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An outreach librarian projects impact upon successful digital library uptake.

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ABSTRACT

This paper reviews the implementation of digital libraries via communities of practice and an outreach clinical librarian. 26 In-depth interviews were conducted across 8 different clinical teams within a London based primary care trust. The interviews and an observational study of the team and information mediator collaborating during a drop-in session, took place over a 6 month period. The findings reveal how effective implementation procedures can produce a positive user motivation towards digital libraries and evidenced based medicine (EBM) that previously was perceived as a chore. An information facilitator implemented within the community which could adapt to and change practices according to individual and group needs was seen as empowering to both the community and the individual.

Categories and Subject Descriptors

General Terms

Health informatics, Human Factors, Organisational structures, Digital libraries

Keywords

Grounded Theory, Evidence based medicine, implementation procedures, communities of practice.

1. INTRODUCTION

Within the health domain the increased importance of evidenced based medicine for healthcare professionals necessitates the use of current best evidence in clinical decision-making [sack]. Reddy & Dourish [8] confirm the importance of information being available at a glance to members of a unit. There is, therefore, an escalating need to improve the accessibility of reputable information sources. Schneider and Wagner [11] also highlighted the increased importance, within a clinical setting, of local knowledge, informal collaborative contexts and technology to support the sharing of information.

However, simply placing technology within current social structure may not provide the uptake or usage expected. A key aspect in effective implementation of digital resources is to understand the context within which the technology is placed. Lave and Wenger [6] argue that social practices shape

how we learn and in turn who we become. Communities of practice, they suggest, are an important factor in the uptake and usage of technology. Wenger [16] notes that *designed organisations'* directives cannot make things happen, this is down to practice and the communities that drive those practices. Organisational directives can also produce barriers (e.g conveying appropriate status, roles) to users ability to establish an identity which is conducive to participation in their community of practice. This would imply that to simply make resources available while organizationally pushing procedures for their usage is not an effective way to implement digital resource usage.

2. BACKGROUND

When hospital information systems were first introduced, it was found that the greatest difficulties in the system's deployment lay not with technical issues but with the users, their reactions to its introduction and the acquisition of new skills [3]. Recent health informatics research also reveals that social and organizational factors can determine the success or failure of healthcare IT developments [2, 5, 4]. Heathfield [5] suggests that this is due to the complex, autonomous nature of the medical discipline and the specialized (clinician or software engineer) approach to system development. Negative reactions to these systems is often due to inappropriate system design and poor implementation. However, there may be other less obvious social and political repercussions of information system design and deployment. Relationships and tensions between communities of practice have a strong impact on changing technology and procedures within the health domain. The diverse organizational culture of hospital structures, made up of many different professions with their own specific social identifiers, can often produce conflicts between those professions [7, 9, 15]. Symon et al [13] have identified, within a hospital scenario, how social structures and work practices can be disrupted by technology implementation.

A key aspect in the awareness and usage of digital resources relates to how the technology is implemented and accessed by the users. Adams & Blandford [1] have identified how social and organisational structures can impact upon users' awareness and acceptability of digital library resources. Todd *et al* [14] highlighted the fact that nurses' current work-practices (e.g. shift patterns, ward-bound duties) restrict their access to libraries and the internet.

The concept of ‘communities of practice’ came from a learning theory developed by Lave and Wenger [6] called legitimate peripheral participation. It is suggested that learning within any domain is more than a formal acquisition of knowledge or information but that it has a social element, which is often ignored. Learning, it is argued, should be a process of participation in ‘communities of practice’. This theory details how new members are brought into knowledge communities, and how knowledge communities both transform and reproduce themselves. This participation is at first peripheral but gradually increases in both engagement and complexity. They proceed to argue that the emphasis within learning should be on the whole person and is equally comprised of the agent, activity and world. Wengers’ [16] book on ‘Communities of Practice’ continues with a framework in which the two basic streams are *Practice* (from collective social norms of practice to accounts of meanings) & *Identity* (from impacts of organisational power and social structures to those of personal subjectivity).

The difficulty some professionals experience in accessing the physical library, and the push for evidenced based medicine, have resulted in different approaches to implementing DL technology – such as remote DL access, computers on the wards and outreach information intermediaries. This paper seeks to present the findings of a review of one approach to digital library implementation through the use of outreach information intermediaries (clinician librarians).

3. RESEARCH METHOD

The project, reviewed in this paper, aimed to support clinicians in their digital library searches by providing direct contact with a clinical librarian (CL), so the ‘library would come to them’. The clinical librarian interacted with clinical teams to facilitate interactions that would support the implementation of evidence-based medicine (EBM). A representative from within each team was chosen to facilitate the team / library interactions at the beginning of the project. The clinical librarian initially interacted with the teams as a whole (e.g. at team meetings, ward rounds etc.) and with the representative. As relationships were built up between the CL and the team members personal contacts were made via email, phone and at scheduled drop-in sessions where the CL was available at the team’s site. The CL initially provided a digital information searching and training service (e.g. digital library and Internet searching, Clinical question framing) appropriate to the team and individual needs. However, the CL role during the project progressed far beyond this (see results).

