More than a Gateway:
The Role of Future University Libraries

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> "Well in *our* country", said Alice, still panting a little, "you'd generally get to
> somewhere else - if you ran very fast for a long time, as we've been doing."
> "A slow sort of country!" said the Queen. "Now, here, you see, it takes all the
> running you can do, to keep in the same place. If you want to get somewhere else,
> you must run at least twice as fast as that!"
> *Lewis Carroll, Through the Looking Glass*

Introduction

Libraries are subject to serious change as a consequence of developments in information technology. This is the case both for public libraries and for libraries working for a parent organisation, such as university libraries. This article presents some thoughts on what the future may hold for university libraries. The role of the library within the university is changing rapidly; information technology is not only pervading the library, but also penetrating the primary processes of the university, research and education. It is a major challenge not only to keep up with these changes, but also to anticipate future developments strategically.

Towards digital libraries

The first wave of library computerisation took place in the seventies. Manual back-room activities, such as acquisition, distribution and cataloguing, were turned into computer-controlled activities. This period also saw the introduction of various electronic databases, such as local bibliographic and indexing databases. As a result, the library's traditional customers had to reorient themselves on a fundamental level to the new way in which bibliographic information was now becoming available, i.e. through an on-line public access catalogue (OPAC).

During the second wave of library computerisation, which started in the nineties, the focus was on the deployment of computer networks providing access to remote electronic information. Since then, access to electronic information is no longer limited to so-called secondary information (catalogues, bibliographic databases). Primary information has now become available electronically as well. For instance, users have access to the full-text electronic versions of scientific journals. Electronic textbooks and readers enable users to consult information outside the library, i.e. at their professional and private workplaces.

All traditional library activities are being affected by this innovation. A number of trends can be identified in this context.

One very important trend is the decreasing prominence of the library's physical collection (mainly printed books and journals), and the corresponding increase in the importance of information reference. The library is a gateway, referring users to information irrespective of the location where that information is physically stored.

A second trend is the integration of library services in the processes that are supported by the library. It is becoming ever more difficult to distinguish between the actual provision of information and the various processes in which that information is used. A university library, for example, is connected to a university, whose primary tasks are education and research. At its most fundamental level, teaching is characterised by the transfer of knowledge from teacher to student. The traditional borderline between knowledge transfer through teaching on the one hand and the provision of information by the library on the other is fading fast, due to the use of information technology in education. To a growing extent, library services are blending with the teaching process. Similar trends can be observed in research processes. It also holds true for primary processes in other types of institutions supported by library tasks, for example in policy-making and legal consultancy.

A third trend is the erosion of the self-evident position of the library in the so-called information chain: the process from information production to information consumption. The role of the library is often described as one link in that chain. In the traditional information chain, the main functions, i.e. the production, distribution, acquisition and consumption of information, were accommodated in strictly separated stages and by different parties. However, the configuration of functions within the information chain has begun to shift. Within this changing constellation, all the parties involved (such as the publisher, the bookseller, the library) are struggling to redefine their positions; many of them are innovating and experimenting creatively with new roles instead of adhering to traditional patterns.

At this time, the full and long-term implications of these developments are far from clear. However, for the first time in history, libraries are confronted with competition. Traditionally, the publisher sold its products to the library, and the library in turn provided services for the so-called end-user. Now several publishers are developing services for the end-user as well. Moreover, new products such as – at this moment - Google scholar provide search facilities, seducing people to use the user-friendly simple tools instead of turning to the library.
The main competitive advantage the library may have is its direct link to the primary processes of the university and its knowledge of these processes. In that case, this advantage should be treasured and strengthened, because the library's added value for research and education should be real and clearly visible.

Developments in research and teaching
As has been mentioned already, the processes of research and education are changing as a consequence of technological developments. These changes have consequences for the way the library has to perform its role.

In research, the following trends can be observed (see for instance Houghton et al., 2003)

- increasing diversity in the location of research activities;
- increasing focus on interdisciplinary, multidisciplinary and transdisciplinary research;
- increasing focus on problems rather than techniques;
- greater emphasis on collaborative work and on more diverse and informal models of communication;
- greater emphasis on working with primary data in digital form;
- increasing demand for access to a wider range of more diverse sources;
- the need for access to and management of non-traditional, non-text digital objects;
- new needs for information dissemination.

