E-COMMERCE FOR LIBRARY PROMOTION AND SUSTAINABILITY: HOW LIBRARY TECHNICIANS CAN MARKET THEMSELVES AND THEIR LIBRARY'S SERVICES ONLINE

Lothar von Retzlaff

As players in the delivery of services and online information, libraries are in the best position to use staff expertise and the technology they have developed to foster community awareness of social, professional and commercial interactions on the internet. Historically, libraries have been progressive institutions, undertaking constant reassessment to stay relevant. As clients become used to the nuances of virtual transactions and the technology for participation on the internet becomes widely available, the provision of value-added services, such as virtual reference, e-reserves and WiFi networking further contribute to transactions and services traditionally provided by institutions such as libraries. These services and transactions use business models to justify funding and ongoing support. It can be argued that libraries must keep abreast of new models of e-commerce to provide relevant services and develop input where necessary, to predict changes and suitably adapt their way of interacting online or doing business, whether it is free, fee-for-service or cost-recovery. Such is the competitive nature of the World Wide Web that libraries are being challenged to justify their existence and budgets against this context. By using e-commerce models, for example, the buying and selling of information, products and services via the internet, and developing new models, libraries are well placed to promote their own successful futures.

Introduction

As we come to understand the increasingly complex business of surviving inan era of decreasing budgets and large-scale advances in technology, it is evident that we can no longer rely on traditional approaches to library management. With the prospect of competition, real or perceived, from developments in search engine technology and the widespread access to the internet by library users, we need to advance our thinking on how to market and promote libraries in the online environment: we need to utilise and develop principles that have proved successful in other contexts, when and where appropriate. This paper will explore e-commerce to determine how developments in technology, promotion and marketing in the commercial arena may be adapted for libraries, so they can utilise services and create infrastructure to ensure the use of the internet benefits libraries in maintaining future funding, relevance and existence.

Libraries as social capital

The World Bank defines social capital as 'the institutions, relationships, and norms that shape the quality and quantity of a society's social interactions… Social capital is not just the sum of the institutions that underpin a society, it is the glue that holds them together' (World Bank 1999).

With the reduction in community meeting places, the internet has developed as a neutral ground where possible divisions such as class, ethnicity and associations are irrelevant, replacing churches, pubs and other inexpensive meeting places. This facilitates the exchange of information and communication, and is the reason the E-commerce for library promotion and sustainability internet was developed in the beginning. It allows society to use the technology available to communicate and to mediate that communication. Traditional forms of communication, such as the written and spoken word, act as reference points for communication in cyberspace. When communicating in cyberspace, we use the processes we have learned throughout our lives. Articulating and communicating our thoughts is taught through schooling and interaction with each other in society. In libraries, we need to address concerns about the erosion of civic life and social capital by regaining community support and positioning libraries as essential community-based institutions. This will require new strategies to improve the value of the library as one element in the stock of social capital.

Libraries made their online catalogues available on the internet in the late 1980s, one of the first instances of online marketing of an organisation's products (Smith 2002). As a player in the delivery of services and information online the library can use the expertise of its staff and technology to make the community aware that its interactions and transactions on the internet,

both socially and commercially, have real and estimable value. This is an intrinsic part of a progressive history that needs continuous reassessment to stay relevant. In September 2004, a comprehensive study carried out by library researchers, Griffiths, King, and Lynch, assessed the return-on-investment in Florida's public libraries:

The total revenue investment in Florida's public libraries is $449 million… The total economic return attributed to the existence of the public libraries is $2.9 billion – based on the analysis of what would happen if the public libraries ceased to exist... The cost to use alternative sources to the public libraries include the cost of user time, as well as monetary costs related to purchasing or renting items, or travelling to another location, etc. For those uses for which a known alternative would be used, the cost to access/acquire the alternatives would be 108 million hours or $1.8 billion, plus $2.3 billion in other expenses. This results in a total cost of $4.1 billion to use alternatives to public libraries.

The study states that all taxpayers in Florida benefit from public libraries through their contribution to 'education, the economy, tourism, retirement, quality of life, and so on.' It includes many key findings that detail the impact of libraries on a community, validating their commercial value. A similar study, which was carried out by the St Louis Public Library in 1998 concluded that 'each $1 of annual tax support for the library produces, on average, direct benefits to users of more than $4' (Holt,Elliot and Moore 1998). Another study – of Southeast Asian nations – indicates that they use libraries to promote national development, literacy programs and to disseminate government information (Lim 1997).

Libraries doing business

Since the World Wide Web became part of everyday life for much of Western society, the ways both businesses and libraries operate and offer services to the public have changed. Libraries have had to develop strategies to 'chart a course from past missions to an uncertain future' (Young 1995). In the online business environment, radical new ways of interacting with and servicing customers have emerged. Harvard economist Peter Schumpeter refers to this as 'creative destruction'. He states that only by discarding old ways of doing business can new ways be created (Schumpeter 1996). New technologies not only make this possible, but for libraries they have evidently enhanced their way of providing services. For example, the card catalogue was replaced by a computerised version, which was then adapted for use on the internet, making access much easier and less restricted. Old tools, like the card catalogue, had to be discarded. Library staff learned new ways of organising information. Making such services available for library users extended the business of library service to an online environment whilst retaining a physical presence in the parent community. That process continues today. Libraries may be lending fewer books (Kerslake and Kinnell 1998), making this justification for their existence less relevant and changing a long-standing rationale. If we chose not to invest in technology, and continued to require library users to come into the actual building to use the library, we would be retrograde in our thinking. If we cannot see that technologies such as those used by search engines (for example, Google's page ranking) and online book ordering businesses (for example Amazon.com) have real ramifications for libraries, then we are derelict in our thinking and missing an opportunity to assure their future. 'The extent of benefits will vary with the extent of e-commerce take up but generally Australian firms using e-business are saving between one and five per cent of ongoing costs, while 10 per cent of these companies are saving 15 per cent and more' (Allen Consulting Group 2001). In 1999 Amazon 'reportedly spent an average of $113 dollars to get each new customer' (Blackwell and Stephen 2001), despite a growing deficit. They did this to ensure their continued domination in online sales of books.

In the current economic climate, libraries are engaged in competition. They compete directly with internet cafes by providing public access to the internet via computer workstations. There are many other ways in which libraries compete directly with commercial businesses and services, like the dissemination and storage (archival or online) of government information. Libraries also train their clients to use the internet effectively as part of their service to the public. This, in effect, enhances library users' skills, which then promotes the use of libraries. Without such use, libraries cannot justify their budgets. In such a paradigm, users are not merely patrons, but customers who must return if libraries are to remain viable.

In Australia the internet is being used to sell goods and services online. This is commerce at its most fundamental level: the exchange of goods and services, usually for money. Commerce relies on buyers, sellers and producers. Those enterprises that combine their 'bricks and mortar' presence with online internet technology are involved in e-commerce. Libraries engage their users in this environment and supply resources and services from their 'bricks and mortar' presence. How far removed they are from actual e-commerce transactions is worth examining.

E-commerce, in its broadest sense, can encompass any form of business interaction, which makes use of information and communications technology. E-commerce can be defined as the buying and selling of information, products and services via computer networks, today and in the future, using any one of the myriad networks that make up the internet (Kalakota and Whinston 1996).

E-business is the wider concept of managing organisations electronically. Whilst e-commerce is the term widely used in the literature, we need to be aware of the broader implications of e-business (Smith 2002). Many of these transactions apply in an e-commerce framework; however businesses are learning that the internet is a new area with new rules and trial-and-error speculation. What passes for conventional e-commerce wisdom today mutates tomorrow.

In the current literature, there appears to be no clear definition of how e-commerce relates to libraries. It seems that library e-commerce could be defined as the interaction involved in providing and supplying library resources, products and services to users or customers through the use of computer networks via the internet. In other words, it is a function similar to a commercial activity that is supported by electronic technology, but in a library environment. There is thus a clear need to examine the implications for libraries in a marketing and business framework if only because the internet has offered alternative sources of information and therefore is in competition with libraries. 'Despite their elevated status as public institutions, libraries are in truth surrounded by competition. Libraries are constantly competing for market share against other information services' (Guscott 2001). One example of competition is the internet search engine. There are many available, and recently Google Scholar has attempted to compete against structured databases. Whilst these search engine technologies cannot replace the standard of service and authority that libraries supply, they do offer a perceived alternative to information seekers at the level of general public convenience. Libraries and their staff need to recognise that they are in a market place where transactions, marketing and the provision of services are comparable with the e-commerce of the e-business environment. The strength of e-business is that it enables organisations to utilise information about current trends and implement them quickly and effectively in their business processes. Rosenbaum (2000) identified three imperatives for electronic commerce.

- Information generated by e-commerce activities must flow rapidly and effectively through the organisation.
- Organisations have a responsibility to carefully manage their e-commerce transactions.
- Organisations must work to build trust into their relations with customers and business partners.

