Combating information overload: a six-month pilot evaluation of a knowledge management system in general practice

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SUMMARY
A six-month prospective study was conducted on the usefulness and usability of a representative electronic knowledge management tool, the WAX Active Library, for 19 general practitioners (GPs) evaluated using questionnaires and audit trail data. The number of pages accessed was highest in the final two months, when over half of the access trails were completed within 40 seconds. Most GPs rated the system as easy to learn, fast to use, and preferable to paper for providing information during consultations. Such tools could provide a medium for the activities of knowledge officers, help demand management, and promote sharing of information within primary care groups and across NHSnet or the Internet.

Keywords: knowledge management tools; audit trail; information technology; primary care.

Introduction

THE information overload experienced by general practitioners (GPs), in terms of patient management and referral guidelines amassed in an unmanageable tower of paper, has been quantified by Hibble *et al.*[1] The present evaluation formed part of a research project set up by the National Health Service (NHS) Executive Anglia and Oxford Research and Development Directorate, to develop a core resource of electronic information with which to pilot an electronic knowledge management system (WAX Active Library) designed to address this information overload in primary care.[2]

WAX displays hyperlinked text with simple formatting supplemented by linked multimedia files and is designed for use during consultations, providing fast navigation and searching of information. The content is given a transparent structure of 'pages' within 'books' on 'shelves' in a library and is stored electronically on the local computer hard disk when in use. Additional features include a 'feedback' function, where users can key in comments about any page displayed, and an audit trail, in which the system logs the date, time, and name of books and pages that are accessed.

Method

This evaluation was designed as a prospective multi-method study of the usefulness and usability of WAX as a representative electronic knowledge management tool rather than of the impact of the system on patient or process outcome measures.

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Nineteen GPs were provided with WAX Active Library software and a set of electronic WAX books and their use of the system was studied for six months. The GPs were volunteers from 17 practices in Cambridgeshire, with computers running Windows 3.1 or higher operating systems, were male, and mostly aged between 30 and 50 years. The pilot began in March 1998 with a seminar at which training was provided in use of the software, the information content of the WAX library was demonstrated, and the purpose of the evaluation was explained. Visits were subsequently made to practices to install the system and to provide brief 'hands-on' training. Data on the pattern of use of the system came from audit trails collected from April to September. In addition, GPs were asked to complete questionnaires before, during, and after the study, and to use the 'feedback' facility while accessing the system.

Results

Audit trail

Figure 1 shows that initial usage subsided after the first full month (April 1998) and then increased steadily, reaching a maximum at the end of the study. Although extra books were added to the Library during the study, this does not entirely account for the increasing use as not all books proved equally popular.

Another feature of WAX use revealed by the audit trails (using data from the final two months of the study) is the short time taken to reach the required page of information. Thirty per cent of access trails were completed within 15 seconds, while 52% were completed within 40 seconds.

Feedback

A total of 97 comments were collected via the 'feedback' function in the user interface: 50 regarding specific information items (including 24 praising and 11 criticising the content), 22 on book structure and page layout, and 25 requests for extra information and new system features.

Questionnaires

Seventeen out of 19 (90%) users declared that WAX was easy to learn to use, including the three who did not use a computer at home. Fifteen GPs used WAX in the consulting room when patients were present. WAX was rated 'excellent' as an information source by 10 out of 19 GPs. All users reported that they found it either 'very easy' or 'moderately easy' to navigate around the information content in WAX, to find a specific book, and to use the search facilities. Twelve users (71%) said they were 'much more' likely to use a referral guideline in WAX format than on paper, while only one thought it was 'a bit less' likely that he would use a WAX version than a paper version. Nine out of 15 users (60%) declared that specific guidelines were easier to locate in WAX.

