

The Redefining of Museums

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1. Introduction

I distinctly remember as a boy of eleven my mother arriving home one night with a number of very heavy boxes and on opening them finding a set of World Book encyclopaedias (from the US). To this day I remember their smell, their glossy smooth paper and I remember the sense of discovery every time I opened a volume. Of course it was not always plain sailing. Their entries were sometimes insufficient, other times too complex and often the chase through numerous other volumes to find cross-referenced material was more like a broken-link than a hot-link.

Whilst the World Book was wonderful for me then, I grew into needing the Britannica. It was bigger, the articles more substantive and it had, what we did not call in those days, an international brand name that money can't buy. Britannica is a source of information held in the highest regard, its brand name is one of the most recognisable academic icons of the western world and one would have thought with its pedigree that it was unassailable. Then along came computers, the World Wide Web and Microsoft's CD ROM Encyclopaedia, Encarta.

The unthinkable happened, Britannica's sales of its bound volumes halved this decade, forcing it into losses. With Encarta selling for \$50, and sometimes given away with new computers, Britannica was forced to rethink its sales strategies and one-product policy. In Australia, its sales staff of 120 was disbanded, it produced a CD ROM version of its encyclopaedia and created an online presence to complement the CD ROM and encyclopaedia. The delivery was opened up to include direct marketing, major retailers and educational institutions. (*from The Australian newspaper, 15/1/98 p.24*)

Is there any message in this for museums? Is it irrelevant or are you in the information business too? Do you have a respected brand name? Do you still rely on the same means of delivering your services as you always have? Do you deliver the same services as you always have? Do you regard your institution's name and standing as being of high repute and its longevity a sure thing? The management of Britannica would have said yes to all of these questions only a handful of years ago!

I believe the message for the management of museums is: if you have not got a well devised and implemented online strategy then you risk having your institution marginalised and eventually put out to pasture. In terms of the theme in which this paper is to be presented: the presence of museums on the web doesn't just make sense, it is an imperative. If management fails to utilise the World Wide Web to improve access and equity of access to its collection; if it fails to employ digitisation programs to maximise preservation and collection management; if it fails to add value to its collection in this age of information; and if it fails to train its staff adequately and resource the new business appropriately then one day management may just wake up to find that its collection is no longer sought after nor supported by government and the private sector and its business is no longer viable.

This paper contends that the online world is rapidly changing the expectations of the consumer and that whilst museums have an obligation to preserve the national heritage and culture, they also have an obligation to provide optimum access to their collections. Those museums that do not digitise and deliver online will lose market share to those that do and those that may have enjoyed a curatorial superiority may well slip behind those that read what the market wants and provide it. How will funding be determined in the world of online collections? Who will get the lion's share of the funding? I would put my money on those museums that have a sound online strategy that is producing visible results – that provide photo opportunities for politicians!

This paper draws heavily from a report I prepared for the Australian government, with assistance from a lawyer Mark Minarelli, entitled Digitisation of Collections. The report was tabled in December 1996 and dealt with the public policy issues that the federal government would need to consider as museums, libraries, art galleries and archives digitise their collections and made them available online.

In this paper I will:

1. outline what I believe are the major online agents of change
2. explore the character and nature of that change; and
3. provide some suggestions as to how museums might best manage change.

2. Online Agents of Change

This section presents the proposition that the Internet is here to stay and that its characteristics, what it enables us to do and the expectations it creates make it a powerful agent of change.

2.1 New technologies

We are living in the middle of a revolution in the way in which we handle, swap and trade information. Just as the industrial revolution was spurred on by a machine - a steam pump - so too is a machine at the heart of the information revolution: the computer. The early 1980s saw the beginnings of this revolution - it was in 1982 that Time Magazine announced its Time Man Of The Year: the Personal Computer.

Information technology, multimedia and the Internet now receive enormous press coverage and are terms known to most people in developed countries. The uptake of these new technologies has been rapid and the number of participants keeps growing. These are not fads; they will not go away

because they are increasingly commercially driven and they are powerful business and education tools.

Most computers sold this year are expected to be sold with additional hardware (modems) and software that will put their users on the Net. The implication of this for museums is that, since their customers are using the new technologies, it will not be long before they will expect to be able to access catalogues, records and collections electronically.

Whether museums like it or not, the growing power and functionality of modern technologies are creating an unprecedented demand for information and an increasing expectation that access will be quick, easy and affordable, but more of this later in this paper. The emphasis will be far more towards demand driven criteria as opposed to supply driven.

