Digital library infrastructure in Finland – political decisions empowering development

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Abstract

This paper presents an overview of effects of recent political decisions on the higher education network as well as the research environment in Finland and in particular describes their impact on digital library services. The driving force behind the government decisions and actions aim to strengthen internationally competitive research and innovation in the country. The change of the legal status of universities and restructuring the higher education network, the realization of Research Infrastructure Survey and Roadmap and the launch of the Finnish Digital Library project are the main actions affecting the development of library services. Particularly in light of the current global economic situation the need for national infrastructures which can be applied at institutional level becomes vital. The cooperation between Finnish libraries and the National Library of Finland is advanced but in the emergence of new digital services there are opportunities for collaborations outside the previous sphere to encompass new partners.

Introduction

The Finnish government defines internationally competitive research and innovation as being the key success factors for society in the long run. Many decisions have been taken, strategies prepared, and projects launched to achieve this aim. This article describes a couple of current projects, which have relevance to the development of library infrastructure.

The government has decided that the higher education network in Finland has to be restructured. A project to develop the network was launched in 2007, and as a consequence, the network is changing. The legal status of universities will change in 2010, and consequently, the universities will become more autonomous than they are now, and economic freedom will increase. At the same time, the higher education network will reduce in size. There have already been some mergers of universities and polytechnics, and more will take place in 2010 and 2011. The aim of these structural changes is to increase the international competitiveness of the Finnish research and improve the quality of research and education. The legal and structural changes also affect library services, and the process of the division of work between libraries and national service providers has to be improved.

The national research infrastructure survey was carried out for the first time in Finland in 2008. As a result, 24 significant national-level infrastructures were identified and 20 proposals were accepted for the roadmap of new needs. Research infrastructure policy will be developed in the future, and it will be linked to national innovation strategy. The emphasis for the development of research infrastructure is on facilitating research of international standards in Finland.

The IT environment of libraries, archives, and museums in Finland is in developing stages. The Finnish Digital Library programme, consisting of two main projects, was launched during 2008 and will run till May 2011. The aim of the initiative is to develop an efficient service for access to digital resources in libraries, archives, and museums, and to develop specifications and recommendations for a national digital long-term preservation system.

The National Library of Finland has been a service centre for libraries since 2006. The library is an active player in all the national projects mentioned above.

Structural changes in the higher education network and their impact on the centralized library IT services

The legal status of universities will change in 2010. The universities will gain more autonomy, and economic freedom and steering by the Ministry of Education will decrease. The major part of the funding for the universities will still come from the Ministry of Education, but the universities will be encouraged to seek additional funding.

For historical reasons, there are as many as 50 institutions of higher education in Finland, a relatively large number for a country with a population of only five million. According to the plan and the recommendations of the Ministry of Education, there will be about 15 universities and 18 polytechnics by 2020. Mergers of higher educational institutions have already started, and more will take place in the coming years. One of the most discussed mergers is the formation of the Aalto University (http://www.aaltoyliopisto.info/en/) in which three universities covering very different disciplines will merge in 2010 (Helsinki University of Technology, Helsinki School of Economics, and the University of Art and Design Helsinki). The driving force in the merger is the idea of encouraging

innovation and new thinking by bringing together education and research in the technical sciences, economics, and art and design.

The Ministry of Education has launched a project to investigate the ways in which the organizational changes taking place at institutions of higher education will affect the libraries. The project will also aim at achieving cost reductions at the library level by strengthening the position of the national library as a central service provider. When planning new services, an appropriate and efficient division of responsibilities among libraries and the National Library will be a top priority.

Digitalization of the working environment of researchers, teachers, and students has been identified as the main issue influencing the development of library services in the next decade. Increasingly, more digital resources will be available through licensing, open access publishing, increasing the availability of e-books, and digitalization on a global level. Research and learning environments are developing, new infrastructure to support learning and research will be created, and easy access to digital content is demanded. It will be very important to be able to provide relevant content for the user at the right phase of the work process and in the right working environment. One of the major drawbacks in the development of the digital working environment is the copyright law. Masses of digitized content are not available to users because of legal restrictions. The needs for research and education should be integrated in the law in the future.

