Introduction

The only thing that is constant is change. Why would we think that archives were immune? Eleven years ago, when the expert group wrote its major report on Archives in the EU, the main focus of digital archiving was authenticity and the novelty of separating the content of the record from its medium. Although impressive progress has been made over the last decade our working environment has changed dramatically. Ten years ago nobody imagined that email might soon become an obsolete way of communicating, or that more powerful mobile devices would be replacing desktop computers. Big Data, cloud computing, machine learning, the Internet of Everything – each shift in technological capability brings a fundamental change in the way people communicate and how we use information. These trends inevitably have an enormous impact on archives.

Given the close connections between e-government, the Digital Single Market and the work of the national archives, the European Archives Group has identified Digital Archiving as a top priority. This report is intended to provide a high level review of the state of e-Archiving in EU public archives. It sets out an overview of the achievements, current standing, ongoing projects and other activities taking place in national archives. It draws attention to the ‘burning platforms’, the big issues and challenges in the field. This paper also reports the conclusions and recommendations following the DLM meeting in Oslo this November. Based on this this document specifies actions to be considered by the European Archives Group.

Chapter by countries

In Bulgaria the electronic government development is among the main priorities. In the E-Government Development Strategy 2014-2020 are specified the fields for which sector strategies should be drawn up and one of them is "archives and records archiving". The e-archiving development and implementation are scheduled to start in 2017 and the responsible institutions are the Electronic Government State Agency and the Archives State Agency. The legislation stipulates that together these two institutions should prepare Regulation on the order and conditions for the preservation, storage, access and use of valuable digital records in the state archives as well as the rules regarding archiving the digital records. The creation of a unified legal and methodological framework necessary for the e-government implementation in the field of digital records and digital archiving, the development and the implementation of an e-archiving are set as goals in the Archives State Agency Strategy 2016-2020. This will provide mechanisms for creation of a digital archiving system and legal regulation of the processes of organization, appraisal, preservation and use of digital records in the state and municipal institutions as well as of transfer, preservation, storage and use of valuable digital records in the state archives.

Archives State Agency (ASA) has a long-term strategy in digitization. Since 2008 the Agency has been building digital archive in accordance with the methodological framework and institutional requirements consistent with the modern requirements and the best practices in the field of archival records digitization. Since the beginning of 2014 this has been carried out entirely online through web-based software that is a part of the Bulgarian Archives Information System (BAIS). The digital archives database in BAIS is dynamic and includes high-quality digital copies (digital master objects) of archival records preserved in ASA and their relevant metadata. The entire process of digitization of the archival records is managed by BAIS. The digital copies from the digital archives database are available directly through the public part of the system for all external users. ASA participates in the APEX Portal by the digital archives database in the public part of BAIS. Currently the content of the digital
archives database in BAIS is: 63330 digital objects (digitized archival records) and the relevant metadata; 206900 digital images; approx. 11 TB content.

Several ongoing projects contribute to Digital Archiving in Belgium. Research project HECTOR (2014-2018) aims to develop the necessary guidelines for the management and preservation of hybrid records in Belgian federal administration (partnership: State Archives, University of Namur, Université Libre de Bruxelles, Université de Montréal). By mid 2018 it is going to make publications of open and restricted access content regarding advice concerning the transition from analogic archives towards digital archives. E-TRANSFER develops State Archives’ procedures for the digital transfers to create new procedures, guidelines, practical instructions of federal archives with 2018 deadline. DIGITAL ACT establishes new legal framework regarding digital transition (digitization) and digital archiving following the E-IDAS regulation. The law and its implementation decrees have been in effect since July 2016. E-ARCHIVING project aims to provide a collaborative platform for archiving the digital documents/data during their intermediary period. By next year “Archiving-as-a-Service” solution to be insert in the general G-Cloud Services. Long-Term Preservation (LTP-BELSPO) preservation aims to guarantee data preservation, readability and intelligibility for long term. Conservation on a system as permanent as possible. DocSafe project has provided Inter-university certificates in the field of management of digital information since 2013. These multidisciplinary trainings take into account the evolution of technology and the legal constraints as well. Development of Piraeus tool contributes to the preservation for ‘digital born data’ with controlling, validating and archiving of digital born data. Project to be confirmed PROMISE (2017-2019) is intended to be a federal research project on how to archive the web-based information (a.o. with the Royal Library of Belgium).