Public demand in this brave new world is poised to redefine how curators package, market and manage the collections they hold on behalf of the public that pays their wages through taxes and entrance fees.

2.1.1 The tools of access

The computers, modems and software now available to users to search, vet, view, edit and reproduce content from on-line digital archives are more powerful, relatively less expensive and more flexible than ever before. Improvements continue to unfold on a monthly basis. The purchase of multimedia and Internet equipped personal computers by households is growing which means more and more people will have the capacity to access digital archives via the Internet.

By the year 2000, there will be very few workplaces and schools in developed countries without access to at least one computer with the capacity to access the Internet.

The function of computers themselves is set to undergo sophisticated changes. Many observers believe that the television and computer will merge into one unit offering interactive live video, audio, video-conferencing plus even more computer power than we have today. The TV-PC will offer people the unparalleled opportunities to communicate with one another and power to access and view content on the Internet.

Network PCs are mooted as the next paradigm shift in personal computer architecture. These computers will be linked permanently to the Internet from where they will derive all of their application software and where they will store information. These devices will cost less than personal computers - recently released models are selling for about \$1000.

That major computer companies are designing and releasing PC/TVs and Network Computers, and that computer sales and Internet access continue to grow monthly, provide further evidence, if any were needed, that the Internet will play an increasingly important role in education, entertainment, training and commerce in the foreseeable future. And there can be little doubt that the number of people using the Internet worldwide will represent a substantial market for on-line digital content.

2.1.2 Security

One of the impediments to the use of the Internet for commercial transactions has been the real concern over security of those transactions. This stumbling block is being rapidly broken down by the likes of Visa, Mastercard and American Express who have been co-operating to produce standards and procedures for the use of credit cards on the Internet. Meanwhile software giants such

as Microsoft and Oracle have been developing encryption technology to ensure the safe transport of credit card numbers across the Net.

Banks are increasingly forcing customers into online banking as it is so much cheaper for them than across-the-counter banking. Of this we can be certain: both demand and supply led initiatives to purchase products and services across the Internet paid for by credit card and/or electronic cash will increase at an exponential rate from 1998 onwards.

Where does this leave your organisation? What policy have you in place to be ready, to avoid being marginalised?

2.2 Delivering digital archives

At present, content on the Internet is delivered to most users via the telephone network. The cables that carry the data are made of copper wire and were designed to deliver voice data yet have proven capable of delivering fax data, colour still images, animations, “live” audio and even video (though of an unsatisfactory frame-rate and quality).

By using fibre optic cable (broadband) instead of copper wire, it is possible to deliver video, audio and animations of very high quality along with all other forms of data at very high speed and at great volumes. Telecommunications companies in Australia and North America are establishing broadband services in major cities in order to provide a superior service and to increase income as a result of increased traffic on their network. There is every reason to believe their expectation that consumers will quickly adapt to the quality of reproduction, speed and interactivity made possible by fibre-optic cable and cease to be content with anything of a lesser quality. They will increase their usage of the network as they are lured by the quality and quantity of material available to them.

This capacity, coupled with the increasing power of computers used to access the Internet, offers the challenge to employ the highest of technical standards for on-line access to digital libraries.

2.3 Finding and navigating digital archives

Electronic finding aids are becoming increasingly sophisticated enabling surfers to enjoy a high degree of success in finding what they are looking for. World Wide Web search engines will take users to the front door of the digital archive, but it is the finding aid that assists them navigate through the archive. Overseas projects, such as the MIT Media Lab Salient Movie and those at University of California, Berkeley are researching and developing sophisticated finding aids.

As finding online digital archives and then exploring them becomes easier and more widely adopted, any museum’s archives can be found. This has quite a profound impact on museums. It effectively means that any digital archive no matter where it might be, no matter what its pedigree or quality will be found and accessed by users where-ever they might be in the world. Will the user care whether the information came from a webserver sitting inside the Met, Ashmolean, Museum of Singapore or from a private webserver sitting in an enthusiast’s home who has become a self-styled, self-made curator of a fabulous digital collection of 19th century Dutch porcelain?

2.4 Democracy and online content

The rapidly growing number of technology-enabled consumers in developed nations is creating a vast pool of people seeking information in digital format in the areas of education, training and

entertainment. There is every indication that governments and numerous public and private organisations will also increasingly expect access to information in electronic format held by museums such as public record offices, archives and libraries.

