
BEYOND E-LIB

How does e-lib fit into the wider context of Electronic Information Research?

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Introduction

Good afternoon, ladies and gentlemen. Although the title of my talk was "How does e-lib fit in to electronic **information** research, I want to concentrate on how it fits in with research into electronic **libraries**. The reason for this is, of course, because e-lib was only concerned with electronic libraries. LIRG is primarily interested in LIS **research**. e-lib was a **development** programme. So, if at the end of my talk it seems that e-lib has not contributed that much, it is hardly surprising; the *raison d'être* of e-lib is not fundamental research.

In this context, it is worth noting that very little e-lib project funding went to the library schools. This is no coincidence. A number of library schools put in e-lib bids, but nearly all of them were considered by FIGIT to be too theoretical. These are issues you may wish to raise in the discussion period at the end of my talk.

In this talk, I want to examine the range of electronic library research that in my opinion should be going on, and briefly assess how much e-lib has contributed to each area. Then I will draw some conclusions on what research I feel still needs to be done.

e-lib in context

Let me start off with some comments to put e-lib in context. The vast bulk of research and development work in electronic libraries is being led by academic libraries, particularly University libraries. Why is this? Firstly, in academic institutions, librarians are expected to attract research funding, do their own research and get publications. Secondly, in the corporate sector

(with the exception of R&D intensive industries such as the pharmaceutical industry), libraries are seen primarily as service institutions, there to help achieve corporate goals, but with relatively little funding or freedom to do things that are speculative. Thirdly, there is e-lib and similar initiatives elsewhere. e-lib explicitly excludes libraries outside higher education, although I think with the latest round we will for the first time see public libraries involved. Indeed, a significant, but unjustified criticism of e-lib is that it ignored libraries outside the HE sector. It is unjustified because e-lib's money comes from the Higher Education Funding Councils, whose remit is to help higher education. The criticism is really a criticism of the lack of a National Information Policy, a much broader issue that is beyond the remit of this talk.

Four countries, in my view, lead in the field of electronic library research - Japan, USA, Netherlands and the UK. One country however, has a clear national strategy in regard to electronic libraries, and that is Denmark.

There, a consortium of a number of Ministries, together with the National Library, is developing a vision for electronic libraries in Denmark that I believe has no parallel anywhere else. However, the Danish work is at an early stage.

The USA is the most active in the numbers of experiments underway, and the amount of money being spent. However, my perception is that the US effort is somewhat unco-ordinated. There are a few, very large projects under the Digital Library Initiative, together with a large number of smaller projects funded by the libraries, by funding agencies, or their parent bodies themselves. It is too early to say whether the US approach is the most productive one. There is no question that US researchers look at the UK with jealousy. This is because the UK leads the way in its co-ordination of R&D. This is, of course, because of its e-lib programme.

The next round of e-lib projects, on hybrid libraries and on so-called Clumps, are much smaller in number and on average involve higher funding, typically hundreds of thousands

of pounds, and are just starting. These involve consortia of libraries and are very much on the development end of the R&D spectrum. The projects are designed to fit into one another and between them cover most of the areas that need exploration. The intention is not to end up with a national system of electronic libraries, but rather to identify the issues and problems, and possible solutions, for a future generation to then develop fully.

Particular areas the programme has homed in on include new digitisation techniques and the digitisation of useful printed materials, the development of new electronic journals, the development of electronic pre-print archives, novel document supply services including on-demand publishing, the training and education of librarians, academics and students, tools for searching the Internet, storage and retrieval of images, and preservation and copyright issues. The long term aim is to engender a culture of change and acceptance of the electronic library within the Higher Education community, and the industries, such as the publishing and bookselling industries, that serve them. I will come back to this agenda of cultural change later in my talk.

Areas that should be researched

In my view there are six areas that need addressing before the electronic library can become a reality. These are the areas that need research and, indeed, to a greater or lesser extent are already the subject of research: Technical issues; Legal issues; Economic issues; Psychological issues; Educational issues; and Cultural issues.

Technical issues abound. The electronic library cannot become a reality until questions regarding the development of efficient searching, retrieval and dissemination tools; the development of methods for the compression and decompression of images, both still and moving; the indexing of images is at a rudimentary stage and needs much more work.

There is also work needed on: the development of widely agreed and accepted standards; the

development of widely accepted cryptographic encoding tools; the development of well established and cost effective digitisation and error correcting tools are all completed. The problems are well understood, and many of the solutions are in hand. However, much work still needs to be carried out. Of course, e-lib has addressed, or is addressing a number of technical issues, and spin offs from the programme, such as the Higher Education Digitisation Service, is addressing others.

Legal issues also abound. The electronic library cannot take effect, even if the technical issues are resolved, unless issues to do with copyright, privacy, etc. are dealt with. The copyright issue is particularly problematic, and is, as you know, a subject dear to my heart!

