THRIVING or SURVIVING?

National Library of Scotland in 2030

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David Hunter & Karen Brown

CONTENTS

Preface

The National Library of Scotland (NLS) is increasingly conscious of the need to maintain an eye not only on the immediate future but on a more distant horizon. Many of our strategic decisions - for example on organisational capacity or capital investment - are best considered in the context of this timescale. For this reason, we have produced this paper looking at the influences that will shape NLS over a twenty-year timescale.

Over recent years I have valued the informal network of national librarians from 'small smart countries' meeting at the International Federation of Library Associations and Institutions (IFLA) conferences, and I believe and hope that many of the thoughts we have on the opportunities and challenges facing NLS will also have relevance and resonance with members of this group, and with others looking at the future of libraries - especially national libraries outwith the 'small smart countries' network. This paper is very much intended as a discussion document (it does not represent formal NLS policy) and so I would be very pleased to hear any further feedback on the ideas and topics contained in the paper.

The paper includes two pieces of original material commissioned by NLS which are published as part of this report. These are firstly, a piece looking at developments in digital libraries, and secondly, a record of a series of interviews with a number of influential library thinkers around the world on the opportunities and challenges they see for smaller national libraries in 2030.

I would like to thank everyone who has contributed to this project and to give special thanks to David Hunter, Strategy and Performance Manager, and Karen Brown, Executive Assistant, at NLS for their work as principal authors of the paper.
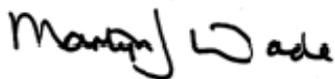
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"To remain as we are – that is, vital – we must change; if we don't change, we won't remain vital"
W. David Penniman (Lancaster 1993:5)

Section 1: Introduction

National libraries, by their nature, take a long term view. They need an awareness of the past and they need to anticipate the needs of future generations. They need to consider not only current needs and demands, but must also bear in mind how the publications of today will form part of the cultural heritage of the nation in the future.

This paper considers the influences which will shape the development of the National Library of Scotland (NLS) towards 2030 - some 20 years time - and goes on to propose how NLS might respond to these influences. This work is important in order to plan the development of our services in the long term and to inform the Library's strategic planning process. We hope also that the consideration of these changes and the questions posed will have some relevance and value to other national libraries in general, and to those of 'small, smart countries' in particular.

1.1 What is a national library?

According to the International Federation of Library Associations and Institutions (IFLA), national libraries have a vital role in society as "custodians of the nation's intellectual heritage, thus providing organisation, access to and preservation of the national imprint in all media." (IFLA 1998)

IFLA also describes national library responsibilities as varied from country to country but likely to include:

- "the collection via legal deposit of the national imprint (both print and electronic) and its cataloguing and preservation;
- the provision of central services (e.g. reference, bibliography, preservation, lending) to users both directly and through other library and information centres;
- the preservation and promotion of the national cultural heritage;
- acquisition of at least a representative collection of foreign publications;
- the promotion of national cultural policy; and leadership in national literacy campaigns.

National libraries often serve as a national forum for international programmes and projects. They may have a close relationship with national governments, may be concerned with the development of national information policies, and may act as a conduit for the views of other sectors of the profession. Occasionally they also serve the information needs of the legislature directly".

Whilst the above IFLA description of national libraries indicates that national libraries share many core functions, as many commentators[1] have noted, there is no such thing as a typical national library. National libraries vary enormously in size, function and range of services they provide. For example, whilst the stated mission of the world's largest national library, the US Library of Congress (2007), is that of "acquiring, preserving, and making accessible the world's knowledge...", national libraries of smaller developed countries, whilst aiming to have a fairly comprehensive coverage of publications produced in the rest of the world, typically aim to collect, preserve and provide access to the published record relating to their country.

1.2 'Small, smart countries'

Although this paper is focussed on the National Library of Scotland in particular, we also have one eye on other national libraries which we characterise as those from 'small, smart countries'. Such countries are politically, educationally, socially and technologically advanced, however they are relatively small on the world stage; their national libraries, for example, are not global leaders in the same way as the Library of Congress, the Bibliothèque Nationale de France or the British Library. These small countries may have cultural identities under threat from globalisation, yet their very size might enable them to respond rapidly to changing circumstances. As such, they can be in a position to help each other in identifying and tackling issues of common concern and bringing solutions to the larger stage.

The community of interest between the national libraries of 'small, smart countries' has developed expression as an informal network of such national libraries meeting at IFLA conferences since 2006. By their nature, these libraries are diverse - each have their own history and governance arrangements, which may involve close association with a national university or, in the case of NLS, with a long-established law library. Nonetheless, many of the strategic issues that they face are shared concerns.

1.3 National Library of Scotland

NLS was established by the National Library of Scotland Act 1925 (subsequently amended by the National Heritage (Scotland) Act 1985) as successor to the Library of the Faculty of Advocates, itself founded in the late 17th Century. Its collections have therefore been built up over three centuries. As such and as one of the UK's five legal deposit libraries, it is the largest library in Scotland and has become one of the largest in Europe with over 14 million printed items, around 8.5km of manuscripts, 2 million maps and around 32,000 films and videos. It is therefore also one of the country's major cultural institutions and a major resource for the Scottish people. Whilst the functions of NLS fall within the range of responsibilities associated with national libraries worldwide as described by international organisations such as IFLA above, within the current devolved political landscape of the UK, the definition of 'national' is complex. The UK has three national libraries[2] and within this complexity, NLS seeks to operate for the benefit of the people of Scotland,

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[1] e.g. Line, M. B. 2001. Libri, Vol 30, No. 1
[2] British Library, National Library of Scotland and National Library of Wales

managing the knowledge that Scotland needs now and in the future, as well as preserving its past.

In the last decade NLS, in common with other national libraries, has committed itself to widening access to its collections and as such has restructured itself from a national library serving a relatively small, narrow band of researchers to one that has opened itself to wider and larger audiences. The digital revolution of the last two decades has been a key factor in enabling NLS to increase such access. This process has been guided principally through its first corporate strategy produced in 2004 '*Breaking through the Walls,* followed by the 2008-2011 strategy document '*Expanding our Horizons'*.

1.4 Methodology

We have approached the task of assessing the changing role of NLS in twenty years time by firstly attempting to identify the key drivers for change, and then to consider what the impact of these may be. In doing so, we have drawn on the developing body of literature on the future role of libraries, which often focuses on research libraries in general and on academic libraries in particular. This is natural given the large network of research libraries and the importance of investment in them by leading universities. As national libraries are almost by definition research libraries, many of the findings of such literature are transferable to the national library sector. However, as noted earlier, national libraries, as "custodians of the nation's intellectual heritage", have a unique role not confined to a specific user base. Moreover, as stated above, in response to the rapid and far-reaching external developments of the last two decades, they have opened themselves up to new public audiences with very varied wishes and needs.

National libraries therefore can be considered to be *both* research libraries *and* public libraries. These twin dimensions are at the heart of many of the opportunities and challenges that face them as they develop in order to meet the needs of current and future generations. The unique position of national libraries also requires a unique analysis of their future development, because we cannot assume that what typically holds true for research libraries, or for public libraries, will also apply to a national library; hence the particular need for this piece of work.

In identifying future influences, an attempt has been made to consider both the impact (how important changes might be) and the likelihood (how likely we expect the change to occur). This approach is borrowed from standard risk management techniques[3], another discipline which is also focussed on understanding the future and how to respond to it (albeit usually in a more imminent timescale). It allows us to focus on factors which we think are both likely to happen and which will significantly affect national libraries of 'small, smart countries'. Factors which are not expected to shape such national libraries significantly, or which seem relatively unlikely to happen, are discounted.

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[3] See for example "Committee Draft of ISO 31000 Risk management" (PDF), International Organization for Standardization.

These include two areas which have been suggested by colleagues while preparing this paper - sustainability and 'digital literacy'. With regard to sustainability, we can assume that NLS will want to demonstrate best practice with regard to environmental performance such as energy consumption and waste; but NLS does not have a particularly significant environmental footprint, and we consider it unnecessary for the purposes of this study to anticipate how NLS might operate in a future where energy supplies, for example, are so scarce or expensive that strategic aims need to be re-evaluated. Similarly, we do not consider digital literacy, and the dangers of the digital divide in any depth. In this case, rather in contrast to Simon Tanner, (see pages 48-49) we consider that, whilst of crucial importance, the key responsibility for information literacy (as with literacy in general and numeracy) does not lie with NLS, but rather with the education sector, including community and adult learning.

Finally, but most fundamentally, we have not included a separate section on technology. This is partly because we do not want to take a determinist approach, with changing collecting behaviour or customer demands being seen as driven inevitably by technical advance. It is partly because of the dangers in trying to anticipate and 'pick' technological advances over the timeframe of a generation. But it is also because the digital information revolution is all-pervasive. It affects how information is produced and published, how it is found, accessed and increasingly re-used and how organisations function internally and relate to others externally. We see then the digital revolution more as a theme running through the paper, rather than as the subject of a particular section.

1.5 Structure of the paper

This main paper is broadly divided into four sections. After this short Introduction, Section 2 identifies the key changes which we anticipate will influence NLS in 20 years time, and the drivers which are behind these changes. Section 3 goes on to explore these implications in broad terms, noting the key transitions which we anticipate will be required by NLS and perhaps similar libraries also. Section 4 then goes on to draw these together into some general conclusions.

In addition to this paper, we commissioned two pieces of original work to inform our thinking. Firstly, in May 2009, we commissioned an independent view of digital developments which will impact on research libraries of the future from Simon Tanner of King's College London. Secondly, we commissioned a number of interviews with leading library thinkers on their views on the challenges and opportunities facing national libraries in twenty years time. This was carried out by Edinburgh-based market research firm Scotinform Ltd in July 2009. Both these commissioned pieces of work have influenced the ideas in this paper, and are referred to in a number of points. Both are published together with this main paper as Appendix 1 and Appendix 2 respectively.

Section 2: Key influences on national libraries

Before we plan future services, it is first necessary to consider what might be the key influences or drivers of change on national libraries in 'small, smart countries'. By adopting a horizon of twenty years time, we need to look beyond a simple extrapolation of current trends, and to identify the fundamental changes which are likely to impinge on national libraries' role.

Considerations of key influences/drivers of change take us into the realms of 'futures work' and the burgeoning horizon scanning field.[4] A fundamental problem of all such work is the uncertainty inherent in predicting future trends, and it is all too easy to get forecasts wrong. For example, in 1901, Daimler proclaimed that "worldwide demand for cars will never exceed one million, primarily because of a limitation in the number of available chauffeurs"(Marr 2008) and in 1943, Thomas Watson Chairman of IBM predicted "there is a world market for maybe five computers" (Ringworks 2009). Nonetheless, fear of making erroneous assumptions is not a satisfactory reason to avoid the task altogether; indeed, *because of* that uncertainty, it is all the more important for us to attempt to envisage the future environment in a structured way, assembling evidence and analysing the future impact on our organisations. This will increase our confidence in identifying robust future scenarios and reduce speculation which would otherwise undermine futures work.

Invariably, many of the anticipated changes are related to the digital information revolution. New business models, user behaviours and service possibilities challenge many of our long-held assumptions about how we collect, preserve and provide access to knowledge. Although we cannot say how new technology, services and behaviours will develop over the next twenty years, we can accept as a 'given' that advances in technology will be a pervasive influence in shaping the global society of 2030. We assume also that well before 2030, there will be confidence in digital preservation processes and technology.

We have identified a small number of influences which may have a significant impact on national libraries of 'small, smart countries' in the future. These are each considered next:

- Changing patterns of publishing
- Changing patterns of customer needs and behaviours
- Competition
- Political influences
- Organisational change

2.1   Changing patterns of publishing

2.1.1 The shift to digital publishing

We are at a crucial stage in the publishing industry, where online delivery is challenging and replacing traditional channels. This shift is, of course, even more evident in other media and creative fields, such as film, broadcasting,

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[4] See for example http://www.foresight.gov.uk/Horizon%20Scanning%20Centre/index.asp

newspapers and music, where new business models are emerging, but as yet are far from mature.

Drivers for change affecting the publishing industry include:

- Technology: the emergence of e-books such as the Sony e-book reader, Amazon's Kindle and the Stanza e-book reader for the iPhone;

- User preferences: customer demand for easy and efficient ways to access, search and navigate content on the internet via smart phones (it is estimated that by 2012 there will be 2 billion smart phones in existence, accounting for 65% of all handset sales, Personal Digital Assistants (PDAs) and Pocket PCs (Perez 2008));

- The emergence of new business models such as Open Access for scholarly publications to challenge the traditional subscription-based model, print on demand (one belief is that by 2015, 48 percent of all books will be digitally printed on-demand (OCLC Reports March 2003)), publisher-consumer direct relationships (e.g. Harper Collins and Authonomy);

- Social collaborative tools such as web 2.0 providing a new form of collaboration through podcasts, blogs and online communities, such as FriendFeed, Facebook, flickr and Second Life.

A study commissioned by the British Library in 2004 predicted that by the year 2016, half of all academic serial publications will be in electronic-only format. The study predicted that science, technology, and medical (STM) titles will be the first to do so; large publishers will start with less profitable titles; smaller publishers will change to electronic format on the basis of rising print and distribution costs. The same study also predicted that by the year 2020, 40 percent of UK research monographs will be available in electronic format only, while a further 50 percent will be produced in both print and digital. Only ten percent of new titles will be available in print alone (Kenny et al. 2006). Already, as academic libraries move to licensing e-journals, they are cancelling their print equivalents. In a 2004 Publishers Communication Group survey of 155 librarians from academic libraries worldwide, 84 percent of respondents said they cancel print when an electronic version is available. Forty percent of current subscription revenues for Elsevier's Science Direct come from electronic-only subscriptions (Kenny et al. 2006). Although these studies are now a little dated, we understand that more recent unpublished evidence confirms the trends.

These changes in publishing represent a convergence of information into digital format. Most newly-created published material - whether fiction, poetry, official reports, research, film, music or business material - will be born digital and will be stored and accessed digitally. This convergence into a broadly speaking common format may have profound implications for the organisations that have traditionally been responsible for conserving information.

2.1.2 Digitisation

The digitisation of materials continues apace, with various commercial and public sector mass digitisation projects including the World Digital Library[5], Europeana (the European Digital Library)[6], the Open Content Alliance[7] and the Million Book Project[8]. Many of these mass digitisation initiatives have been partnerships between commercial organisations and major research libraries, most notably the Google Library Project partnership between Google and the libraries of Harvard, Stanford, Michigan and Oxford Universities and the New York Public Library (known as the 'Google Five'), now expanded to include five other library partners. However these initiatives develop, we can assume that most printed out-of-copyright paper publications will be digitised and fully available on the web by 2030. New ways, moreover, will be developed so that researchers can find digitised materials and re-use them easily. Michael Keller, University Librarian at Stanford University, has spoken of the development of services for researchers such as citation links, the indexing of ideas as well as words and the further scope for links based on smart keywords to online maps, biographies and encyclopaedias (Scholarship and Libraries in Transition 2006). Extrapolating current innovation, other significant developments might include effective, intuitive automated translation, and automated interpretation of digitised images of handwriting.