As a consequence of these trends, it is necessary to re-engineer the present system for the creation, production and distribution of scientific knowledge. Easy access to as much information sources as possible is vital. However, researchers also need tools to manage the information they actually use and to support communication with their peers.
The scholarly publishing system is now evolving along two distinct paths (Savenije, 2003). On the one hand, large multinational commercial publishers are increasing their dominance in access to scientific publications. This has led to the so-called serials crisis. Prices of scholarly journals are rising every year by a percentage that is substantially higher than the consumer price index. This leads to the cancellation of subscriptions, which in turn leads to new price rises. Consequently, the traditional system of scholarly communication is becoming unaffordable.
On the other hand, there is a worldwide movement towards Open Access publishing. There are an increasing number of Open Access journals, i.e. journals for which the reader does not have to pay. These journals operate using alternative business models: for instance, the author (or his institution) pays for the peer review and/or the publishing of his text. Alternatively, the journal is financially supported by stakeholders that have a serious interest in the continuity of the journal. In addition, many universities are setting up an institutional repository in which the university's publications are collected, preserved and disclosed. There are also dedicated repositories, giving access to publications in a certain discipline. The philosophy behind these repositories is that the content they contain should in principle be freely accessible for everyone.

The teaching and learning processes at a university are also subject to important changes (see e.g. Simons, 2003).

- A shift is taking place from an emphasis on education to an emphasis on learning. This implies more active forms of learning, such as more problem-oriented learning.
- The dichotomy between distance learning and face-to-face learning is being abandoned. Various forms of blended learning are emerging, which attempt to discover the optimal combination of different forms of learning.
- A change is also taking place in how people see knowledge. What is considered to be important and certain knowledge is much less clear than several decades ago.

For education, this means an increased emphasis on essential basic concepts and principles supplemented by teaching students the skills to master the quickly changing knowledge rapidly.

- Finally, the educational objectives are focusing more on developing competencies. University education is increasingly aimed at academic competencies, such as:
    - communicating using new media;
    - searching for, finding and assessing information;
    - using, exchanging, analysing and interpreting data;
    - compiling, organising and synthesising information;
    - drawing conclusions and generalising;
    - being able to work together.

It thus becomes more and more important for students to learn how to access and use scientific information. However, they also have to learn how to integrate different information sources, how to communicate with others about this information, and how to detect existing research communities or build new ones.

There is also a growing need for repositories for educational material, such as learning objects: basic electronic building blocks for e-learning, which can be combined and reused in different courses.

The library as a gateway

One of the distinguishing features of the digital library is that it provides access to digital information irrespective of the location where that information is stored. A modern library's policy should aim at making as much relevant information as possible accessible by electronic means. A library can of course store all relevant information on its own server, but this is generally not particularly efficient unless the data involved is information that has been produced by its own university. Most of the information to which the library provides access is stored on servers run by publishers or intermediary organisations. How can the access to that information be guaranteed? In practice, a number of possibilities can be distinguished.

- Free access. This is the case for many Internet sites, including a growing number of Open Access journals, which are high-quality, peer-reviewed scholarly journals. There are currently 1440 acknowledged Open Access journals. There are also institutional and dedicated repositories as well as free portals which provide an overview of information sources for specific disciplines.
- Full licenses for well-defined user groups. This is the case with most of the traditional publishers. For universities, so-called campus licenses arranged by the library provide access for university staff and students from the workstations at the university, but also from their homes. These licenses tend to be fairly expensive. Some campus licenses are offered in the form of so-called Big Deals: the library pays a fixed amount of money, in return for which access is provided to all of the publisher's titles.
- Licenses for well-defined user groups with a maximum number of concurrent users. An extreme variant of such a license would be to restrict access to one user

at one specified workstation. These licenses are seen less and less frequently for scientific information.