The importance of digital object management systems, digital preservation systems, and systems for easy discovery and delivery of digital content will become fundamental. In a small country like Finland, the only way to produce high quality infrastructure is to do develop it centrally.

Research infrastructure survey and roadmap

In 2008, the Finnish Ministry of Education coordinated a project to identify current national-level research infrastructure and develop a roadmap for new needs. Research infrastructure is the resource for research facilities, equipment, materials and services, permitting research and development at different stages of innovation, supporting organized research, and maintaining and developing research capacity (National Level 2008). Similar work has been carried out in Europe. In 2006, ESFRI, or the European Strategy Forum on Research Infrastructure, published its plan, the so-called roadmap, on the need to construct and update research infrastructure at the European level.

The Steering Group of the Finnish project listed 24 projects out of 184 as significant national-level infrastructures in Finland. One of these is the National Electronic Library (FinELib), which is a joint activity performed by the Finnish libraries and the National Library.

For the roadmap for new research infrastructure, 116 proposals were received from which 20 were selected for the roadmap. System Architecture for Memory Institutions, a proposal representing Finnish libraries, museums, and archives, was one of the accepted proposals.

According to the preliminary estimate provided by the mapping, Finland spends approximately 130 million euros per year in public appropriations for the upkeep of national infrastructure. The construction costs of the projects chosen for the roadmap will be approximately 230 million euros over the period 2008–20, with annual costs for Finland of approximately 30 million euros. Finland needs a centralized funding system for renewing the existing research infrastructure and for funding new projects at the national level.

The centralized funding system should also take into account the need to manage research infrastructure policy and make long-term international commitments.

The National Electronic Library, FinELib – a significant national research infrastructure

The National Electronic Library, FinELib, is a national consortium, which supports research and academics in Finland by promoting the availability of high-quality information and its use in society (Figure 1). FinELib acquires most of the electronic resources in Finnish libraries (Hormia-Poutanen 2002b, 2003). The resources available include approximately 20 000 electronic journals and 300 000 e-books plus approximately 130 databases which attract tens of millions of information searches every year (Table 1). The members of the consortium are all Finnish universities, polytechnics, public libraries, and a large number of research institutes.

The acquisitions, which are made through FinELib, cover over 80% of the acquisitions of electronic resources at Finnish universities. Thus, FinELib has a key role in providing electronic materials for the user population of universities. According to user surveys and usage information, the selection of resources meets the needs of the users well. Over the years, FinELib has been operating and showing a growing trend in usage (Hormia-Poutanen 2007). FinELib has been very active in international cooperation related to the development of cost division models, sharing experiences, and giving consultations (Hormia-Poutanen 2006).

The main principles guiding the management of the consortium have been defined in the Memorandum of Understanding. FinELib has a service agreement policy, which covers two main services, namely the licensing of e-resources and the maintenance of the national portal. These service agreements define the responsibilities of the national library and the customer.