However, national libraries of smaller countries will also have an important role in ensuring that less obvious material is digitised and that globalised digital content meets local (national) needs. Some national libraries of smaller countries, such as Norway, have already committed themselves to digitising the entire published record in their languages.[9] In Scotland, where English is the principal language, many national publications will be swept up by globalised digitisation operations, such as those between Google and the 'Google Five'. Even here however, there is enormous scope for NLS to digitise unique material such as the out-of-copyright Scottish Gaelic material it holds which has been the focus for the first 'mass digitisation' initiative by NLS and the not-for-profit organisation, the Internet Archive. ScotInform interviews show clearly that leading library figures place great importance on national libraries' role in co-ordinating digitisation.

2.1.3 Too much material?

Digital publishing has become so easy and widespread that the amount of digitally created content has increased exponentially. The boundary between the commercially published and the self-published is increasingly unclear. Text messages, social networking messages and mobile-recorded video may be essentially private creations, but increasingly they are uploaded and associated with clearly 'published' websites such as YouTube, flickr and so on. As Andrew Green, Librarian of the National Library of Wales (2008:6) says: "Whereas in the printed past, publishers were relatively few and acted

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[5] http://www.wdl.org
[6] http://www.europeana.eu/portal/
[7] http://www.opencontentalliance.org/
[8] http://www.archive.org/details/millionbooks
[9] http://www.nb.no/

as gatekeepers controlling the flow of material achieving print status, now almost anyone can act as his or her own publisher. The size and without doubt the quality of the published universe have therefore been changed utterly".

Even now, NLS does not capture all digitally-published material, partly because of the lack of statutory e-legal deposit legislation in the UK (see 2.1.5) and partly because of immaturity of digital retrieval and preservation standards and processes; harvesting of websites, for example, is selective. Assuming that technological and legislative developments make this easier in the future, we can anticipate that the quantity of material produced will be so great and the quality so varied, that national libraries will have to be more discriminating in what they choose to select for permanent safekeeping. 'Collecting everything' will be neither viable nor worthwhile. National libraries will therefore have to develop more active collecting policies which reflect national needs and values.

This will be a difficult transition, as the apparent neutrality and objectivity of collecting all printed material will need to be replaced by the exercise of judgements, valuing some material higher than others. However, even the current collection practices of printed material inevitably reflects social and political status and values. A hundred or more years ago, the ideas and creativity of the elite were more likely to be published than those of the working class or poor rural Scots, especially women. Their voices are less likely to be recorded in the printed (or even manuscript) material that we inherit from these times.

2.1.4 Intellectual Property

Intellectual Property (IP) is an arena where national policy and law have not yet come to terms with technological advance in the global digital revolution. This is demonstrated by the disputes and accommodation between Google and American publishers[10] or the as-yet unresolved dispute between YouTube and music publishers.[11] As Muir (2006: 5) points out, "digital publishing and networking has the potential to open up access to information: the explosion of information provision on the internet illustrates this. It also provides rights holders with the means to control access and use of information more tightly." Regulators, however, have still to make IP fit for purpose in a digital context; and some commentators are of the opinion that this situation is likely to persist. For example, in a Pew Internet & American Life survey of 1,196 technology stakeholders and critics, 60% of respondents disagreed with the idea that there would be effective intellectual property control by 2020 (Anderson, Raine 2008:7).

The challenges presented by copyright and IP law were highlighted by some participants in the survey by Scotinform with comments made that the UK was falling behind other countries in terms of approaches to copyright and that its national libraries should lobby legislators to move the law forward.

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[10] See *AAP, Authors Guild, Google Announce GroundbreakingSettlement over Google Book Search Library Project*, October 2008 http://www.publishers.org/main/Copyright/CopyKey/copyKey_01_03.htm

[11] See Palmer, S. "Lawsuit: Music Publishers v. YouTube Doesn't Solve the Problem", *Huffington Post*, http://w ww.huffingtonpost.com/shelly-palmer/lawsuit-music-publishers_b_59979.html

(Scotinform 2009: 71-72). Many other commentators such as Lawrence Lessing (2008) have commented on the problems faced by libraries; "The system of intellectual property is focussed on the commercial side of creativity. (...) For all non commercial uses – libraries for example – it becomes an intolerable obstacle" (quoted in *The future of intellectual property: Creativity and innovation in the digital era*).

For example, current UK copyright law which allows libraries to copy items in their collections for preservation or replacement does not extend to artistic works or multi-media publications. It also gives close to total legal protection to digital rights management (DRM). As Muir (2006: 7) again points out, "Even where libraries have legitimate rights to manipulate the information, for example for preservation, DRM may provide a legally insurmountable obstacle". Likewise, licences, which are emerging as the key transaction method in the digital environment, currently often have the effect of restricting access by ignoring copyright exemptions. These challenges will become even more urgent to be clarified by legislation as more and more material is only being published digitally.

2.1.5 Electronic Legal Deposit

Likewise, the move to electronic publishing and users' increasing preference for online resources make the enactment of electronic Legal Deposit legislation an imperative issue to resolve if national libraries are by 2030 still to effectively provide access to their unique national output and fulfil their mandate to collect the national imprint. However, the challenge to identify digital publications, to preserve and archive them for future generations along with commercial publishers' attempts to develop viable new business models means that the development of legislation, at least in the UK, has been problematic.

Although primary legislation was passed in the UK in 2003 extending the right of Legal Deposit to electronic as well as print, more than six years later, the regulations which will put this into practice are still not in place. Progress has been made more recently on a regulation-based harvesting and archive scheme for the UK 'free web' space and through the use of voluntary codes. It would seem, however, that despite being one of the first countries to implement legislation in this area, the UK is lagging behind other countries in establishing a sustainable legal basis for long term collection and preservation. In a recent survey (unpubl.) conducted by the British Library of other national libraries worldwide, it was found that of the 34 responding countries, many are more successful in terms of ensuring that publishers deposit electronic material and providing access to e-publications for research.

2.2 Changing patterns of customer needs and behaviours

National libraries have been subject to considerable change in the recent past; much of this change derives from the changing customer base of a national library. NLS, for example, began life as the Library of the Faculty of Advocates, the professional society for Scottish barristers, becoming a National Library in 1925. As Dennis Smith (Stams (ed.) 2001:570) has noted "The old Advocates' Library had a long tradition of welcoming outside scholars, but combined this with something of the atmosphere of a gentleman's club. [Former keeper] WK Dickson occasionally received a brace of grouse from a satisfied reader…some members of the public may have found the atmosphere intimidating."

As the notion of a national library serving a relatively narrow clientele became outdated, today NLS readily accepts its responsibility to meet much broader and more diverse client needs. NLS has stated clearly that it is there for all who can benefit from its collections, services and expertise. Current users are much more likely than before to be female, to be interested in a broader and less predictable range of subjects and critically, to use a range of information sources, of which NLS is just one. Any such significant change in user base has profound implications for any organisation, and NLS is no exception.

Who will be our users in 2030? User profiles will continue to change for a number of reasons, and three key changes are identified here:

- Demographic changes will alter customer demands for information;
- The information-seeking behaviour and expectations of customers will be influenced by the development of new technologies and provision by alternative information providers;
- New customer groups will emerge

2.2.1 Demographic changes

The demographic profile of Scotland around 2030 can be predicted with some confidence, using projections prepared by the General Register Office for Scotland (GROS).

In short, we expect that while there will be fewer young people (the number of 18 year olds is expected to decline by 18% by 2028), there will be many more people aged 45+ in the workforce. The number of 'very old' will continue to increase (81% increase in over-75s by 2031) (GROS 2007:5). Visitor numbers to Scotland are also forecast to increase from 17.3m in 2005 to 27.3m in 2025, with annual growth rates forecast to be the highest (3.7%) in the older (55+) age group (Yeoman et al. 2007:5).

These increases in the older population and in visitors are together likely to increase demand for independent research by the 'citizen-scholar', in many cases associated with family history. In an increasingly global interconnected age, we expect increasing long-term interest in accessing Scottish information sources from the global Scottish Diaspora, already a key audience for NLS.

Migration patterns currently indicate that the one age group which has a net inflow to Scotland is the late teens – early twenties, owing partly to the success of Scottish universities in attracting students from abroad (Joint Future Thinking Taskforce on Universities, 2008:14). This section of the community may not only counterbalance the general trend to an older population profile, but may boost birth rates if they stay, work and have children in Scotland. One significant effect of these demographic changes on Scotland's student population will be the need to cater for a much more diverse student population than at present; as the Joint Futures Task Force puts it, "There will be no 'typical' student". Not only will there be more older students, there will be greater demand for part time study, for flexible learning and for more employment-linked education. These students - both undergraduate and postgraduate - are more likely to increasingly want "24/7" services, available at their desk tops and on mobile platforms. And many of these students will go on to become the next generation of professionals, commercial entrepreneurs and academics, all potential customers of NLS.

2.2.2 Changing information-seeking behaviour and expectations

A considerable and convincing body of evidence is beginning to accumulate on changing information-seeking behaviours and expectations.[12] Such studies suggest the key to understanding future expectations lies in understanding the behaviours of today's teenagers (variously characterised as, for example, the 'Google Generation', 'Screenagers', 'digital natives', 'Generation Y') and envisioning how these may continue into adulthood. These studies have shown that that this generation of information-seeking users are generally happy/prefer to use digital media and have little need to see the original items and little need or desire to visit the physical library (Connaway 2008:8). Although there is very little research as yet on the generation following this – those born after 2001 (variously termed the 'born digital' generation, Generation Z, the Net Generation) - this generation will have never known a world without the Internet.

Already then, the new generation of library users exhibit certain traits which we can expect to continue and increase. Access to electronic resources mean that users will use a range of information sources to carry out research, overwhelmingly online. This means not only increased competition for national libraries, but also a demand for easy-to-use services and increasingly-personalised resources (whether through bookmarked resources, rss feeds and other increasingly-sophisticated personalisation tools).

Nearly 10 years ago, Bas Savenije (2000:6) observed that these tools "allow the scientist to become a librarian himself, a librarian who has no other clients." We can anticipate that these users will increasingly wish to repurpose and link together various sources, with different formats. They will want 24/7 access to intuitive services and will have little tolerance of administrative rules and restrictions or of 'user education'. They will create and share multi-media creations, as well as consume them, and they will engage in leisure activities at work or study, and vice versa.

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[12] (cf CIBER, OCLC 2006, Screenager OCLC 2008)

If this pattern of demand is becoming increasingly clear and certain, it is however worth noting that even in 2030, there will still be considerable numbers of pre-'Google Generation' users (or Digital Immigrants as Prensky (2001) has termed them). They may be just as technologically literate as those of Generation Y and Z (recent figures, for example, show that the majority of Twitter's 10 million or so users are aged 35 or over (Leggatt 2009)) but may still maintain a preference for print format. Users of the same generation will not adopt homogenous behaviours – some young people in the future will still want to access print, just as some older people are currently avid users of digital resources. The 'traditional reader', though depleted in numbers, will not be an extinct species. As one respondent to the Scotinform report noted, national libraries will have to provide services for distinctive audience segments with different information-seeking behaviour and needs: "We need to provide for users variously and add expertise in whatever setting they choose" (Scotinform:83). The key, therefore, for national libraries will be to anticipate the interests, demands and expectations of and within the various age ranges of its future visitors.

2.2.3 Other User Groups

In addition to these *individual* user profiles however, it may also be useful to consider other customer *organisations* that national libraries will need to cater for. Not all users will be individuals – national libraries will need to cater for the needs of organisations such as schools, colleges, businesses, libraries and professional associations. Many of these organisations will provide increasingly important channels for making NLS collections and services accessible to far more people than will ever be able to visit the Library.

For example, a key role for national cultural bodies will be to make digital resources available to e-learning specialists, for use in school projects and in support of national curricula. NLS, like other national cultural institutions in Scotland, has already begun contributing digital resources and interpretative material to Glow, an online resource for Scottish schools provided by Learning & Teaching Scotland.[13]

Emerging work at NLS with academic institutions includes the provision of repository services, particularly to small and medium sized bodies, to hold, preserve and enable access to valuable electronic resources such as research outputs. Moreover, as academic libraries continue to dispose of surplus print stocks, national libraries will have a key role in helping to maintain and manage a 'research reserve' of printed materials which will ensure the preservation of publications. UK initiatives in this respect include the UK Research Reserve (UKRR) at a UK level and the Collaborative Academic Store for Scotland (CASS) pilot.[14]

In the current context, the key point is that many users of NLS are not and will not be individuals, but what might be termed 'corporate customers' or common interest groups with different, developing needs. National libraries must

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[13] http://www.ltscotland.org.uk/glowscotland
[14] See especially UKRR at http://www.rluk.ac.uk/node/552 and the CASS pilot project http://cass.nls.uk

maintain awareness of these developing needs and respond effectively to them, in common with meeting the needs of the individual user.

2.3   Competition

As long ago as 2000, it was noted that we are "moving from an economy built on scarce bandwidth to one built on scarce attention" (Information, Communications and Media (ICM) Panel 2000: 3). As online material continues to expand, scarce attention becomes ever more difficult to achieve and sustain. National libraries in 'small smart countries' will be (and already are) only one player in a crowded market place. Competition will come in particular from other information providers in the commercial sector, and from the larger national libraries and major research libraries which have global reach.

National libraries in small countries will not have the resources (human, financial and otherwise) to compete with either the major research libraries of the world or, more significantly, commercial and globalised information services which provide profit-driven and customer-focussed services around the world (the equivalent of today's Google). Many competitors - both commercial and not-for-profit ones - will have far bigger budgets and professional marketing capabilities and are perceived by users as easy to access and use.

As noted above, we can anticipate that most printed material will be available digitally, either born-digital or through digitisation. But it is essential to note that it will not be only national libraries that will be conducting digitisation of printed materials. Commercial companies (the main player at present being Google) will be the main drivers for this. If Google Scholar has everything at the click of a mouse, will customers of the future need to or want to use a national library for online research? Research today, for example, shows that over 70 percent of researchers go to Google routinely for scholarly content (Brown and Swan 2009: 11). A candid comment made by one respondent in the Scotinform study encapsulated this challenge: "I sit in one of the largest national libraries in the world and if I want to know something, I Google it." (Scotinform: 69).

However, as well as providing a threat of alternative suppliers, competition will generate opportunities for collaboration. Publishers will want to negotiate access to the unique collections held in national libraries where there is a demand. NLS has a wealth of unique material in its collections. Most obviously, there are the manuscript collections which effectively by definition are unique. However, our holdings include also significant unique (or very rare) books, maps, music and, since the merger of the Scottish Screen Archive into NLS in 2007, film. NLS is also currently investigating the possibility of establishing a national sound archive for Scotland. Much of this unique material is not well documented at present and has considerable commercial potential. As business models develop to exploit the 'long tail', national libraries can expect publishers to seek agreements to provide access to this material.

The JISC/SCONUL study on the future of Library Management Systems argues that "libraries should identify their unique selling points and let others do the rest: (a) recognising essential points of integration with corporate

systems, questioning duplicated functions; and (b) embracing the network, recognising that some things are better done by others 'out there'" (Adamson et al. 2008: 27). National libraries are generally fortunate to have an inherent unique selling point: their collections, frequently including many unique or very rare items and often representing the most broad, deep and complete cultural record of that country.

Moreover, library material with commercial potential (such as in-demand images and genealogy resources) is likely to be increasingly of interest to businesses, which wish to develop services exploiting material in response to market demands. Libraries may find it difficult to compete with such services and may themselves develop new business models, such as licensing the original materials to be used for commercial, educational or personal purposes.