Access to digital collections via the Internet liberates consumers from the restrictions of place and time - the walls and doors of our museums. It brings the collection to the consumer rather than the consumer to the museum. The act of making collections available on-line has a number of favourable outcomes.

On-line collections are accessible to those who for reasons of location, physical disability, working hours, or nature of their work are unable to physically visit a collecting institution during its normal hours of opening. In addition to this group are those who become stressed in public or who simply find visiting institutions too difficult or inconvenient.

The Internet has now made it possible for consumers to be collectors and curators of their own virtual museum, library or gallery. Whereas it has always been the decision of the collecting institutions' management as to what was placed on the walls, shelves, cases and interactive multimedia kiosks and what special exhibitions will be mounted, the consumer is now increasingly empowered to make those decisions as well - the walls, shelves and cases are inside the desktop computer, wherever that might be.

The consumer empowered with the choice of content opens new possibilities for the public and an opportunity for museums as a whole. Consumers will be able mount their own collections, drawing on images from anywhere in the world. The most popular libraries of digital images are likely to demonstrate the following characteristics (not in order of importance) :

- is very well known
- has a superior number of images from which to choose
- has a highly effective search engine, intuitive navigation design and an extremely user-friendly interface
- provides images of an appropriate quality
- is fairly priced
- offers more relevant and accessible information on each item than other sites

If for no other reason, museums will be compelled to digitise their collections and make them available online because the public and government agencies will increasingly demand electronic access to their collections. Institutions will need to develop strategies to balance public demand with such things as the owners' rights, cost of digitising and availability of resources.

Major museums that do not embark on an effective and efficient online program will become increasingly marginalised as consumers, both public and government, become accustomed to accessing digital collections wherever they can be found in the world.

2.5 Doing traditional tasks better

Not all agents of change come from outside the museum world. Many within the museum sector are turning to digitisation and digital archiving as tools that enable them to do their traditional jobs more effectively and efficiently.

2.5.1 Collection management

Many institutions are viewing the digitisation of their collections for online consumption as an opportunity to adopt new and more effective collection management strategies and practices.

For many institutions the digitisation process will help reveal the extent and actual contents of their collections.

Once an institution embarks on a digitisation programme it is likely that a number of in-house benefits will emerge.

- research by curators and in-house specialists will be made easier and more effective
- conservation of material will gain a new emphasis and will be enhanced
- the necessary cataloguing and resulting image bank of the collection will provide valuable collection management information

2.5.2 Preservation of objects

The preservation of our cultural heritage is a corner-stone of enabling charters and vision statements of most museums.

The digitisation of cultural items and the resultant digital archives offer some obvious and potentially powerful aids to preservation.

- handling and use of original items is minimised thereby reducing the possibility of damage from mishap, overuse or exposure to hostile environments
- the digital image provides a backup copy (or copies) of the original
- digitisation can offer an immediate replacement strategy for items that are on the verge of complete deterioration - such as film and sound archives

Digitisation may offer an additional but less direct boost to preservation efforts. Assuming the digitised images are available via on-line services then wider public access to items may increase awareness of our cultural heritage. These potential outcomes would validate and possibly help fund further efforts to preserve that heritage through digitisation and other methods of preservation.

However, such benefits will only be enjoyed when a number of conditions are met. The digitisation process must be of appropriate quality, it has to be managed effectively and the resulting images must be stored, indexed and catalogued effectively. At present, meeting these fundamental conditions is proving elusive due to funding problems, technical shortcomings and the absence of recognised management standards and protocols.

3. The Character of Change

Having examined the major agents of change, what are the fundamental characteristics of that change? What is changing? What will be the impact on museums? What assumptions have we always made about museums that need re-thinking? (Aspects of this section of the paper were researched and developed by Mark Minarelli in our Digitisation of Collections report)

3.1 Museums as businesses

It may seem too obvious a statement to make, but almost all museums were established in the pre-World Wide Web world. As a result their charter, mission statements and the expectations of their management and in some cases boards, do not take into account, in any formal sense, the online world. Charters and mission statements tend to presuppose traditional functions and a physical location only in which objects or material are displayed and to which the public is permitted access. Institutions are frequently, therefore, not well served or adequately guided by the legislative frameworks or guiding missions within which they live.

Pressure is being exerted on most museums to become more profitable; to recover costs where possible and to be less reliant on the public purse. However, often their charters do not cater well for profit-making ventures and in many cases, the public benefit purpose is not clearly defined in their legislation or mission statements and in a period of profound change this will fundamentally disadvantage the institutions.