All GPs wanted to continue using WAX after the pilot study, with either no change or only a small modification to the software (15 GPs [88%]) or after a major improvement to the software (two GPs).
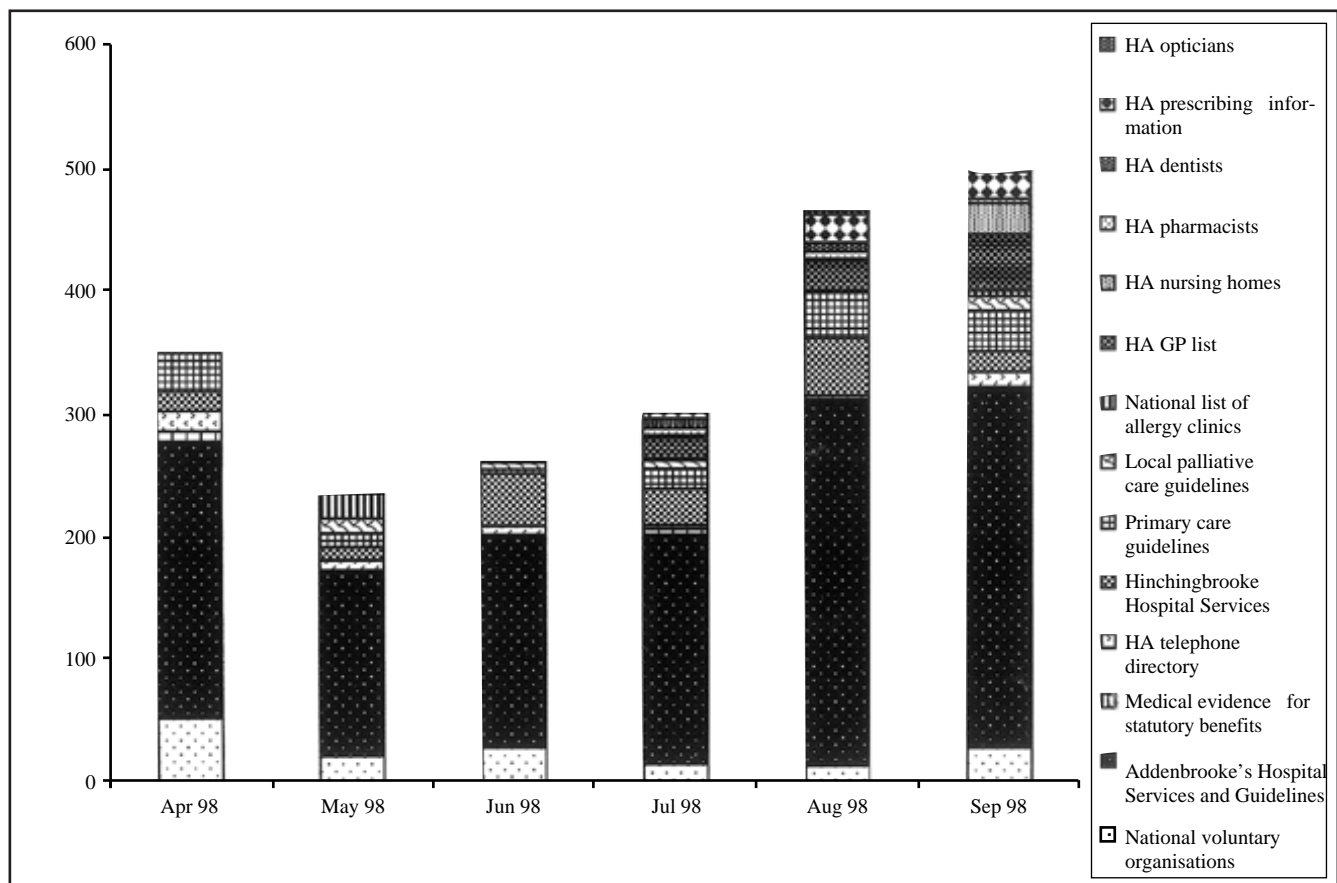
Figure 1. Use of the WAX Active Library, measured by number of pages accessed per month, broken down by book title. (HA = local health authority).

Conclusions

This study involved a small number of GPs, all of whom volunteered to participate, indicating a prevailing positive attitude towards information technology. Despite these limitations, our results regarding the high ratings for usefulness and usability, the increasing use made of the system, and the wish of all GPs to continue using WAX when the pilot was finished suggest that simple, fast information management tools have a potentially wider application in helping GPs to combat paper overload, and also in other roles. Such tools could, for example, provide a vehicle for the activities of a chief knowledge officer[3] who would oversee the information coming into and leaving an organisation, such as a primary care group or the National Electronic Library for Health.

National Health Service Trusts and health authorities, such as those providing information content used in this pilot, appreciate the potential of such tools for demand management. The 'feedback' function in WAX, which allows users to make comments immediately upon accessing information, provides a mechanism for communication between purchasers and providers.

Neither the software of current web browsers nor the diversity of website formats support optimal clinical knowledge management because they lack the transparency of information structure and fast access that GPs valued in the current study. While WAX Active Library cannot fully exploit the potential for knowledge sharing now offered by intranets, NHSnet, and the Internet, its network-aware successor WaX version 2, which uses HTML/XML documents, is designed to do so.

References

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