Copyright owners (typically at the moment the publishers) are extremely reluctant to allow libraries to digitise their materials, and then let those digitised materials loose on networks, as they are concerned about the considerable potential for copyright infringement that could so easily occur under such circumstances.

Publishers initially responded to the challenge by generally refusing to give libraries permission to do such digitisation (and threatening to sue anyone who does such digitising without permission) whilst at the same time attacking on two fronts.

The first is to attempt to gain changes in the law to make it explicit that browsing on screen, and sending material down a network are both restricted acts that require the copyright owners' permission before they can be done.

Secondly, the publishers are supporting the development of a variety of hardware and software tools to protect their data. These range from encrypted materials, through to Electronic Copyright Management Systems (ECMS) that control the access to material, keep records of who has accessed the materials, and provide for charging mechanisms for those that do access the material. All these efforts by the copyright owners have only been partially matched by user

developments. Some user organisations are attempting to fight the proposed changes in the law; they have been successful until now in the USA, but with recently agreed changes to the Berne Convention on copyright, the sorts of changes that copyright owners want are coming about.

Indeed, there is a feeling of inevitability that the law will eventually change to some extent to favour copyright owners.

Research work is needed both on the technical issues, the economic issues and the legal issues associated with ECMS. It is essential that the library research community gets involved and doesn't just leave it to the copyright owners.

There was a real risk that the users and publishers would move to opposed and entrenched positions, a situation that would do neither side any good and would have delayed the development of the electronic library, or else result in an electronic library that has large gaps in its collections. However, I have to say that the risk has largely been averted. Really as a result of e-lib, the JISC and the Publishers' Association have got together in a series of Working Parties to iron out issues to do with the development of electronic libraries. These Working Parties, covering issues such as fair dealing, a standard licence contract, networking issues and one stop shops for copyright clearance, have made remarkably good progress. Overall, it is my impression that the relationship in the UK between the academic community and the publishers is likely to go closer. I'm not claiming we will love each other for ever, but things are remarkably cordial right now - and this is thanks directly to e-lib.

Other legal issues, such as liability for information provision, privacy, illegal materials on the Internet, defamation and libel are all there waiting to spring out and trap the unwary. There is a need for some legal research in this area - in particular for legal experts and digital information experts to talk to each other and then develop model laws or regulations.

Economic issues are being considered at last. The question of how one should price, and charge for information in an electronic library has yet to be resolved.

This is an issue that has been addressed, and resolved, by other industries, such as the online industry, the CD ROM industry, the real time financial information industry, and the software industry. The pricing and licensing strategies they have come up with vary considerably, but all have one thing in common: they involve an element of trusting the client to only do what the client says it will do. It is a pity that this sort of trust is not yet much evident in the debates on pricing of electronic materials for libraries.

Each of the algorithms one can think of for charging in an electronic library environment has its pros and cons, and it is clear there is no one single best solution. The fundamental question is whether users are willing to pay at point of use, or whether libraries retain their general principle that most services are free to users. If they decide to charge users, there are a variety of models they could adopt; these may or may not reflect the charges the library bears for offering the data.

Clearly, somewhere money has to change hands. A fundamental part of that is the question of whether this is based on pay per use, on a subscription with unlimited use, or some combination of the two (so much to join the club, and then so much to use). If one decides to charge by use, then further questions arise. On what basis are the charges made? On the time spent? On the number of items retrieved? On the number of bytes downloaded? Whatever model is adopted will favour some types of users and penalise others.

We have a long way to go to understand the economics of electronic publishing, yet pricing decisions made now will set the standard for the future. The uncertainty about the economics of electronic publishing, the pricing models to be adopted, and how libraries and users will adapt to them, is certainly hindering the development of the electronic library. Whilst e-lib was keen to

have its projects explore novel pricing mechanisms, few have come out of the programme so far. Perhaps this is not surprising, as each e-lib project is a limited life project with explicit subsidy, and so realistic pricing strategies for the future are inevitably hard to achieve.

In my view, economic issues are a key area for further research work, and one that e-lib has not fully addressed yet. Not that this is FIGIT's fault. It has tried hard to involve academic economists in research on economic models, but so far not a single economics department in the UK HE sector has nibbled at offers of funding. Maybe you know some economists who might be interested in participating in an e-lib funded research programme in this area? It's not too late!

Psychological issues have hardly been considered, and yet could have an enormous impact on how well electronic libraries are used. How do people select and use information? How do they like it displayed? How do they react to electronic material rather than print? Would they prefer the electronic library to look and feel like a traditional library? The limited research done far has mainly concentrated on user friendliness of interfaces, but the issues go far deeper than that.

For example, even highly computer literate students still feel more comfortable with print if they are given the choice. Why is this? It is clear, too, that people prefer to read items on the train, at home and in the bath rather than in a work environment. If the electronic library is to succeed, it must deliver information in the way that people feel most comfortable, rather than forcing people to read at a PC terminal on a desk. I am arguing that people come first, and that attempts to force people to read on screen when the system is not appropriate for that purpose will lead to resistance or resentment.