The agents of change discussed in the previous section will push museums into new business models and they will have to respond or wither. Being a business will necessitate changed organisational structures, skills and strategies. While technological change is one of the key features driving the transition of museums into businesses and the convergence of institutions, the challenge will be to not allow technology to dictate the agenda, but rather to use the technology to give new meaning to the role of museums.

An important issue for the museums is to delineate clearly, in consultation with governments, their owners and each other, the dilemma between their traditional non-profit public benefit role and more commercial arrangements needed to achieve the potential of the online world.

3.2 Branding & marketing museums

Users searching for information on the Internet have two main search methods at their disposal: a global search using search engines such as Lycos, Magellan and Yahoo; and a known URL (uniform resource locator) such as www.nla.gov.au (our National Library's World Wide Web site). The former lists all registered sites on the Internet world-wide that claim to hold information on the search topic, whilst the latter takes the user directly to a site they believe may hold the information.

Combine this with the current and ever-growing predominance of content from North American collections and it is reasonable to assert that searches for information on say, endangered species, will result in finding content held predominantly by North American institutions. What ultimate impact will this have on museums in countries such as Australia, Malaysia or Belgium where the size of population and economy, and the relatively small number of museums mean that they will be pouring much less digital content into the world wide reservoir of digital content. Will they be able to compete for the user's custom, but more importantly, for his or her money?

To compound matters, when choosing URLs, users will select the institution that either comes to mind most readily or one that they have used before (and bookmarked), often because it was found using a search engine. Thus brand-names such as, Oxford, Smithsonian and the Louvre will prove difficult to compete against - just as soft-drink manufacturers around the world, other than Coke, find much to their dismay that most people think of Coke when they think of soft-drink.

A World Wide Web site if not marketed appropriately becomes a small desert island in a large ocean - people only find it if they stray off course on their way to the well known ports. Users are lured by marketing ploys and sheer critical mass of content to the large sites, the large ports, and only visit the smaller sites, those small desert islands, if they know they exist. A challenge for the museums is to develop a strategy that ensures that their online collections do not become desert islands.

3.3 What do users want?

Much of the discussion thus far has centred on digitisation from the institutions' point of view. But what of the end user of the digital archives; what are their expectations and needs and how might this impact on the way museums approach online solutions?

There has been no thorough market research conducted across Australia into what the end-user wants from a cultural digital archive in terms of content, interaction, design, accessibility, cost and value-added services and what the likely patterns of use will be.

At the risk of being proved wrong by subsequent research, I would suggest that users want a one-stop-shop World Wide Web site that meets all their research requirements for content held by collecting institutions. They do not want to visit each institution's web site. They want to search for a topic and be presented with a list of digital objects (text, photos, video, sound) that they can download and for which copyright payment, should any be required, can be made easily and once only for all the items downloaded.

If museums fail to identify and meet consumer needs in this regard then they risk losing them to the on-line digital archives of other institutions whether they be in Glasgow, Sydney or Penang.

3.4 Value Adding

I believe that value-adding is the single most important activity a museum can undertake to remain viable in the online world. By value-adding to a digital object I mean providing:

- additional information to that which has been available to the general public physically visiting the museum – eg extensive historical context, detailed provenance, links to other objects in the collection, hotlinks to other relevant digital collections
- multiple access points – give virtual visitors numerous opportunities to find objects in the collection and to realise links between objects
- new ways of experiencing an object – eg. using holograms and 3-D effects; rotating an object giving multiple viewing points; using audio and visual to provide stimuli and information; animating or recreating the context of the object's original existence
- additional services – eg helpdesks, ability to download the object in multiple formats, copyright information, other museums with similar collections, reference books and journals relevant to the object

If all a museum does is make available online digital copies of items in its collection without value-adding to them in the manner described above then it will be bypassed by the user of the 21st century. They want more information and stimulus, faster and more easily accessed than most museums are currently offering. Those that get it right in the 21st century will succeed; those that don't will be marginalised.