National libraries are therefore well placed to maintain relevance, with legal deposit privileges as well as historic collections forming a strong platform for future relevance. Undoubtedly, however, they will face competition for attention and relevance and must form new ways to realise their potential, often in alliance with emerging partners with a clear focus on the customer and the increasing choices available to the latter. Part of the complexity for NLS is the need to cultivate productive relationships with other organisations (both public and private) which may be potential competitors and, at the same time, potential collaborative partners,

2.4   Political influences

We can anticipate that in twenty years time, governments will still be the core funders of national libraries, given that they are examples of what economists call a 'public good'.[15]   However, if governments are to continue to pay for national libraries, what will they want of them?

In general, governments might want national libraries to:

- meet topical political priorities (e.g. to promote the prestige of national culture and heritage; to attract tourists; to support education/skills, economic priorities;)
- minimise costs (e.g. by raising more money from non-government sources, through public sector reform).

2.4.1   Meet topical political priorities

National libraries receiving government funds will be expected to meet topical political priorities; in Scotland in 2009, the focus is increasingly on mitigating the impact of the global economic recession.   More broadly, the current administration of the Scottish Government has introduced an integrated national performance framework with 15 broadly-defined 'National Outcomes' which all public bodies, including NLS, are expected to align their activities with and contribute to.   A number of commentators in the ScotInform study suggested that national libraries will need to be more active in embracing topical political concerns.

One of these Outcomes is the promotion of national cultural identity, and this is an outcome which is close to the mission of the National Library of Scotland. In an increasingly homogenised and globalised world culture, the preservation of cultural and linguistic traditions in small countries is likely to be highly-valued and national libraries will have an important role to play in this area. This may be especially important where the country has a unique language, such as Iceland, the Nordic countries or the Baltic countries, as national libraries are probably the best placed of institutions to entrust the preservation of that linguistic heritage.   For example, the National Library of Norway, which aims to digitise its entire collection of Norwegian material, was granted approximately £1 million additional funds for digitisation from the Norwegian Ministry of Culture and Church Affairs in 2009 (Tackle 2009: 4).   Even in a principally English-speaking country like Scotland, NLS will have an important role in maintaining and guaranteeing access to important and unique collections in Gaelic and Scots languages, not to mention the many varieties of local dialect and cultural expression.

Other relevant current priorities for the Scottish Government which seem likely to endure include the promotion of tourism, either directly by attracting cultural tourists or more indirectly by promoting a positive image and reputation for Scotland internationally.   Governments may indeed expect national libraries to

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[15] For current definitions of public goods see any mainstream microeconomics textbook, eg.: Hal R. Varian, *Microeconomic Analysis* ISBN 0-393-95735-7; Mas-Colell, Whinston & Green, *Microeconomic Theory* ISBN 0-19-507340-1; or Gravelle & Rees, *Microeconomics* ISBN 0-582-40487-8.

develop further their role as active cultural ambassadors and contributors to collaborative national promotions. (In Scotland, for example, 2009 was designated as the *Year of Homecoming.[16]*)

Another key policy area which will retain relevance is support for education, particularly tertiary education, skills and research. The economies of 'small smart countries' tend to rely more on the 'knowledge economy' than on primary resources or industries. Maintaining the national skills base and capacity for innovation will be central to their economic well-being. NLS expects to develop more detailed plans and evaluation frameworks on how it contributes to these areas so that we both understand, and can also demonstrate, the tangible contribution we make in this field.

Apart from the contribution made by national libraries to substantive fields such as tourism, education and skills, national libraries have an opportunity to provide leadership in specific areas of innovation. These may include digital preservation, provision of joined-up access to cultural heritage and establishing and sharing best practice and expertise in metadata standards. Specialised fields such as these may have a small pool of expertise, and that expertise may be cultivated especially within national institutions. Governments will wish such knowledge to be shared and should value them taking a leadership role to disseminate specialist knowledge for the benefit of the country as a whole.

2.4.2 Minimise costs

We can safely assume that governments will never have a shortage of alternatives when it comes to spending public money (or reducing taxation) and that government funders will wish to keep down their financial contributions to national libraries. This wish may manifest itself in encouragement for libraries to raise income and grants from non-government sources. It is also likely to add value to the role of national libraries in saving money in other fields, for example by keeping 'last copy' publications which enable academic libraries in universities to save money through disposal of stock.

A further way of reducing government costs which has been a continuing theme of government policy in Scotland (and the UK more generally) over recent decades, is public sector reform. The desire to make the public sector more efficient and effective has straddled Conservative and Labour administrations in central government (Westminster) and Labour and Scottish National Party (SNP) administrations in devolved government (Holyrood). It has been expressed through measures to reduce the size of the public sector directly by outsourcing to the private sector, and through softer means such as 'Best Value'[17] and the encouragement of public bodies to collaborate and share common services. There is little reason to suggest that this pressure will diminish, especially in Scotland which has a larger than (UK) average public sector, with a number of current commentators claiming that this is

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[16] http://www.homecomingscotland.com/default.html
http://www.communities.gov.uk/localgovernment/performanceframeworkpartnerships/bestvalue/bestvalue

unsustainable and a drag on Scottish economic performance.[18] The consequence is likely to be continued pressure to reduce the number of public bodies, their staff and costs.

We have noted above how the national record of cultural resources (film, music, literature, research) is increasingly digital. This convergence on the use of digital formats increases the likelihood that governments will want to bring about also convergence of the *management* of these resources. There may be increased pressure for those bodies mandated to maintain the national electronic memory to merge, or at least to collaborate more profoundly, especially in smaller countries where a profusion of public bodies doing similar work may be especially unwelcome. In Scotland, this may include bodies like the National Archives of Scotland and the Royal Commission on the Ancient and Historic Monuments of Scotland (RCAHMS) as well as NLS.

2.4.3 Constitutional change

In Scotland, there is a further political element which needs to be considered briefly - the development of constitutional arrangements. Political devolution was re-introduced to Scotland in 1997, with the establishment of the Holyrood parliament in Edinburgh. This gives Scotland control over a wide range of domestic affairs including health, education, transport and culture. Certain powers however, remain reserved for the UK government at Westminster; these include international relations, defence and social security, as well as legislation directly relevant to NLS such as laws governing copyright. In 2007, the SNP, which seeks Scottish independence from the UK, formed a minority government. It is certainly possible that there could be further constitutional change (including independence) by 2030.

It is neither productive nor wise to speculate on the prospects of such constitutional changes; however, NLS needs to maintain an active and informed awareness of the potential for such changes and their implications for the Library. In general terms, clearly the status of the National Library of Scotland would be affected by a change in the constitutional status of Scotland itself. A number of Scotinform respondents, however, noted that devolution generally increases the status and profile of national institutions, national libraries included (Scotinform: 65). More specifically, further devolution of powers to Scotland could lead to new and distinctive Scottish laws on subjects important to NLS such as Legal Deposit and Intellectual Property, although UK, European and other international legal frameworks will retain relevance.

The conclusion then to this brief consideration of constitutional reform and its impact on NLS, must be that while increased devolution of power to Scotland, up to and including full independence, will influence NLS and government expectations of it, relationships with other institutions on the global, European and UK stage, not least the British Library, would remain of vital importance.

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[18] E.g. Machmahon, P. 2006. 'Scotland plc falters amid yawning split in economy', *Scotsman*.
http://thescotsman.scotsman.com/scotland/Scotland-plc-falters-amid-yawning.2753523.jp

2.5   Organisational Change

As Battin (1984) wrote: "One of the most powerful deterrents to change in conservative institutions is the existence of strong autonomous vested interests and the fear of losing one's empire". National libraries in general have traditionally tended to be risk- averse organisations which may value their stewardship role over the needs of the customer.

The challenges which face libraries today, and will persist towards 2030, constitute a major change management agenda, in which many traditional ways of perceiving and working must be reviewed. A number of Scotinform respondents note that while national libraries have many opportunities and strengths, they also face severe risks - including the risk of obsolescence (Scotinform: 67). This change agenda, which is described in more detail in the following section, has implications for both human resources planning, and more widely for leadership.

2.5.1 Workforce skills

Given the challenges ahead, what then will be the required workforce of national libraries and NLS in particular in 2030? A conference on 21st Century Curators in 2004 hosted by New York Public Library in association with the British Library, suggested that curators will require to be more and more aware of the needs and demands of users. They will require partnering and contract skills and be prepared to work collaboratively in different types of partnership (such as with marketing and IT specialists) to promote access as much as traditionally care for the collections as individuals (Bury 2004).

Many libraries have an ageing professional workforce. The British Library 21st Century Project, for example, was set up in recognition of the fact that there would be a loss of up to a third of its curators in the following five years (Bury 2004). Forty percent of Library of Congress staff are eligible for retirement in 2010 (Miller 2006) and NLS itself has 54 percent of its staff aged 45 years or older. [19] Bob McKee, the Chief Executive of the Chartered Institute of Information Professionals (CILIP) in the UK referred to this problem in 2005 as 'a greying of the profession' (House of Commons Culture Media and Sport Committee 2004:39).

Some commentators have suggested that an aging workforce is a problem for libraries developing in the digital environment. In 2006, it was reported that 200 employees of the Library of Congress who "had become 'very comfortable' with traditional librarianship chose not to gain new technological skills and took advantage of a voluntary retirement incentive" (Miller, 2006). Steele and Guha (2000) stated that "Recruiting 'new blood' younger staff with different skills and attitudes will be essential if libraries are to survive not simply as physical entities but as facilitators of the changes as the end user becomes the judge and jury of access to information."

However, equipping NLS with the human resources fit for 2030 will not simply be a matter of replacing older workers through recruitment of new staff. Staff

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[19] Figures from NLS' HR department, May 2009

training and continuous development of skills will play a crucial part for staff (of all ages). New skills will always need to be developed, in order to respond to, capitalise on and lead innovation - in publishing, or in user behaviour for example. New incentives and rewards need to be introduced to recognise and stimulate innovation. Decision-making processes and behaviours - from governance structures to leadership styles - need to evolve which encourage change to be identified and implemented where it is needed to adapt to change and to conform to corporate goals.

There are changes likely also for the way we organise ourselves. At present, NLS functions much as it has done over recent decades, with a traditional departmental structure based on assumptions that any skills or services will be provided 'in-house'. But in the future, the Library may need to be much smarter in procuring and managing inputs from external suppliers and partners, demanding different skills in project and contract management. To give examples, crucial emerging activities such as digitisation of collections, digital preservation or legal deposit of digital materials will all require skills in designing and monitoring joint projects and relationship management. The organisation of collections, catalogues and services on a traditional 'format' basis will increasingly look anachronistic as users expect to see emphasis on the links between content, rather than the difference in their format.

2.5.2 Leadership and agility

In the rapidly changing information society moving towards 2030, the ability of national libraries to be agile organisations, responsive to change, will be essential if they are to remain relevant. Maurice Line (Lancaster 1993) recognised this as far back as 1993. Speaking of his predictions for the type of staff needed in libraries in the future [in this case 2015], he stated that:

"Above all, there will be a need for *management* and entrepreneurial attitudes and abilities. Much of traditional librarianship will have become irrelevant; librarianship will have been largely de-professionalised. Persons appointed to senior posts in libraries may or may not have been through some library training, but they will certainly have received some management training..."

In common with other national libraries, NLS has already moved in this direction. In 2004, in line with the adoption of its first corporate strategy *Breaking through the Walls,* an important step in the modernisation of NLS, setting out its fundamental role, mission and vision, it appointed a new senior management team and formed a new Development Department (subsequently realigned in 2008 to become Department of Development and External Affairs). Of the senior management team of NLS today, three of the five members are not LIS professionals, rather bringing senior management experience of corporate and customer services, marketing and fundraising.

Just as significant, however, is the question of who will be the library leaders of the future? As Frye observed "... as we plan for the future we must make provision for the recruitment and development of potential leaders – persons who are capable of seeing the big picture and understanding institutional relationships: persons who welcome change and have the vision, imagination

and courage to take carefully considered risks..." (Griffiths, Cravens 2009:201). However, as Dowlin (Lancaster 1993:37) prophesised: "The library schools are providing the skills necessary for "the general contractor or skilled craftspersons", but no one is specialising in training the architects (designers) of the library of the twenty-first century". In the UK, there is concern across the library profession about this lack of leadership potential and lack of succession planning. A 2001 study of UK public library workforces revealed that both practitioners and those teaching in library schools were concerned about a lack of leaders in the public library sector with no identified strategies for bringing about a new generation of leaders, not just leadership at the top but throughout the organisation. Similarly, in library services of UK higher education institutions, there is evidence that there are recruitment problems at senior level posts and no proactive strategies for remedying them (Abbott 2002).

What is clear is that libraries need strategies to equip them for change - to enable them to have the 'agility' which is a feature of the observations from the ScotInform interviews. This requires libraries to be more effective and proactive in monitoring strategic changes outside the library world, and to lead change within the organisation. This goes beyond the recruitment of effective managers to senior positions, important though that will be; generating positive organisational cultures which embrace change and innovation, in support of clear strategic goals will be essential.

To conclude, we can anticipate therefore that while many technical solutions to today's problems will have been found by 2030, political, legal and organisational choices, challenges and constraints will persist. The key to successful stewardship of NLS lies in ensuring that we are well-informed about such influences, have effective communications with the critical external stakeholders and have the skills and capacity to manage them positively and proactively.

Section 3: The Implications for NLS

Faced with these drivers for change, what are the broad change challenges which confront NLS and other national libraries? These can be seen conceptually as a number of transformations, moving from a current or past position, to a future one. It is important to recognise that, as in any dynamic environment, we are not starting from a baseline of 'today'. As we have seen above, many of these transitions are already evident and may indeed have been underway for some time. In addition, many of these changes are not as cut and dried as they are presented here; but presenting these shifts in this way should be helpful in clarifying the dimensions of change.

In order to group these transformations in a conceptually coherent way, we have borrowed the four 'core themes' of the NLS Strategy:

- Collections,
- Organisational development,
- Building relationships and
- Widening access to knowledge.

3.1   Collections

- **Comprehensive collecting ⇨ selective collecting**

As more and more current material is published digitally, the historic role of a national library in ensuring that the 'last copy' is preserved, will diminish. As Tanner's paper notes, digital preservation is likely to rely on a proliferation of copies (Tanner: 53-54). NLS will maintain important 'last copies' from existing collections, and especially for unique items; however, for current publishing output (especially for non-Scottish digital material), the role of NLS will become more one of providing access to material (possibly through third parties or in UK electronic Legal Deposit) than one of ensuring the preservation of a last copy. This is especially the case in the UK where NLS is one of four Legal Deposit libraries, in addition to the British Library. It will represent a further move away from the notion of a 'library of last resort' towards a public library, providing direct access to resources.

We have seen how digital publishing, in its broadest sense, has enabled anyone to become an author. It seems unlikely that national libraries will seek to collect digital output comprehensively, as they often formerly sought to do with print. Sampling, selections and other non-comprehensive approaches will become more common, bringing greater decision-making responsibilities to bear on libraries. This may be unfamiliar and uncomfortable territory for many staff, and may need to be informed by greater engagement with external authorities.

- **Preserve the Library's collections ⇨ preserve the country's collections**

As participants in the Scotinform survey suggested, the focus of national libraries is increasingly not solely on what they themselves hold, but on the resources of the country as a whole, providing national libraries the opportunity to become the coordinators of national heritage. The role of NLS goes beyond the items we own, to a wider responsibility for stewardship of Scotland's collections, which are distributed amongst other organisations throughout the country. A unique archival record housed in a provincial town is as much part of 'the national collection' as a unique archival record kept in NLS.   Again, this is particularly the case in smaller countries, where identifying, describing and making available 'the national collections' may be a realistic (but still challenging) aim. This requires national libraries to look outward, to the distributed collection of the country, rather than inward to their own holdings.   This implies much stronger partnerships and service developments with local collections, potentially including material held not only by local councils and universities but also by professional societies, amateur bodies and private collectors.