With the widespread acceptance of hypertext mark-up language (HTML) as a standard, from its beginnings in the 1980s as Standard Generalised Mark-up Language (SGML), e-business began to come to life. HTML is the coded format language used for creating hypertext documents on the World Wide Web and controls how Web pages appear. It allows developers of web pages to define hyperlinks to other pages. Technological developments in more sophisticated standards such as Extensible Mark-up Language (XML) have allowed the e-business process to develop further. XML is a flexible, pared-down version of Standard Generalised Mark-Up Language that facilitates the creation of standard information formats and the sharing of both the format and the data on the World Wide Web. It was designed especially for Web documents and allows the creation of customised tags, enabling the definition, transmission, validation, and interpretation of data between applications and between organisations. E-business and e-commerce have become borderless and instantaneous, without the constraints of the set opening hours of bricks

and mortar businesses. For instance, e-businesses can be open 24 hours a day, 7 days a week, 365 days a year. This offers the potential for 'one-stop shopping', as portal sites integrate and offer a number of e-business transactions seamlessly. Libraries have developed their own 'one stop shops', but use terms such as 'information toolbox' or 'information portal'. The internet for libraries has become a high speed, worldwide, instantaneous response-orientated economy that directly affects the way we do things, plan our futures and supply our customers' requirements.

The value of e-business for libraries

To continue offering services and remain relevant in the information industry, libraries are consolidating to offer complete packages online, inclusive of such concepts as e-reserve, database access to full text journals, e-texts; online interlibrary loan ordering and delivery. We service our customers by developing best practice based on commercial standards. For instance, e-mail is used more and more, and the availability of journal articles is facilitated through the use of the PDF format because logically and commercially it is faster, more efficient and convenient for our users. Users of computers have become familiar with convenience and universal formats that operate on different types of computers. Library staff, however, especially library technicians, assistants, officers, and support staff in general, have 'never trained to act as if we were doing business in the private sector, battling for market share through innovation or aggressive service models' (Guscott 2001).

The way the internet is used and developed for business has been one of adaptation and innovation. One example of this is the adult entertainment industry. Whilst in libraries it is part of our skills to understand the use of meta tags, 'adult website' webmasters (not librarians) pioneered and remain the most aggressive manipulators of search engines (Glidewell 2000). This manipulation has increased with the exponential growth of the World Wide Web and page ranking. Good quality metadata would help return good quality results and improve relevance. However, the use of incorrect and manipulative metadata leads to misuse as websites try to increase their exposure by appearing at the top of search engine hit lists. 'Most popular is the usage of pornographic vocabulary' (Mair 2002) which is an example of the intense use of metadata in an online presence. With librarians and library technicians trained and skilled in the use of trustworthy and correct metadata and in light of the growing commercialism of the internet, 'libraries may well be able to trade their information about knowledge in ways that assist their financial viability' (Allen and Retzlaff 1998) and to present legitimate information.

Another area where Glidewell (2000) discusses adaptation and innovation is the example of CaveCreek Wholesale Internet Exchange, a business that specialises in developing its servers cheaply to deliver large bandwidth-hogging data to adult site customers at acceptable speed. This type of performance from their computer system gives them better control and is seen as an essential part of their customer service, since these types of sites depend on delivering large amounts of data in the form of video streams at any time from an unpredictable amount of subscribers. They claim that their servers can not only cope with exceedingly large amounts of data transmission but, at the time, they also exceed the Yahoo search engine in total traffic. The reason that this is important may be seen in the example of when, in January 1999, Victoria's Secret aired its first-ever Super Bowl commercial, announcing the live webcast of its Spring fashion show. The site was flooded with millions of hits within a few minutes after the thirty-second spot ran. Just a few days later, the live webcast drew a record-breaking worldwide 1.5 million visitors. This incredible drawing power posed technical problems in the form of slow and unstable downloading capacity for VictoriasSecret.com and many customers were turned away due to the website's inability to support the traffic bursts.

The number of e-services available for delivering information over the internet is continuously increasing. A wide range of groups such as credit card firms, utilities such as gas and electric suppliers, the online bookshop Amazon.com and so on, use e-commerce in the market place. As internet technology has developed, the cost of an online presence has fallen, allowing more opportunities to participate in a timely and efficient manner. Extensive content, new and challenging environments, variety and diversity of opinions, ease of access and falling costs are among the many characteristics that make the internet an effective vehicle for libraries. One of these developments for the internet is the 'Chasing the Sun' project, a collaboration of Australian

and United Kingdom health libraries using Questionpoint software. Questionpoint is virtual reference software that enables chat and interactive web searching to answer questions 24/7 around the globe through the use of the World Wide Web. The Chasing the Sun project provides an after business hours, on-line, reference service for urgent clinical questions relating to patient care. The project takes advantage of global time differences between countries to offer out-of-hours librarian support for clinicians seeking urgently needed information. Members of the service comprise members of the South Australian Health Services Libraries Consortium, health libraries from Victoria, the Northern Territory and the Australian Capital Territory in Australia, and members of the South West Region of the United Kingdom National Health Service. Another similar service is AskNow!, a pilot initiative of the Council of Australian State Libraries. As users get used to the nuances of virtual transactions, and the technology for participation becomes widely available, virtual reference services, like AskNow! and Chasing the Sun, add to the value of services and transactions traditionally provided by libraries.

Some functions, such as selection of library materials, acquisitions, supplies, material management and processing are obvious tasks that benefit from an e-commerce framework. This involves ordering and payment online, now a well-established procedure. However, libraries need to re-examine the potentials of e-commerce operational processes for other areas, such as circulation. Functions such as self-checkout, check-in and renewal, as well as self-registration, can utilise the frameworks that exist for e-commerce models for business to consumer. These are e-services that can be developed to be included in library websites, offering as many services online as possible, adding to existing online library services available through the internet or e-mail. Libraries already offer online tutorials. This can be expanded to include other learning information such as interactive workshops for the public in internet searching or database use, similar to that already offered by university libraries. It would seem appropriate for local public libraries to offer such services as portals to local government services and forms. Libraries have the records management skills to organise resources for their parent body. Library users could, with current technology, utilise e-commerce software to create individual profiles to alert them to areas of interest that the library can offer. For children, the opportunity to access virtual storytime that the library offers in real time would be added value and a promotion of current services.

Most services follow the rationale of a business model to justify funding and ongoing support. It can therefore be argued that libraries must keep abreast of new models of e-commerce to provide relevant services and develop input where necessary to predict changes and suitably adapt their way of interacting online or doing business, whether it is free, fee for service or based on cost recovery. These actions are invariably e-commerce transactions. Such is the competitive nature of business that has come to the World Wide Web.

The literature

The study of e-commerce is a relatively new field: a large part of the reported research examining the impact of e-commerce is predictive or prescriptive – the ‘how to succeed’ type of publication. Much of the readily accessible literature comes from commercial interests, such as consultants, hardware and software sales agents.

Most of the discussion about business models occurs in the business and management literature. A large amount of the business literature is concerned with the emergence, planning and operational challenges of e-commerce for managers, rather than on systematic analysis of the business model as such (Cummings and Doh 2000). In regard to e-commerce applied to libraries, a large proportion of the literature centres on economic transactions such as bill paying, money transfer and ordering. The most prominent articles deal with theory and latest developments (but such articles are relatively rare) with three to four articles discussing the benefits for libraries (see Smith 2002; Holba Puacz 2002; and Fogelberg et al. 2003). Online research agencies such as Pew Research and Forrester discuss latest research and analysis in the e-commerce area but not specifically in relation to libraries.

Modern approaches to e-commerce take into account the dotcom crash of the 1990s and the way in which that phenomenon emphasised a need to include the bricks and mortar presence of

a business for credibility, even though business takes place online. ‘Any business-to-consumer internet company that doesn’t have a foot planted firmly in the real world – with experienced management teams, a physical presence, efficient distribution system, and ability to make a profit – is doomed to fail’ (Blackwell and Stephen 2001:1). From this follows the idea of a business process as a logical sequence of interconnected activities that use organisational resources to create products and services to meet customer needs (Childe, Maull and Bennett 1994).

Jutla, Bodorik and Wang (1999) divide e-commerce business models into three broad categories: cybermediaries, manufacturers and auctions. That the existing spectrum of e-commerce activity should be limited to these categories seems far from clear. Two, cybermediaries and manufacturers, describe how revenue is produced in relation to particular products and services, whereas auction models describe a transaction process. Furthermore Jutla et al. disregard the two most common e-commerce models, pornography and spam. The manipulation of metadata and the use of sophisticated e-mail list collection technology to market products is well known and, whether we like it or not, a successful example of e-commerce in the online internet environment.