3.5 Is it a museum, library, gallery ? Does the consumer care?

The very nature of the Internet breaks down walls and geographical boundaries rendering the institutional source of the information of little consequence to the user who is almost solely concerned with obtaining the information he or she is seeking. As Boyd Rayward, says in his, *Libraries, Museums and Archives in the Digital Future: The Blurring of Institutional Boundaries* “Libraries, museums and archives in our society have emerged over the centuries as important organisational components of what I have called society’s information infrastructure. Their roles and functions, as they have developed over this period, are the expression of a variety of cultural and social practices related to education, research, artistic creativity, entertainment and recreation. Until recently the distinctive differences between libraries, museums and archives have rested in part on the formats of the typical artefacts that have been accepted as their special province. Specialised techniques have been required to manage these different formats. These techniques have created organisationally prescribed ways of using the artefacts by the various clienteles permitted access to them but something was lost in these immense gains of organisational sophistication. What has developed does not reflect the needs of an individual scholar or member of the educated public interested in some aspect of learning or life. For the individual the ideal is still the personal cabinet of curiosities that contains whatever is needed for a particular purpose or to respond to a particular interest, irrespective of the nature of the artefacts involved - books, objects, data, personal papers, recorded image, government files.”

If we accept that those using the Internet to seek information have little concern whether the information has come from an art gallery, museum or say archive, only that they have access to it and that the content has integrity and is reasonably priced, then this has significant ramifications for the place of museums in a digital age and for their digitisation strategies. Should joint ventures between collecting institutions be pursued – on a profit-making basis?

3.6 Promoting national identity – who else will do it?

I can best explain this issue by an example close to home. Australians seeking content for research purposes or just personal interest have historically turned to their local libraries, museums, art galleries and archives. Venture into any Australian museum today and you will find that their collections include both Australian and non-Australian content, with the latter sometimes being greater than the former.

Now consider the size of the digital archives being developed in North America and Europe for on-line consumption and the integrity of digital archives that will be offered on-line by the likes of The British Museum and the Smithsonian. The non- native Australian content held and digitised by Australian museums will be overwhelmed by sheer weight of the digital offerings emanating from the Northern Hemisphere and by world recognised centres of academic excellence. As researchers in Australia shift their mode of research increasingly to on-line sources they will find most of their non-Australian content coming from these bountiful overseas sources, which in turn will render the physical holdings of non-Australian content accessed less and less.

Should museums therefore continue to collect, hold and/or digitise non-native content? Shouldn’t they concentrate their resources on collecting, digitising and adding value to content native to their land, heritage and culture? If they don’t, who will?

4. Managing Change

The two previous sections of this paper examined the major agents of change and the fundamental characteristics of that change. This final section looks at how museums can best manage change. That is, how they might best adapt to operating in an online world which will see the differentiation between collecting institutions blur and competition from museums, libraries and galleries from around the world increase dramatically.

That the digital age is moving museums into new business models is a major tenet of this paper. It would be a mistake, however, to think that institutions were moving from one static, definable paradigm to another static paradigm. The truth is that there will always be change. Once that is recognised, museums can set about developing strategies to transform the challenges of change into opportunities.

If the transformation process is not dealt with appropriately it has the potential to disorientate institutions and their staff causing unnecessary stress, ineffective responses and lost opportunities. However, with the right preparation and appropriate change management strategies museums can be the masters of change rather than its servants.

4.1 Equipping management for the digital age

The digitisation of collections and public access to digital archives will, in the long term, have a fundamental impact on the functions and functioning of collecting institutions. It is likely that departments and managerial positions will be re-fashioned and/or new ones formed to deal with such things as digitisation programs, copyright and commercial issues and maintaining digital archives. Those departments and managers currently operating in museums will most likely be undertaking quite different tasks, using new tools and responding to different sets of priorities and new demands ranging from the curatorial to the commercial.

An effective and efficient transition from the present to the time when consumers will be able to access a significant portion of national collections on-line requires a enormous enterprise, collaboration, skill and vision on the part of the management of collecting institutions. Management will need to give of their time and exercise their expertise in contemplating and finding solutions to the myriad of management issues amongst which are: the re-deployment of human and physical resources; budgeting for digitisation; staff training; acquisition and maintenance of new equipment; the preservation of digital objects, prioritising what to digitise; and maintaining current projects. Management may need to acquire new sets of skills in order that they might deal appropriately with the new issues associated with a digital world.

Given the scope of this new undertaking and the existing commitments of management, it will be highly desirable to establish methods of encouraging and supporting professional development in appropriate areas for management and to explore support mechanisms that will minimise the burden of change and maximise the efficiency of the transition.