- **Keeping books ⇨ connecting to many things**

Associated with the assumption of a wider responsibility for national collections beyond the library buildings is an increase in synergy with other national 'memory institutions'. As Tanner's paper suggests, the convergence of material into digital format is likely to lead to ever closer integration of materials, blurring distinctions between libraries and archives, museums and galleries. Already NLS, like many national libraries, has rich collections of maps, archives, film and sound, and not inconsiderable collections of artworks. Much of this material will be available digitally, and it will make increasing sense for libraries and other organisations to join together in order to maintain and interpret these separate collections.

Knowledge and understanding will be enhanced by the joining together of different kinds of cultural heritage, so that a student of science, for example, will be able not only to read the books of an early scientist, but to see their letters and manuscripts, their scientific instruments and collections and possibly photographs and films of their lectures and the reactions of contemporaries. Original collection items will still need the specialist attention of conservators and curators, so that the scientific instruments - or industrial machinery, zoological specimens or installation artworks - are preserved. However, researchers will demand more remote, seamless, multi-format access to digital representations for their study. This demand is likely to lead to a need to establish a national digitisation centre (already on the agenda through the EU's 2010 initiative). The leadership for such a project would seem most naturally to lie with institutions such as NLS, or the National Archives of Scotland (NAS).

As national libraries increasingly provide electronic resources acquired under a range of licences, subscriptions and purchase, the role shifts from one of collecting items to one of connecting users. Bearing in mind the competitive environment, the libraries of 'small, smart countries' will need an awareness of alternative business models which also do this, and may do this on more attractive terms for the user. Larger national libraries (most obviously the

British Library in the UK), for example, may negotiate good deals to provide access to such resources; in which case it may be reasonable to question what benefit there would be for Scottish users for NLS to subscribe to such resources too.

3.2   Organisational development

- **Control ⇨ responsiveness**

Libraries have traditionally been highly controlled environments, with a number of systems devised by professionals to maintain order in how the library and its contents are used. These controls have often been introduced for the best of motives - to provide a quiet environment suitable for most customers, to respect intellectual property laws, to ensure that acceptable use policies are adhered to and (especially relevant to national libraries) to ensure the preservation of collections. As we have noted earlier, however, new generations of customers will want to do things in their own way and in their own time. Library systems and procedures which are not intuitive will be less and less attractive, and customers will be able and want to go elsewhere to meet information needs, at least superficially. New generations of users will increasingly be unwilling to tolerate catalogue searches or other mechanisms which require 'user education'. Instead, libraries must develop user-friendly search and access services; but they may also need to ensure that unique specialist knowledge - most obviously possessed by curators and other specialist staff, but perhaps also from other users, and experts such as academic specialists - is easily made available to library customers, principally through online means.

- **Integrated Library Management Systems ⇨ versatile, inter-operable systems**

A number of studies have already been done on the development and future direction of the market for Integrated Library Systems (ILS) [20]. These have noted the trend towards consolidation of suppliers through merger and a declining market – "The concept of a forever expanding one stop integrated system is anathema set against the trajectory of corporate systems and global services." (Adamson, V. et al 2008:16). The shift from a monolithic ILS to an integrated system that improves interoperability and becomes a collection of products from different ILS vendors is already being discussed and we can be confident that long before 2030, NLS will have moved away from our ILS (Ex Libris/Voyager). The decisions about how and when to make these changes may come soon, but such decisions are of both strategic and practical importance. Might we go further and suggest that catalogue records will be held in some global virtual world, so that no single institution has to maintain them?

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[20] See for example
http://www.jisc.ac.uk/media/documents/programmes/resourcediscovery/lms_section_3_horizon_scan.doc

- **Current human resources ⇨ future human resources**

The types of transformation discussed here will be reflected in changing needs for staffing. While increased digital literacy of all kinds of staff will be clearly be required, we can anticipate greater needs for staff who can design and innovate services which enable resources to be discovered and used intuitively and creatively. On the other hand, we can expect a reducing requirement for traditional cataloguers, for reading room staff, administrative personnel and people processing physical intake. The ability to understand and engage with external bodies will be increasingly important, as will change management and leadership in a flexible and fluid environment. Systems which reward and encourage innovation by staff within an agreed strategic context will be needed. Organisational structures may change, with more outsourcing, shared services or even mergers with other knowledge organisations where there is affinity and synergy. Human resources systems, policies and resources will require the ability to change and adapt. At the same time, the value of specialist knowledge, associated with specialist collections should be enduring. The National Library may be expected to be the natural home within Scotland for certain key skills in areas such as curatorship and conservation of historic collections, at the disposal not only of NLS, but of the country as a whole.

- **Reliance on Government funding ⇨ diversification of income streams**

As noted above (2.4.2), future governments are likely to want to want to restrain public spending on national libraries, although we envisage them retaining a 'core funding' role. At the same time, libraries face daunting costs in rising to the challenges of the digital revolution (see Tanner, Section 3). How might libraries respond to the tension between these parameters?

Part of the answer for NLS must lie in positioning itself as close as possible to the heart of government policy. The leadership of digital information management, development of national frameworks and standards and so on can help equip Scotland with the skills and infrastructure necessary for economic, social and intellectual success through the century. NLS must show its relevance to research and education and creative industries in order to be valued by government and for this value to reflected in both revenue and capital investment. However, NLS will also need to diversify its funding base.

There are three key strands which we can identify here. Firstly, NLS may need to build long term relationships to attract philanthropic funding and to endow NLS with income from private individuals and charitable trusts. Secondly, NLS may need to develop more income from charged-for activities, based especially on digital services and electronic payment (discussed in greater detail at the end of this section). Finally, NLS may have considerable scope for greater diversification of public funding sources at Scottish, UK and European levels especially to support project work, for example for digitisation.

- **Today's estate ⇨ tomorrow's estate**

Many of the changes we anticipate here will have profound implications for the buildings needed by NLS. It is premature to detail what those implications may be, but some trends appear to be reasonably clear. Intake of physical items received by NLS peaked in 1990-91 when some 365,000 new items were recorded (excluding manuscripts). In 2008-09, the intake was 265,000 items and a modest further decline seems likely as collecting policy becomes more focussed. The annual requirement for new shelf space may reduce from former levels of 3000 metres, and could be considerably reduced still further if digital intake replaces print more routinely. Mass disposal of collections seems unlikely (having built them up through Legal Deposit over centuries), but low-demand and digitised material which does not need to be retrieved may be best kept in low-cost 'dark storage', probably on cheap land away from city centres. Space for the public will still be required, but their nature is likely to change, and will depend also on the extent of collaboration with other libraries, museums, archives and galleries, for example on exhibitions. The nature of the space for staff may also change considerably; for example, the expected emphasis on management of electronic information could permit far more use of tele-working. Modelling future needs for storage, public and staff space will be a key input to plans for capital investment in infrastructure.

3.3   Building relationships

- **Operating independently ⇨ operating collaboratively**

It has frequently been observed that digital transformation involves the 'blurring' of roles and functions in organisations[21]. The need for national libraries to collaborate has undoubtedly intensified, not only because collaborative activity may be valued by funders and other key stakeholders, but because collaboration is essential for the delivery of core services. Like many other libraries, NLS has developed a number of digitisation contracts with commercial publishers (such as Thomson Gale through its Eighteenth Century Collections Online project) to digitise and make available unique or rare content. So collaboration is not only with other similar organisations, collaboration is increasingly with other different organisations – organisations which can help NLS meet its strategic goals, even if they operate from quite different motivations. A number of examples have already been given of the increasing convergence between national libraries and other national archives, museums and other memory institutions. This collaborative environment will continue, meaning that the boundaries defining what the Library does, and what it is, are more complex and less certain. Crucially, the role of NLS will become as dependent on what others do, as on what NLS itself wishes to do.

The relationship between the national library and the local public library network is another dimension of this changing environment. For much of its history, NLS has stood somewhat apart (some might say aloof) from the network of public libraries run by Scottish councils. The connectivity inherent in digital services will provide new opportunities for sharing content procured by Legal Deposit libraries with local communities, both directly and through the public library network. Consumers of such content will be at the same time,

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[21] for example Graham Hill in Boys and Ford eds The e-revolution and Post compulsory Education.

customers of both the public library and the national library. All this will require NLS to develop new ways of managing contracts, licenses and customer relations.

Another important set of relationships for NLS is that with the other Legal Deposit libraries in the UK and Ireland. The British Library has a right to receive all publications produced in these countries; additionally NLS, the National Library of Wales, Oxford and Cambridge Universities and Trinity College Dublin have a right to claim such publications. The extension of Legal Deposit to electronic materials (an entitlement spelt out in the 2003 Legal Deposit Libraries Act) demands a more collaborative approach than was needed for print, because a single digital item will be acquired, rather than up to six copies. Cataloguing activity has long been divided between the libraries (through the Legal Deposit Libraries Shared Cataloguing Programme) [22] and there is currently interest in co-ordinating print collecting policies more closely, to reduce duplication of material of low consumer demand. It appears that incentives to deepen collaboration between Legal Deposit libraries will grow.

- **Passive recipients ⇨ co-creators**

Traditionally, libraries with legal deposit powers have often acted essentially as passive recipients of published output. They aspired to collect all of 'the published record' which in print terms, was more or less manageable, if at times demanding. However, digital publishing fundamentally changes both this role, and the mindset that goes with it. Not only must libraries increasingly be active and discriminating in their collecting policies, selecting only those digital items they wish to preserve, but they also become involved in publishing, or quasi-publishing roles themselves. This may occur when a library digitises a collection of rare books, films or manuscripts, or provides a digital space for users to contribute ideas or metadata, thereby forming new knowledge and (digital) objects with a creative element. Libraries are no longer passive recipients of material published in the outside world, but are increasingly becoming engaged in the creative process themselves.

- **National collections ⇨ international collections**

As information is increasingly digital and globalised, there is increasing need and potential to join together national collections which previously stood alone. High profile examples today include the Codex Sinaiiticus.[23] In Scotland, a researcher investigating Scottish music, for example, will increasingly expect to find and use some of the rich Scottish heritage held in Canada or Australia. Current initiatives to join content together intelligibly include, as forementioned, the European Union's promotion of Europeana, the European Digital Library and through the eContentplus programmes.[24] In April 2009, the World Digital Library was launched. [25] It may take some time for the relationship between such initiatives to mature and develop, but we can

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[22] http://www.bl.uk/bibliographic/clscp.html

[23] Codex Sinaiticus: http://www.codexsinaiticus.org/en/

[24] http://ec.europa.eu/information_society/activities/econtentplus/index_en.htm

[25] http://www.wdl.org

anticipate that national library collections will more and more form part of a global heritage that has continental, national, regional and local dimensions.

3.4   Widening access to knowledge

- **Expert users ⇨ generic users/everyone**

This change, largely underway, represents the customer base of national libraries moving from a small, narrow band of researchers to a broad and very varied user base, reflecting increased democratic expectations. The customer base of national libraries is expanding and becoming wider and more diffuse as a result of the expansion of digital services.

At the same time as this expansion and diversification takes place, we know less about who our users are, what they do and what services they want. This is a consequence of the shift where remote use, rather than the visit of the familiar reader, becomes the norm.   This will require national libraries to become more responsive to more differentiated user demands, instead of dealing with largely predictable client wishes and suggests a greater need for new market research techniques. Automated business intelligence may also be needed in order to understand and meet developing trends of customer demand, which increasingly will be evident through patterns of searching, downloading and uploading.

A further question on future library roles emerges from the ScotInform interviews, where two apparently different roles for libraries are outlined. Some see a need for national libraries to become more vigorous in attracting people to exhibitions and other attractions. Others see libraries as potentially much less engaged with users personally, as investment in digital services meets needs remotely.   In this case, libraries may not wish to invest in expensive exhibitions and public events, preferring to make historic treasures available to the public through museums, where this is a core activity.

- **Providing customer service ⇨ self service**

Customers will demand more personalisation; they will collect resources from a variety of different sources including libraries and non-library information providers, specifying their particular interests and especially valuing new primary material when it becomes available. There is evidence that these information users, especially those who have grown up with the internet, increasingly want to find out things themselves (cf 'Screenagers' study op cit). This implies a preference for 'self-service', where users can find information they want without having to ask someone. Users will have alternatives and if they can get the information they want independently (currently from services like Google or Wikipedia), then they will do so. For libraries, this has benefits of reduced costs, as there is less need for expensive human intervention in the customer-library transaction. However, for it to be successful, there must be much-increased investment in the organisation of the information itself, as Tanner notes.

- **Traditional cataloguing ⇨ new forms of descriptive metadata**

A fundamental challenge for libraries has always been how to describe and organise collections so that their holdings can be discovered and used. The principal means for achieving this has been in the creation of catalogue records, and a significant part of NLS' present staffing resource is devoted to cataloguing. However, as Tanner's paper indicates, the focus of traditional cataloguing practice is on the 'container' of information, rather than on the content, and still less on the context' (Tanner: p50). Old-style research libraries were highly competent at supplying specific items, when the user was able to identity the title, author or year of publication. While this will still be necessary, users increasingly demand the ability to browse, to skim and quickly assess potential sources of information and to pick something from many sources.

With digitised, full-text searching of publications becoming the norm, users are increasingly able to 'look inside the book' – without necessarily knowing (or particularly caring) what the title, or the author of the book is. We can anticipate much greater automation and linkage of content, so that, for example, a researcher who identifies a reference of interest in an article, will be able electronically and immediately to access all other works by that author. The ideas that the author works in may be indexed intuitively, pointing to the works of other authors on the same theme and explaining and showing place names and biographical details. All of this may be achieved through smart automatic indexing and the intuitive, 'semantic' web, rather than the decisions of a human cataloguer.

At the same time, we are aware how Web 2.0 has also begun to allow users to generate metadata online easily, quickly and in high volumes, notably through sites such as YouTube and Flickr. This means that the description of resources will no longer be controlled by librarians according to clearly-defined rules such as AACR2 and Marc 21 but through an uncontrolled array of keywords describing the content itself, rather than the container. The role of libraries is likely to lie in ensuring that there are basic descriptions of resources and in ensuring that user- generated content is managed effectively in appropriate contexts.

- **Investment in reading rooms ⇨ investment in a range of channels**

For many researchers, reading rooms have already lost their place as the main delivery channel for access to a library's collections and knowledge. Apart from online channels, NLS, and similar libraries, supply large volumes of valuable content to wider, remote audiences through other media such as television, print and digital press. A clear message from the ScotInform interviews is the vital role that national libraries will have in leading and co-ordinating national digitisation efforts which need to be funded.

The increasing diversity of channels must call into question whether libraries can maintain the present levels of spending on reading room services, and at the same time make the necessary investment in developing remote access, digital collections and preservation. In the UK, major institutions are

considering a degree of reading room closure (the UK's National Archives[26] has already reduced reading room opening by a day a week). It is far too early to suggest that these decisions represent an emerging trend, but as investment in digital services and infrastructure becomes more central to achieving the organisation's missions, capital and revenue plans will need to change to reflect these changing strategic needs.