26 In-depth interviews were conducted across 8 different clinical teams within a London based primary care trust. Five of the interviews were conducted with key stakeholders (e.g. project co-ordinators, project librarians and IM&T) while the other 21 interviews were conducted with a spread of clinicians (e.g. doctors & consultants, nurses, social workers, physiotherapists, psychiatrists and psychologists). The interviews and an observational study of the team and information mediator collaborating during a drop-in session, took place over a 6 month period. Although there were a wide variety of digital resources mentioned the three main digital libraries discussed were Medline, the Cochrane library and the UK National electronic Library of Health, NeLH).

Four issues guided the focus of questions analyzed within all the studies:

- ♣ Perceptions of their role within the organization, and their information requirements.
- ♣ Perceptions of current information practices, social structures and organisational norms.
- ♣ The impact of current practices, structures and norms on information resource awareness, acceptance and use.
- ♣ Technology perceptions (specifically of DLs) and how these affect other issues already identified.

An in-depth analysis of respondents’ perceptions was conducted using the Grounded Theory method. Grounded Theory [12] is a social-science approach to data collection and analysis that combines systematic levels of abstraction into a framework about a phenomenon which is verified and expanded throughout the study. Once the data is collected it is analysed in a standard Grounded Theory format (i.e. open, axial and selective coding and identification of process effects). Compared to other social science methodologies, Grounded Theory provides a more focused, structured approach to qualitative research (closer in some ways to quantitative methods) [12]. The methodology’s flexibility can cope with complex data, and its continual cross-referencing allows for grounding of theory in the data, thus uncovering previously unknown issues.

In the results discussed below, many points are illustrated with verbatim extracts from the interviews and focus groups. In these quotations, the speaker is identified by role, but not as an individual (so, for instance, multiple excerpts from a ‘Pre-registration nurse’ are not necessarily from the same individual).

4. RESULTS

The research identified what impact the clinical librarian intervention had on the implementation of EBM and the use of digital resources. The findings highlighted that without the clinical librarian support clinicians noted problems in implementing EBM due to time factors, IT facilities and searching skills resulting in clinicians a) adopting informal evidence verification methods (e.g. asking colleagues, patients to search for information) or b) avoiding EBM.

Time factors	“So if I think of the hours that I spent and the cost effectiveness of doing it in that way.” (Consultant)
<i>EBM</i>	“I think what would happen is that it would get shelved for quite a time.” (Psychologist)
<i>Patient information</i>	“I would have got along without knowing and simply given the patient the best answer I could without knowledge and saying ‘to my way of thinking that’s as much as I know about this, that’s what I think.’ I may have said there may be ways of finding out further and encourage them to do that for themselves – I may, I might not. If I really wanted to know something I would do something that I still do now which is to ask a colleague.” (Consultant)

Clinical librarians and their search skills, in particular, were valued by clinicians as they saved them time while providing them with a high level of appropriate information.

<i>Search skills</i>	“... you knew that she, through her training and knowledge, was accessing everything that there was available.” (Social Worker)
	“But I think again its our lack of expertise ... she could do it in a fraction of the time that it would take me to do it, because she's got the knowledge.” (Physiotherapist)
	“So she's been quite thorough, she's highly respected in the team.” (Doctor)

Ultimately, however, clinical librarians support for EBM raised its awareness and implementation either by attending meetings, recording queries and searches or actively proposing searches.

<i>EBM awareness and support</i>	“Because as you go along seeing other patients you do have some doubts and questions that you're not sure about.” (Nurse)
	“It increases the sense that you think, I can find out the answer to this question” (Consultant)
	“Because she was there the team ... would be saying well I wonder what the latest research has been showing and (the CL) would be there and she would begin the process of registering that search and going away and doing it.” (Doctor)
	“(The CL) would sort of raise the flag and she became very good also at predicting and anticipating when a clinical discussion was leading towards asking a clinical question that could then be addressed by her help. So there would be times, as and when appropriate when she would actually take the initiative herself.” (Consultant)

The study also identified further what were termed ‘knock-on-effects’ which resulted from the clinical librarians interaction within the teams. A wide variety of information was sourced by the CL ultimately turning their role into one of an ‘information facilitator and manager’ for the team and its members.

- ♣ On medication, diagnosis, therapies, procedures and services
- ♣ On financial, legal and management issues
- ♣ For patients and carers.

<i>Service and financial information</i>	“We had a patient on our acute ward whose clinical condition had been dealt with and we were having difficulties at a service level with discharging that patient ... what we managed to do with (the CLs) help was actually address the financial implications
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	of the patient remaining on our ward ... because she knew exactly who to access for that information.” (Consultant) “For example, she got this information for us – its about giving patients medication without them knowing it and she checked it out. It’s an up and coming issue and we wanted to know the legality issues as much as anything else.” (Social Worker)
Patient / Carer information	“Well if you haven't got the evidence you can't feel that you can advise ... you might be just advising carers you know, this is what I've read and this is what we've got.” (Physiotherapist)
New information sources	“We give over one of the Journal clubs for (the CL) to come and talk about the ‘focus project’, which is the government’s ‘finding the evidence’.” (Doctor)

Increased team cohesion and development also resulted from the CL interventions especially with regard to joint goals and knowledge acquisition. Individual skills were also identified to increase depending on the degree of CL contact time and access to IT facilities.

