REDESIGNING THE UNIVERSITY LIBRARY IN THE DIGITAL AGE

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Business process re-engineering (or redesign) has achieved mixed results in business and industry but it offers an approach to thinking about the future of academic libraries in the digital age that is worth considering. This paper outlines the forces that are currently affecting academic libraries in the UK and proposes a strategy whereby the transformation from the handling of artefacts to the handling of electronic sources may be effected with maximum benefit to the information user.

INTRODUCTION

WHEN MICHAEL LYNCH ARRIVED at the University of Sheffield in 1965 library automation was not so much in its infancy as still in an embryonic form. One of the first things that Michael did was to organise the first workshop on library automation to be held in the UK. The records of this event no longer exist, but Frederick Kilgour of OCLC was the keynote speaker and the event was very well attended. However, little interest could be aroused locally in substantive research into the problems of fitting library operations to computer systems and Michael’s interests turned to other things that are well covered in this Festschrift.

We might argue that the lack of enthusiasm evinced in 1965 was not surprising: after all, computers were large, expensive, unwieldy things requiring specialists to program and operate them, and the means for inputting data and for dealing with the output were rudimentary by present-day standards. Since then, the development of computer applications in libraries has followed a generally evolutionary pattern: gradually, different aspects of library housekeeping activities (lending, cataloguing, serials control, inter-library loans, etc.) have been taken into computational systems, but the pattern has been very much one of extension of systems that were designed decades ago.

Today, however, the nature of access to information is changing rapidly and changing radically. The source of the change is well known—it is the emergence of the Internet and the transformative character of the World Wide Web technology, which, quite suddenly, has changed the ground-rules for the production of and access to scholarly communication. In contrast to the evolutionary trend of the past thirty years, today’s developments are revolutionary in their impact and in their significance.

As a result, academic libraries find themselves in a position not unlike that of certain kinds of business that were also centrally concerned with the production
and distribution of information – banks, building societies and insurance companies. That is, needing to review their internal information handling processes (e.g. applications for policies and claims against policies, in the case of the insurance industry) and to determine how developments in information technology should now be used to transform those processes.

**BUSINESS PROCESS REDESIGN**

The term ‘business process re-engineering’ (BPR) [1] has been used to describe this activity, which has had the intention of not only improving effectiveness, but also of improving efficiency and, thereby, reducing costs. In spite of criticisms of re-engineering (e.g. by Strassman [2]), the transformations that have taken place in organisations have sometimes been successful in achieving one or other of these intentions, but not always, and some work exists to suggest that the key to success is to apply the re-engineering process throughout the organisation, rather than simply in relation to the activities of a single division, department or function [3].

Hammer and Champy [1] define BPR as:

… the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed

and note, further that, ‘Re-engineering takes nothing for granted. It ignores what is and concentrates on what should be’.

Given that business processes vary enormously, there is, naturally, no single way in which BPR may be carried out but, typically, questions will be asked about whether a process is necessary before it is redesigned, and the aim is to achieve simplicity in processes by combining several jobs into one, allowing multiple versions of processes where that is appropriate (rather than standardising on one version that may be inefficient in some contexts), and allowing decisions to be taken by workers at the point at which they are needed, rather than transferring those decisions up the managerial chain.

In this paper, the term ‘redesign’ is preferred over ‘re-engineering’, but the issue is the same: how does the academic library transform itself into the kind of support service needed by academia in the networked future? In the language of Zuboff [4], how does it move from ‘automating’ to ‘informating’? Libraries can rightly claim to have been at the forefront of developments in automating their processes, from the development of the first computer-based circulation systems and catalogues, but it is very evident that the systems that were developed were, in large part, simply the mechanisation of manual processes. Thus, the screen image of the OPAC still bears a very close resemblance to the card in the card catalogue, with the residual confusion between what is needed by the user and what is needed for administrative purposes by the library.

The new information technologies and the new knowledge transfer processes based upon those technologies now offer libraries the opportunity to review their processes and, indeed, require them to do so. This paper suggests that the review must embrace the new modes of delivery of electronic information from distributed
sources, the new methods of teaching and learning that depend upon such distributed resources, and new modes of interaction between teacher, learner and support services that must take place in a networked environment. The mere automation of existing manual processes is not the challenge: libraries must now redesign their processes in the light of the new possibilities. Of course, the idea of BPR has been widely disseminated and it would be strange if librarians did not already know of it: the idea of applying BPR has been advanced by others (e.g. Shaughnessy [5]; Anderson [6]) and there are also reports of work in progress [7, 8].