E-commerce, libraries and the internet

To understand more the significance of e-commercial development on the internet for libraries, we can examine more closely its historical development. There is no doubt that communication technologies represent a further change for society similar to that experienced by the invention of the printing press and the written word in the fourteenth century. Jones (1998) says ‘It can be argued, in fact, that the internet is the latest expression of print capitalism. Much as newspapers and pamphlets spread the word of the New World to Europe, the internet spreads word of electronic environments.’ New forms of technology present new and extended ways of performing traditional tasks including business, interacting and communicating within society. This encompasses all aspects of social, political, cultural and economic life.

Culture and society adapt constantly and take advantage of learning experiences. These experiences evolve and develop in a process that is repeated throughout history. Advances in technology are an integral component in society and culture adapting and the ways in which we interact. These technological developments are constantly changing the cultural landscape. For example, internet relay chat (IRC) software is a multi-user synchronous communication facility that is available all over the world to people with access to the internet network of computer systems. ‘IRC was not specifically designed for a business environment’ (Reid 1991). It was designed originally for academics to communicate with each other, but its ability to allow real time discussion, anywhere in the world, makes it an economic way of conducting business and social communication. IRC is also used by used by libraries in virtual reference services.

Other uses of technology for new or alternate purposes include the widespread use of ‘spam e-mail’ for advertising and the proliferation of pornography where the internet is used for distribution of its products and services. Therefore it is feasible to say that technology and the uses to which it is put are shaped by prevailing social values and consumers’ lifestyle choices, as much as by the original intentions of the artefact’s designer (Kling 1996). Whilst this process is ongoing, the basic historic principles and experiences of commerce and economics form the basis of commerce on the internet. This is evident by the rise in commercial activity, not just as simulations of past experiences that evolution has taught, but also as extensions to our intellectual and physical ability to adapt.

The exponential growth of the internet shows that it is the fastest growing technology in our history. According to the Australian Bureau of Statistics, the income generated by businesses selling on the internet increased from an estimated $9.4 billion in the years 2000/01 to $11.3 billion in 2001/03 (Australian Bureau of Statistics 2003)[i]. The number of internet workstations available in public libraries in Australia grew from 827 in June 1997 to 3005 in June 2000[ii].

The Australian Bureau of Statistics[iii] states that ‘the percentage of Australian households with access to the internet at home has increased strongly, rising from 16 per cent in 1998 to 46 per

cent in 2002. In the USA, where the internet began, 75 per cent or 204.3 million Americans have access to the internet from home (Nielson//NetRatings 2004). In Britain, the first Oxford Internet Survey (2003) sampled 2030 people aged 14 and upwards and found that the average person has access to the internet in at least two of four places: home, work, school or at a public library. The survey states that 'among Britons age 14 and over, 59 per cent currently use the internet.'

It is more than apparent that a marketplace exists online. The library has an online presence where that marketplace exists. In its capacity as an information provider, the library of today exists where market forces can, to an extent, dictate the type of presence it has online. Whether that influence is on the style and presentation of websites, the usefulness of portals or the efficiency of software used to pay for journal subscriptions, the chances are that commercial influences are present. While the modus operandi of the library is to provide information freely, and when appropriate, on a fee-for-service basis, it is useful to frame services on a business model and to examine the value of labour and services of libraries and their staff in an e-commerce, online environment. Services such as interlibrary loans (ILL) have been costed in

the past. In some cases, such as public libraries, this service is free to users, however the effectiveness of the service is an essential component in providing evidence of the value of library services and determining their funding. Such valuations may become a useful tool. For instance, in 1992, the Association of Research Libraries (ARL) carried out a study that determined the cost of an interlibrary loan. That cost was $25 per transaction, inclusive of postage, labour, materials etc. This was a useful benchmark because if an actual item costs $20 to purchase then it is obviously more cost efficient, and perhaps time efficient, to consider purchasing the item as part of library stock instead of requesting it from another library. Free services still need to be business-modelled for this reason.

The goal of research on business models for e-commerce in libraries is to integrate knowledge about historical practice, experience with emerging practice, and anticipations of future practice to produce up-to-date marketing models. As alluded to previously, it is widely anticipated that internet-based e-commerce will alter the overall commercial environment significantly in the future. One positive effect is that e-commerce will enable entirely new kinds of business ventures to generate substantial new opportunities for economic growth, changing the various structures and processes of online transactions. For instance, the business of adult pornography through websites has seen the pioneering of aggressive manipulation of search engines, as discussed earlier. It also reinforced the demand for the transference of large amounts of information across the internet, a technological development that e-business and libraries have benefited from in the past and will benefit in future.

Data mining

Libraries have always had a large database of users, stocks and usage statistics. The objective of collecting library statistics is 'to assess the quality and effectiveness of services [and resources] provided by the library' (Poll 2001). Whilst we examine these statistics for such purposes, libraries seldom examine the profiles of their users for marketing. Occasionally, they send out surveys to evaluate the data in the context of their unique setting to enable sound decision-making (Bland and Howard 2003). A continuing trend toward data-driven decision making and accountability requires institutions to store more data in a data warehouse. Data warehousing is simply storing information about customers, clients or users that keeps the records as indexed files, in an ordered usable management system which has been around for many years. In the competitive business environment, this data is increasingly being used in sophisticated ways through use of new technologies in data mining. Data mining is the ability to extract and interpret specific data held within the data warehouse. Telecommunication companies, banks, insurance companies, utilities and retailers compile data about customers by using this new technology. The data gives insights into their customers' future behaviour and product needs. This newer technology is more sophisticated than previous data collection and analysis software that gathered for analysis and application simpler data such as customers' ages, gender, income and geographical location.

Data mining, customer analytics and predictive modelling software often allow the user to select subgroups of customers, track cohort groups, create queries, and build visual representations of data patterns or trends to make changes in products and make long range plans for new directions. Hence data-driven decisions can be made. This actual concept is not so new (Chen, Han and Yu 1995). In the past, staff of the local library could recommend and purchase new stock for customers by developing a personal interest and knowledge of individuals who used its services. Data mining attempts to do this on a larger and more consistent scale and it seeks, through statistical analysis, to reveal that often-elusive relationship between a business and its loyal customers. Libraries have always kept statistics on usage. Customer analytics are a way of making statistics more useful by applying algorithms in a way that makes them easy to use. This yields valuable information for target marketing such library patron profiles. In theory, the more information you can gather about your customers, the better you can anticipate and cater to their needs. By using advanced profiling technology, libraries would be in the position of predicting library users' satisfaction rates rather than establishing current satisfaction. This involves changing strategies to meet new realities in user demands. It is a perfect vehicle for soliciting unbiased information on current trends and anticipating future challenges. It also facilitates clarification of current needs through the administration of random surveys of pre-existent data that can be mined without the necessity to impose on clients by ad hoc or sustained interrogation.

The ability to develop effective marketing and promotion strategies is another key benefit of utilising the customer profile. Target marketing is available as a means of profiling the library user. For example, even basic statistics can be used to ascertain the nature of information retrieval habits of library users. Staff can identify usage by such things as type of resource, time and how up-to-date the resource is. A sophisticated yield of user profiling would also establish that items were checked out by particular demographic groups, then by cross referencing to a database of information about users, such things as age groups and reading levels would be revealed for examination. As a result we could query the user profile provided by a database and disseminate information to staff of the library who would benefit from the query results, such as appropriate times to run courses. If this profiling is further examined, it might provide results not only for students in universities, but also for community users of public libraries and so on. For example, public library users who have very young children could be profiled differently to those with secondary school-age children to provide a service for homework resources. A database query might also indicate that there is not a sufficient population within the profiled group to offer any program. If that is the case, an alternative approach to programming might be considered. An important benefit of having the ability to understand the critical mass available for a particular in-house training program results in more cost-effective and co-operative programming. Fiscal and human resources may be more efficiently deployed through the use of this type of mined data from databases that already exist.

Increasingly, we have been asked to provide evidence that the money provided to libraries is an investment with discernible and quantifiable returns. As noted above, instruments such as the customer profile are important tools that enable us to develop a strong rationale for our existence. Library administrators can report to funding sources that they are making wise and cost-effective decisions based upon data that is mined through the latest technological advances. Enlightened decisions made in the areas of planning and development, marketing, stakeholder reporting, and developing measures of accountability, can benefit libraries well into the future.

Google and e-commerce

A survey undertaken in 2001 found that 71 per cent of internet users expressed frustration when searching the internet and, at that time, it took about 12 minutes, on average, for users to experience 'search rage' (Sullivan 2001). Danny Sullivan (2001), editor of SearchEngineWatch, suggests we 'consider some more "traditional" alternatives. For example, consult an informational professional, such as a librarian.' In this statement, Sullivan sums up the quandary of the internet as threat and opportunity.

Libraries are threatened because, in social terms, the internet might seem to render them less relevant. At the same time, the technologies of information brought to life in the internet make

libraries so much more extensive that their relevance has never seemed more obvious (Allen and Retzlaff 1998:92).