Nonetheless, there will be an enduring need to consult original items in reading rooms, perhaps rooms more diverse in nature than those traditionally provided by NLS, to permit discussion, dialogue and collaborative learning as well as silent study, a trend that we can see emerging already in British academic libraries.

- **Free ⇨ fee?**

NLS has a strong tradition of providing services free at the point of use; NLS charges are restricted to covering costs over reprographic services, or charging limited modest fees for permissions and for specialist business services. However, the sustainability of free services may come under scrutiny for a number of reasons.

The development of online publishing allows for 'micro-charging', with income generated from many users paying a (small) fee for access to information or services, collected efficiently through automated processes. Legal Deposit libraries will need to collect such publications, or at least provide access to them within the licensing framework adopted by the publisher – which may include a payment that the library is obliged to charge.

In addition, digital delivery channels will increasingly enable libraries to charge for access to their content, such as special collections of unique material, if they choose to do so. This emphatically does not mean that national libraries would swing from universal free access to universal charging; but that libraries could differentiate services more finely, offering basic access free, while applying a charge to 'premium' services. Services such as 'Scotland's People' pioneered by the National Archives of Scotland and partners, have shown that there is demand for 'pay per access' services with regard to genealogy.

As we have seen, governments are likely to encourage public bodies to raise more income themselves, and reduce dependency on government grants and this may encourage libraries to become more entrepreneurial in identifying different markets for information, and distinguishing between those that should be free, and those that may reasonably be charged a fee.

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[26] http://www.nationalarchives.gov.uk/news/stories/325.htm?WT.hp=nf-37377;

Section 4: Conclusions - Thriving or Surviving?

In the course of this paper, we have moved from seeking to identify the key drivers for change in national libraries to assessing the broad implications in terms of transformation. Finally, we briefly aim to draw some overall conclusions. There are three fundamental themes which we see emerging from these considerations.

The transition to digital

It seems beyond doubt that the greatest single challenge for national libraries like NLS will be managing the transformation to a digital environment successfully. The JISC/SCONUL study on the future of Library Management Systems noted above suggests that "whilst issues of demographics, learner diversity, fee structures and even carbon reduction will ripple through university planning, none are as immediate in terms of impact on library services as the march towards ubiquitous broadband access underpinned by a wide range of mobile devices" (Adamson, V. et al. 2008:26). The transition to digital calls into question many conventions about acquiring, owning, preserving and using knowledge. It challenges our assumptions about the nature of collections, access, our customers and how we measure success. It is essential to envisage the transformation not principally as a technical challenge but an organisational and managerial one. This leads us to the second key theme.

The need for outward focus

Changes from physical to digital and from stewardship to access imply a broader change in mindset, a move from a tangible environment, where the users and their needs seem clear, to a world of blurred boundaries, of changing goalposts and uncertainty. National libraries will need to cater for ever-increasing diversity – diverse users, increasingly remote and unseen, who want to use diverse collections through diverse means and services. As one participant in the Scotinform study suggested: "There is an opportunity to create a new environment where national libraries can provide new services for the public. This requires a change of outlook and a proper consideration of the end-user's needs" (Scotinform: p73). Perhaps one of the most fundamental changes in outlook is turning attention away from what happens to collections and customers within the library buildings to developing a broad and deep awareness of the outside world, and how the Library can best contribute to it.

An agile library

Technological constraints may diminish (as current problems are solved) but managing technology wisely will remain a constant challenge. Significant constraints on NLS will persist in the legal, political and financial arenas. National libraries will not be a priority for scarce public funding, in the future as now, unless they are seen as offering a high return on investment and a direct relevance to current political agendas. Such agendas may include promoting cultural heritage, contributing to education, skills and research, by supporting

business and creative industries such as publishing and revenue earning activities such as cultural tourism. Customers everywhere will have alternatives they can turn to for information. Success will depend on collaboration with a range of external partners. This shift requires different managerial and strategic approaches, above all being comfortable with change and flexibility.

*   *   *

These challenges represent considerable change, and the need for new skills and organisational cultures. They require our libraries to be effective in monitoring the external environment and to respond quickly to them. They will require us to set priorities more explicitly, so that our energy and resources are channelled into the most relevant activities, and we withdraw from areas which are not productive.

Not everything will change. National libraries will always be relied upon to preserve cultural heritage; perhaps even more so, as other research libraries (e.g. academic libraries) in the country dispose of redundant collections which do not meet current needs. National libraries of small states may have a particularly important role in an increasingly globalised world; they will be entrusted to look after the national cultural identity expressed in the specific cultural output and legacy of that country and ensure that it is preserved and made available to the world, especially if it may be overlooked by major global players. The role of national libraries in guaranteeing access to national resources and heritage will endure.

NLS and national libraries in general will probably be able to survive in a rapidly changing world, as they have done through turbulent times in the past. However, we aspire to do more that this. The challenge will be to thrive as an organisation at the centre of Scottish life. To achieve this, we will require a clear vision of where we want to be in the future and how we are going to get there.

Appendix A

Technological Trends and Developments and their Future Influence on Digital National Libraries

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34

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Contents

1   Introduction

This future looking paper will identify some of key technology trends that will create the environment in which digital libraries will have to exist. It also considers a significant trend expressed by digital libraries that will define the future environment; specifically, the move from managing information containers to managing content and now context.

The two other trends that seem to hold the most likelihood for future change are the Open Source and Open Access movements. Open Source offers new opportunities for collaboration and technical sophistication with interesting new total cost of ownership models. The Open Access movement provides a similar revolution to the financing of content to populate the digital library. At the same time, the "digital divide" will affect the development and use of digital libraries on an international basis and so will collaborative preservation models.

Thus this paper expresses the technological environment we might see in the future but contextualises this from the perspective of the information environment and the models of managing the change it encompasses (collaboration). This will address issues such as how content gets joined with user's expectations and how national libraries will need to manage knowledge and context wisely rather than relying upon technology to meet our future needs. It is also promulgated in this paper that memory institutions (libraries, museums, archives and publishing/media) are converging as they migrate to digital to provide access and become less tethered to their buildings and physical collections.

2   Technology Trends

What can possibly be said about the state of digital technologies that will not be woefully and embarrassingly incorrect by 2030? Global disaster notwithstanding, it would not be too great an assumption to suggest that devices and services will become ever more wireless, connected and powerful such that the environment in high connectivity countries will become "intelligent". We can assume that people's technology will not necessarily look like a traditional screen-mouse-keyboard computer anymore as personal devices (such as PDA's or phones) become powerful enough to take over most day to day content access and use functions. Further, the changes to display technologies such that they become physically light, thin and literally flexible, touch oriented and able to utilise e-ink means that display will no longer be a major barrier to users reading large written documents on a screen.

These suppositions are supported by the technology either being already in place or by fairly conservative predictions from future watchers such as Gartner. For instance, Gartner predicts that "by 2012, 50 per cent of travelling workers will leave their notebooks at home in favour of other devices". [1] They further predict that "80 per cent of all commercial software will include

elements of open-source technology… embedded open source strategies will become the minimal level of investment that most large software vendors will find necessary to maintain competitive advantages during the next five years". Gartner also predicts a huge spending growth in Software as Service (SaaS) and virtualisation of both computing and storage. My previous assertion that screen technology will increasingly utilise e-ink like technologies is also a conservative estimate, considering the growth in Electronic Paper Display (EPD) display technologies (with 10 major companies like Sony, Amazon or Motorola utilising it in everything from e-book readers to watches and phones). [2] EPD is a display that possesses a paper-like high contrast appearance, ultra-low power consumption, and a thin, light form. Combine this with the bendable, all colour display technology of E Ink's Imaging Film [3] and the likelihood that future users will read lengthy documents in purely electronically form becomes very realistic. [4]

2.1 Ambient Intelligence

As users move to mobile computing and the environment becomes more wirelessly connected then this throws up interesting possibilities for how this so called "ambient intelligent environment" [5] will impact and affect the future of digital libraries. This assumes that the device will be able to identify: geographic location, user identity and authentication, personalization and preferences; and use these to interact with other devices. If this becomes achieved, as seems likely, then it would be a tragic waste of connectivity if that device was not also able to interrogate local devices and the wider network to find information and resources of interest to its pre-defined (and possibly self-taught) set of owners preferences, desires and needs.

The day may come when a tourist wanders into a cathedral and has the local tour automatically available to them in their own language, plus: images and information on the stained glass too high to view, video of famous ceremonies carried out, the historic plans with a 3D visualization of what the cathedral may have looked like 200 years previously, full text of historic and literary references to the cathedral, a list of people buried, baptized or married there, choral works performed: the list could go on.

The above scenario would be quite an astonishing feat when we consider the state, not of the current technology, but of the strategic and research agendas for digital repositories and archiving. Without massive resource interoperability, context sensitive digital objects, deep metadata and ontologies with concomitant supporting business models then this scenario will remain just a dream for digital library and repository providers. In other words, the ambient intelligence environment will be populated by the lowest common denominator unless there is significant effort put in by the digital library community.

3 Managing Containers, Content and Context

Digital libraries are trying to move from managing *containers* and *content* to managing *context* and it is proving to be a larger and historically more difficult

challenge to overcome. The Semantic Web views a future in which information is given well-defined meaning, better enabling computers and people to work in cooperation. The infrastructure of the Semantic Web would allow machines as well as humans to make deductions and organize information. We have moved from managing *containers*, to *content*, to *context* and at each stage the volumes of data and the complexity of the information domain has grown exponentially. This explosion in information, services and resources, whether appropriate to the user's needs or not, all consume attention. Information has to be selected or discarded, read or not read, but it cannot readily be ignored.

3.1 Containers: the traditional role

Memory institutions (museums, libraries, archives and media) have historically focused upon archiving, managing and preserving what can be termed *containers* of information: whether books, boxed letters, reports, documents, paintings, film or photographs. These physical, primary carriers of recorded information and knowledge content were the main locus of efforts to enable description and discovery by archivists and librarians in the past. In short, the route to acquiring the content of these documents was inherently wrapped up in a search for the container.

Managing containers as an achievable library goal has led to a biblio-centric view where the containers are described and the *contents* and *context* of the information containers inferred from indexes, catalogues, classification schemes or collection management. The advantage of this is that at its most granular level this provides an extremely high level of discovery enabling a single letter in an enormous library to be found easily. In reality, most libraries are not this well described because it costs large amounts of money to get to this level of granularity for a very large collection. Frequently, the Librarian or Archivist is actually the repository of this granularity of knowledge and the recorded discovery tools to containers are not adequate to full digital discovery. Thus, discovery of the book chapter requires discovery of its book container and then searching that book by hand to find the physical chapter. In no way could this discovery be deemed as managing much content.

In digital library terms we have been very successful in developing methods for the preservation and discovery of digital containers.

3.2 Content: the unfunded mandate

The growth in computing use from the 1960s onwards propelled information professionals into the direct management of content. Managing content on the Web throws up other issues for resource discovery and Web Archiving. The aptly named 'Deep Web', those massive resources missed by search engines due to being in a non-harvestable format, remains an often unnoticed problem to be resolved. Ironically, these may be very content rich and from a reliable publicly funded source such as an archive, library or museum. Michael K. Bergman and Bright Planet have issued a White Paper [6] that estimates:

- Public information on the deep Web is currently 400 to 550 times larger than the commonly defined World Wide Web.

- The deep Web contains 7,500 terabytes of information compared to nineteen terabytes of information in the surface Web.
- The deep Web contains nearly 550 billion individual documents compared to the one billion of the surface Web.

Because many of us are now of a generation who have grown up with computers as ubiquitous to our lives we forget that before their widespread use managing content was limited and very difficult; whilst managing context was resource hungry, time consuming and tended to reflect the narrow concerns of the organization archiving the content. Well, computer use for storage and manipulation has biased the equation towards managing content, especially in terms of volume and for textual resources (e.g. Google Book Search).

3.3   Context: the human element

'We do not see things as they are; we see things as we are' The Talmud [7].

Finding a known object is always going to be easier than finding a range of previously unknown pertinent objects. In a known case, searches can be constructed by inexperienced users that will almost certainly result in satisfactory retrieval. It is when the user knows only the field of enquiry, and not the precise resource, that search engines are very much less useful. If the starting perspective of the searcher is unknown because of diversity (age, education, language, etc) then making a resource findable when it might be text, audio, video, 3D, geographic, database or image based is a challenge to any digital repository. Metadata and tools for resource discovery are needed to allow users to locate the items they seek, whether they know of their existence or not.

We still find ourselves managing containers and sometimes content but rarely is context any better managed than it was in the pre-computer archival record. Ted Nelson's 1965 aspiration for his Xanadu system, in which all the books in all the world would be 'deeply intertwingled' has still not been fully realized. In other words, we understand the principles and the need quite well, have applied it where possible, but rarely are the resources or infrastructure actually available in the digital domain to make contextual information widely shared, usable, robust and powerful.

3.4   Conclusions from the trend towards managing context

There are a number of major barriers in front of the community inherent in this continuing transition from managing *containers*, to *content* and *context*.

The major unresolved issues in the transition revolve around money, infrastructure, scalability and sustainability. Frankly, managing content and context in digital repositories is a large and unfunded mandate that has been forced upon the LIS community because of perceived user demand and the short timeframe in which action must be taken or the resource will not just be unmanaged but lost to the future.

IT in digital libraries is no longer showing the immediate return on investment delivered in the 1980s and 1990s, such that future developments will not necessarily instantly save staff time or reduce costs. **The current benefits from technology for libraries are improving resources, processes and services, not replacing the human factor.** Of course, the issues of sustainability and scale become paramount once significant investment has been made and there is an undercurrent of dissatisfaction regarding the sustainability and scalability of digital technology regarding issues of preservation and continuing access to resources.

Perspectives of value and the incentives to contribute are skewed in relation to digital libraries. Many information users would like the Semantic Web where information is intuitively available. Yet few show any interest in expending effort to document information for use by others – time expended recording contextual information and improving accessibility is time not spent on new activity. The user assumption is that the library will take care of all this, but please don't ask for any resources or funding to do this!

Hedstrom identifies 'that human labor is the most costly element… and one that is likely to increase, while storage and processing costs continue to decline. Therefore, there is a premium on developing methods that reduce the amount of human intervention'. [8] This is clearly important and better tools will certainly help the community.

The bigger goal may not be to remove human intervention but to gain greater value from it. One way this could be achieved would be to focus on ways people can augment contextual management rather than spending time managing content and containers.

More research attention should also be focused on metrics and quantifiable factors that deliver cost models against benefits and values rather than just technology. 'Survey after survey conducted over the past five years provides a bleak picture of institutional readiness and responsiveness… This emphasis [on technology] has led to a reductionist view wherein technology is equated with solution, which in turn is deferred until some time in the future when the technology has matured'. [9]

4   Collaboration

Collaboration will be a key feature of future digital library economics as the technologies become so great as to be unobtainable or unsustainable within a singular institutional context. Just as collaborative cataloguing proved the most economically sustainable way forward in the 1980's then collaborative models for tools and infrastructure will prove fiscally attractive for digital libraries in the next two decades.