- Pay-per-view licenses. The user has to pay for viewing or downloading the article in question. At this moment, this is not a very popular variant with scientific publishers. The costs are still very high (for instance $ 30 per article) and publishers are reluctant to lower this fee in fear of losing turnover.
- No access. This, of course, is the case for information sources with a license fee that is too expensive for an institution. Traditionally, systems of interlibrary loan solved this problem in the print world. Comparable solutions for digital sources are available or will become available in the future.

Ideally, users have access to all sources of information, although availability may be subject to a variety of financial conditions. This ideal situation cannot be achieved unless flexible arrangements are in place between libraries and publishers. Clever combinations between full licenses and pay-per-view may increase flexibility and thus accessibility.

A well-known problem with freely accessible sources is the problem of information overload. This problem can of course be solved by selection. A library presents a selection of these sources that are relevant for the target group to the different communities in its university. This selection should be made with the help of researchers, as they are better equipped to judge the relevance than library staff.

When a library has arranged access, there still remains the problem of information retrieval. Publishers often present their electronic databases with the help of a user interface developed specifically for their own products, and tend to regard that interface as added value. The consequence of this from the user's point of view is that he will have to scan the information sources from different publishers using different interfaces. In other words, if you look for information, you will have to know which publisher is offering it in order to find it. This is highly inefficient from a user's point of view.
This is where the library comes in. The library can play an important role in facilitating user navigation. Traditionally, libraries operate in close contact with their users and communicate with them in order to establish specific user needs. This is important because information retrieval needs may vary between different organisations and also between different disciplines. Chemists would obviously make different types of demands on library services than theologians. The library therefore presents an interface, tailored to its users' needs, which makes it possible to search all information sources in a specific discipline (free-access sources, licensed information and pay-per-view from different publishers) in a single search action. The result will be that the users during the search process only get answers that are fully relevant to their question, without being swamped by thousands of articles only marginally related to their subject.
The system for information retrieval has a digital helpdesk in the background. In cases where this proves insufficient, personal assistance can be offered. When there are new developments and tools in the field of information retrieval, the library will provide instructions and explanations.

A partner in science
The role of the library as a gateway may seem somewhat distant. Nevertheless, in order to excel in this capacity, the library needs to be fully informed of the preferences of the faculty and students. This requires personal contact with the widely diverse target groups. However, to realise the library's potential added value, the library can and must do more. It is essential in this context that the services mesh seamlessly with the education and research processes, and preferably even be an integrated part of these processes. This may seem to be to the detriment of the library's visible presence, but the alternative is that the client must step outside his own process to consult the library's resources. This is a barrier that will increasingly be seen as a problem. On the other hand, the library will no longer be seen as overhead; it will become a realistic ambition for it to develop into a partner for both faculty and students.

One important task, then, is to support faculty and students in managing their own information and facilitating the communication with their peers and fellow students. What does it actually mean to support them in managing their own information? First, the library will ensure that the client has all the relevant sources of information at his disposal. Access alone is not enough to achieve this goal. A personal message will be displayed when something new appears that is relevant to that specific client. The message is defined based on a sophisticated personal profile that the client can adjust as needed.
However, the user will want to organise the relevant information and store it in a way that will make it easy to use. In a sense, he wants to create his own bookshelf that will always be available to him. Using portals ("my library"), the library will give each user access to his own selection and structure, but also to additional relevant information, such as news, conferences and job openings. This type of portal can also offer opportunities for interaction, such as discussion forums.
All the tools listed must be developed with the direct involvement of the target group. This use of modern technology will significantly reduce the time that faculty and students need to search for information. That time can be used to assimilate more information, or for increasing direct production.

To supplement this service, the library will offer the following services to facilitate scientific research.

The library will maintain an institutional repository: it will collect, disclose and store the scientific output from the university in such a way that everyone has free access to the publications. In this way, the library also supports the open access movement. Where copyrights cause complications (e.g. for monographs), the information can be stored for the time being, while free access can be granted at a later date. The publications are presented on a university website, as well as the site of the relevant research institute and the site of the individual researcher. This is useful for profiling the researcher and his institute and university, but it also increases the impact of the publications. This service can be seen as a new core business for the library and will therefore preferably be financed from the budget that the library receives from the university, which implies offering it to the researchers free of charge. For long-term preservation, the library can

enter into a partnership with an organisation specialising in this field. In the Netherlands, that organisation is the Royal Library.

