web pages, information channels, bulletin boards, discussion lists, annotations, e-mail, and shared workspaces. These collaboration services are the centerpieces of the virtual medical office, which can be used to provide media-rich teleconsultation services.

1 *WebOnCOLL* Integrated Collaboration Services

The Healthcare Information Infrastructure of a regional network includes high-speed networks and a wide range of regional information services that operate as enabling/middleware services [1]. Regional directory, resource, and security services may interoperate with web-based collaboration services for information channels, annotations, e-mail, and on-line teamware. *WebOnCOLL* [2] employs the HII to provide integrated web-based collaboration services, customized for the healthcare domain. *WebOnCOLL* is currently used as a platform in the design of a virtual medical office. A virtual medical office can support a network of experts that provide healthcare-related consultation services. Within the network, private conversation, secure e-mail, audio and video conferencing, as well as personalized web pages, facilitate the exchange of information, while medical case folders support and organize media-rich teleconsultation services.

Central notions of the *WebOnCOLL* architecture are virtual workspaces and user profiles. Virtual workspaces maintain the common context in user sessions enabling service interoperability, while user profiles customize the environment in accordance to user preferences. Virtual workspaces maintain session information, history of interaction, and access privileges. Each user session is associated with a virtual workspace. A virtual workspace is a directory of multimedia objects selected or created during navigation. Users may populate the current virtual workspace with objects originating from a medical intranet, the web, or private collections. Virtual workspaces may be public, shared, or private. All users connected to a shared workspace are notified of workspace updates as they occur and may inspect the attributes of workspace objects. Furthermore, a user connected to a workspace may be aware of all other users connected to the same workspace. Special types of virtual workspaces are medical case folders and information channels. Medical case folders contain multimedia objects relevant to a particular medical encounter e.g. images, examinations, comments, discussions, updates, alerts, etc. Information channels linked to personalized web pages, bulletin boards, discussion lists, shared workspaces and medical case folders, enable the *push* delivery of information, without the user manually requesting it. Each information channel is associated with a personalized profile that specifies the content provided by the channel, the disk space allocated for the channel, and the update frequency [3]. User profiles allow the customization of the environment to user authorities, tasks, and preferences. Information maintained by user profiles concerns also account information and subscribed services. Subscribed services relate to personalized information services such as notification services and information channels.

2 Virtual Medical Office for Teleworking

Certain medical professionals need constant access to their working environment, even though this environment is naturally distributed. Consider a medical professional who maintains a university office, a home office, and a private practice office. There is constant interaction with assistants, colleagues,

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and patients in all offices and the professional needs to access information (colleagues, medical cases, reminders, notifications, etc.) regardless location.

The *WebOnColl* collaboration environment is used to create a virtual medical office [4][5], which improves the ability of medical professionals to work, while enhancing their mobility. The front-end to a virtual medical office maintained in *WebOnCOLL*, is a personalized web page that serves both as a contact point and as a front-end to the working environment of the user. People that wish to communicate with the user may post notes or content to a personal bulletin board present in that page. At the same time, the personal web page provides access to the working environment of the user. The working environment of a medical professional is comprised of notifications, calendar, information channels, health records, and other relevant services. Assistants, collaborators and patients may interact with this environment as appropriate. An assistant may post a schedule change, a collaborator may leave a note, a patient may request an appointment or an advice, etc. The notification support of virtual workspaces ensures that the physician is informed of workspace updates in a timely manner.

The virtual medical office facilitates the provision of media-rich teleconsultation services through the support of medical case folders. A patient or a collaborator may create a medical case folder and populate it with clinically relevant material. Later on, the medical professional will be able to review the material, request further information, discuss it with collaborators and the patient, or suggest further examinations or treatment. The medical case folder provides a partial view of the electronic healthcare record. A typical medical case folder includes information from medical history, medication, progress reports, and data intensive diagnostic services, such as laboratories and imaging departments etc. following the Subjective, Objective, Assessment, Plan (SOAP) information model [6]. Part of the multimedia data in a typical medical case folder requires specialized applications for viewing and processing, e.g. DICOM or ECG viewers. To meet this requirement, *WebOnCOLL* provides *helper* applications, which are associated with medical data types. Health-related data may be inserted to a medical case folder through uploading, or direct access to web-enabled clinical information systems, or even the virtual healthcare record interface which integrates and provides access to heterogeneous autonomous information systems within the medical intranet. A medical case folder may also be linked to information channels that provide customized access to diagnostic databases and digital medical libraries. Furthermore, access to regional information services facilitates the exchange of secure and up-to-date information.

3 Conclusion

The *WebOnCOLL* open collaboration environment is used as a platform in the design of a virtual medical office for teleworking. The provision of *helper* applications and web services for viewing, processing, and collaborating on the multimedia contents of medical case folders, sum up the approach to medical collaboration as employed in *WebOnCOLL*. Medical case folders simplify the organization of multimedia information related to particular encounters while collections of medical case folders facilitate various forms of collaboration such as teleconsultation, referral, and education.

4 References

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