Collaborative digital preservation is a good indicator of how this may proceed. The best example is the CLOCKSS digital preservation community partnership model (www.clockss.org). CLOCKSS is working to achieve a sustainable, globally distributed archive to ensure reliable, long-term access to scholarly e-

content. It also uses the Open Source LOCKSS (Lots of Copies Keep Stuff Safe) software. The CLOCKSS collaboration between publishers and libraries requires some movement in attitudes from both perspectives - as Michael Seadle states:

For librarians and archivists to accept the social structure of the LOCKSS community-based model for long-term archiving requires the same kind of shift in thinking that moves them from focusing on a single original copy on a single durable medium to a world where any one of dozens or hundreds of identical true originals exists on a variety of transient media. In the digital world trusting a single provider, a single institution, and a single archive represents the real risk. [10]

The shift in thinking will not just relate to digital forms, but to the likely convergence of the institutions and professions that curate those digital objects. As memory institutions become ever more dependent upon the digital element to deliver services then the traditional disciplines are likely to share more skills across boundaries to remain effective. Hence, libraries need curators, museums need digital collection development, and archives need digital asset management.

So, the key reasons for working collaboratively are the renewed nature of digital activity which has the following key attributes:

- Multi-disciplinary / inter-disciplinary
- Multiple technologies
- Multiple source types & formats
- Multiple audiences and uses
- New methodologies
- Stakeholder needs over-ride technical demands

No longer can one institution hope to skilfully encompass every attribute required to succeed in the digital domain. Substantial research demonstrates that successful collaboration leads to more: money, creativity, perspectives, experience, champions and bigger results/audience than could be achieved singularly. Collaboration appears to also show the strongest sustainability profiles.

If you work collaboratively you can often obtain greater resources, recognition and reward when facing competition for finite resources. [11]

The national library of the future is unlikely to remain structured within the strictures of the current library sector. Users are deeply engaged with content and context. The user community is heading away from information silos as represented by the traditional library collection to semantically driven content drawn from wherever has the requisite resources. At the same time, the user is expecting highly personalised and bespoke experiences. The nexus of information desire is unlikely to be served effectively by most national libraries singularly - with maybe the exception of the British Library and the Library of Congress.

Thus, collaboration between memory institutions across sectoral boundaries is the key way in which the user community can still be served within a national context where the nationhood of the institution and their collections retains significance. This may lead to umbrella organisations that pull together all the national library, museum and archival collections into one huge managerial critical mass of activity. More likely, in the near future, is that national memory organisations will seek collaborative models that allow them to each retain their distinctive natures (including their physical collections and buildings) whilst seeking to engage in the digital domain. It is not clear which of these models will prevail and decisions will probably be driven as much by nation-building, politics and economic realities than by intellectual or strategic parameters.

4.1   Open Source

The most obvious example of collaboration that will deliver benefits to the digital library community is the Open Source movement.

Open Source software typically refers to software licensed under a licence that allows the licensee to examine, modify and distribute the code without paying a royalty to the licensor. By contrast, proprietary software usually requires payment of a royalty, disallows examination of the source code and restricts or prohibits modification and distribution of the code.

Open Source has shown huge benefits to some institutions in developing countries to enable them to build similar or superior infrastructures to more historically developed institutions.

A key figure in the Open Source firmament is Mark Shuttleworth. He is best known for his leadership of the Ubuntu Linux operating system distribution. He describes the economic model behind this as:

The vision of Ubuntu and Canonical is a symbiotic one. We believe that Linux has grown to the point where it is possible to build the platform at a low enough cost to make it sustainable purely though services around it, rather than through licensing the platform. In other words, we think that support, training, online services, and professional engineering for people who want to adapt Ubuntu commercially will earn enough money to pay for Ubuntu itself. [12]

One conclusion is inevitable - our future will be Open Source, whether in part or whole. The hard-nosed Gartner prediction, mentioned earlier, and the analysis of Brad Wheeler (Chief Information Officer for Indiana University) agrees that all trends point to the continued mainstreaming of open-source application software in the commercial and academic markets. Brad states:

Open-source software—through directly leveraging the investments of others—is a potential remedy for the four challenges noted above: rising IT services demand; modest-to-declining resources; a marketplace failure of true alternatives; and the growing distance between developers and users to shape software. Yet to be precise, it is the institutions that develop the

collaborative capability that will extract the greatest value from open source. [13]

Roy Tennant identifies the stability benefits that Open Source collaboration could actually bring to digital libraries:

On September 5, 2006, over 250 libraries in the Georgia consortium, PINES, began using a next-generation integrated library system (ILS) they wrote from scratch. Within two months they racked up two million checkouts and half-a-million renewals for a collection of eight million items and 1.5 million borrowers.
While they aren't the first to use an open source solution for their most essential operations, they are the largest and most complex system in the United States to attempt such a transition. The potential impact of this event on the library marketplace, which has recently been dominated by mergers and acquisitions, cannot be overstated. [14]

Evergreen, the system developed, has subsequently been taken up by others, including the Michigan Library Consortium. It represents a truly sophisticated ILS development and demonstrates that Open Source has a significant future in digital libraries. Considering the family of Open Source software resources including Fedora, Greenstone, Koha etc. and the growth of library communities, such as Code4Lib (code4lib.org), then the trend for sophisticated implementations is set to increase in frequency with commensurate positive impacts for digital libraries.

National Libraries have an opportunity to build library systems that suit their purpose better than the monolithic integrated library management systems have yet achieved, especially as these are generally oriented to the main market: public and university libraries. Collaboration across boundaries, as achieved in the collaborative procurement policies of the Scandanavian library sector, will filter to national libraries via the open source software model. Open source is also likely to be the only way to ensure the cross-disciplinary requirements of the semantic web (sometimes known as Web 3.0) are achievable for memory institutions.

4.2   Open Access

Open Access (OA) carries forward the theme of collaboration and community engagement that will be a defining underlying factor in the economic future of digital libraries. Whilst Open Source offers the possibility for the whole community to benefit from license free software tools then Open Access offers the chance to access and engage with current intellectual discourse without having to pay an excessive entrance fee. The advantage for digital libraries is the opportunity to provide low-cost access to more content to their user base than can be achieved with ever reducing acquisition budgets.

The challenge therefore is twofold – will Open Access actually prove as low-cost to provide long term access to content as it promises and will the content be of value to the user community?

Regarding the value of the OA content, Mary Waltham identifies the 2 key influences to uptake of OA by producers and consumers:

Firstly, are articles that are OA from first publication cited, read and integrated into research more, and more rapidly than subscription-only access articles? Secondly, does an open access journal receive more high quality submissions than a competing subscription-based journal? The answers to these questions will take time and rigour to develop a clear understanding as there are important disciplinary differences to consider. [15]

Research into the impact of citations in open access publications suggest that these factors will be satisfied shortly, meaning that OA will become ever more part of the mainstream of publishing models.

The question remains whether the costs to digital libraries of maintaining access will be equitable in OA models against traditional journal publication. A main critique of the OA models regards concerns that OA is not a sustainable model, with this issue raised most notably by the Royal Society. [16] The Royal Society's position sits in direct opposition to that taken by funders, such as the National Institutes of Health or the Wellcome. Those, like Matthew Cockerill, who support OA state that the sustainability is equitable with the "toll access model" as this latter model is purely sustained "because the academic/research community funnels large amounts of money into it through library budgets". [17] Thus, from the digital libraries perspective if a library can stop paying the ever higher price of journal subscriptions these funds could be redirected to Open Access models or to sustainability plans.

The apparent good news for the future digital library economics must be offset against the continuing concerns for <u>all</u> digital format publications of their total lifecycle costs for libraries. The lifecycle cost equates to the cost of acquisitions plus a series of time dependent costs associated with actions such as ingest, metadata, access, storage and preservation. So even if OA saves libraries the acquisitions costs there remains a significant volume of expenditure over time.

5   Digital Divide

Future digital libraries will need to address the current digital divide. The digital divide refers to the gap between those people who have effective access to digital technologies (and the benefits that may bring) and those who do not. Typical reasons for the digital divide include lack of material access (computers, software, etc.), lack of technical infrastructure (connectivity, power, etc.) problems of usability or usage access (lack of IT experience or instruction, linguistic barriers), or lack of access to intellectual content (subscription costs, suitable content).

The collaborative models discussed earlier are important as levellers of the information domain and provide hope for a reduction in the information gap. The idea that Open Access may provide a bridge across the digital divide has

been strongly supported by many parties and particularly by Pertti Saariluoma [18].

All peoples, no matter what the economic nature of their society, need the opportunity to access scientific knowledge… the digital divide is more than simply an academic discussion, but rather a vital issue to allow all peoples to participate in the contemporary information society and global economy.

This is more than just a matter of democratising access and moral considerations. Even straightforward commercial imperatives should suggest to the information rich that they need to engage with the widest possible community of use as this will provide more opportunities for income generation (even if indirect) and a raised profile which will all contribute to sustainability. For example, Universities which engage with the Open Access model may benefit from their research being more heavily read and used worldwide. Academics and students in countries, such as China, that are disinclined or unable to afford access to subscription based publications may be strongly oriented towards Open Access resources. This creates a reflective market opportunity and competitive advantage in China against Universities which do not utilise Open Access – i.e. students will attend Universities they know and have read, providing more high value overseas fee opportunities to those Universities.

The digital divide needs to be bridged for everyone's benefit. Not only as a matter of social justice but a matter of long term collaborative survival for all communities, such as science, that rely upon the sharing of information to stretch, grow and advance. National libraries will clearly retain a key role in promulgating information and digital literacy and helping nations to work collaboratively to bridge the digital divide.

6   Further thoughts

We must not assume that technology will solve our information problems – in that direction lies a frustrating wait. It is time to stop avoiding the clearest conclusion possible from the current state of the digital domain: higher levels of human intervention are needed and are in fact desirable to enrich and make more valuable all our digitization and preservation efforts to date and for the future. Without this commitment of time and energy the chances of a vibrant, open information environment are slim. In such a vacuum, commercial interests will bifurcate the market into its smallest common denominator with all its context stripped. If we lose sight of the value of investing in context and the incredible possibilities that managing context presents, then we may very well look back from 2030 and regret that we did not grasp this opportunity.

Deep and faceted metadata is clearly of vital importance to the Semantic Web and must be more widely deployed and very much more scalable than it is now. At the very least, a clear definition of its value must be promulgated across the community so the creator, mediator and user understand their roles and respect the benefits concomitant in metadata creation. Metadata will certainly be captured closer to the point of resource creation.

Further exploration and work to discover the means and modes to bring the nation's public and the national libraries closer together is essential. The goal of enabling more metadata to be inferred automatically from the resource characteristics will ensure that where human intervention is required it will deliver greater value. This will have particular benefits in a post Web 2.0 world where users will expect as a matter of course that resources will be enhanced and changed by their interaction with them. As already demonstrated by the collaborative text correction in Australian historic newspapers from the National Library of Australia. [19]

The Internet benefits both the users and the sellers of information. The users reduce their search costs and gain greater value from the wider resource base available. The sellers gain more routes to market their wares and options, such as flexibility of pricing or updating, which are often not practicable in traditional markets. The clear trend is towards hybrid charging models based on a combination of subscription, membership, pay-per-use and advertising revenues that will replace the pure revenue models. [20]

The digital library finds itself in a difficult economic position. As an intermediary and an enabler of information use from both non-chargeable and bought content it experiences both the upside and the downside of the Internet. The upside is the ability to deliver a much wider aggregation of reliable information at a generally smaller unit price than before. The downside is that whatever the source and the price of the units being delivered the digital library infrastructure costs continue to rise and the spectre of rising total cost of ownership and digital preservation costs are clearly apparent. It has been correctly argued that maintaining digital access and addressing preservation is not necessarily a costly enterprise compared with the analogue world. However, the digital library costs are not replacing those analogue costs but offering additional requirements often not financed. This forms a huge unfunded mandate that will provide the biggest single threat to future digital library economic sustainability.

The other significant implication for libraries is that it becomes increasingly unlikely that users will ever visit the physical premises and they will increasingly have an expectation that services will be delivered directly to their devices wherever they are physically. The national library thus becomes not a centrist organisation but a highly distributed conceptual space for a nation's cultural memory. Thus the library concept becomes of less value than the national and memory natures of the organisation. In a pervasive ambient information environment then the concept space of a nation's cultural and heritage memory gains more value and importance than the bricks and mortar space. This does not mean that a building is no longer required, but merely that the users will have almost no interest in the physicality of the nations library or other memory institutions but an intense interest in the information content and context derived from the collected memory represented by those institutions.

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Appendix B

51

Research conducted by Scotinform for the National Library of Scotland on the Future of National Libraries

August 2009

This paper has been commissioned by the National Library of Scotland to inform its research work on national libraries of 'small smart countries' in 2030.

CONTENTS

1 Introduction

1.1 Background

As part of long term strategic planning the National Library of Scotland (NLS) has prepared internal research and analysis on the opportunities and challenges facing national libraries in 20 years' time, and how NLS may need to adapt in order to respond to these changes. This topic will be a major theme of a meeting of the 'Small Countries – Smart Ideas' Group at the International Federation of Library Associations and Institutions (IFLA) conference being held in August 2009 in Milan.

In order to contribute to this work, NLS commissioned Scotinform Ltd to carry out a series of interviews with key stakeholders within national libraries and other relevant organisations in order to understand their perceptions of the challenges and opportunities facing national libraries in small, educationally and technologically advanced countries ('small smart countries') in 20 years' time. This report presents the results of these interviews. A full list of interviewees is available in appendix one of the report.

1.2 Research Objectives

The objectives associated with this study were to:

- Understand the challenges and opportunities facing national libraries in the next 20 years
- Understand how national libraries in 'small smart countries' will respond to challenges

1.3 Methodology and Sample

In order to meet the above objectives Scotinform Ltd completed 21 telephone interviews with key stakeholders, including Librarians, Trustees and Chairpersons at national libraries and other relevant institutions. The names and contact details of key stakeholders were identified by NLS.

Prior to the research taking place NLS sent an introductory email to the stakeholders which outlined the purpose of the research, requested their participation and notified them that Scotinform would be contacting them. At this stage stakeholders were given the opportunity to opt-out of the research.

Following this initial contact from NLS, Scotinform Ltd arranged telephone interviews at suitable dates and times with all those stakeholders who agreed to take part. Interviews were based on a loosely structured discussion guide (see appendix two) which was jointly designed by Scotinform and NLS. Interviews took place between Tuesday 7th and Friday 31st July and were conducted by a member of the Scotinform study team.

2. In 20 Years: Challenges and Responses for National Libraries in Small Smart Countries

This section of the report presents the feedback provided by stakeholders categorised into a number of themes. The order in which the themes are discussed reflects both the strength of feeling and the amount of feedback received on each topic. Quotes have been used throughout the report to elucidate the points made by participants.-

2.1 Digitisation

The challenge of digitisation was highlighted by all participants, yet most admitted to having no idea what the digital landscape would look like in 20 years. One participant summed up the affect of digitisation on national libraries as follows:

"The digital world and the retreat from print will increase in pace. A move towards a multi-media culture. Sound and moving image archives will need more work and expertise as we will be less text based as a society."

Other participants highlighted the effect digitisation will have on the book and the likelihood that the principles that define a book will need to change. Others pointed out that a tipping point will come when books will be born digital and when they can be read electronically in comfort. This presents a threat to the way national libraries currently operate. In 20 years, national libraries and their users will be interacting in very different ways.

"The book will become an even more marginalised form of knowledge distribution. The challenge to national libraries is to take over the role of digital distributor of texts."

The recurring message was that for national libraries the challenge is to be at the forefront of digitisation on an ongoing basis.

However, many participants voiced concerns that national libraries in 'small smart countries' may not be in a position to lead digitisation in 20 years' time.