The literature of BPR is extensive and different practitioners and consultancy groups give varying rules for what should and should not be done. Janson’s analysis of the starting points for BPR is of interest in the context of libraries:

- Make the customer the starting point for change – by identifying customer wants and creating the infrastructure to support these expectations;
- design work processes in light of organisational goals;
- restructure to support front-line performance [9].

If we accept these starting points, we must then ask:

- How are customer wants changing as electronic publication begins to make an impact upon teaching, learning and research?
- Are organisational goals being reformulated in the light of current developments?, and
- What is the nature of the ‘front-line’ in the new electronic environment, and how is it expected to perform?

The propositions underlying this paper are that customer wants will change significantly as a result of increasing access to electronic sources of information, that goals must be reformulated in the direction of supporting access to information rather than acquisition of information and in the direction of pro-active support of the information user, rather than passive provision of self-use resources in the library, and that the ‘front-line’ will operate increasingly in network communication with the user, rather than in face-to-face communications and that, consequently, performance will be judged by abilities to operate in that context and to help meet organisational goals in satisfying new customer wants.

DISTRIBUTED ELECTRONIC INFORMATION

The principal factor that is changing the nature and process of scholarly communication is the increasing extent to which such communication is based on electronic means. New journals are now being published in electronic form to an increasing extent, rather than in print, and the publishers of print journals are scrambling to convert their print journals to electronic form and, at the same time, introduce new pricing formulae that will ultimately enable them to make the shift permanent. The scale and speed of change in the transfer to electronic publication is difficult to determine, but the NewJour mailing list archive [10] now (at 10 October 1997) contains references to 4,556 items. Many of the items in NewJour are newsletters, popular or hobbyist magazines or electronic versions of established print journals. However, many are new academic ones and many are in new disciplines, or bridging disciplinary boundaries; in the past, the editors or
originators of these journals would have sought out a print publisher willing to
take the risk on a journal in a new field; now, the originators are venturing on to
the Web and taking whatever risk is involved themselves.

Just one example of the new style of journal is the *African Studies Quarterly* [11] from the Center for African Studies at the University of Florida, made its appearance in May 1997. The editors set out their rationale for electronic publication by commenting:

Second … it is accessible to a growing number of scholars and institutions
around the world with World Wide Web access. Many scholars and institu-
tions cannot afford the exorbitant subscription rates of most journals.
Third, the electronic format allows for a very rapid turnaround. ASQ
intends only a three-month lag from submission, to review, to publication.
This means that the journal can carry scholarly writing of a time-sensitive
nature. In this way, it is likely to become somewhat of a hybrid between
serial commentaries and scholarly publications. As a bonus, there is a cer-
tain satisfaction to be had by the authors in seeing an article ‘go to print’
so rapidly [12].

It is clear, from their comments, that the editors anticipate that individual scholars
will be able to access the journal directly.

Electronic access to journals is also high on the agenda of the publishers of
printed scholarly journals and has been given impetus in the UK by the Higher
Education Funding Councils’ (HEFCs’) Pilot Site Licence Initiative through which
four publishers (Institute of Physics Publishing, Academic Press, Blackwell
Publishers and Blackwell Science) are offering discounted prices, relaxation of
photocopying rules, and access to electronic versions of their journals.

Electronic access generally is also being aided in the UK by the Electronic
Libraries Programme of the HEFCs’ Joint Information Systems Committee. This
programme involves some sixty projects in eleven programme areas, including
electronic journals, digitisation, on-demand publishing, training and awareness,
and electronic document delivery.

At the same time, governments, the European Commission, and official bodies
of all kinds see electronic publication as a means of reducing the cost of dissemi-
nating various official documents, from requests to tender to official reports.
Examples include the Web site for the UK Parliament [13], with its access to
Hansard [14], and the site of the Higher Education Funding Council [15], which
provides access to its publications, including that on the 1996 Research
Assessment Exercise [16].

Similarly, we find academics in many fields turning to electronic publication
for, at least, draft reports, working papers and the like.