It is challenging to find a balance between a traditional education and more innovative skills usually related to IT. Keeping up with fast-evolving technologies is also a struggle which becomes more challenging when combined with a very limited budget and project-based financing. Not only these factors make the business continuity almost impossible, but also guaranteeing the very long term and accurate access to data through a full documentation in the form of metadata taking into account the versatility of supports, formats, systems and so on. Moreover, convincing the federal authorities that digital archiving is a fundamental part of the “e-administration” (and that it is not just simple storage) in order to invest in it does not make the situation easier for archives institutions.

In Denmark, the development of e-government services and solutions has been a priority for many years. All individuals and businesses have their own digital mailbox, and online self-service has been made mandatory for more than 100 administrative procedures. The newest e-government strategy is called “A stronger and more secure digital Denmark”, and it covers the years 2016-20. Among other things, it emphasizes the role of reusable public data as a driver for economic growth. It also underlines the need for at robust public infrastructure and that security and confidence must be in focus at all times.

The Danish National Archives has a complete framework for the managing of digital records in place, covering all phases of the life cycle of records management systems. It includes an initial notification of the National Archives on new it-systems, appraisal and approval of the it-systems, transfer of data an documents as a Submission Information Package (SIP), test, preservation and access to the archived born-digital records.

The vast majority of government records today are created and stored in various IT systems. In 2016, the Danish National Archives will ingest more than 40 terabytes of born digital records. The growing amounts of data as well as the increasing complexity of the preservation work has made international cooperation a priority for the Danish National Archives, which is an active participant in several projects and organizations, most notably the E-ARK-project.

In Estonia, digitally signed documents became the majority in public institutions some 5-7 years ago. Additionally public institutions were forbidden to send paper documents to each
other. Nowadays it is widespread that paper-based original letters or applications (whether coming from abroad or citizens) are immediately digitized and the paper original is either destroyed or returned to the person. This all means that the National Archives of Estonia (NAE) is on the edge of future massive inflow of digital records, as the new (2012) archives law states the 10-years-delivery-period of archival records. So far, most of the digital materials in NAE have been digital films and digitised paper records. Current ingests of digitally born records from a few institutions have been used for testing the existing software and procedures and have lead digital archivists to an understanding that requirements for transferring digital records to the NAE digital archives need to be simplified both in technical and intellectual terms. The local pre-ingest software (Universal Archiving Module) is being made compliant to the results of the E-ARK project and more emphasis is put on archiving from public registries and databases.

In **Finland**, National Archives of Finland (NAF) has made a strategic decision to enhance preservation in digital format. According to the new strategy, records which are in digital format should be preserved digitally. This has a significant impact for information which is in databases and registers. Previously that should have printed to paper, but now NAF can preserve those in digital structural format, which supports modern archives research purposes. NAF examines possibilities to dispose paper documents after digitization and preserve those in digital format. Long-Term preservation of digital cultural heritage is provided as a service from the of National Digital Library (NDL) service. NDL is a common initiative under Ministry of culture and education and it combines both usability and preservation from Archives, Museums and Library organizations in Finland. Ministry of Finance has SAPA-initiative to enhance public organizations ability to deliver both born digital and digitized records to archives custody. SAPA is expected to provide significant savings from preservation costs and to support cross boundaries interactions between organizations.