"National libraries have been early adopters of digitisation but haven't re-thought the library organisation. Digital skills need to be incorporated into the librarian role."

"National libraries need to be relevant in digitisation. Lots of plans have been drawn up but not put into effect yet as people are waiting on legislation and technology upgrades, but legislation could take ages to change and technology will always become out-dated at some point."

For some this perceived stagnation threatened to marginalise national libraries' role in digitisation, whilst others recognised the huge task digital preservation represents to national libraries.

"The volume of material that will be potentially digitised will be overwhelming e.g. emails, blogs, YouTube. It won't be possible to be comprehensive."

Many participants saw a natural role for national libraries as the coordinator of digitisation in the library sector. It was felt that other libraries e.g. regional, university, are not in a position to lead digitisation, therefore by assuming this role national libraries would have an important place in the digitisation process in 20 years and would be addressing a need.

"A lack of coordination means digitisation of materials becomes spread out and piecemeal. The opportunity exists for national libraries in 'small smart' countries to assume the role of coordinator and teacher."

Other benefits from assuming the role of coordinator would include access to unique materials held elsewhere in the country, increased influence on legislation (representing the 'free at point of use' sector) and ensuring increased participation and availability of digital resources.

"National libraries need to become the digitisation educator for other libraries in universities and the regions. This will ensure national libraries are taken seriously and allow them to maintain a legislative role."

Participants pointed out that national libraries have an abundance of material eligible for digitisation. The digitisation of this material will bring services to users' desktops and preserve the long term future of these materials. A question national libraries will need to answer is what to digitise, but for many participants the question of how to digitise materials in a way that is user-friendly and attractive to users is just as important.

"National libraries need to understand how users will imbibe information in the future by monitoring fast-moving changes in clientele behaviour."

"Libraries are organised by format. That makes no sense in a digital world. We need to be more focused on the user and not on the things we're protecting - look at it from the user's perspective."

Participants mentioned that national libraries already have skills that can be used in the digitisation of materials. The need for accuracy and reliability will be just as important in digital preservation as it has been in print preservation. The library has the opportunity to transfer these skills in order to create a coherent digital environment.

There was wide consensus on the need for cooperation with other organisations including, but not limited to, other national libraries. To have a presence at the vanguard of digitisation, national libraries need to work with legislators and competitors.

"I think a body like NLS would struggle to digitise on its own. It needs to work together within/out-with 'small smart' countries as it lacks the skills and technology to go it alone."

"The answer is ongoing lobbying of legislators and collaboration with those on the cutting edge of technology i.e. other national libraries with more advanced technology, to build relationships/help them now in return for help later."

Participants felt that in 20 years' time national libraries must also have resolved the tension that exists with commercial interests: licensing content is an ongoing issue that must be resolved. In addition, born digital material will become common and may bypass national libraries. Many participants were unsure how national libraries were going to react to this challenge.

Encouragingly, many participants felt national libraries in 'small smart countries' were in a good position to react to the challenge of digitisation but stressed that effective cooperation between countries needed to begin now.

"Digitisation is a big task but a country the size of Scotland can do this more easily. For instance in Australia they have Music Australia, Dance Australia etc.... and have tackled digitisation in this layered approach. Collecting and projecting part manifestations of Scotland is practical and possible e.g. the screen archive is a good starting point."

It was highlighted that national libraries in 'small smart countries' have manageable amounts of material so there is a chance for them to be at the centre of new developments.

2.2 A Changing Role

Many participants saw the continuation in 20 years' time of an already evident tension between traditional roles performed by national libraries, such as preservation of printed material, and new roles, such as digital preservation, which national libraries will need to perform more and more in the future.

"Few people understand what libraries are in general. It's hard to distinguish between our actual role and our viewed role."

"The rules we have today for collecting and preserving will be completely different. A national library will not perform the same role – not a store house of physical items, but perhaps of digital items."

Currently, national libraries are research libraries in the process of becoming something different with new innovations for users and a focus on national identity. However, at present many felt there is not a clear idea of what role national libraries will play in 20 years' time. Most participants agreed that national libraries need to be research led but populist as well. The challenge is to achieve this dual role and ensure it is established and maintained in 20 years' time.

"There will be pressure on the role of 'research library' and moves towards becoming a resource for the wider public who are interested in Scotland, Wales etc.."

"There will be an increasing tension between traditional 'research' roles and the 'social and cultural' role of national libraries which is more important to those holding the purse strings. This will put a strain on traditional roles."

Some participants suggested that in 20 years' time the role of collecting the heritage of a country will be seen as less important. Instead there will be a focus on innovation and education, e.g. offering services to the public.

"National libraries need to become educators and innovators whilst maintaining their core role of recording the national heritage."

The consensus amongst participants was that the traditional role of national libraries will still be important in 20 years' time, but principles regarding preservation will need to adjust to a very different situation. National libraries will still be responsible for public access to materials but will need to make tough decisions on what will and will not be preserved as a vast amount of published and unpublished material will exist. This will alter traditional principles on the scope of preservation, i.e. what to preserve.

Participants felt it will become more difficult to define the core role of national libraries with the advent of newer sources of information; and at the same time it will be difficult to justify the acquisition of rare materials that few people will look at. Some materials may not be important to politicians or the general public but are essential to national library principles, e.g. the first issue of Cosmopolitan magazine.

"The question national libraries will need to answer more and more is - what do we preserve? It's been easy as a deposit library but with the advent of electronic information it is impossible to retain everything."

It was felt that another challenge to national libraries in 20 years' time will concern the physical location of national libraries. Participants envisaged that storage would become more of an issue and foresaw the possibility that national libraries would be centres of digital, rather than physical, preservation. If this is the case in 20 years', some asked, why would national libraries need to be located in cities when a storage facility would serve the same purpose?

"If preservation remains the core role and digital preservation and remote access become the basis of preservation why will NLS need a city centre location? A storage facility elsewhere would be cheaper."

"National libraries will still exist in 20 years' time but they could be moribund storage facilities on the edge of town."

Participants concerned about physical access and the maintenance of national libraries as revered institutions provided warnings about the rush to digitisation. These participants insisted that a physical space where people can come together to discuss topics and get advice will still be required in 20 years' time.

"Don't digitise the legacy as this is just giving it away for nothing. A digitised original, iconic piece is not the same as seeing it in the flesh."

It was felt that national libraries need to emphasise their expertise in helping users both remotely and face-to-face if they are to justify the costs associated with their current locations.

Whilst most participants felt preservation and physical access to collections will still be important in 20 years' time, for many the rules of preservation will be completely changed. National libraries will be more concerned with the preservation of digital materials and staff may spend more time dealing with publishers than providing services face-to-face to the public.

"The majority of information is becoming digital and we may need to abandon some old principles if we are to move forward."

Whilst qualitative challenges will remain in terms of the preservation of materials, most participants noted that when one considers the amount of information available for preservation and the various forms this information might take in 20 years, quantitative challenges will be much bigger. This will require constant re-evaluation of the principles of preservation in light of changes to the world around national libraries.

All participants wished to see a continuation of the traditional roles performed by national libraries but perceived that in 20 years' time it will become more difficult to justify traditional approaches to preservation that cost so much more than digital preservation and will be used by fewer people. In response to this challenge national libraries need to assume new roles and welcome technology.

"We need to embrace new technology while stressing the importance of traditional roles such as preservation and conservation. To become two institutions in one."

"If libraries are to remain beacons of information, we need to think about the best ways of putting forth that information."

Others suggested promoting the traditional role of national libraries through changes to the visitor experience e.g. exhibitions, thus highlighting the existence of materials as a result of the national libraries' traditional approach and principles on conservation and preservation.

"People won't be flocking to use libraries, but instead working remotely. Instead the library will get more visitors to its exhibitions and facilities e.g. families, groups, to see the iconic/historical items, thus the library becomes a type of museum."

Positively, the majority of participants felt national libraries in 'small smart countries' were well placed to adapt to the various changes they will encounter in 20 years' time.

"National libraries will still have an important role but will need to be 'fleet of foot' in adapting to changes and driving changes, e.g. digital services for remote users."

"Only map what's map-able. We can never predict, but 'small smart countries' can react quicker to the particular and democratic nature of challenges which are a permanent fixture of the landscape for national libraries."

2.3 Political Change and Funding

Participants highlighted the current downturn in the economy as having major implications for national libraries and they foresaw that budgetary constraints would still be a challenge for national libraries in 20 years' time.

"In 20 years' time, the reality is that funding will be scarce. If funding dries up this will have major impacts on national libraries ability to innovate and keep up/be relevant."

"Finance remains a big problem and will be for many years to come. There will be a nose dive in public spending for many years. The amount of money available is smaller and being divided between the same or more groups."

An allied challenge is the uncertainty created by changes in government administration. The UK's four year political cycle restricts national libraries' long term planning which ultimately affects the service provided to users.

"Funding is an issue for all national libraries. The inability to define funding as a result of changes in government makes policies difficult to follow. We can't plan or service users as we would like."

An ongoing challenge for many participants was the need for national libraries to be seen as relevant to government policies. Some participants felt national libraries needed to be more assertive and to lobby legislators persistently for what would be a decreasing funding pot.

Many participants anticipated that persuading funders to provide support for preservation and physical access to printed material would be more difficult in 20 years' time. The inability to quantify the benefits in terms of visitor numbers or online hits was perceived as a major obstacle to maintaining funding in these areas.

"National libraries will find it difficult to justify expenditure on preservation and physical access when funders will say 'you can get this on Google'."

"Storage will become more of an issue. It is getting cheaper but it is still expensive to store materials in perpetuity. This will not be lost on funders."

Some participants highlighted the unique situation in the UK where the National Library of Scotland finds itself working with a national and a devolved government as well as a British Library. A challenge for NLS is to work out the nature of its relationship with each of these groups.

In considering what national libraries' response should be to the political and funding challenges that will face them in 20 years' time the majority of participants stressed the importance of lobbying and influencing governments

and funders. In particular, politicians need to be convinced that national libraries produce outcomes that are relevant to government policy. If this can be achieved national libraries will be viewed as institutions which are good for society and which can add value to economic investments.

"National libraries need to grab the ear of the national government and position themselves as assets in a knowledge-based economy."

"It is important that national libraries in 'small smart countries' are seen as directly relevant to government considerations. Competition for funds is fierce and if considered less relevant, national libraries will receive less funding."

The need for good relations with funders will be particularly important when national libraries seek funding for projects with unknown outcomes, e.g. digitisation, or to maintain processes which, to an outside audience, may seem uneconomic, e.g. print preservation and storage.

Justification for these funding requests requires national libraries to recognise their role in helping to build and maintain the economic pillars of society. National libraries need to take a lead in clearly stating their role and how they benefit society, how funding will be used and how it will be measured in terms of accessibility, knowledge transfer etc.

"Libraries need to articulate their vision not by saying 'we're really struggling, we need more money' but by saying 'we've done a brilliant job in the past and if you keep investing in us, we can achieve more.' We need to show our knowledge policy and how we can help achieve it."

It was also suggested that national libraries in 'small smart countries' have an advantage in being closer to opinion formers and influencers within government. In addition, in Scotland it was perceived that devolved government will be good for the national library as support for national cultural heritage will be greater than under a UK administration.

"The devolved government should be good for NLS as national pride will swell and this should result in increased support for cultural heritage."

Participants advised that national libraries in 'small smart countries' will need to explore all possible funding avenues, whether these be public or private, UK, EU or international and need to maximise their own income generation.

"National libraries will need to fight for the pot of funding and cast the net wide for funding opportunities. External funding is very important as it is less reliant on government changes, whilst partnerships with external bodies and income generation are also important, e.g. shops."

2.4 Staffing and Organisational Change

Participants highlighted staffing and organisational change as a major challenge for national libraries in 20 years' time. There is already a perception that technology and customer needs change faster than national libraries can react.

There was wide recognition that national libraries lack the skills required to react quickly to such changes.

"The public expect information to be presented in the way they want, not the way it's always been done."

"National libraries have a stagnating workforce that resists organisational change. We need to incorporate a range of skills and attitudes coming from other sectors so we can compete."

In 20 years' time national libraries will need a distinctly different workforce. Currently the workforce is typified by people with a deep knowledge and strong commitment to traditional principles. They are reflective of their generation, but newer systems and processes can be hard to adopt. This means organisational structure has become a key issue.

"Competencies of staff will change. There will be a reduction in traditional skills and we will have more management staff and service providers."

That national libraries will require staff with different skills is clear, but there are concerns that these skills are scarce and that national libraries will struggle to compete with private industry. In addition, traditional skills will still be required so a balance needs to be struck between old and new skills. Participants saw the prospect of tensions being created between staff with traditional library skills who have worked in a library environment for lengthy periods and staff with new skills who have come from private industry.

Changing the organisational structure is a challenge facing many national libraries, yet participants expressed concerns about the ability of national libraries to do this efficiently and foresaw ongoing problems.

"National libraries find succession planning difficult. They tend to recruit generationally then lose a lot of people at once. In the future they have difficult decisions to make between maintaining traditional library skills and recruiting professional management skills."

In order to have the right staff and organisation structure in 20 years' time, participants felt national libraries would need to make some painful decisions on which roles are required and which need to be cast aside.

"People will have to be multi-tasked and less formal in their hierarchical structure. They will need to move across a variety of tasks."

For many, the quality of leadership was the single most important factor in ensuring these changes came about, but it was also important that national libraries were perceived as interesting places to work. For some, the difficulty in competing on salary with private industry could be overcome if national libraries were seen as vibrant and interesting places to work.

"Put the right person at the top and the rest will fall into place. For instance, if national libraries are players in the digital process, then talented people will be excited at the prospect of working for them."

"We need to completely re-design the organisation which isn't being done at the moment. Leadership is required to do this and 'small smart countries' should be more agile. Digitisation is a democratiser for 'small smart countries' and they need to take the opportunities available by adapting their workforce."

It was stressed by a number of participants that, in order for national libraries to get better at succession planning, they needed to prepare leaders with the appropriate skills. For this reason many saw national libraries continuing to employ management professionals at the expense of library professionals.

2.5 Relevance of National Libraries in 20 Years' Time

For some participants a major challenge for national libraries is simply to still be in existence in 20 years' time. There were real concerns that national libraries would become obsolete'.

"The biggest threat is that national libraries may become obsolete and have no relevance to the modern world."
"The future for national libraries is not secure and I wonder if some countries will still have national libraries if they do not take a lead role as coordinators in areas such as digitisation."

The majority of participants believed national libraries would still exist in 20 years' time but envisaged a number of scenarios in which they would look very different. One such scenario involves the possibility that libraries and archives could be merged. This has happened already in Canada and participants saw potential for this to occur elsewhere, particularly in small smart countries.

"The public don't care where the information comes from, in fact, would prefer it to be in one place. In Canada there was overlap in the library and archives so it made sense to merge. This could also happen in Scotland."

Another scenario is that national libraries will look more like museums in 20 years' time with visits coming mainly from those wishing to see exhibitions of iconic works or original copies.

"Will we still exist as a national library in 20 years' time? We are already a quasi-museum now!"

A major threat to the relevance of national libraries is that people will think the same information is available elsewhere and national libraries will lose their 'revered' reputation as primary sources of authoritative and reliable information.

"Same challenge as many other libraries – to still be relevant in 20 years' time. Perhaps the challenge is even greater for national libraries actually. Need to avoid people saying 'we don't need libraries'."

"National libraries need to show they can answer your question better than Google - a more in-depth experience."