The methods and mechanism that might be employed in this regard are:

- workshops conducted on issues such as: risk management, change management, ownership/copyright, managing staff training, budgeting for digitisation
- the publication and dissemination of national and international best practice case-studies
- an Internet site devoted to the publication and dissemination of professional development material including open discussion groups

- establishment of regional management reference groups that meet to promote collaboration and sharing of experiences and lessons learnt at a regional level
- a register of projects currently under way or planned in museums
- a register of consultants organised according to the services they provide

The provision of effective professional development appropriate to the new service in which management will find themselves requires appropriate needs analysis, planning, resourcing, constant evaluation and commitment.

4.1.1 The prevailing management environment

The managers of museums hold key positions in the decision-making process with regard to their online policies. However, it is a point of fact that most managers of museums, like managers of most similar sized commercial organisations, grew up in the pre-information technology age and certainly the pre-World Wide Web age. For most, their schooling and professional training pre-dates electronic calculators, word processors and fax machines. They were taught and accessed information in what are now termed, *traditional* methods, and they mainly disseminated their ideas on paper.

In short, managers of our museums did not grow up in our current information age; rather, they are in the process of adapting to it with varying degrees of willingness and success. The speed and all-embracing nature of this revolution challenges managers to anticipate the changes and to adapt themselves and their organisations appropriately.

It must be said that the successful transition to the online world and to new business models by each museums will depend to a large extent on the degree to which managers re-skill and on their vision of the future.

4.1.2 Risk management

Digitisation of content and management of digital objects will bring with it certain obligations and potential liabilities. If we characterise the obligations and potential liabilities as risks it should be acknowledged that these risks need to be identified and then managed.

A risk analysis should seek to examine, for potential or actual failure to meet obligations, the procedures and protocols adopted by the institution as it undertakes each of the following aspects of creating an online digital archive:

- budgeting
- prioritisation
- staff training
- purchase of hardware and software
- allocation of resources
- the digitisation of physical objects
- copyright and ownership
- indexing and cataloguing
- storage medium
- migration of digital objects
- provision of access to digital objects

Once the risks have been identified risk management systems can be introduced with the aim of any one or all of:

- eliminating or reducing risks;
- sharing risks; and/or
- transferring risks.

Managers of museums will require support and direction in identifying aspects of their institution's digitisation process that require application of risk management procedures. They will also require expert advice and would benefit from the collective experience of their colleagues when selecting and applying risk management policies.

4.2 Staff training

Just as managers of museums will require well targeted professional development to help manage their institutions effectively in the digital age so too will their staff require specific training in new disciplines and techniques. Institutions will require staff whose combined skill-sets embrace, in the right combination, the following functions:

- preservation, archiving and disposal of digital objects
- cataloguing and indexing digital objects
- preparing objects for digitisation
- the use of online navigational tools and finding aids
- the monitoring of digitisation procedures and performing of quality reviews
- preparation of detailed instructions for digitisation - whether in-house or outsourced
- technical knowhow in operating digitisation hardware and software
- web graphic design and authoring
- webserver technical expertise
- online marketing strategies and e-commerce

The training of personnel to perform these functions requires a coordinated national approach in every country similar to that suggested for the professional development of management.

Within nations and cities the sharing of human resources between institutions that are in close physical proximity of one-another is a resourcing strategy that has much to recommend it and deserves careful consideration. The sharing may take the form of an individual or team that has particular skills in one or several aspects of digitisation consulting to all museums in a capital city or region. In addition, another model may see staff in one institution with specialist expertise in their cultural sector consult to that sector on a national basis. Possible advantages of these collaborative models are: the fast-tracking of online programs; the utilisation of best-practice by all participating institutions; and the dissemination of knowledge and skills which will increase the national pool of skilled personnel. An alternative is the establishment of at least one all-round skilled person who works solely in the one collecting institution. This approach is based on the premise that a rapport with staff, availability and an intimate understanding of the institution's ethos and vision are essential ingredients in successful consulting and cannot easily be achieved if the consultant is operating from outside the institution.

As with so many issues raised in this paper, it is unlikely that one approach will serve the needs of all. A successful resolution to this issue is more likely to reside in an approach that recognises the differing circumstances between institutions themselves and which offers various models for the timely provision of suitably trained staff.

4.3 Know thy market and then differentiate

In the online world, competition amongst museums for home page hits and for securing customers for digital archives will be intense. And it is not just the museum down the road that will be the competitor to watch but the Getty, Louvre, Victoria & Albert – the competition is any museum, anywhere in the world that has gone online. To compete, museums will need to develop differentiators that separate them from the pack. Value-added services, effective web-site design, pricing of digital objects and marketing are all key elements in differentiating one digital archive from another.