Thus, we are at the beginning of a very rapid revolution in scholarly commu-
nication, which has barely begun to impact upon many disciplines and which, yet,
has had a readily discernible impact on others.

END-USER ACCESS

The natural corollary of distributed electronic publication is independent access by
the ultimate user of the information without requiring the services of intermediaries.
With publications freely available over networks (and the fact that many are free is important, and not to be taken for granted as continuing indefinitely) the user does not need support services to obtain publications from the publisher, does not require those publications to be catalogued and organised on site, does not require lending services or short loan collections, and does not require a large structure in which to store the artefacts. Of course, this begs the question of the extent to which end users will need training in access to information and the extent to which they, themselves, will believe such training to be necessary. The very simplicity of access may lead to unjustifiable conclusions as to competency.

Needless to say, this is only true for those publications that are freely available in electronic form. For print publications the systems are still needed, and for electronic publications that are available at a price some system for approving expenditure and validating purchases must be in place. The question of interest for the future of academic libraries, of course, is for how long will this remain true and when will the balance shift from making print publications available to facilitating and managing access to electronic resources? The probability that the HEFCs will begin to levy charges for access to SuperJANET and the probability that these costs will be devolved to user departments may lead to some rethinking about the value of uncontrolled access to electronic information sources for both students and staff.

BUDGETARY AUTONOMY

There is a tendency in organisations of all kinds for financial responsibility to be transferred to the most appropriate ‘business unit’. In the case of business that may be an operating division or some other profit centre, or in the case of service provision, cost centres. This is also true of universities, where budgets, after top slicing for central services and administration, are devolved to departments or faculties.

As a result, decisions on the purchase of electronic information services will be taken at departmental level, with the possibility, for example, of each academic having a personal budget for information acquisition, and with research proposals increasingly having such costs written into them.

The use of such personal or departmental budgets for information access and provision will put increasing pressure on institutions to reduce the amount of top slicing for central library services and to increase the grants to faculties or departments. This may lead to friction not only between the library and academics but also between academics whose needs are increasingly met by electronic resources and those whose needs still necessitate access to print.

The problem for librarians, therefore, is to define a role for themselves in relation to electronic information resources that is regarded as legitimate and necessary by academics and which justifies a continuing allocation of the institution’s budget.

THE NETWORKED USER SUPPORT ROLE

The role we foresee for academic libraries can be simply expressed as one in which they support the networked information user. Elsewhere, this has been
expressed as networked learner support [17] but in this context we prefer the more general term. The networked user will be any member of the university community, including remote learners and research associates, who conducts a significant part of his or her studies, teaching or research through networked interaction.

Let us imagine a postgraduate student in this situation: although located locally to the university she (let us call her Sarah) logs on to the university network after breakfast from her accommodation – a self-catering, university apartment, which, like all university accommodation is connected to the campus network.

Scenario 1 is already being partly fulfilled in many places and is at least capable of some degree of implementation in most British universities.

Sarah checks the Sydney Morning Herald, the Washington Post and the Electronic Telegraph, for the morning news and then checks three or four e-journals in her field that have free subscriptions and those published by Academic Press, Elsevier, and other publishers, to which the University Library subscribes. All of this is done through the University Library’s Web pages that list daily newspapers, free electronic journals, and library subscriptions to priced e-journals. A couple of papers are downloaded for closer reading later.

After a coffee and a couple of hours’ work on her thesis, Sarah gets back to the downloaded papers and discovers a couple of potentially interesting references in one of them. She transfers the references to her bibliography file and logs on to the campus network again to check the Web version of the University’s union list of periodicals. This reveals that both journals are held by the Library, so she e-mails her personal contact with an encrypted authorisation to photocopy the papers and debit her photocopying account, asking for them to be delivered to the Department.

Later in the day, Sarah logs on again to do a Web search to discover the e-mail addresses of the two authors whose papers she has asked for and finds an e-mail message from her contact in the library to the effect that a new system has been installed to scan requested papers and that she will find both of them attached to the e-mail message – the copyright charges have been deducted from the photocopying account, but the charge, in fact, is lower than for photocopying.

