Data-Mail: A Design for Electronic Consultation

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Data-Mail is an electronic consultation system that combines a database with the existing electronic mail system. Electronic mail allows for targeted delivery of information regardless of location or computer sophistication. The database facilitates retrieval, storage, and analysis of consultation requests and reports. The impetus for development was the emerging managed care environment. Managed care necessitates that physicians maintain a quality medical practice while being cost effective. Resources must be used efficiently and one such resource is consultants [1]. The current system hampers efficiency because consultation is a cumbersome, labor-intensive process which often generates illegible carbon copies. Data-Mail is designed to facilitate consultation through a rapid, accurate, legible, and complete exchange of information between primary care physicians and consultants.

A major consideration in designing the consultation system were plans to deploy a highly sophisticated electronic medical record for the Outpatient environment. We therefore needed to develop an interim solution at minimal cost that could be incorporated into the future system. Our interim solution was to use existing networked software (Lotus® cc:Mail 2.2 and Microsoft® Access 2.0) that runs on the standard workstation. At the time of development, the standard workstation was a PC compatible 486, 33-66 MHz with 16 Meg RAM, running Windows 3.1 (near future Windows NT). The network was Novell® Netware 3.12 LAN. Neither the World Wide Web nor Lotus® Notes were supported on the hospital network.

The consultation requests are sent across the LAN as encrypted binary files attached to an electronic mail letter forwarded to a central mail box. The central mail box relays the information to all appropriate parties (e.g., consulting physicians, medical records, and practice management personnel by the use of keywords attached to each message. Information received by the central Mailbox is permanently stored in Microsoft® Access.

The consultant's Data-Mail application interface automatically retrieves and decrypt referrals. All referral output is available on screen and as print outs automatically generated on the day of visit. Consultation reports are sent and stored in the same manner as the requests described above.

All reports are sent to the referring physician as electronic mail. This encourages further dialogue between referring physicians and consultants. For this reason, electronic mail has been used to disseminate medical information including consults at other sites [2-4]. The database provides for retrieval and analysis by practice management personnel.

We are currently implementing the system in a pilot project with the General Medicine Practice (Internal Medicine Associates) and the Gastroenterology Practice of the Mount Sinai Medical Center. The General Medicine Practice sees an average of 2,000 to 3,000 patients per month and requests 300 to 400 consults per month. Requests for Gastroenterology consults average about 35 per month. The method for inputting information into the Data-Mail is designed to be flexible and accomodate the wide range of experiences and preferences of the different specialties for entering data. For example, gastroenterology lends itself to a more structured form with drop-down lists. These lists can be populated by a standardized vocabulary and contain terms related to specific procedures, and/or body geography. The Endoscopy Reporting Interface (developed in Visual Basic 3.0) employs a structured form with drop-down menu's and pick lists populated with a pre-defined gastroenterology vocabulary [5].

In conclusion our system combine electronic mail and a database into one system to provide rapid, accurate, legible, and complete exchange of consult information. Future plans include evaluating the system (e.g. user satisfaction, on-time performance, cost, frequency of use), development of a Web-based front end, and migration to Oracle (database).

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