Co-Operation Models to Ensure the Preservation of Digital Heritage: The Case of Estonia

Leeni Langebraun (National Archives of Estonia [1])
Raivo Ruusalepp (Estonian Business Archives[2] Consultancy, plc.)

1. Digital Preservation – A Shared Responsibility

Digital resources are created, managed and retained in practically all organisations today and digital preservation is a common challenge and responsibility to all of them. Many institutions and individuals participate in the creation of digital cultural heritage resources while the responsibility of preserving and making them accessible rests in a country usually with only a handful of memory institutions. Despite the fact that digital preservation is, on operational and technological level, similar for all digital objects in any institution, different stakeholders have different requirements for the ingest, authenticity, preservation processing, data protection, IPR and access regulations to the preserved resources. Numerous guidelines and recommendations for digital preservation have been published by institutions in various cultural heritage related domains. It is often difficult for an individual organisation to identify the 'correct' strategy and to meet the internationally accepted best practice requirements when managing and preserving its digital collections. Finding a solution to digital preservation requirements of each memory organisation individually is resource and time consuming. Instead, a collaborative effort should be made to first achieve common standards and then build shared preservation solutions on them.

2. Estonia – A Small e-Country

Estonia is a small country spending considerable effort to develop e-services for its 1.3 million citizens and 61 thousand businesses. Despite the reputedly advanced level of e-governance, the history of using computers in public administration and business is not very long – only since about 1990 which coincided with building up the administrative systems for newly independent Estonia. Although the tradition of using computers is not very long, it has been an essential part of the 'new way and doing things ourselves in our country' for the last fifteen years.

The high usage levels of Internet and mobile phones in Estonia contribute to achieving the critical mass of users to make the development of e-services sustainable.[3] E-services are provided by both the public and private sectors, particularly successful e-services are electronic tax declarations (78% of Estonian taxpayers used electronic declarations for the 2004 income tax returns) and Internet banking (95% of bank operations are electronic, the number of Internet bank users is nearing 800,000).

The co-ordination and development of state information systems is the responsibility of the Ministry of Economic Affairs and Communications. The most significant nation-wide IT development projects are the ID card with digital signature and the X-road communication system.[4]

---

[1] see http://www.ra.ee and http://www.eha.ee
[2] see http://www.eba.ee
[3] for figures and statistics see http://www.riso.ee/en/coordination/statistics
[4] for more information on the development of the information society and innovation system in Estonia see http://www.esis.ee

ID Card

The national ID card project was initiated in 1998 when a smartcard was introduced with two functions: it can be used to identify the person and to give digital signatures. In Estonia, the ID card contains only information required to identify the person, all other information would be managed by different information systems that the e-services are based on. The concept of the ID card and the software (*DigiDoc*) for giving digital signatures has been developed by Estonian specialists.[5] The ID card is mandatory personal identification document in Estonia and by the end of July 2005 807641 ID cards had been issued, or approximately 56% of the population.

One of the recent ID card based services launched in Estonia is the e-ticket for public transport in Tallinn and Tartu. Accessing various e-services via the eCitizen portal requires authorisation either with the ID card or Internet bank authentication system. The ID card is used more often for identification and authentication, like for example checking your school exam results, than for signing digital documents when communicating with public authorities. In October 2005, Estonians will be for the first time able to use e-voting system with their ID cards in local elections.

Data Exchange Layer X-Road

Over the past decade many state registries and databases have been set up to serve individual institutions. E-services are often based on information from several databases that need to be interoperable. The X-Road project[6] is a secure web-based data exchange layer that provides access to the data in state registry databases through a unified interface. In Spring 2005 the X-road system connected 41 databases that provide e-services, 354 institutions and companies that use the e-services and offered 687 different e-services.

Cultural Heritage Sector

For the cultural heritage sector the rapid changes of the 1990s in the administrative system resulted in a mixture of institutions that are in different subordination and do not always fall under the same legislation. The Ministry of Culture is co-ordinating the work of libraries, museums, broadcasting and the national heritage; the Ministry of Education and Science governs universities and research institutions; responsibility for records management and archiving is shared between the State Chancellery and the National Archives of Estonia. Currently only the National Library and National Archives have a legal obligation to collect and preserve digital materials. Attempts to deal with an increasing volume of digital cultural heritage material are also made by museums, research institutes, in the National Heritage Board and other stakeholders.

Many institutions have been postponing finding a comprehensive solution to their digital data management and preservation needs due to poor knowledge of general digital preservation issues, increasingly cheaper computer storage, and the absence of clear quality criteria and data management requirements. The default, implicit expectation has been that solutions for long-term digital preservation will be developed by the National Archives and the National Library. These national level institutions have taken a lead in developing common solutions to the whole cultural heritage sector. Instead of simply becoming service providers, the collaboration started on strategic level.