By inference, we can see something of the library’s networked user support role in this scenario: the information content of the Internet is already so great and so relatively disorganised that someone must superimpose order if scholars are to use it efficiently and effectively. Clearly, to set up some alternative when the expertise to do this already exists in the university library would be pointless and many librarians are already taking the initiative to establish guides to particular subjects (see, for example, the Web site for the NetLinkS project for a ‘case base’ of interesting examples of such guides and other net-related ventures [18]). In the UK, a number of the eLib projects, for example, EEVL [19] and SOSIG [20], are designed to achieve this for particular disciplines on a collaborative basis.

The development of resources of this kind is not without its problems, including those of maintenance (particularly when the development funds cease) and of copyright: as a result of the Shetland Times [21] case, doubt currently exists as to the validity of citing links in guides to resources without the agreement of the ‘owner’ of the linked site.
Quite apart from the copyright issue, there is also an ethical issue about the extent to which linking may actually constitute re-use of someone else’s material within one’s own system. This point is perhaps best exemplified by the case of a training package aimed at introducing a student to ways of using the Internet and associated software. Links that, in effect, take the student to supporting materials, which augment the basic training pack, can be argued to be re-using material and to be equivalent to using portions of another text in a printed textbook. If material is made available for public training purposes, as in the case of material from software houses designed to teach effective use, there may be no problem. However, if the linked material is intended for a quite different purpose it seems reasonable that the author of the training package should first obtain approval from the author of that material. It can be argued that, by making material available on the Internet, the author is inviting public use, but such public use, particularly if it involves payment by third parties, may infringe the author’s moral rights, if not his or her legal rights.

Because of their experience with copyright in relation to photocopying, librarians are well placed to advise on these issues and, therefore, they can play a role in supporting not only the use of networked resources, but also the development and effective dissemination of such resources.

There are also advantages in having some centralised control of subscriptions to e-journals, just as there are for print journals. It is likely, of course, that individual research groups and departments will choose to use their own resources for such subscriptions if they cannot get priority in the university library budget, but even here there would be advantage in organising the subscription through the university library – if only to ensure effective subscription renewal. Librarians are familiar with the contracts for supplying electronic information services and with other aspects of negotiation over the supply of information resources and, therefore, are the logical group to develop expertise on all aspects of information acquisition within the institution. They are likely, of course, to require legal advice from time to time in this respect, but that is also usually readily available in the institution. Of course, there is likely to be a great increase, over time, in the volume of material produced within the leading research institutions that is held locally in electronic form, possibly as electronic journals or collections of electronic working papers. Again, the effective management of resources such as these, including the negotiation of access agreements with publishers and other institutions may be seen as appropriate for the library to undertake.

For some time to come, wanted information is going to be available in the print archive and, whether the copy is scanned into digital form or left on paper, the university library will be expected to deliver it to the user rather than the user visiting the library to collect the item. On grounds of simplicity and speed of transaction it is likely that digitally scanning wanted items will predominate over retrospective digital conversion and that this process will be speeded if national agreements exist with publishers to cover the copyright issues, where existing ‘fair use’ agreements are inadequate.

Whatever the physical means of delivery, some secure accounting system will be needed to be put in place to ensure proper, authorised payment. Again, the library is the logical locus for this activity, since it already has systems in place for proper accounting of the costs of other information acquisition activities.
We do not imagine that visits to the library will cease: paper products, journals and books will continue to be produced and will need to be scanned. Shelves of archived materials will continue to be browsed – for inspiration, amusement, and the pleasures of serendipity. Libraries will continue to provide the venues for chance meetings with friends and colleagues and, perhaps as we suggest below, for meetings with one’s personal librarian. However, it is likely, in our opinion, that over time, particularly as the speed and functionality of equipment grows, such use will decline, until it becomes the exception rather than the norm of information acquisition, and the new functions, outlined above, will become the norm.

REDESIGNING THE SYSTEM

If the scenario set out above describes what becomes the dominant mode of information access for the future, then the academic library and its role, and the roles of academic librarians will need to be redesigned. At present, academic libraries function mainly as systems that acquire and organise physical artefacts in the form of books, journals and other information-bearing products. Of course, the system has changed and is changing – access to online information services has become a standard part of library practice (although financial pressures have meant that the services are not as widely available as might be wished), and libraries have acquired CD-ROMs and have mounted them on campus networks for university-wide access.

However, the structure of library systems is still geared to acquiring objects, organising them and making them generally available and accessible. Scholarly publication and, indeed, many other forms of publication, however, are increasingly moving towards electronic delivery to the end user. Under these circumstances, how can the university library redefine its role?