The library may also play a serious role in the management of non-traditional, non-text digital objects, such as primary data and multimedia objects.

Furthermore, the library can offer assistance in scientific communications. Various libraries support scientists by setting up and producing electronic journals, in which the library and the editorial staff work together to assume the traditional role of the publisher. Because such projects use existing infrastructure, it is possible to offer more appealing conditions than commercial publishers. The library will use the Open Access model for such publications as much as possible, so that everyone can have free access. Due to the lack of subscription fees, the necessary funding will have to come from other sources, for instance by means of subsidies, sponsorships, advertising or author payments. Since 2004, the Utrecht University Library has a unit called Igitur for services in the area of electronic publication and archiving.

The library will also offer services to supplement education. Traditionally, libraries play a role in instructions on library use. Much more is needed now; in this context, the librarian should not be the sole instructor, but the teacher's partner. In a partnership with the teachers involved, the library will teach students to work with scientific information, including using that information in their own publications. Student instruction on using scientific information will take place not as a separate training course, but as an integrated component of a relevant part of the curriculum where working with scientific information is relevant. To supplement this instruction, the students need to learn to seek out communities of colleagues who share their interests, but also to create and maintain such communities themselves. This is very important to their future role in scientific communication. The library will offer the teachers support in compiling digital readers: not only the selection of materials, but also saving, storing and disclosing the information. If desired, a printing on demand facility could be linked to the service.

The library will also play a role in storing and disclosing educational material in a broader sense, including e.g. recording guest lectures. The same applies to the theses that students write for their Master's degrees; the papers can be linked to the institutional repository. Finally, the library will offer advice and assistance in using scientific information in the curriculum. Among other aspects, this concerns the use of parts of the special collections, such as manuscripts and old printed documents. If these materials are used in education, the library can make them available in a digital format. The papers that the students write on these materials can then be enclosed with the digital versions of the documents as added value, to enrich the sources for future users.

Conclusion

Traditionally, a library has a physical collection. It is responsible for the storage and proper maintenance of this collection, as well as its disclosure and availability. For centuries, users could gain access to the documents in the collection by requesting assistance from a librarian. The physical collection is gradually declining in importance. The library's storage function is changing, increasingly concentrating on the scientific output of the university itself. The library ensures that the university community has

access to as many sources as possible, even if they are stored elsewhere. The availability of the relevant sources has to mesh seamlessly with the primary activities of the clients. The user will use the tools of the library, in a sense, to create his own bookshelf and organise it in the manner that suits him best. He becomes his own librarian.

If this will be the future of the library, will we still need library buildings?
Yes, we will need physical libraries for a number of purposes, both now and in the future. One obvious purpose is to house the print collection and other tangible materials, and to create places where people can obtain assistance in their use. Important factors in this context include the specialised collections and associated library services. It should be noted that even if many sources will be available electronically, many documents will be kept for their cultural value, for instance from the viewpoint of the history of art. The library also provides places where people can gain access to the Internet and the whole range of electronic resources and obtain assistance in their use. There is an ever-increasing need for such access and assistance.
It houses spaces for people to study, to do research; for students, the library building is evolving toward a learning resource centre. It also provides facilities for people to work together, which are increasingly necessary.
Last but not least, library buildings are increasingly evolving to become an agora, a social assembly place where people meet, by appointment or by accident. Both now and in years to come, the building for the future library is certain to be more than a gateway.

References
Houghton, John, Colin Steele & Margaret Henty (2003). **Changing Research Practices in the Digital Information and Communication Environment**. Department of Education, Science and Training. Australia.
Savenije, Bas (2003). **Recent developments in commercial scientific publishing**: an economic and strategic analysis. DF Revy 26 (8), pp.220-227.
Simons, Robert-Jan (2003). **ICT in het onderwijs: naar de derde fase?** In: SURF/WTR, De vruchten plukken: Trends en visie. Utrecht 2003.