CL Identifying team & individual information needs	“What I find very valuable is that she comes to some of the team meetings so she really does have an understanding of the topic and an empathy with it.” (Psychologist) “just on the off-chance she was looking for stuff for Christine and found other stuff for me which was so helpful.” (Consultant)
Team information enthusiasm (journal groups, team resources, information sharing)	“It feels as though there has been an ethos of shared endeavour to get a more pro-active relationship to evidence-based practice and I think without this it will just collapse. I think people will be motivated by their own personal gain or requirements. But in terms of an integrated mindset, which is ongoing and developmental, I can't see it happening without (the CL)” (Doctor)
IT and DL searching skill development	“I think it encourages me to begin to do more myself because she’s there and because she can just say well we can start and do something. The whole technology side doesn’t become so overwhelming and daunting.” (Psychologist) “She trained us up though, she showed us how to look up for relevant information, how to word questions.” (Social worker)

5. CONCLUSION

The project was identified as supporting and encouraging a positive motivation towards evidenced based medicine (EBM) that without this support was perceived as a chore. The clinical librarians' role within the team acted as external force and guidance for support and social pressure to adhere to these initiatives by the community of practice. It also resulted in more positive interactions with regard to team cohesion, goals, knowledge management and patient interactions. This in turn provided higher job satisfaction, as the clinicians' perceived professional and knowledge development both for themselves and the team.

Ultimately this project was identified as of benefit to clinicians at all levels. It was also identified as potentially one of the most effective ways to introduce both evidenced based medicine and computer usage to those who have strong negative perceptions about both of these.

The results of this evaluation have identified two main issues:

1. The project of outreach clinical librarians interfacing with clinical teams was perceived by ALL of the clinicians interviewed as successful in supporting the teams and their own digital resource searching needs for evidenced based medicine.
2. The project also benefited the teams with a variety of knock-on effects (See Results) which proportionally increased clinicians' enthusiasm for the project. The level of knock-on effects encountered was identified as relating to two factors:
 - a) Level of interaction between the team and the clinical librarian.
 - b) Level of technology access that was available to the team.

Ultimately effective implementation procedures have been identified as a key factor in the success of a digital resource. However, with poor training, fast changing resources and negative technology perceptions within medical communities of practice these procedure need to be more proactive than has occurred before.

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7. REFERENCES

1. Adams, A & Blandford, A. In Press. The unseen and unacceptable face of digital libraries. To appear in Journal of Digital Libraries.

2. Gremy, F. and Bonnin, M.: Evaluation of automatic health information systems: what and how: Assessment and evaluation of information technologies. In Gennip, E. and Talmon, J.L. (eds.) *medicine van*. Amsterdam, IOS Press 1995: 9-20.
3. Harrison, G. S.: The Winchester experience with the TDS hospital information system. *British Journal of Urology*, May (1991); 67,5: 532-535.
4. Heathfield, H., Pitty, D. and Hanka, R.: Evaluating information technology in health care: barriers and challenges. *BMJ*, 316, (1998) 1959 –1961.
5. Heathfield, H.: The rise and fall of expert systems in medicine. In *Expert Systems*, Vol. 16, No.3. (August 1999) 183 – 188.
6. Lave, J. & Wenger, E.: *Situated learning: legitimate peripheral participation*. Cambridge: Cambridge University Press (1991).
7. Morgan, G.: *Images of organization*. London: Sage (1991).
8. Reddy, M. & Dourish, P.: A finger on the Pulse: Temporal Rhythms and information seeking in medical work. In proceedings of *ACM CSCW'02*. ACM Press. (2002) 344-353.
9. Richman, J.: *Medicine and Health*. London: Longman (1987).
10. Sackett, D., Rosenberg, W., Gray, M., Haynes, B. & Richardson, S.: Evidence based medicine: what it is and what it isn't. *BMJ*. (1996) 312: 71-72
11. Schneider, K. & Wagner, I.: Constructing the 'Dossier Representatif': Computer-based information sharing in French hospitals. *Computer Supported Cooperative Work*, 1, (1993) 229-253.
12. Strauss, A & Corbin, J.: *Basics of qualitative research: Grounded theory procedures and techniques*. 1990. Sage, Newbury Park
13. Symon, G., Long, K & Ellis, J.: The Coordination of work activities: co-operation and conflict in a hospital context. *Computer supported cooperative work*, 1996; 5,1:1-31.
14. Tod, A. M., Harrison, J., Morris Docker, S., Black, R. & Wolstenholme, D. 2003. Access to the internet in an acute care area: experiences of nurses. In *British journal of nursing*. Vol. 12, No. 7. 425- 434.
15. Turner, B.: *Medical Power and Social Knowledge*. London: Sage (1987).
16. Wenger, E.: *Communities of practice: Learning, meaning and identity*. Cambridge: Cambridge University Press (1999).