Expert Notification System: Automated E-mailing of Test Results to Ordering Physicians

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INTRODUCTION AND BACKGROUND

Despite the installation of a computerized order entry and result reporting system, physicians at the Cleveland Clinic Foundation (a multispecialty group practice and hospital) continued to experience delays in receiving test results. Primarily this was due to the absence of a system for notifying the physicians that the result was available for review. Prior to the development of Expert Notification physicians had two choices for retrieving results; 1. Look up all pending orders on the computerized result repository or 2. Wait for the hard paper copy of the report to be mailed to them. An alternative approach called Expert Notification was proposed that used existing systems, namely, Novell GroupWise an E-mail system, and Datagate, an interface engine, to send the test results directly to the ordering physician as E-mail.

TECHNICAL SOLUTION AND DESIGN

The results from ancillary computer systems are currently flowing through Datagate to the result repository. Datagate logs these results making them available for other uses. A team from the Information Technology Division at the Cleveland Clinic was given the task of improving the flow of results to physicians using a notification system. The team was comprised of a Clinical Analyst, and three Systems Analysts.

The solution uses a logic script written in PERL programming language. When the program is run it imports a database that contains information concerning the physicians that are currently enrolled in Expert Notification and the results that they have chosen to receive. Once the results for the physicians are identified, they are sent via Unix mail to the Simple Mail Transfer Protocol (SMTP) Gateway. From here they are forwarded to the GroupWise E-mail system and finally to the physicians' personal mailbox. The program is run twice a day, at 1:00 a.m. and at 1:00 p.m.

Two ancillary services, General Laboratory and Radiology, that are highly used and have well-established interfaces were selected to begin the project. Physicians were given the choice of receiving results from one or both of the services. For General Laboratory and mammography, physicians were also given the choice between receiving all test results or just abnormal results. Finally, physicians were given the choice of electing to receive results from specific tests with respect to radiology or laboratory.

RESULTS

The pilot began on November 4th 1997. Physician entry into Expert Notification has been staggered over the last 4 months and currently there are 31 physicians enrolled. So far only three physicians have elected to go back to the manual approach of receiving results citing in two cases that their previous routine for retrieving result was not an issue and one found Expert Notification to be overwhelming. Nineteen physicians have been enrolled for more than 6 weeks and were asked to respond to an evaluation. All of the 19 physicians found that Expert Notification provided results faster than the manual systems. Generally the improvement was found to be 24 hours for lab results and 72 hours for radiology results. Seventeen of the 19 physicians surveyed found that Expert Notification allowed them to get information from the patient faster which they felt improved patient care. The two physicians that did not think it improve the delivery of information to patients were two of the three that elected to quit the pilot.

CONCLUSIONS

Although the pilot is small, the overwhelming response has been positive. 89% of physicians surveyed found that receiving results via E-mail has made them more efficient thereby improving services to the patient. All physicians surveyed found that E-mailed results were available for review quicker than relying on manual systems to retrieve results. While more evaluation is needed, sending results to physicians via E-mail appears to be an improvement over the more conventional methods of delivery.