Differentiating requires market intelligence. Museums have to get to know what the market wants – what objects in the collection will people be most interested in (this should instruct the prioritisation policy for digitisation of the collection), what are the price-points, what value-added services do people want and how can they be brought back to the site time, and time again. The market research needs to establish answers to these questions and to provide constant monitoring of the market-place in this regard.

4.4 Collaboration

At his paper presented at the First International Memory of the World Conference in June 1996, Ray Edmondson, from the Australian National Film and Sound Archive, proposed this approach to addressing the preservation crisis facing audiovisual material the world over :

“I believe coordinated action - national, regional and global - is a strategic necessity if we are going to save the audiovisual memory of the world. We haven't always been good at this. Now we must be. Much has been irretrievably lost; much more is on the brink; trained and committed people are the foundation of development; and we need the strategic and collective approach. Nitrate - and acetate - won't wait.”

Although he was referring to audiovisual objects, Edmondson's plea for cooperation and collaboration at a national and international level strikes at the heart of the way ahead for tackling the significant issues raised in this paper. The online world has scant regard for the physical world's differentiation between libraries, museums, galleries and archives, so those that can achieve effective collaboration between institutions across the sectors and within each sector will have an important competitive advantage over others.

If we do not move efficiently and effectively to provide models and pathways that help resolve the complex issues facing owners and custodians of digital information, then we risk losing much of our respective cultural heritage and of jeopardising the benefits that digitisation and on-line digital archives promise. The resolve must be found to ensure that neither of these scenarios comes to pass.

4.5 Digital technology

The digital technology of today provides us with new and powerful means of preserving our cultural heritage and making it accessible to all in a medium that is empowering, equitable and convenient. However, the technological revolution in which museums are currently operating presents several significant challenges to those institutions:

- the rapidity with which new and better technologies are emerging;
- the increasing rate of obsolescence of digital technologies used to store and provide access to digital objects; and
- the proliferation of hardware and software solutions.

4.5.1 Responding to the rapidity of technological change

The rapid increase in power and functionality of digital technology and of the computers in homes, schools and community centres through which people will access digital archives creates the dilemma of when to commit to purchasing and/or using new equipment. The promise of things to come can debilitate the online program yet hasty decisions can prove costly and more importantly may endanger the long-term preservation of digital objects. Strategies are needed for anticipating new technologies and estimating their likely impact on online programs and for evaluating digital technologies that have been released to assess their suitability and impact.

A number of observers have called the World Wide Web an immature technical environment. This suggests that at some point in the future it will become “mature” with the attendant stability and familiarity that that term implies. However, given the history of technological change over the past fifteen years and the predictions of even more rapid and far reaching changes into the foreseeable future, the question arises: will the World Wide Web ever be “mature”? Will it not always be in a state of flux, with great improvements always around the corner? The challenge to management then is to manage change.

4.5.2 Obsolescence of media and hardware

The issue of obsolescence may be seen to comprise of two main aspects:

- obsolescence of the media on which digital objects are stored; and
- obsolescence of the hardware used to read the media on which data is stored

Digital data, as we understand it, does have a finite shelf-life. The pits etched into a CD ROM that constitute data and the bits stored magnetically on storage devices such as hard disks do deteriorate over time. Yet, even if the bits remained forever on these or new storage media it is highly unlikely that the hardware used to store and read that media will itself have a life beyond five to seven years. If the publicity is to be believed, certain new CD ROMs are capable of retaining data stored on them for up to 200 years. The question to ask is: will the technology used now to read these CD ROMs be available in 10 years’ time, leave alone 200 years from now? The transition from the 5.25 inch floppy diskette that were marvelled at when first released to 3.5 inch mini-diskettes over the past five years is perhaps a more stark reminder of how we misguidedly attribute immortality to that which always seems exciting new technology. What future the 3.5inch mini-diskette?

Managing obsolescence requires a collaborative decision-making process within museums that brings together managers, technicians and accountants and which is mindful of best practice models, the potential for resource sharing with other institutions, balancing cost with the obligation to provide and maintain the means of access to digital information (even though they might be obsolete in the public arena) and technological developments either pending or which seem likely in the future.

4.5.3 Proliferation of technological solutions

Managing the issues of obsolescence and migration is complicated further by the sheer number of technology solutions that are in the market-place today. Whilst the ever increasing array of possible

technical solutions constitutes a competitive market-place keeping prices down and encouraging a service ethos, it does mean that institutions are obliged to vet numerous solutions and solution providers.