The programme is managed through three working groups. The high-level steering group is responsible for policy-making, strategic planning, drawing up the annual plan of action, and evaluating the results. The group consists of top-level management from the universities, polytechnics, research institutes and the assicuated libraries, the public libraries, the Ministry of Education, and the end-users. The consortium group is responsible for more practical issues and consists of library directors from the four library sectors. The expertise of the various fields of science as well as technology issues and the interests of end-users are represented
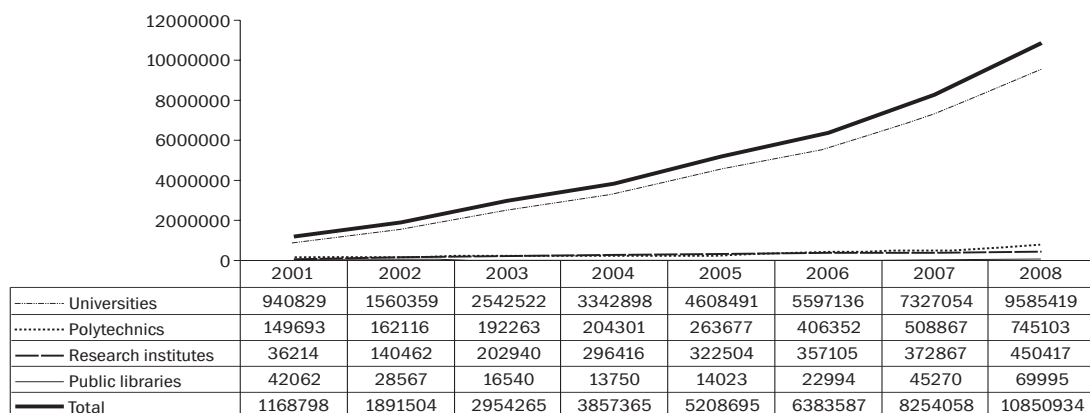
	2001	2002	2003	2004	2005	2006	2007	2008
Universities	940829	1560359	2542522	3342898	4608491	5597136	7327054	9585419
Polytechnics	149693	162116	192263	204301	263677	406352	508867	745103
Research institutes	36214	140462	202940	296416	322504	357105	372867	450417
Public libraries	42062	28567	16540	13750	14023	22994	45270	69995
Total	1168798	1891504	2954265	3857365	5208695	6383587	8254058	10850934

Figure 1 The trend of downloaded articles in the FinELib consortium

Table 1 Central services for libraries provided by the National Library

Service	Indicators 2008
Access to high-quality information	20 000 e-journals available
National licensing – FinELib	300 000 e-books
	11 million article downloads
National databases	Access to National databases: 10 million searches
Library system development (Voyager)	All universities and polytechnics use Voyager
Portal Development (MetaLib & SFX)	All universities, polytechnics and public libraries use MetaLib and SFX.
Digital Object management system development (Dspace)	All polytechnics and a few universities use Dspace.
Library statistics (KITT)	All universities, polytechnics and several special libraries
National library surveys	All library sectors
Projects	
Finnish Digital Library: Public interface	
Structural changes in the libraries of the higher education network	
Projects related to institutional repositories and open access	

in the expert groups. Their main task is to submit proposals for resources to be licensed in the future and to develop Nelli-portal services at the organizational level. The programme was evaluated in 2003 (Varis and Saari 2003).

Although the final decision has to be taken by the National Library, this three-tier organization guarantees that all consortium members can make their voices heard and influence the decision.

In 2009, FinELib is a well-known and highly valued national research infrastructure. The level of government funding is 4 million euros and the funding is directed towards the acquisition of high-quality electronic resources as well as the development of the national portal. The funding also includes additional costs, such as staff and staff development costs. The estimated total turnover in 2008 was over 16 million euros, consisting of central funding and the organization's own funding.

The Finnish Digital Library – chosen for the research infrastructure roadmap

System architecture for memory organizations was chosen for the roadmap of needed research infrastructures. The Finnish Digital Library forms the main part of the concept. The Finnish Digital Library initiative was launched as part of the Finnish Information Society strategy for 2007–2015. The aim of the initiative is to develop an efficient service for access to digital resources in libraries, archives and museums and to develop specifications and recommendations for a national digital long-term preservation system. The initiative is a very ambitious one. The participating

organizations range from different kinds of libraries to art museums, science museums, audiovisual archives and other archives. Altogether, there are 35 organizations represented in the programme. The IT infrastructure of libraries, museums and archives will be undergoing a major change due to the initiative. The aim is to improve the efficiency of processes, save costs in digitalization, improve access to information and preserve content in the long term for use in education, research and innovation for the benefit of the country.

The Finnish Digital Library project consists of two subprojects, namely the public interface and digital preservation project. The challenges in these two subprojects are different. In developing the digital long-term preservation system, the technical challenges are huge. It is not possible to choose from among a large variety of software. At the moment, the National Library of the Netherlands runs a digital preservation system and the National Library of New Zealand is developing one in cooperation with ExLibris and an international group of experts. In addition, many national libraries have chosen to develop their own digital preservation systems. The experience gained in these projects will be used in the Finnish project.

The challenges of the public interface project are more political or human than technical in nature. Questions such as 'Who is the user' and 'What are the needs of users?', 'What content can be accessed?', 'What is the added value of the new system compared with current systems?' have to be answered.