---

[5] see http://www.id.ee
[6] see http://www.ria.ee/atp/?id=1037

3. National Strategies

The first provisions for setting up a digital archive within the National Archives were made in the national strategic development plan for records management and archiving (2001-2005). Based on this strategy, the first analysis of requirements of record creating agencies and needs of the National Archives was conducted. As a result legal acts were amended with transfer requirements of electronic records to the National Archives. The strategy of the National Library aimed at the same time to set up services for collecting and preserving electronic publications. A workgroup at the Ministry of Culture prepared the document 'Knowledge-based Estonia. Estonian Strategy for Research and Development 2002–2006'.[7]

The scope of strategic planning was widened considerably when in 2003 a working group at the Ministry of Culture began working on the national strategy for the digital preservation of cultural heritage. The working group included representatives from all sectors of cultural heritage, academic research and science institutions. The resulting strategy was informed by international developments, especially the Minerva project, and besides explaining the crucial aspects of creating, collecting, describing, preserving and using digital resources, it sets an action plan for the priority development areas. The action plan of the strategy has today received specialised funding for promotion of digital preservation, digitisation and access to digital cultural heritage, as well as training activities. Centres of excellence are being established to help the memory institutions in achieving and implementing common standards for the digitisation and description of cultural heritage.

Earlier this year, the National Archives finished working on the national digital archiving strategy that determines priority areas for development in record-creating agencies and for setting up a digital archive system at the National Archives. A concept for National Archives partnerships for developing the digital archive was conceptualised in the strategy. The public discussion of the strategy confirmed that interest in digital archiving is increasing in all sectors and that the requirements for preservation are becoming clearer and better defined.

Publication of these strategies and the open debate around them has sent a clear message to the IT governing bodies in the country and issues of electronic records management, digital preservation of records and cultural heritage materials are now firmly part of the 'Principles of the Estonian Information Policy 2004–2006' document.[8] Further steps towards introduction of cultural heritage and digital preservation issues into official e-governance strategies were the 'Estonian IT Architecture' and the 'State IT Interoperability Framework' documents that now include sections on electronic records management and digital archiving.

4. Implementing the strategies

Developing national strategies is important for ensuring the collaboration of different institutions in an area where there would otherwise be little contact between organisations. However, when strategies proliferate, organisations will begin choosing and selecting which ones to follow and try to interpret the strategic aims in their own best interest. The key question is how can the strategies be put into practice over the years and keep the co-operation alive and maintain organisations' interest in achieving common solutions. The small size of Estonia has helped in implementation of strategies since the same institutions and often the same people are discussing the strategic issues and participating in the development work. While this ensures the continuity of projects, it may also have

---

[7] see http://www.hm.ee/uus/hm/client/download.php?id=847
[8] see http://www.riso.ee/en/files/Policy.pdf

some limiting aspects like a modest degree of innovation and openness to new solutions. Estonians are well known for doing things by themselves, rather than asking for advice from their neighbours. It seems that such self-made-man strategy could somewhat be a weak point in achieving aims. Development of complicated areas is more reasonable through international co-operation.

The Estonian solution for continuing collaboration when implementing the strategies is the common standards that different organisations have an interest in. Many stakeholders are willing and happy to participate in the development of, for example, quality criteria for digitisation of textual heritage resources or defining elements for public records or specifying metadata for digital sound recordings, when they later have to comply with these. As a first step of implementing the national strategies, significant effort has been invested into developing common standards for memory institutions. These standards fall broadly into two categories, but a conscious effort is made to keep them interoperable.

Standards for the creation of digital resources:
- common guidelines for electronic records management;
- standardisation of elements of public records and their formatting;
- standard functional requirements for the electronic records management systems;
- standardised guidelines for the digitisation of cultural heritage material (based on the best practice of the Minerva project).

These standards aim to establish a common set of quality criteria for the creation of digital cultural heritage resources – whether born digital or digitised – to ensure that the resources can be preserved digitally. The considerable investment made to create these resources should not be wasted on creation of material that cannot be preserved or will be very expensive to preserve and provide access to in the future.

Standards for the description of digital resources:
- standard metadata for digital cultural heritage resources, in four parts: metadata for the digitisation process, administrative, technical and access control metadata;
- translation of ISO standards on records management and metadata;
- work on development of a metadata model for electronic records management;
- development of digital preservation metadata for datasets.