Another issue is the ongoing challenge for national libraries to be relevant to everyone and not just researchers and academics. Although many participants noted real improvements in this area it was felt that national libraries still had a job to do in becoming relevant to more people in society.

For most participants, national libraries were still revered institutions, though many highlighted the importance of maintaining such a reputation as there is a real threat that national libraries may become dispensable. It was felt this would be a challenge for all heritage institutions in 20 years' time.

"We are decreasingly becoming the great custodians of national heritage. The difficulty is being accessible and relevant."

Specific concerns included a lack of visibility amongst the wider public and a reluctance to embrace new forms of communication such as Twitter – both as a method of meeting users' information needs and of raising awareness of national libraries and their services.

"Nls need to be much more visible, embrace new mediums such as flickr, Facebook, Twitter, where people can find information as an alternative to visiting the physical library."

Participants felt there was a need for national libraries to assert their relevance in new ways, reaching out to more of the population. Suggestions included extolling national libraries as the '*reliable guardians of the national cultural heritage*' with a focus on maintaining and representing the national identity.

"We need to continue to stand for our national identity. With such huge diasporas, we need to improve our role as memory institutions."

Ensuring national libraries are well regarded by the public was perceived as very important. For some this meant opening up the library in different ways, such as extending the use of exhibitions as a means of attracting new audiences, using travelling exhibitions and outreach programmes to raise the profile of national libraries or collaborating with other libraries to break down the perception of the national library as an institution only for academics and researchers.

"We need to make the library experience user-friendly, accessible, child-friendly, interactive. We need to serve our own nation's people before thinking internationally. Get them onboard, be the people's library."

It was felt that a strong public profile will meet the ongoing objective of making national libraries accessible to more people and in so doing help national libraries justify their existence and work.

Participants recognised that in 20 years' time the traditional image of a national library as a 'research institution' may be less important, whereas the need to remain relevant and innovative was already, and would become more important over time.

"In through the door or in through the portal - doesn't matter which. Need to provide an all-round visitor experience and compete with museums - make libraries exciting!"

2.6 Competition

Participants recognised the challenge facing national libraries from other information providers such as Google Scholar. For some, the free market will promote quality and force national libraries to improve, while for others there is a danger that the presence of commercial information sources will make it difficult for national libraries to justify their reliance on public finances. All agreed that national libraries have a lot to do if they are to compete with commercial rivals.

"We have a lot to learn from Google Scholar as we don't create interactive user experiences very well (libraries have a very ugly interface) and we are competing with other, better services offered to the public."

The challenge facing national libraries was summed up by one participant.

"I sit in one of the largest national libraries in the world and if I want to know something, I Google it."

The ongoing challenge that national libraries must meet if they are to maintain a role as information providers in 20 years is to demonstrate the value of information they offer access to: they will provide intermediation, helping to guide people through the information landscape.

"There is a danger that people are satisfied with superficial information. We need to show them that national libraries can give them more than this."

Participants stressed that, in facing up to competition, it is important that national libraries maintain their uniqueness. The risk that must be avoided is that national libraries will be perceived as just another information provider.

The level of investment and resources behind rivals like Google mean that national libraries will struggle to provide a comparable service to users, instead some participants recommended cooperation. Others suggested that Google is a tool as well as competition. National libraries can learn how competitors organise and evaluate information for public consumption.

"Whoever the Google is in 20 years' time it is important that national libraries collaborate with them. It is unlikely that national libraries will have the funds to compete directly therefore we need to work with these organisations in mutually beneficial ways."

2.7 Changes in Technology and Customer Behaviour

Most participants suggested that a challenge for national libraries is to adapt its services to the changes in technology and subsequent changes in customer behaviour. However, few participants could imagine what this might involve in 20 years.

"Look back 20 years to 1990, could any of us have predicted the array of technology and devices that people have at their disposal. To predict what may be available to people in 2030 would be folly, but we can be certain that things will be very different from now."

For most, the way people use technology will transform the way they interact with national library materials. The challenge for national libraries is to keep up with changes but this is a role that is becoming increasingly complex and for which many feel national libraries are ill prepared.

"People nowadays have mobile phones, portable devices that are familiar and very much embedded into daily life. Our challenge is to compete with that."

Participants also highlighted the different audiences that national libraries need to cater for. Whilst younger users have grown up in a Web 2.0 world, others still prefer the traditional services offered by national libraries.

"We need to understand how younger users are learning in a digital world yet recognise that users adopt a mixture of methods - some go to reading rooms, others only use websites, others employ a mix. We need to provide for users variously and add expertise in whatever setting they choose."

National libraries led the preservation of the printed word and it is now necessary for them to embrace the digital age and lead it. The importance of digitisation for national libraries was clear to all participants.

"It will be a way of life in 20 years. There will be a fundamental change from authorities interpreting information to their audience (the traditional model) to a collective model where people aren't told things, but instead conversations are held."

"The speed of change is huge. Gaining access and participating in the digital universe is imperative. Everyone is enabled by wireless devices and the highly participative nature of the universe is game-changing."

National libraries will need to adapt to technology whilst meeting the needs of a public who are content hungry. This requires national libraries to think about how they provide the public with the service they want. For instance, increasingly users want remote access to life-like, impressive, electronic material and national libraries need to meet this challenge.

"In 20 years' time you will have a range of user-types. Perhaps national libraries will have more outposts – not just one central location – so people can go there and access digital books, etc."

2.8 Legal Demands

The challenge presented by copyright and intellectual property (IP) law was highlighted by some participants. Whilst recognising the need for national libraries to adhere to the law of the land, some felt national libraries needed to lobby legislators more in order to push the law forward.

"The UK is already falling behind other 'small smart countries' in terms of approaches to copyright. This is a very big issue in Scotland and Wales."

With regards to IP law, participants accepted that national libraries are faced with a law which is not 'fit for purpose' in the digital landscape: orphan works[27] were cited as an example. However, the need to 'stop wasting public money' means Legal Deposit law must be clarified.

It was felt that national libraries should become pro-active in their approach to Legal Deposit. Participants' advice to national libraries was to work hard to find solutions to the legal issues currently affecting their work as it is envisaged that legal issues will only grow.

"National libraries need to influence the redefinition of ownership and come to terms with ethics and privacy issues with relation to policy making."

For some, an opportunity exists for national libraries to become the legal repository of digital materials as for printed materials, and therefore the place where people can access full digital texts. National libraries need to try and establish this by influencing legislation. This role of lobbyist and influencer is required as some participants have seen the increasing influence on legislation brought about by other groups such as publishers.

"National libraries need to be 'fleet of foot' in adapting to changes and driving changes in legislation e.g. IP law."

2.9 Cooperation

A number of participants pointed out that national libraries need to become better at cooperating with other institutions if they are to remain relevant in the eyes of the public and governments. As well as working with other national libraries, participants highlighted a range of organisations with which national libraries need to cooperate:

- Community groups
- Local authorities
- Volunteers
- Businesses/employers
- Universities
- Commercial information providers
- Advisory and professional bodies
- Library forums and discussion bodies

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[27] An orphan work is a copyright work where it is difficult or impossible to contact the copyright holder.

Participants suggested that national libraries in 'small smart countries' could benefit from closer relationships with advisory and professional bodies. In a Scottish context the Scottish Library and Information Council (SLIC) and the Chartered Institute of Library and Information Professionals (CILIP) were examples of these organisations.

"National libraries need to work with organisations like SLIC who have good political connections and are permanent, unlike governments which change periodically."

One challenge brought about by digitisation is the avoidance of duplication. Without a coordinated approach it is possible that different bodies will carry out overlapping work. In 20 years' time efficiency will be as important as it is now, therefore it is important that national libraries take a lead

For many, national libraries have a major role to play as coordinators as other institutions such as universities and local authorities lack the resources, skills or indeed the desire to fulfil the role of preservation. In 20 years' time this will be very important when one considers the likelihood that digital preservation will be widespread.
"Universities and local authorities will struggle to fund their own digital libraries so national libraries have a role as coordinator and partner which would go down well with government."

Collaboration with the range of bodies and organisations outlined above is essential if national libraries are to remain relevant and capable. Exchanges of knowledge are vital to the ongoing effectiveness of national libraries in 20 years' time.

"National libraries need to make more connections. They cannot be isolated structures."

3. In 20 Years: Opportunities for National Libraries in Small Smart Countries

As a final question participants were asked to identify opportunities facing national libraries in 'small smart countries' in 20 years' time. A number of core themes emerged which built on feedback received elsewhere. The following section summarises the main opportunities highlighted by participants.

3.1 Coordination and Collaboration

Participants saw a major opportunity for national libraries to become the coordinators of national cultural heritage working with the government, university and local libraries and commercial leaders.

"There is an opportunity to be more than a store house in 20 years' time. National libraries could be the coordinators of digitisation strategy e.g. managing government outputs and archives, coordinating digitisation for university and local libraries."

"Public and academic libraries are looking for more shared resources. A national library can assume the role of coordinating the preservation of these services."

To fulfil this role of coordinator national libraries need to ensure they have the necessary skills and experience. For this to happen participants stressed the need for cooperation and highlighted that opportunities exist for national libraries to learn from one another and from other external bodies.

"We have skills that are scarce so knowledge transfer is important e.g. curation, conservation, digital support skills."

Some participants envisaged a scenario where local libraries might be taken out of the hands of local authorities and placed in the hands of the national library as the library leader.

3.2 Digitisation

Participants stressed that digitisation offered national libraries in 'small smart countries' tremendous opportunities.

"Digitisation presents a situation where national libraries can make their resources available to many more people – this has to be regarded as an opportunity, not a threat."

Participants highlighted the opportunity to present national library materials in new ways, for instance the recent introduction of NLS map holdings overlayed with modern maps in cooperation with Google. It was envisaged that this use of new technology will happen elsewhere within the national library collections enabling materials to be made available in innovative ways.

It was also suggested that national libraries in 'small smart countries' will have the ability to react quickly to changes within digitisation and therefore remain at the cutting edge in terms of technology and skills.

"National libraries in 'small smart countries' are agile and should be able to seize opportunities arising out of digitisation quicker than larger organisations, which gives them a business advantage."

3.3 Relevance

Participants highlighted that there was a real opportunity for national libraries to become the 'library of the people'

"In response to the political and economic crisis we need to build our community around trusted institutions and national libraries are just that – trusted institutions."

This mission to become the library of the people requires national libraries to build on the process of widening access and reaching out to the population which many libraries have already started.

3.4 Enhanced User Experience

Participants pointed out the wealth of materials national libraries have to offer the public but stressed the need to present this information in ways that are accessible and user-friendly.

"Lessons can be learnt from the competition. We need to provide enhanced finder aids, e.g. searches, research, manipulation of size."

There is an opportunity for national libraries to design services for a variety of audiences: the general public, the public sector and the private sector. The key for many is that national libraries need to start designing services with the end user in mind, not the curator.

"There is an opportunity to create a new environment where national libraries can provide new services for the public. This requires a change of outlook and a proper consideration of the end-users needs."

3.5 Key Challenges

The key challenges faced by national libraries in 20 years' time were identified in the research as:

- making sure national libraries' services are relevant to a wide range of users; developing beyond traditional user groups to embrace the general public and society as a whole

- seizing the opportunities offered by digitisation and being proactive in coordinating digitisation in the library sector

- taking the lead in finding solutions to the legal issues around Legal Deposit in order to ensure that digitisation programmes are fully realised

- making use of the latest technology to offer innovative services to the public, particularly important in meeting the challenge from other information providers such as Google

- presenting the case for funding effectively to governments by actively lobbying and promoting national libraries and their role as the 'keeper' of the nation's cultural heritage

- creating organisations whose leaders can implement change and whose workforce are flexible and appropriately skilled

73

APPENDIX ONE: INTERVIEWEE LIST

Interviewee	Position
Lorcan Dempsey	Vice President and Chief Strategist of the Online Computer Library Center (OCLC).
Andrew Green	Chief Executive, National Library of Wales
Professor Seamus Ross	Dean, Faculty of Information Studies, University of Toronto
Deanna Marcum	Associate Librarian for Library Services, Library of Congress
Anne Poulson	Director of Academic Services, King's College London (former director of RLUK)
Ingrid Parent	University Librarian, University of British Columbia
Michael Moss	Research Professor in Archival Studies, HATII, University of Glasgow
Nick Poole	Chief Executive, Collections Trust
Dennis Nicholson	Director, CDLR, Strathclyde University
Prof Mike Anderson	NLS Trustee/Chairman of the Board
Prof Derek Law	Emeritus Professor, Information Resources Directorate, University of Strathclyde
Moira Methven	Head of Libraries, Information and Culture, Dundee City Council/NLS Trustee
Penny Carnaby	Chief Executive and National Librarian, National Library of New Zealand
Elaine Fulton	Director SLIC/CILIPS
Michael Jubb	Director, Research Information Network (RIN)
Dr Judith Broady-Preston	Lecturer in Information Studies, Aberystwyth University
Wendy Newman	Senior Fellow, Faculty of Information, University of Toronto
Bob McKee	Chief Executive, CILIP
Dame Lynne Brindley	Chief Executive, British Library
Peter Eckersley	Staff technologist at the Electronic Frontier Foundation
Sheila Cannell	Director of Library Services, University of Edinburgh

APPENDIX TWO: DISCUSSION GUIDE

**National Library of Scotland – Research on the Future of National Libraries
Final Discussion Guide**

Research Objectives

- To understand the challenges and opportunities facing national libraries in 20 years' time
- To understand how national libraries in 'small smart countries' will respond to challenges

1.   Introduction

Aim: to describe the aims of the discussion and act as 'warm up' for participants
-    Describe the aims of the study and purpose of the interview
-    Introduction from interviewee
-    Current role, length of time in role
-    What current role involves

2.   Current challenges for National Libraries in 'small smart countries' (SSCs)

Aim: to establish perceptions of current challenges for national libraries in small smart countries.
-    What are the current challenges facing national libraries
-    How are these challenges affecting national libraries currently
-    Awareness of how national libraries are addressing these challenges
-    Advice on best ways for national libraries to address these challenges
-    What is the biggest current opportunity for national libraries

3.   The next 20 years: Challenges and Opportunities for National Libraries in SSCs

Aim: to understand what influential thinkers see as challenges and opportunities in 20 years' time
-    (*UNPROMPTED*) What are the challenges for national libraries in 20 years' time
-    How will national libraries in SSCs respond to these challenges
-    What effect will these challenges have on services, buildings, skills and collaboration
-    To what extent will the following be challenges in 20 years' time:

NOTE: For each, establish how libraries in SSCs will respond and, where relevant, the effect on services, buildings, skills and collaboration

   o Innovation in digital information services e.g. Web 2.0 / 3.0
   o Changes in customer demography e.g. older Scottish population
   o Changes in customer learning needs e.g. genealogy
   o Changes in customer behaviour and expectations e.g. digital vs physical access
   o Changes in customer access to technology e.g. user-friendly resources
   o Competition from other information sources e.g. Google
   o Organisational change within national libraries e.g. Mgt structure, ageing workforce
   o Legal demands: development of Intellectual Property law

- o Political change: the availability of public funds. Policy towards national libraries

4. Final thoughts: Main Challenges & Opportunities for National Libraries in SSCs

- Thoughts on the single biggest threat facing national libraries in 'small smart countries' in 20 years' time
- Thoughts on the single biggest opportunity facing national libraries in 'small smart countries' in 20 years' time

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