What if libraries and their staff applied commercial methods for marketing their library expertise in finding information on the internet and through the services they provide on a daily basis? It is feasible to examine how library staff can market their skills in saving time searching for information on the internet. This is a valuable service, as is demonstrated by Google and its question answering service, Google Answers.

Larry Page and Sergey Brin founded Google. In just five years, it became the most popular search engine on the internet to the extent that rivals became Google customers, including Yahoo and AOL, which license the technology and route search queries through Google. In August 2003, Google represented 75 per cent of all searches (Jefferson 2003). This represents widespread implications for libraries in that it is evident that we have competition for the provision of information services. There is much to note in the way that Google has become so popular.

From the great Library of Alexandria in the 3rd century BC, libraries have had a long period of time to market and promote themselves in ever-changing environments and societies. Crawford and Gorman (1995:4) state that:

…the tasks of the library can be simply stated and understood. They are as true for a modern branch of a public library as they are for cathedral libraries of the Middle Ages or the great research collections of universities. Libraries exist to acquire, give access to and safeguard carriers of knowledge and information in all forms and to provide instruction and assistance in the use of the collections to which their users have access. In short, libraries exist to give meaning to the continuing human attempt to transcend space and time in the advancement of knowledge and the preservation of culture.

It is apparent that search engines do not go that far. Even though search engines like Google can be regarded as competitors in the provision of information, this does not mean that the actual quality of information an internet searcher gets from a search engine compares to the service offered by skilled library professionals.

Whilst libraries have trained staff and licenses to full-text databases, and offer virtual reference services and a collection of hard print material, users have increasingly chosen the convenient alternative of search engines such as Google. Google may be convenient, but libraries have an edge: Google searches using ranking technology to rate the most popular at the top of the hit list often produce far too many hits to be useful. Google For example, when Google was searched in March 2005 for information about arthritis and over 11.4 million hits were retrieved: for cancer, there were over 52.5 million hits and for probiotics, substances that promote the health of the gastrointestinal tract, there were over 461 000 hits. Probiotics is a good example of unmediated searching. The results of a Google search on probiotics contain mainly commercial results that offer sales instead of scientific facts. But, by using mediated searching techniques and limiting the search on probiotics by sites that have in the URL '.gov', there are 3170 hits. The function to limit searches is available on Google and perhaps it will take less than 12 minutes, thus avoiding 'search rage'. Serious information seeking should involve structured searching of more specialised databases than are offered through Google search engines. Libraries provide a better product, by using research information that is not necessarily free on the internet but is often available freely through libraries as well as mediated searching.

New forms of technology present new and extended ways of performing traditional tasks, including interacting and communicating within society. This encompasses all aspects of social, political, cultural and economic life. The culture of the internet is one that easily empowers the user. The results are instant and quite often, as stated, there is a lot of information offered in the results gained by typing keywords into a search engine. Using the analogy of fast food, driving down the road and stopping at a fast food store for convenience food does the job of satisfying hunger. However, the continued consumption of poor quality food may lead to health problems (Prentice and Jebb 2003).

It is the quality that counts, not instant satisfaction, especially if serious research is being undertaken. If it is a 'fast fix' that is required, the interfaces of search engines, like Google, are practical and easy to use. Seemingly, the culture of the internet says that 'Google is easy to use...therefore it must be' (Bell 2004). Everyone is doing it. Again, instant results are provided, and they can seem to offer large amounts of information. However, it is important to note that the value of all information is relative and its limitations need to be considered (Eldredge 2000). Certainly library professionals know this, and it is implicit in our training. Search engine searches are unstructured and interrogate a large body of essentially unstructured data, the only structure being provided by the query itself.

When Google doesn't work, most people don't have a plan B…Librarians have lots of plan Bs. We know when to go to a book, when to call someone, even when to go to Google (Selingo 2004).

So why then are libraries losing ground (comparatively) as the first port of call for information? What was it that gave Google its popularity and what can libraries learn from the commercial online environment and its use of e-commerce?

Google was in the right place at the right time. When the Google search engine is loaded there is less time spent waiting for the downloading of pages encumbered by advertising. Google was clear and simply laid out. Interestingly, this remains the same today as the white background page of Google loads quickly. Ogbuji (2004) states.

It uses plenty of white space, the Google home page contains exactly 37 words and search results are largely undecorated and ads are discreet text boxes. Even as Google has added features, from Usenet and image searching in e-commerce terms, the emphasis on the simple interface remains and is one of Google's most admired features (see also Bell 2004).

If you have the internet, you don't have to log on to Google as well as load the page. You can start typing your query immediately. Google's simple-to-use image was promoted from the beginning. It marketed itself as 'the people's' search engine and its popularity spread by word of mouth. Ogbuji (2004) also states that 'The name "Google" became a generic verb, the surest sign of zeitgeist possession, and has become a top brand with very little traditional marketing.' Libraries need to examine this model of populist marketing in the e-commerce environment and to understand the benefits of internet culture for their own advantage, as Google did (Price 2003). These days, libraries are discussing the use of simplified search screens similar to the Google example. (Bell 2004). A new interface to Kinetica[iv], the Australian national database available through the National Library of Australia, has a white background with a minimum of colour and graphics, similar to the Google interface. However, the idea that Google is merely a search tool and not necessarily a solution has not been made clear. Google will give results but the correct, appropriate or most relevant answer is not guaranteed, nor is the search necessarily a mediated one unless the user has some skill in searching.

Most libraries offer databases with content not accessible via Google. These are often fully accessible outside the library building and available all hours of the day and night. The current range of databases has become easier to search through the design of better interfaces. Companies that supply and market databases, like ProQuest (Bell 2004:3), offer different interfaces depending on the user's need and skill level. However, unlike Google, the databases offered by libraries come with people available to help use them. It is incumbent on libraries to look at these positive aspects of library service and determine how they can exploit the techniques that Google has successfully employed (such as word-of-mouth, e-commerce marketing and the constant media focus) and utilise some of these technique for marketing their own services. The databases that are available and the quality of the search training that is offered can be used as a marketing device just as Google markets its services online. It's very inexpensive (Price 2003) and produces results. Libraries have experience and quality on their side, which means they possess huge marketing opportunities.

Google Scholar and Google Print

Google Scholar, a test version of a search engine aimed specifically at academic material, searches only research publications such as journal articles, books, preprints and technical reports. It puts the most pertinent articles and citations at the top of its searches by means of algorithms similar to those used by Google's conventional web search. These analyse the number and importance of links pointing to sites (Butler 2000). In Google Scholar, papers with many citations are generally ranked highest. Google says almost all 'major publishers' have allowed the full text of their papers to be searched, although it does not reveal those involved: however Google Scholar has problems such as ranking older articles at the top of the hit list, thus effectively putting dated material ahead of more recent articles. It is noteworthy that while the attention that Google Scholar received in the mainstream media and in discussion within research circles was very significant, the excitement about Google Scholar was concentrated in those circles. The Google Print projects, however, received widespread public attention. Google plans to digitise millions of books from the collections of the Universities of Michigan, Harvard, Stanford and Oxford and the New York Public Library and to make them accessible through the Google search screen. The New York Times ran this as the lead news item for 14 December 2004 (Markoff and Wyatt 2004), thus delivering publicity that may effectively draw library users towards using Google.

Litwin (2004) argues that the e-commerce foundations of Google Print are the opposite to the principles of librarianship. Until now library resources have been of 'inestimable value in a society' and have served as a free service to the community. Now they will become vehicles for selling Google and its sponsors. In addition, many of the hits direct the searcher to pay-per-view databases supplied by commercial publishing houses, thereby tending to diminish the 'free' nature of library resources and bypassing the library's expert services. There are also issues of commercial bias and equity of access that libraries need to understand in the evolving e-commerce environment. These are threatening the very role of the libraries on the internet. Litwin (2004) calls this 'the distorting influence of e-commerce' whose influence and commercial models the library itself could control and utilise in a managed context to maximise its own survival and ensure that the long-held principles of the unbiased professional continue to be available for selection.

As a comparison for the purpose of e-commerce evaluation, a structured database of articles and citations offered by Elsevier, essentially a commercial search engine known as Scopus, has a range of annual institutional subscriptions from $25 000 to several hundred thousand dollars (Butler 2000). 'The company argues that research institutions are willing to pay for high-quality search and information services such as Scopus and Web of Science, which is marketed by Thomson ISI of Philadelphia.' Google Scholar and Google Print market the perception that Google offers this type of service simply by using their search engine.