The needs of users and, particularly, the entrance of the 'Google generation' into universities and other institutions are exerting a powerful influence on the development of library services. The information behaviour of the researcher of the future is described in an interesting and thought-provoking report commissioned by the British Library and JISC

(Information Behaviour 2008). Developments in standardisation and IT technology provide libraries and other memory institutions with new tools to react to the new demands. Current library services or the services at museums or archives do not satisfactorily meet end-users' needs because, for example, they are considered too complicated and difficult to integrate into working environments. Additionally, the services do not support the consortia's solutions and divisions of labour.

One of the basic ideas in the development of the public interface is to separate the user interface from the back-end systems. Separating the user interface from back-end systems shifts the developmental focus from libraries to end-user needs. Back-end systems are, for example, library catalogues and other catalogues, institutional repositories, digital preservation systems, learning environments. In the current model, back-end systems also include interface functionality and the needs of end-users and librarians will have to be taken into account (Hormia-Poutanen 2008).

The public interface project will run from 2008 until May 2011 and by then a service for a large group of memory organizations should be up and running. The year 2009 is dedicated to the definition of the functional and technical specifications, preparation of the documentation for a tender and organizing the tender. In 2010, a pilot to test the software(s) will be organized. The National Library of Finland is responsible for the coordination of the public interface project.

The architecture is described in Figure 2.

Background to the current situation

The role of the National Library as a service provider is becoming stronger. New responsibilities, especially related to digital library tasks, are being given to the library. There is a long history behind this
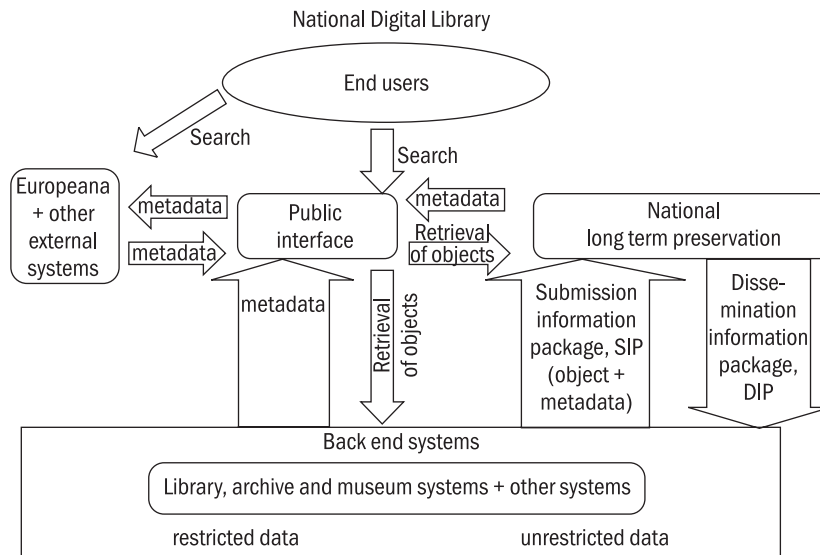
National Digital Library

End users

Search

Search

Europeana + other external systems

metadata

metadata

Public interface

metadata

Retrieval of objects

National long term preservation

metadata

Retrieval of objects

Submission information package, SIP (object + metadata)

Disse- mination information package, DIP

Back end systems

Library, archive and museum systems + other systems

restricted data   unrestricted data

Figure 2 Information architecture for memory organizations

development. The role of the library has grown over the last couple of decades, but the tradition of cooperation among libraries forms an important background to this development.

The Finnish Library Network— cooperation as a working model

The tradition of cooperation among libraries has been an important factor in the development of library services in Finland; the university libraries in particular have a long history of cooperation. One very concrete expression of this cooperation is the shared library system that all Finnish university libraries have been using since the early 1990s. The first integrated library system was called VTLS, but today all university and polytechnic libraries use the Voyager system.

The National Library of Finland's development of national services for libraries has increased the need to improve the coordination and management of each library sector. For the libraries and the National Library it is essential that national service-related negotiations be organized in a timesaving and practical way that avoids repetitive duplication.