Another psychological issue is the depth of information needed. Some people want simple answers, others complex ones. The ideal system will recognise these needs, and supply results according to those needs; but how will the computer system recognise those needs?

It implies highly intelligent retrieval engines, with a lot of sophistication hidden under the surface that the user is not aware of. Much research is also needed in this area.

In my view, the psychological factors have not been studied sufficiently, or given sufficiently high priority. The research that has been carried out so far gives us some inkling of the problems we have to overcome before people feel comfortable with the electronic library. e-lib certainly did not pay much attention to such issues, leaving them largely to the whim of the projects.

Educational issues need to be taken into account. Print on paper is so commonplace that it almost appears natural to know what to do with the artefacts based on this technology. This is not the case for an electronic information source. Methods of training and educating users have to be developed. People also need to understand the implications of the electronic library for the life, their work and their leisure. These are clearly a set of issues far greater than the electronic library itself, but even the simple act of training people how to access and use electronic information routinely is enormous. We do not yet know the best way of achieving this aim.

Closely linked to education issues is the final issue I want to look at in this part of my talk, *cultural change*.

If electronic libraries are to be implemented successfully, some shifts in culture are essential. Such change was one of e-lib's aims, although rarely stated explicitly. The change, it was hoped would apply to librarians, library patrons, senior managers, and outside stakeholders such as authors (often the same people as the patrons), publishers, bookshops and subscription agents.

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But what do I mean by cultural change? It depends to a large extent on both the attitudes and perceptions of the people and organisational structures involved.

The use of language over time (the words, meanings and concepts that become an accepted part of the natural terminology of a community) provides arguably the best evidence of changes in culture. I would argue that cultural change involves:

- lasting structural and social changes (within an organisation or set of linked organisations), PLUS
- lasting changes to the shared ways of thinking, beliefs, values, procedures and relationships of the stakeholders within that grouping.

This definition assumes that both the formal (structural) and informal (socio-cognitive) aspects of stakeholders' work must change in some way for the 'culture' to have been fundamentally changed. The word 'lasting' is important. Changes caused by, say, the initiation of an e-lib project, but which do not last beyond the project's end, cannot be counted as cultural change.

Of course, many people think that cultural change happens anyway, or that cultural change is a subsidiary issue. I am arguing that it is central to the success of the electronic library, and that further research to build on Joan Day's IMPEL work is needed in this area to assess what makes it happen.

For cultural change to happen, the structural and functional aspects of the organisation and the attitudes of stakeholders towards the innovations being made must change.

In the LIS context, the traditional roles and assumptions of librarians, patrons and other stakeholders strongly affect the types of cultural change that can be achieved in the near future.

Cultural change in e-lib was affected by both project-related and organisational factors. The former included: amount of money; length of project; degree of innovation; who was responsible for the project; amount of accompanying training and awareness activity; and whether the project was technology driven or people driven.

The latter included: user expectations; involvement of staff and their ownership of the project; existence of champions or enemies of the project; level of organisational commitment to the project; degree of integration with other projects or developments; and degree of collaboration with other organisations.

Looking at e-lib, my perception is that it has aroused a lot of interest, and probably accelerated cultural change within the library community. However, I suspect the effects of e-lib projects may be limited initially if librarians are unable to change their working roles to take advantage of new knowledge because of rigid structures or managers.

Meanwhile, academics remain unconvinced of the credibility of new forms of scholarly communication and/or information seeking and although they have taken to searching for electronic information with enthusiasm, they will tend to add working papers or low level work into the system.

They still keep the best material for print publication. Therefore, e-lib's impact on patrons and on senior managers is unclear. e-lib has certainly created a lot of interest in the book selling and subscription agent community, but I doubt whether it has significantly affected attitudes.

The one area where it has without doubt achieved change is in the academic publishing community, as I have already indicated. Because of the constant requests from, and negotiations with e-lib project staff, many publishers have resolved to become more fully involved in electronic publishing ventures.

So what needs doing in the future to achieve cultural change? Projects should take a 'people-centred' approach, even where a project is largely on the 'D' side of 'R&D'. For example, they should include potential users in the design and development process. We also need research on socio-organisational considerations and on user-centred design.

Conclusions

In my view, e-lib has succeeded in many ways, but has not addressed some of the fundamental issues that still require research. This is not a criticism of e-lib - it was never intended to be, as I said, a programme of fundamental research. In this talk I have said where I think research is still needed. These include:

- rights management technologies
- copyright and other legal issues
- user interface design and evaluation
- the issues that contribute to cultural change
- economic models for electronic information
- methods of indexing, and evaluating the quality of, Internet materials

A future e-lib might address some of these, but other funding agencies, such as BLRIC, need to consider the others and pick up the gauntlet where e-lib dropped, or placed it.

Thank you for your attention.