Google Answers

Google has challenged a fundamental role of libraries in the post-modern era, that of the virtual reference service. The Online Computer Library Centre (OCLC) defines virtual reference as 'using computer and communications technology to provide reference service to patrons anytime and anywhere' (OCLC 2005). As discussed earlier it uses computer software such as Questionpoint to answer reference questions online, using real time chat and the ability to send web pages to the client's computer. Google Answers, introduced in April 2002, is a fee-based service where someone with an information need can ask a question and have a Google 'expert' get back to them with an answer, using asynchronous e-mail chat. The client sets the price she wants to pay, anywhere between $2 and $200. If not satisfied with the answer the client can get his or her money back, minus a 50 cent listing fee. Google Answers claims that 'More than 500 carefully screened Researchers are ready to answer your question for as little as $2.50 – usually within 24 hours.' It is a competitive process where the 'carefully' screened researchers lock up a question so that they have exclusive rights to answer it.

Edelmann's study showed that more than 78 per cent of answers provided by Google Answers have a value of $20 or less (Edelman 2004). Google receives 25 per cent commission on all

money earned from providing answers. The study found that the characteristics clients valued in answers were:

- answer length in characters
- number of URL references in the answer
- time in minutes between asking a question and receiving an answer

This study was an economic analysis of the virtual reference model so answer quality was not examined. Jessamyn West describes the experience of working as a researcher for *Google* Answers:

The difference between the Google Answers model and the public/academic library model appears mainly that when a librarian gives a patron a response to their reference query, the patron tends not to argue with her. If she tells the patron the question has no definitive answer, that response is more likely taken as fact rather than a personal failing on the librarian's part. The fact that all library patrons share the time of the librarians tends to encourage a polite acceptance that each patron's specific question is one of many needing to be answered. In the Google Answers arena, I have seen researchers insulted, sworn at, and otherwise degraded by people not happy with the responses they received, when you might think that just not paying for the answer would be reprobation enough (West 2002).

Intermediaries, such as library staff, provide quality control and product evaluation for the material needed. While Google Answers states that its researchers are carefully screened, it is important to note that time constraints on earnings may mean providing quality is not a primary consideration, but rather that a fast and sufficient answer is what is wanted. Thus the quality of the goods expected at the library counter, on the library shelves, and through online services may be significantly different because time constraints do not necessarily apply in the same manner and obviously the library staff need not rely on the amount of money the question is worth.

Added value services are provided by specialised intermediaries such as library staff for services such as literature searches and technical instruction on database usage. However, library intermediaries design the type of the search and evaluation services that will be offered to users by choosing the product mix and focus based on the clients needs. How then does this equate to a commercial world? In the online commercial arena of the retail industry, the quality of the goods expected at a second-hand market, a discount store, and a specialty clothing boutique is significantly different. The boutique has chosen the product mix and charges prices accordingly for their specialty service. In the library, the staff select methods of access to information in order to provide easy access. This happens in a boutique manner where the users have choice of access through the physical library or from their desktop anywhere in the world.

Value of websites

We need to look hard at who we want to talk to through our website: a library website offers many advantages such as twenty-four hour access and online catalogues and databases. Online catalogues are examples of systems that have replaced costly manual processes. Others are ATMs and electronic banking. A university's e-reserve and access to online databases increases traditional business through website access when the customer can access information for courses 24/7/365, in much the same way that commercial products on a website like Amazon.com or Barnes and Noble are always available. Not so long ago, libraries were accessible only during opening hours.

Prospective users in their online communities may differ from the traditional library user and therefore we need to ask new questions about potential, new and established users of library services. Does a library website have the ability to target new segments of the online community? In this online environment we can find ways to offer more extensive opportunities for updating service provision through technology than we traditionally have. Like Amazon.com, the ideal e-commerce site needs four things to succeed: extensive inventory, competitive prices, easy-to-use interface and fast-loading web pages. It also helps if, like Amazon, it offers inventive

extras such as a ‘customers who bought this book also bought ...’ feature. Libraries have the requisite inventory free, and thereby general access to their users largely uninhibited by price or cost considerations. The interfaces libraries use vary in complexity but, if there is a lesson to be learnt from the commercial online world, it is that an easy-to-use interface helps to retain business.

Supplying e-resources

By using a business outlook and e-business methods we have the potential to refocus and re-engineer library operations, not only within the institution, but also the way in which libraries relate to each other on a B2B basis. These operations are similar to the principle of supply chain linkages for commercial business and have transformed the way the institutions work together. Supply chain linkages have been defined as ‘life cycle processes supporting physical, information, financial and knowledge flows for moving products and services from suppliers to end users’ (Ayers 2000). Supply chain linkages manage the flow of materials to the customer and other libraries. Close examination of the way we supply and receive information and resources can improve the design, planning, and control of the network of facilities and tasks that comprise the many stages of the supply chain (Davis 1993).

With an unprecedented number and variety of databases, document delivery options and online knowledge resources available to users, the dynamics of internet technology have both benefited the library’s ability to provide services and set new expectation standards for libraries to meet user requirements. Meeting the ‘customer’s’ desire for high quality and quick service has added pressures not historically present. This means the development of new systems and procedures inclusive of such developments as mobile phone access to libraries and the ability to download information from an organised internet interface or website, involves new understanding and new procedures. Many of these procedures are in existence already but the intentional use of e-commerce business principles such as inculcating an understanding of supply chain linkages can only enhance the competitive development of library services and the training of library staff.

Some academic libraries provide services such as document delivery outside their usual client base for a fee: a private law firm wanting journal articles may pay the law library of a university to supply a document or a service such as a literature search. This can extend to other areas as well: a private law firm may want a literature search from an information professional in a medical library in order to support a case for negligence. If these transactions occur online they can be regarded as e-business, involved in e-commerce, and it is already an issue for organisations whose purpose is not sales and profit, but not-for-profit services to defined communities, like patient support groups. Their traditional strengths have focussed on networking, expertise and lobbying: as such their e-commerce strategies will need to feature high levels of interaction, and this has a technology and bandwidth overhead which needs to be managed (Field 2000).

This transformation can continue to evolve through partnerships and B2B cooperation. Some libraries form sponsored partnerships, which are becoming more common. Some methods of sponsorship are government grants; endowment funds; donations from individuals, corporations and foundations; foundations/trusts specially established for public library projects; Friends of the Library groups; and special events and positive merchandising (Potts and Roper 1995). In an online environment, would this change? If change is not the correct term, then perhaps we may call it an adaptation to the new online commercial environment. For example, as discussed earlier, Google has plans to digitise the books of five major libraries, the collections of the University of Michigan, Harvard, Stanford, and Oxford as well as the New York Public Library. The University of Michigan claims this is worth ‘hundreds of millions’ of dollars to the university (Carlson and Young 2004). It would seem, therefore that the relation of libraries to commercial online partnerships will continue to evolve. Libraries need to be aware of this evolution and formulate a critical perspective on where things may lead before they are overtaken.

Intermediaries

It is not reasonable for libraries to assume that individual users always possess the knowledge needed to access and assess the information they need. That many do not make any such

assumption is apparent in the provision of user education built into most libraries' services. It follows that they can help users by providing instruction and even explicit expert assistance about how to find the information needed and about the usefulness of the search engine or database and matching service to needs so as to provide highly evolved assistance worthy of valuing as a specific library service. By providing users with the option to interact with library staff, through online interaction such as Ask Now!, intermediaries reduce the users' exposure to the risk associated with search error. If the user has the option of expert instruction, the intermediary further reduces the user's exposure to the risk associated with failure to assess his or her needs accurately and match them to the characteristics of the information required. By choosing an intermediary that provides these services, library users, as ratepayers or subscribers, are implicitly purchasing expertise from the intermediary. Libraries match the users' needs with service. But is not 'free' in that it comes at an indirect or direct cost by funding from rates, taxes or fees.

Methodology

A literature search of e-commerce in libraries and on the web was undertaken across ten databases. Bibliographies contained in articles found from these sources were examined for further relevant information. Library catalogues were also searched for e-commerce publications, as was the World Wide Web. Searches for information were divided into three categories, libraries, e-commerce and the internet: in addition interviews with librarians and library technicians on e-reserve and the *AskNow!* service were carried out in three Australian states.

- Databases searched
- ABI Inform (Trade and Industry) – searches Business, Economics: trade and industry periodicals and newsletters
- Academic Research Library
- ProQuest Computing (searches web commerce)
- Proquest education journals
- Proquest social science journals
- Factiva (formerly Reuters)
- Wiley Interscience
- OVID
- Australian Library and Information Science Abstracts (ALISA)
- Web of Science

Case studies from the commercial sector

Airlines were obvious entrants into the e-business arena. When airlines made bookings available via the internet in the 1990s (Gasson 2003 p238) it was an example of organisations marketing their products and services through an online presence. This is not the only example of bold new forays onto the internet. When airlines progressed to online sales it was thought this would seriously challenge the bricks and mortar outlets. The dotcom crash of the late 1990s showed that a physical presence was still very important to business and that doing business online was to prove to be more complex than many had anticipated (Gasson 2003). Businesses and entrepreneurs discovered that new strategies for doing business needed to be developed for the e-commerce environment. For example, travel agents faced being sidelined through consumers' ability to directly access airline bookings via the internet. However the complexity of booking holidays and renting cars as part of a complete holiday package was still something that needed direct consultation between consumer and travel agents. The convenience of a travel agent with local knowledge proved to be an asset, one that at the time airlines didn't possess and which enabled travel agents to adapt their services to stay in business (Gasson 2003). Those travel agencies whose businesses survived on the internet were those that could combine tried and tested commerce strategies with innovative ones.