For those institutions investigating digital storage formats for sound recordings there are about twelve viable solutions in the market place. The number of scanners, digital cameras, compression cards, CD ROM burners, browser plugins and utilities and other hardware and software associated with online archives is increasing. In addition, the number of companies offering solutions is increasing rapidly.

Choosing the right hardware or software platform and solution provider is a time-consuming and demanding task. It requires a:

- thorough needs analysis to define exactly what technical solution is required;
- very sound understanding of technical issues and of the process for which the solution is sought, so that costly and time-consuming pitfalls might be avoided; and
- well articulated brief so that potential suppliers might understand the institution's needs and respond accordingly and so that effective and meaningful contractual arrangements can be entered into.

4.6 Resourcing an online program

Providing resources at appropriate levels presents a number of significant challenges to collecting institutions. Each raises issues of what constitutes an appropriate level; what is the most suitable training program, equipment and software; how should the various products and services be purchased and maintained; what is the time-frame for the provision of these resources; and what amount of funds should be allocated to the digitisation process.

The successful balancing, on one hand, of resources against, on the other, the institution's charter and social responsibility requires constant re-evaluation of the deployment of the former and a deep understanding of, and commitment to, the latter.

4.7 Budgeting for the online world

Establishing budgets to undertake digitisation and digital object preservation can be a complex and often unsatisfactory exercise for museums and other collecting organisations. There are a number of inter-related reasons for this:

- digitisation is too new for there to be a sufficient number of digitisation programs with sufficiently advanced strategies to provide reliable cost models;
- data relevant to costings from online programs that have been undertaken is not readily accessible nor has it necessarily been recorded with a view to providing cost models;
- general uncertainty as to what technology to acquire and under what acquisition model (purchase, rent or lease?) in a market-place in which new technologies and solutions are unveiled regularly and where purchase prices reduce over time;
- general uncertainty as to the nature and quantity of personnel and physical resources that are required or need to be redeployed immediately and over time; and
- the unpredictability of the rate of obsolescence of hardware and software and the resultant necessity for purchasing new equipment and for the migration of data.

In budgeting for digitisation programs, it would be prudent for institutions to engage in a costings exercise involving a thorough identification and costing of the physical and human resources required. The experience of the Australian National Film and Sound Archives and of the Australian Archives suggest that the most common cost items apart from the cost of hardware and software, include: research and development, the process of digitisation itself, and intellectual control, data transfer, storage and delivery systems, as well as for the training of personnel and the development of a range of appropriate management systems. Implied in this list, yet deserving of particular mention, are the cost of selection, cataloguing and indexing, and migration of data.

Of less obvious and immediate impact on the cost is the on-going cost of maintenance, staff training and provision and maintenance of electronic or personal “help-desks” in cases where the public or other institutions have access to the digital archive.

The complexity of establishing a budget is reflected in the somewhat complex situation where most institutions that embark on a digitisation strategy will need to undertake and maintain three parallel digitisation programs:

- digitisation of the collection as it existed pre-establishment of the program
- digitisation of additions to the collection post-establishment of the program
- preservation of digital objects - both those created via the digitisation program and those that originated as digital objects

These three programs will, of course, be running in parallel with all other programs and day-to-day activities undertaken by the institution and with which they will compete for the finite resources.

5. Conclusion

This paper has argued that the World Wide Web is forcing a re-defining of the role and business of museums. This re-defining is being brought about by agents of change that emanate from the online world such as: increasingly sophisticated technology, finding and navigation aids; consumer demand; and the widely acknowledged benefits that digitisation offers to collection management and preservation of objects.

Having established that the re-defining of museums is occurring, the paper then outlined the nature of those changes - that is, how the World Wide Web will impact on the way museums operate. The aspects of museums that are being re-defined include: the very business in which they are engaged; the way they perceive and respond to users, their role as custodians of the national heritage and culture and their relationship with other collecting institutions (convergence as opposed to differentiation).

Finally, in order to provide constructive and helpful advice on the ways to manage change, the paper dealt with areas such as: management training, how to resource online programs, collaborative methodologies, budgeting and the imperative of market research.

The rapid expansion of the World Wide Web into all sectors of business and government and into our personal lives, together with the more enabling and user-friendly technologies being developed mean that museums that do not establish and implement an effective online strategy will eventually be marginalised by both users and funding bodies.

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