Leaving aside the continuing need to acquire books, journal issues and other artefacts, which will require the same systems as at present, although possibly on a reduced scale, some radical rethinking will be necessary. One possibility will be to focus even more closely upon the client and the experience of business process redesign in the insurance industry offers the model of the ‘case officer’ – interestingly this is also the terminology adopted in other client-serving organisations.

THE ‘CASE OFFICER’ MODEL

The case officer model can be described quite simply with respect to the insurance industry: before redesign, an application for an insurance policy might take several weeks before approval was given and the premium notified to the client. The process was speeded up a little by equipping agents with lap-top computers, but delays still occurred in the main office, since paper records had to be moved from one office to another, requiring particular tasks to be performed, calculations to be made, and authorisations to be given before the policy ‘got out of the door’.

In Zuboff’s terms, various parts of the total process had been automated (the forms were produced by word-processor, for example, with ‘boiler plate’ paragraphs being used), but the system as a whole had not been ‘informed’.
In engaging in BPR companies in the insurance industry applied the perspective of determining how computers might be used not to automate individual processes, but how those processes themselves might be redesigned to make them more appropriate for the application of computers. As a result, systems were devised that allowed one person to act as the case officer for any given client, processing an electronic record, and calling in the relevant information to complete the policy approval. In some cases, this reduced the processing time from thirty days to three days. The documents no longer had to move from one department to another, because the documents were electronic and all of the information necessary to calculate premiums and complete the electronic form, as well as issue the policy, was available in the system or available from others on the network. The case officer as the person in charge of a given group of clients was able to progress the application quickly and deliver the agreed policy to the user. Of course, the possibility of direct interaction with users on public networks now opens up more opportunities for redesign.

APPLYING THE CASE OFFICER MODEL IN THE UNIVERSITY LIBRARY

We have argued above that the proportion of electronic documents accessed directly by users is likely to increase considerably over the next few years but that, clearly, there will be a continuing demand for access to printed materials. In these circumstances we can identify a number of key processes in the academic library:

- acquisition of physical materials (including temporary acquisition through inter-library borrowing), including physical repositories of electronic information such as CD-ROMs, and arrangement of licensing agreements with owners of electronic, networked information;
- processing (cataloguing, classification) of physical materials and of sources of networked electronic information – much of which is already a matter of retrieving electronic records of existing materials;
- diffusion of information: i.e. lending physical materials, mounting electronic sources on the campus network, acting as an intermediate source of information on sources of networked information;
- information enquiry service, which covers everything from the location of items in the stock of the library through discovery of wanted electronic sources, to searching online databases and answering specific factual enquiries from either printed or electronic sources. Increasingly, enquiries are also being made about information technology applications.

At present, both computer-based systems and professional roles in libraries tend to be based on the differences among these processes but, from the point of view of the library and information user, the distinctions are irrelevant to his or her work. In essence, the user wants data or a document, which we can interpret in very general terms to include any physical or electronic form, textual, graphical or other, or he or she wants information, either information about information sources (meta-information) or answers to specific questions. By focusing, therefore, upon Janson’s first ‘principle’:
Roger switches on his workstation as soon as he gets into work: his calendar and to-do list appear, the former warning of a planning meeting on the redesign of the library’s Web site, to take account of the expansion in the University’s use of electronic information sources, and the latter showing that he has a number of tasks that are now urgent: completing the revision of his guide to electronic sources in control engineering, checking on subscribing to a new electronic journal on behalf of a user, and continuing negotiation with another publisher on access to journals in science and engineering.

He decides to finish his work on the first of these before the planning meeting, since there is now very little to add before the guide is complete. After the meeting he checks his e-mail and finds a message asking him to provide copies of a couple of journal papers to one of his clients in the Department of Control Engineering – one of Roger’s two client Departments. He scans the periodical listing in another window, discovers that one of the journals is in the library and sends the request for that item to the processing department, asking them to scan it and e-mail it to the client. The other journal exists in electronic form but is not on the subscription list: Roger locates it on the Web and notes that the paper is available for a page charge that compares favourably with photocopying costs, so he downloads the paper, authorising payment from the client’s departmental account. He then attaches the paper to an e-mail message to the client, reporting what he has done.