In the 1980s, academic and public libraries were early entrants into the e-business environment (Smith 2002). This came when libraries made their online catalogues available via the internet. Now libraries provide many of their services electronically on the internet. In fact, libraries

augmented their bricks and mortar presence with an online presence. For airlines, their entrance to the online world of e-commerce took an alternative strategy compared to that of libraries. While they have different types of customers, libraries connected their customers back to elements of their bricks and mortar presence, while airlines attempted to persuade their customers to do all their business with them online. This was a strategy devised to cut costs by reducing their overheads and what they saw as a bricks and mortar encumbrance in the shape of flesh and blood travel agents. Interestingly, however, in 2005, travel agents were able to pledge that they would match any airlines' online booking price thus vindicating the assertion of Glasson (2003 p243): '…exploiting market structures opportunistically through IT innovations leads to high rewards' and travel agents have survived because they have found a gap in the business of online booking. That is they reduce search time and effort of booking online by providing a personalised service or local expertise, through a bricks and mortar presence and a branding of their profession as intermediaries of information. In libraries we have not let the horizon-free call of the internet dissuade us from our primary function and our roots as a physical presence in the community, nor did we ignore the chance for the opportunistic exploitation of the internet by providing information in a timely and efficient manner. Libraries have fully become gateways of information, offering online resources as well as traditional resources and services.

The Encyclopaedia Britannica, founded in 1768 in Edinburgh, Scotland, developed a reputation for authoritative content; it was continually revised and features were added such as an atlas and a yearbook. Initially the main customers were libraries, but selling was expanded through direct door-to-door sales to middle income families. At its peak in 1989, Britannica's world wide sales force numbered 7500. By 1990, sales had reached a peak of $650 million (Corman 1996).

In the mid-1990s, its main competitors, Funk and Wagnall's and Grolier, stopped printing hard copy versions and went on to CD-ROM. Later Funk and Wagnall's was bought by Microsoft and renamed Encarta. Both Encarta and Grolier's were distributed free with new home computers which combined were roughly the same price as bound versions of the Encyclopaedia Britannica, about $2000 (Corman 1996). Britannica developed its own CD-ROM in 1995, but it was expensive and contained text only, as the vast amount of content in the original was too large to fit onto a single CD. Consumers opted for the cheaper and more interactive multi-media products offered by Encarta and Grolier. Britannica, the business, was sold in 1996, its lack of technological capability proving to be a liability. The new owner redefined the way that Britannica was presented by eliminating the sales force and broadened its value. The core of its value at present lies in the website, Britannica.com, which offers a wide range of products and services, including news, book and encyclopedia sales, filtered search capabilities and online subscriptions. The internet made it possible for Britannica to deliver its vast amount of content efficiently, demonstrating that evolution of the technology can make rivals out of previously unrelated businesses such as was the case with Britannica and Microsoft computers. When Britannica was a print-based and successful business its only competitors were other encyclopedias. By selling information-related retail products it competes directly with search engines like Google and Yahoo and businesses such as Amazon.com. By systematically defining a business's competitors with a broad view, whole new competitive arenas are revealed.

From the perspective of online multimedia content, there have been two strategies. One is to license the database to third parties who decide what to offer online in terms of content and searchability; the other is for the content producers themselves to offer the online version of the multimedia encyclopedia. Grolier and Compton'sbelonged to the former school, while Encarta, World Book, and Encyclopaedia Britannica belonged to the second. A third alternative is to make the database available online in both ways. Whilst selling library services with any of these models is not currently happening, an understanding of such evolution and successes in the business area may assist libraries to deal with market features with which they are increasingly being associated.

Amazon.com opened for business in July 1995. At that time it set out to prove that a retailer selling exclusively via the internet could succeed against established competitors with physical stores. Amazon.com has grown from selling a single type of product, books, from a US web site, to selling a wide variety of wares, including CDs, DVDs, jewellery, home and garden supplies

and electronic devices, from various international web sites including Canada, the United Kingdom, France, Germany, China, and Japan. In 1997, the year the company went public, net sales were $147.8 million and the net loss was $27.6 million. In 2004, Amazon.com had net revenue of $6.92 billion, up 31 per cent from 2003 (Stires 2004). In December 2000, Amazon.com was servicing 67 million customers worldwide. Barnes and Noble, its nearest online competitor, was servicing 11 million customers. In an expansionary move Amazon.com entered into co-branding agreements with Toys 'R' Us, Circuit City and Target. In the agreement, Toys 'R' Us contracted to pay Amazon.com $50 million a year for ten years for the exclusivity provision, as well as a percentage of its sales on the Amazon.com site (Hendershot 2001). Features of Amazon.com are that:

- customers can place orders;
- easily find books;
- find books that are the most read;
- identify books recommended and reviewed by experts;
- find award-winning books;
- examine ratings and reviews by peers;
- rate and review books for other readers;
- select and pay for books directly on the internet;
- have details of new books (selected by Amazon.com on the basis of previous choices) pushed onto their computers.

Digitised library resources

Libraries are expensive and the costs can be attributed to three main areas (Arms 2000): facilities (including buildings), library staff and library materials. Library materials that were previously available only in hard copy at considerable expense are increasingly offered in digital form, sometimes free. Digital resources require computers and networks, but are relatively inexpensive once purchased or assembled, with many cost-reducing advantages such as elimination of the need to purchase duplicate copies. They cannot easily get damaged or lost: digital resources such as texts, articles and slide presentations may be tracked for usage statistics and are not as labour-intensive to maintain as their hard copy counterparts. For instance there is no need for re-shelving or repairs and these materials can be accessed at any time by multiple users. Several economic models can be used to describe the provision of digitised resources. They may be provided free and costs of provision

recouped through advertising throughout the access process or through banners alongside the text. Costs may be covered by external support from an institution like a university or foundation that supports the access. In a subscription model, the user pays a periodic fee and some of the costs are returned to the creator. In fee-per-use, the user pays only for the period or amount of use required.

For libraries, online digital resources represent a cost saving. With online access to digital text, the overheads for libraries are reduced and a distillation of value occurs through fully utilising network access to the library. Lynch (2003) suggests that the digital revolution allows '…exploring more transformative new uses of the digital medium'. A manifestation of this is the creation of e-reserves in university libraries: Monash University in Victoria 'has students on six Australian and two overseas campuses, and distance education students who access digitised material in over 120 countries…Some indication of the success of the digitisation of readings and reserve material is the fact that there are approximately 30 000 accesses per week to the library's image server' (Harboe-Ree, Sabto and Treloar 2003).

Interlibrary loans

Libraries have developed document request forms on the Web allowing faster and more efficient handling of interlibrary loan (ILL) requests. In university libraries, this allows remote users quicker access and more equity in accessing library materials. Remote access to libraries has come to be expected by many students who do not necessarily want to visit the physical library, thereby

affecting funding through student choice of enrolments in modern universities. These libraries are capable of delivering ILLs electronically, either by fax, e-mail or in a digitised format such as full text or as a PDF document and 'when electronic versions are offered alongside a limited amount of interlibrary loans, a reduction in library costs was observed' (Roussel, Darmoni and Thirion 2001).

Library catalogues are free on the internet and most services are provided without charge. OCLC FirstSearch and Nexis, however, charge for database access. The provision of ILLs by libraries has a comparable commercial service example. Companies such as Infotrieve, Subito and CISTI provide a fee-based document delivery service. CISTI has a collection of over 50 000 journals in most languages, worldwide conference proceedings and papers, monographs, and over one million technical reports and translations. Both these businesses and libraries actually offer the same end results except that the businesses are making profits. Libraries are, in fact, ceding a traditional service to a commercial company that has modernised the concept into an e-commerce model for profit. There are a variety of relevant e-commerce models.

Infomediary: offers mediated links to other related information, either personally or as a part of an online service. An example of this is *AskNow!*, the online collaborative reference service.

Information community: the library creates a community by becoming the primary reputable source of knowledge, and the users return because they are satisfied with library services. Virtual public libraries provide a facility that allows communities of interest to form online through their servers.

Subscription: access to databases and toolboxes as well as forwarding traffic to another site in return for a small per-consumer fee. In Australia Gulliver.net provides consortia membership advantages in dealing with publishers and databases. (http://www.libraries.vic.gov.au/gulliver/about.htm#history)

Advertising: promotes libraries through the available e-mail lists and library websites and uses internal banner advertisements.