University libraries have been organizing cooperation between the libraries in the network for over ten years. The Council of University Libraries <http:// www.nationallibrary.fi/libraries/ council.html>, formed in 1996, is a cooperative body that promotes common activities and supervises the libraries' interests. The Council monitors developments within the library sector, creates new initiatives and improves cooperation among libraries as well as between libraries and third parties.

Cooperation among the polytechnic and research institute libraries, as well as public libraries, has been organized more recently and can be seen as a response to the demands of the changing operational environment. The forums coordinating activities within the university, special library and public library sectors are called councils, while the polytechnic libraries have formed the AMKIT

consortium. The management groups of the councils and the AMKIT consortium act as negotiation partners for the National Library (Hormia-Poutanen 2002a).

There are three different types of library consortium in Finland. The Linnea consortium <http://www.lib.helsinki.fi/linnea2/konsortio/index_eng.htm> was formed to handle matters related to the library system at universities and at several special libraries (Jauhiainen 2000, 2004). The licensing of electronic resources and development and coordination of the national information retrieval portal, Nelli, are handled by the FinELib consortium <http://www.nationallibrary.fi/libraries/finelib/>. Universities, polytechnics, research institutes and public libraries are members of the FinELib consortium. The Linnea and FinELib consortia were formed to develop certain digital library services. The third consortium, AMKIT <http://www.amkit.fi>, was formed to process all issues related to the development of polytechnic libraries (Hormia-Poutanen 2002a).

The organization of the Finnish library network is exceptional by international standards. Each library sector can handle questions related to the entire sector, and the councils' management groups are authorised to represent the whole sector in negotiations. There is a growing need for cross-sectoral cooperation and exchange of expertise among the different disciplines.

IT centre for research, the National Library and libraries working in partnership

The Ministry of Education administers CSC <http://www.csc.fi/>, the Finnish IT Centre for Science. CSC is a non-profit company providing IT support and resources for academia. CSC provides Finland's widest selection of scientific software and databases, Finland's most powerful supercomputing

environment and a very advanced research network, Funet.

The National Library of Finland became a service centre for university, polytechnic, public and special libraries in 2006. The new role was formalized in the University Act which emphasises the importance of the library's national responsibilities. The main task of the service centre is to improve public access to information (Hormia-Poutanen 2005). The Ministry of Education provides central funding to cover the costs of staff and to some extent also software and licences. The amount of central funding is approximately 5.5 million euros annually. The services currently provided by the National Library for the library network are described in more detail in Table 1.

In 2008, the Ministry of Education sent out a clear message – the role of the National Library as a service provider should be further strengthened.

For academia, the CSC and the National Library are two particularly important major service centres. These two organisations have a long tradition of cooperation, particularly regarding library hardware maintenance. The cooperation has resulted in significant centralisation of servers running library software (Table 2). Perhaps the most important end result has been the very clear division of work between the CSC, the National Library and the individual libraries (Figure 3).

The CSC also plays an important role in the Finnish Digital Library project.

Figure 3 Division of labour between the IT center for research, the national library and libraries

Table 2 Steps taken to centralise library system hardware maintenance in Finland

Year	Systems involved	Level of cooperation and centralisation	Funding
1989–1993	VTLS library system implemented for universities, Parliament, Statistics Finland and the Repository Library	22 organizations implemented the same system, VTLS 17 servers	Central funding from the Ministry of Education
2001	Voyager library system purchased implemented for Linnea2 consortium (universities and major special libraries)	27 organizations purchased the same system, Voyager 1 server	Own funding from the participating organizations
2002–2004	Voyager library system implemented for polytechnic consortium	57 organisations using Voyager 2 servers	Central funding from the Ministry of Education
2005-2007	MetaLib and SFX implemented for universities, polytechnics, public libraries	68 organizations purchased the same system 3 servers altogether (Voyager + MetaLib)	Central funding from the Ministry of Education
2007	Centralized server solutions to run Voyager and MetaLib + SFX software.	1 server (SUN M9000) for universities, polytechnics, public libraries.	Central funding from the Ministry of Education

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