Digital cultural heritage resources are created in a multitude of institutions with their domain-specific aims. The preservation of these digital resources will only be possible if a common set of descriptive information is available about them. The aim of the various metadata standards is to create an interoperable set of description that would make the preservation of digital resources possible and their use meaningful.

Developing and establishing standards for the creation and description of electronic resources have been well timed since the digitisation of cultural heritage material has not reached its peak in Estonia yet. Another major issue for the creators and users of digital cultural heritage resources is preservation. A number of developments for common digital preservation infrastructure have been started, taking into account the developed standards:
- the development of the digital archive system at the National Archives, based on the national digital archiving strategy;
- setting up a digital repository system DIGAR at the National Library;
- guidelines for the public sector for the preservation of digital material, published by the National Archives;

- the national strategy for the digital preservation of cultural heritage materials also includes plans for common digital storage infrastructure for all memory institutions and a feasibility study for this will be undertaken next year;
- feasibility studies for a common access gateway for all digital cultural heritage material.

Collaborative effort to develop standards, guidelines and best practice as part of the work towards achieving the aims of national strategies has been a success in Estonia.

5. The future with e-services

In the rapidly developing world of information technology standards tend to last not very long. Software and technology developers are not often thinking in decades and centuries – the preservation of digital resources for these kinds of time periods has been left to archives, libraries and other memory institutions to 'figure out'. Having established criteria and standards for the creation and description of static digital resources solves many problems of today, but leaves many preservation questions for dynamic digital resources unanswered. The e-services that we are all keen to use are mostly based on dynamic technology environments that require a different level of standards and criteria to capture, describe, preserve and make them accessible again for future generations.

In Estonia the digital signatures that are linked to everyone's ID card are the main means of authenticating yourself in the integrated business information systems and registry databases that offer seamless e-services by communicating via the X-Road technology. These e-services already have components where what would be considered a historical record is created by a computer-to-computer transaction without any human interference. The ever-increasing automation of administrative and 'back-office' procedures requires new standards to ensure that the necessary processes and transactions are recorded, protected, described, appraised, captured, and preserved. Even if it is clear to many involved that the information created by a system will outlive the system itself, the rapid pace of developing the e-services and the business needs leave little time for developing standards and archival long-term retention, authenticity and security concerns.

In Estonia, all e-services development has recently been taken under the control of a co-ordinating body and thanks to archival and records management issues being included in the national e-governance development strategies. There is hope that at least some of the long-term retention concerns will be taken into account in the future.

There is now a fairly active collaboration between the records management and archives co-ordinating bodies, cultural heritage co-ordinators and the institutions overseeing the development of information systems in the public sector. An early lesson learned by archives in this dialogue is that the demands on technology skills and knowledge of an archivist have risen considerably.

6. Conclusions

Taking the top-down approach to begin solving stepwise the issues of preservation of digital cultural heritage resources has been successful in Estonia. First, the national level strategies were developed, then domain-specific and institutional strategies, and then common standards were established for achieving the strategic aims. The collaborative effort in developing strategies and standards has generated wider discussions of digital cultural heritage issues, has given an opportunity to practically all stakeholders to participate, has been mutually instructive and has spurred further co-operation between institutions involved. For example, digitisation services are now shared – the National

Archives microfilm scanner is being used in two largest digitalisation projects in Estonia: project 'Saaga' at the Historical Archives digitising family history records and at the National Library and the Literary Museum project Digitised Estonian Newspapers (DEA).[9]

The top-down approach has also helped to cut costs, save resources and effort, and reach the set goals quicker. In a small country with limited funding opportunities, all stakeholders should see the larger picture than just their own institutional needs and understand that there is strength in doing things together.

The collaborative effort for establishing common standards and criteria is necessary in areas where one or two institutions alone cannot solve the outstanding issues. In the Estonian national strategies, these areas were identified as the creation, description and preservation of digital cultural heritage resources. Efforts of one institution or even an agreement between two or three memory institutions will not be enough to ensure the long-term preservation and access provision to these digital resources. Quality criteria for the creation and descriptive standards are necessary components of digital preservation that also need to be established through co-operation and at an early stage of creating the digital heritage resources. It has been relatively easy to get the memory institutions around the same table and to agree on standards. The next challenge is to involve the people who design and develop information technology solutions for institutions that create digital resources. First successful steps in this direction have been taken in Estonia and the lesson learned is that memory institutions need to be more technology-aware and quicken up their pace of standards development.

---

[9] see http://www.eha.ee/saaga and http://dea.nlib.ee

Figure 1. Model of collaboration between stakeholders in digital cultural heritage