Brokerage: promotes fee-for-service through web sites: this model differs significantly from the traditional library service approach. 'Information Edge', a commercial online information broker (http://www.infoedge.com.au) is an example.

Email push: involves gathering information such as job vacancies or community announcements and posting to subscribers by e-mail. For example, the 'EmployLT' job posting service on the Australian Library and Information Association library technician e-mail list http://alia.org.au/groups/aliawest/biblia/2003.11/employlt.html

Portal (aka 'toolbox'): offers a variety of services/links from one location. Examples are Libraries Australia, AARLIN. AARLIN (Australian Academic Research Libraries Information Network) allows searching of multiple databases. (http://www.aarlin.edu.au)

How can libraries develop additional e-commerce strategies?

Libraries can do this by:

- focussing on quality services and resources that can be differentiated from the general information provided by the internet and maintaining credibility as a source of trustworthy products and services in the online environment.
- re–examining traditional service models for adaptation to online services.
- providing services '24 x7 x 365'.
- organising easy, sustainable access to resources and services by developing reliable software and bandwidth connections.
- providing both direct and indirect communication with library staff and reinventing customer service for an e-commerce framework.
- using promotion models where appropriate, to offer further value-added services that users may require.

- developing new e-commerce transactions through innovation and keeping up-to-date with current trends and technology.
- identifying the competition and examining their successes.
- identifying significantly cheaper ways of using the internet to provide services.
- developing key products and services and the mechanisms that allow easy access.
- establishing the relationships of library products and services to users of library services and profiling them for marketing, including to the executive body of the library's parent organisation.
- creating a social place as one of value that is commonly known as a source of user requirements.
- demonstrating that a link to a possible answer on a search engine may still be no answer and that libraries do supply answers.

While there are different models of e-commerce there are two fundamental patterns to frame e-commerce models: libraries may use the internet and internet technologies to enable services and resources to be presented in a framework that facilitates the use of services and support in an online framework. The second pattern is the provision of library resources to its users. That is, that these library resources are provided on a time and point of need basis that is immediate and increasingly becoming the norm. A library may include both these models to provide specific resources, collect feedback and provide additional services such as training or develop new services or products online. The use of e-commerce models provides a concurrent development of the services of libraries, possibly leading to assured relevance in society as valued social capital. E-commerce facilitates the extraction of value of the library to its users, or in the economic sense to its customers. For instance online texts or digital books reduce overheads. They cannot readily be stolen or wear out and they are available to users all the time because they are not loaned in the traditional sense.

The popularity of mobile phones shows that the community is more than wiling to adopt new technology in a way that makes it hard to imagine that libraries' use of technology will slow down. Libraries are enabled through their staff to run with this acceptance of technology and to develop methods of providing services unique to their own market. New technology will no doubt continue to simplify user interfaces making services accessible to all in their communities. Digital texts, e-reserve and databases extract and export the intrinsically valuable content of libraries to their users. The people who use libraries have come to be comfortable with complex online transactions in the true e-commerce sense: such devices as automatic teller machines and online banking have an established role in society. With Moore's Law in mind libraries can adapt to and exploit these e-commerce strategies. (The rate of progress in computing power is described by Moore's Law, the observation made in 1965 by Gordon Moore, co-founder of Intel, that the number of transistors on a semiconductor doubles every eighteen months. This is roughly equivalent to saying that computing power increases 100-fold in 10 years or 10 000-fold in 20 years).

Conclusions

Gold is valuable, but this value cannot be fully realised until it is dug out of the ground, refined and shaped. Until then its value is merely potential. Similarly a book has only potential value until it has been read and understood; further, intangible assets hold no value outside the context in and for which they were designed. A library's intangible assets, like staff knowledge and skills, information technology and service innovations may be unique and in the future libraries will benefit only to the extent that they can exploit these intangible assets. To exploit the potential of e-commerce, libraries will need to identify and refocus on such assets, and indeed, if we examine the functions of libraries in today's online environment, it can be argued that many of their online roles are based on an e-commerce principle already existing, or have the potential to be restructured on e-commerce lines consistent with current successful business principles.

Improvements in intangible assets affect financial outcomes through chains of cause-and-effect relationships involving two or three intermediate stages. Kaplan and Korton (2001).

While libraries do not (so far) need to return dividends to shareholders, they do need to justify their worth in order to sustain funding and a continued existence. Just as the business world evolves in search of commercial success, libraries need to be innovative and adaptive where appropriate, the processes that have been successful in business. Of these, e-commerce can provide sound models for successful libraries as it does in business generally. If they learn to value their customers, provide the services they need, and give a level of service comparable to the best offered in the commercial online examples, libraries have a greater chance of success: in the commercial online environment, services are being measured against e-commerce models such as amazon.com and Google. This is what the user expects and this is what they are increasingly becoming comfortable in using. '[The value] arises from creating the entire set of assets along with a strategy that links them together' (Kaplan and Norton 2001:67). The online auction EBay has set the standard for buying items through the auction model and uses PayPal, an account-based system that allows anyone with an e-mail address to send and receive online payments. It also uses the 'shopping basket' feature. Both are features that other businesses emulate because they are familiar. For libraries, and as a consequence of their long histories of service, models adopted should retain that familiarity factor for our users, especially in the online environment.

Bibliography

Allen Consulting Group 2001, Built for Business: Australia's internet economy, available at http://www.webeasy.com.au/newsletter_nov02.php.

Amazon.com. 2003, Annual Report. Amazon.com Company website: http://phx.corporate-ir.net/phoenix.zhtml?c=97664&p=irol-annualreports.

Arms, WY 2000, 'Automated digital libraries'. D-Lib Magazine, vol 6, nº 7/8,available at http://www.dlib.org/dlib/july00/arms/07arms.html.

Australian Bureau of Statistics 2004, Proportion of businesses placing or receiving orders via the internet or web, by broad industry group, available at http://www.abs.gov.au/, "Measures of a knowledge-bsed economy and society'

—— 2001 Public Libraries Australia: internet workstations available for public use

1999–2000, (cat nº 8561.0), available at http://www.abs.gov.au.TheAusTrAliAn

Ayers, JB 2000, 'A primer on supply chain management', Information Strategy:

the executive's journal, Winter 2000, available at http://www.ayers-consulting.com/download/01-Primer-2nd-version-2000.pdf p2.

Bell, Steven J 2004, 'The infodiet: how libraries can offer an appetizing alternative to Google', Chronicle of Higher Education, vol 50, nº 24, p B15, available at http://chronicle.com.

Benjamin, R and Wigand, R 1995, 'Electronic markets and virtual value chains on the information highway' Sloan Management Review, Winter, pp62–72.

Blackwell, RD and Stephan, K 2001, 'The E-Commerce of Commerce' (ch 1), Customers rule: why the e-commerce honeymoon is over and where winning businesses go from here, New York, Crown Business.

Bland, RL and Howard, AM 2003, 'Library statistics and outcomes assessment',Building a virtual library, Hershey, PA: Idea Group Publishing, pp194–211.

Butler, D 2000, 'Souped-up search engines', Nature, vol 405, pp112–15.Carlson, S and Young, JR 2004, 'Google will digitize and search millions of books from five leading research libraries', Chronicle of Higher Education, 14 December 2004, available at http://chronicle.com/free/2004/12/2004121401n.htm.

Chen, M-S; Han, J and Yu, PS 1995, Data mining: an overview from a database perspective, available at http://ir.iit.edu/~dagr/cs522/files/handouts/ExcellentSurvey.pdf.

Childe, S; Maull, R and Bennett, J 1994, 'Frameworks for understanding business processes re-engineering', International Journal of Operations and Production Management, 14(12):22–34.

Corman, L 1996, 'Why Britannica got rid of its reps', Sales and Marketing Management, 148(9):82–84.

Crawford, W and Gorman, M 1995, Future libraries: dreams, madness and reality, Chicago and London: American Library Association.

Cummings, JL and Doh, JP 2000, 'Identifying who matters: mapping key players in multiple environments', California Management Review, 42(2):83–104.

Davis, T 1993, 'Effective supply chain management', Sloan Management Review, 34(4):35–46.

Edelman, B 2004, Earnings and ratings at Google Answers, available at http://cyber.law.harvard.edu/people/edelman/pubs/GoogleAnswers-011404.pdf.

Eldredge, JD 2000, 'Evidence-based librarianship: searching for the needed EBL evidence'. Medical Reference Services Quarterly, 19(3):1–18.

Field, M 2000, 'In the year 2525...E-commerce, information and society: the response of the Library Association to Smoke on the Water', available at http://www.la-hq.org.uk/directory/prof_issues/ity2525.html.

Fogelberg, H; Scott, P; Hlava, MMK and Pannell, A 2003, 'E-commerce in libraries', Proceedings of the American Society for Information Science and Technology, 40(1):459.