Roger now returns to his to-do list and reads the latest e-mails from the publisher with whom access to electronic journals is being negotiated. He compares the proposed contract with the model contract used by the library in other situations and notes a number of differences relating to page charges, site licence and number of users. He prepares a letter on the basis of this comparison and e-mails it to the publisher – he is trying to use the model contract to make the subscription more economically viable for the Department concerned.

Later, another e-mail message from a client asks for a book to be purchased. Roger checks the bibliographical details on the publisher’s Web site, where he also finds a table of contents and an electronic version of the introduction, and then compares the book with those already in the library collection. There appears to be little that is new in the book, so he e-mails the client with that information and suggests that he takes a look at three specific titles before making a final decision to purchase.

Towards the end of the day, a new postgraduate student in Control Engineering calls him on the phone and asks what he needs to do to establish an information service account. Roger explains that an electronic form exists on the network, which must be completed by the student and then be electronically countersigned by his Head of Department. When the form is completed a new account is automatically established if the Department has enough money to support it: if there is insufficient money in the total Departmental account, the Head of Department will be automatically e-mailed with a request to transfer additional funds to cover the new account.

Scenario 2. The library case officer

make the customer the starting point for change – by identifying customer wants and creating the infrastructure to support these expectations

we are led to the conclusion that the existing systems must be redesigned to sup-
port users’ needs and not the needs of the organisation, since, at present, the library housekeeping systems are designed predominantly to aid the acquisition and processing of physical documents.

To accomplish this we would need the seamless integration of systems so that a single individual, the case officer, could set in train or use all of the processes demanded by a particular interaction with a client. (In reality, the case officer might actually be a team of two or three persons sharing the role.) Such an integrated system would support the four primary functions defined above and, in addition, would have links to an accounting system which would monitor the use by departments or individuals of their accounts for particular purposes: document supply, inter-library loans, journal subscriptions (print and electronic), online search fees, etc.

We can then imagine an ‘information officer’s workbench’ – a front-end to the new, integrated university library system, which is used by the library ‘case officer’ in responding to the wants of users. In much the same way we imagined the activities of the library user in Scenario 1 above, we can also imagine the activities of the future librarian in Scenario 2.

Clearly, filling a role of this kind will be extremely demanding of staff time and competencies and the integrated systems underlying the workbench will need to be not only reliable and robust, but will also need as high a degree of built-in intelligence as can be achieved. For example, the systems should know the identities of everyone associated with the system – users and librarians; they should be able to distinguish internal users from those outside the system, and they will need to be highly secure to prevent mis-use by either members of the university community or those outside. In those parts of the electronic library used directly by clients, without the intervention of the case officer, there will need to be systems that learn how the individual user behaves in searching and in using other capabilities of the system. It will need to include personal digital libraries of downloaded materials for every user and should be able to determine, through an in-built filter, when an item requested by one user is already held in another personal library. Those personal digital libraries will need to be supported by search and retrieval systems that can be customised by the individual user to relate to his or her search behaviour and particular modes of classifying the contents.

CONCLUSION

The kind of redesign described in this paper may appear to be demanding a great deal of future integrated systems, but the technology to achieve that integration and the kind of functionality described here are now emerging and are already being used at least to some extent. For example, academic libraries are already using Web-based front ends to provide access to catalogues and to electronic sources in the manner described above (see, for example, the Web pages of the University of Sheffield Library [22]). While these developments appear to be driven more by a desire to provide access to resources than to form a case officer’s workbench for interaction with the network-based client, their conversion to that function is possible and necessary, if libraries are to rise to the challenge of electronic sources and find a new role in the academic community.
If the technology is ready and if functions are capable of being integrated in the way suggested above, and if librarians are eager to achieve the kind of changes outlined, there remains another barrier to the development of this model. The barrier is the user: not all members of academic and research staff and not all students are happy with computer-based access to resources. Many are happy with the systems that exist and are quite resistant to change. In other words, redesign is not simply a matter of new technology, nor is it only about changing professional roles; it is also about changing the culture of the organisation and this is neither an easy nor an overnight task. It was suggested earlier that evidence exists that BPR needs to be applied across the organisation if it is succeed: in the university this means that strategies for teaching and learning and for research support must also change, if the benefits of the redesigned university library are to be realised.

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