Gasson, S 2003, The impact of e-commerce technology on the air travel industry, Hershey, PA: Idea Group Publishing, available at http://idea-group.com/downloads/pdf/IT5668_H7Ga22HCEZ.pdf.128

Glidewell, RA 2000, 'Business lessons from online porn', Upside (US ed), 12(4):194–208.

Graham, J 2003, 'The search engine that could', USA Today, available at http://www.usatoday.com/tech/news/2003-08-25-google_x.htm.

Griffiths, J-M; King, DW and Lynch, T 2004, Taxpayer return on investment in Florida Public Libraries: summary report, prepared for State Library and Archives of Florida, available at http://dlis.dos.state.fl.us/bld/roi/pdfs/ROISummaryReport.pdf.

Guscott J ed. 2001, 'Intelligence reports for library strategists', Library Futures Quarterly, vol 1, nº 2, available at http://www.libraryfutures.com/v1_n2.htm.

Harboe-Ree, C; Sabto, M and Treloar A 2004, 'The library as Digitorium: new modes of information creation, distribution and access', paper presented at VALA 2004, Breaking Boundaries: Integration & Interoperability, 12th BiennialConference and Exhibition, 3–5 February 2004, Melbourne, available at http://vala.org.au/vala2004/2004pdfs/21HrSaTr.pdf.

Hendershott, P; Hendershott, RJ and Hendershott, TJ 2001, 'The future of virtual malls', Real Estate Finance, 18(1):25–32.

Holba-Puacz, J 2002, 'Catching (and keeping) e-patrons', Computers in Libraries, 22(1):12, available at http://www.infotoday.com/cilmag/jan02/puacz.htm.

Holt, GE; Elliott, D and Moore, A 1998, Placing a value on public library services, available at http://www.slpl.lib.mo.us/libsrc/resresul.htm.

Jones, SG 1998, Cybersociety 2.0, California: Sage Publications.

Jutla, D; Bodorik, P and Wang, Y 1999, 'Developing internet e-commerce benchmarks', Information Systems, 24(6):475–93.

Kalakota, R and Whinston, A 1996, Frontiers of electronic commerce, Boston: Addison-Wesley, p5.

Kaplan, RS and Norton DP 2001, The strategy-focused organization, Boston: Harvard University Press, p62.

Kerslake, E and Kinnell, M 1998, 'Public libraries, public interest and the information society: theoretical issues in the social impact of public libraries', Journal of Librarianship and Information Science, 30(3):159–67.

Kitchin, R 1998, Cyberspace: the world in the wires, Hoboken, NJ: John Wiley & Sons.

Kling, R (ed.) 1996, Computerization and controversy: value conflicts and social changes (2nd ed), San Diego, CA: Academic Press.

Lawrence, E; Corbitt, B; Fisher, J and Tidwell, A 2000, Internet Commerce: digital models for business (2nd ed) Brisbane: John Wiley & Sons.

Lee C-S 2001, 'An analytical framework for evaluating e-commerce business models and strategies', Internet Research, 11(4):349–59.

Licklider, JCR 1965, Libraries of the future, Cambridge, MA: MIT Press.

Lim, E 1997, 'The internet and its impact on libraries and national development in Southeast Asia', LASIE, 28(1):13–31.

Litwin, R 2004, 'On Google's monetization of libraries', Library Juice, vol 7, nº 26,available at http://libr.org/juice/issues/vol7/LJ_7.26.html#3.

Lynch, C 2003, 'Institutional repositories: essential infrastructure for scholarship in the digital age', ARL Bimonthly Report nº 226, available at http://www.arl.org/newsltr/226/ir.html.

Mair, M 2002, Increasing the value of meta data by using associative semantic networks, (unpublished thesis) Graz University of Technology, available at http://www.iicm.edu/thesis/finished-theses.

McIvor, R; O'Reilly, D and Ponsonby, S 2003, 'The impact of internet technologies on the airline industry: current strategies and future developments', Strategic Change, vol 12 (Jan/Feb) pp31–47.

McKeown, P and Wayson, R 1996, Metamorphosis: a guide to the World Wide Web and electronic commerce, New York: John Wiley & Sons.

Malone, T; Yates, J and Benjamin, R 1987, 'Electronic markets and electronic hierarchies: effects of information technology on market structure and corporate strategies', Communications of the Association of Computing Machinery, 30(6):484–97.

—— 1989, 'The logic of electronic markets', Harvard Business Review, May/June, pp166–71.

Markoff, J and Wyatt, E 2004, 'Google is adding major libraries to its database', New York Times, 14 December, p A1, available at http://www.nytimes.com/2004/12/14/technology/14google.html.

Nielson//NetRatings 2004, Three out of four Americans have access to the internet, available at http://www.netratings.com/pr/pr_040318.pdf.

Ogbuji U 2004, Perspective on XML: steady steps spell success with Google, available at http://www.adtmag.com/article.asp?id=9663.

Online Computer Library Centre 2005, What is virtual reference?, available at http://www.oclc.org/questionpoint/about/virtual/default.htm.

Oxford Internet Survey (OxIS), Results of a nationwide representative survey of Britons aged 14 and older, 23 May – 28 June 2003, Oxford Internet Institute, available at http://users.ox.ac.uk/~oxis/enough.htm

Podgainy, MD 2001, 'E-business lessons learned', The Secured Lender, 57(6):26–32.Poll, R 2001, 'Performance measures for library networked services and resources', The Electronic Library, 19(5):307–14.

Potts JC and Roper V 1995, 'Sponsorship and fund-raising in public libraries: American and British perceptions', New Library World, 96(1):13–22.

Prentice, AM and Jebb, SA 2003, 'Fast foods, energy density and obesity: a possible mechanistic link', Obesity Reviews, 4(4):187.

Price, G 2003, 'What Google teaches us that has nothing to do with searching', Searcher Magazine, available at (http://www.infotoday.com/searcher/nov03/price.shtml).

Reid, EM 1991, Electropolis: communication and community on internet relay chat, available at http://www.irchelp.org/irchelp/communication-research/academic/academic-reid-e-electropolis-1991.html.

Rosenbaum, H 2000, 'The information environment of electronic commerce: information imperatives for the firm', Journal of Information Science, 26(3):161–71.130

Roussel, F; Darmoni, S and Thirion, JB 2001, 'Cost effectiveness of a medical digital library', Medical Informatics and the Internet in Medicine, 26(4):325–30.

Schumpeter, Peter 1996, in McKeown, P and Wayson, R op cit, p2.

Selingo, J 2004, 'When a search engine isn't enough, call a librarian', New York Timesavailable at http://www.nytimes.com/2004/02/05/technology/circuits/05libr.html?ex=1391403600&en=26c6c8a9c0c4212f&ei=5007&partner=google.

Smith, AG 2002, 'What can e-libraries learn from e-business?', paper presented at VALA 2002: e-volving Information Futures, 11th Biennial Conference and Exhibition, 6–8 February, Melbourne, available at http://www.vala.org.au/vala2002/2002pdf/12Smith.pdf.

Stires, D 2004 'Amazon's secret', Fortune, 149(8):144.Sullivan, D 2001, '12 minutes to search rage', Searchenginewatch, available at http://searchenginewatch.com/sereport/article.php/2163351.

Timmers, P 2000, Electronic commerce: strategies and models for business-to-business trading. Chichester: John Wiley & Sons.West, J 2002, 'Information for sale: my experience with Google Answers', Searcher, vol 10, nº 9.

World Bank, Poverty net 1999, What is social capital?, available at http://www1.worldbank.org/prem/poverty/scapital/whatsc.htm.

Young, Peter 1995, unpublished speech (14 November 1995), cited in Lim 1997, op cit. p31.

The author acknowledges the assistance of Tania Barry in obtaining journal articles for research for this paper.

---

[i] Australian Bureau of Statistics, (2003) Proportion of businesses placing or receiving orders via the internet or

web, by broad industry group, available at http://www.abs.gov.au/Ausstats/abs@.nsf/0/

EEDC81603071F238CA256D97002C864A?Open

[ii] Australian Bureau of Statistics. Public Libraries, Australia, 1999-2000 (cat Nº 8561.0) Internet workstations available for public use, available at http://www.abs.gov.au/Ausstats/abs%40.nsf/94713ad445ff1425ca25682000192af2/61487afbb6a6598aca256d97002c8641!OpenDocument.

[iii] Australian Bureau of Statistics. Proportion of households with access to the internet by type of household, state or territory and broad region, available at http://www.abs.gov.au/Ausstats/abs%40.nsf/94713ad445ff1425ca25682000192af2/5fd96b99b19469acca256d97002c8643!OpenDocument.

[iv] Kinetica web page, available at http://www.nla.gov.au/ntwkpubs/gw/68/html/2kinetica.html.