In **Hungary** the digital use of archives is rocketing, with new and popular services based exclusively on digitized materials. In 2013 NAH and Budapest City Archives established the Digital Archives on a shared infrastructure run by a third party organization. Then the county archives merged with the NAH so the new enlarged institution is working now on an integration project. It covers direct system connections to e-government, and shift to E-ARK compliance. The Hungarian Chamber of Civil Law Notaries and Open Society Archives have their own Digital Archives as well. Although all the conditions and the full workflow for digital archiving is available, only a limited number of digitally born records were transferred to the archives. New transfer regulation will be in effect in next January. It makes OAIS compliant transfer mandatory for all public bodies. The greatest challenges are the lack of trained archivists, limited legal influence on record management and the maintenance of increasingly expensive infrastructure.

The National Archives of **Ireland** is developing a pilot Public Service Records Management Plan. This plan will incorporate both paper and electronic records and as an initial step is undertaking a quantitative and qualitative survey of a government department to review Information systems, eRecords, file store holdings and information culture. This will feed into the requirements specification of a digital repository for the National Archives.

**Italy** has a comprehensive legislation on the creation, management and preservation of digital archives. The Agenzia per l’Italia Digitale (AgID), an agency that is directly under the authority of the Prime Minister’s Office, is in charge of coordinating the enforcement of the Italian Digital Agenda and of setting rules and standards in the field of digitalization. The Directorate General of Archives and the Central State Archives cooperate with AgID for the elaboration of such rules and standards.

A law (the Code for Digital Administration) set general rules on the production and preservation of digital documents. Rulings issued by AgID set more specific norms on the preservation of digital documents and information systems. Currently, the law dictates that
the Public Administration has to issue only digital invoices, stipulate digital contracts, and keep in digital form the register of documents (registri di protocollo).

AgID set the requirements that an entity should meet in order to qualify for the long-term preservation of legally valid digital archives, including the digital invoices, digital contracts and digital registers (registri di protocollo) produced by the Public Administration. So far, only a few public bodies, and a few dozen private bodies have been able to meet such standards and thus to qualify for the long-term preservation of legally valid digital archival documents. The Central State Archives (Archivio centrale dello Stato) is still in the process of setting up a digital preservation centre.

In **Lithuania** legal preconditions to move gradually from traditional written documents to electronic records were made in 2006. The main goals of the Law on Documents and Archives related to electronic documents management are the following: to ensure permanent and long-term (26-100 years) preservation of electronic documents and access to them; to determine order of their transfer to state archives; legitimate use of the Electronic Archive Information System (EAIS). The law also defines the concept of electronic document in Lithuania. The functionality requirements of electronic documents management system are defined in *Instruction on management of electronic documents* (2006, 2012). The compulsory (creation, registration etc) as well as possible functions are defined. These descriptions of the functions are grounded on approved specifications of electronic documents. The main parts of an electronic record are: content, metadata and electronic signature.

A special infrastructure has been created for the management of the state information resources. The Platform for the Interrelation of the State Information Resources (PISIR) is a state information system. The purpose of this system is to ensure the possibility for the people to receive public and administrative electronic services, provided by various institutions. The centralised service of the electronic document management within the PISIR infrastructure was created in 2015.

Besides paper documents and video or audio recordings, the national archives started accumulation of digital documents, i.e. digital born documents as well as the digitalised ones. The aim is to enable the Lithuanian archives to accept for storage not only documents (irrespective the way they had been produced), but also the information systems (state registers, state information systems etc) data which has the persistent (archival) value. Taking into consideration the progressive foreign practice, Lithuania seeks to revise and replace the existing legal regulation in order to enable the state archives to accumulate the diverse digital information. That would result in innovative service provision, access to the digital content and offering of document resources – different in their origin and form – to consumers.

In **Norway**, e-government services have been used for several years now and the landscape is in constant change. One inherent challenge, from the archival perspective, is that these changes are driven by IT-professionals. The National Archives of Norway, has several ongoing activities to align records management and archiving with the national e-government initiatives. The most important is participation in a national coordination board called Skate.

When it comes to public records management the situation is that over a couple of decades the National Archives of Norway has specified and maintained a national standard called Noark. Noark is standardizing transfer of records from the public sector’s general purpose records management systems into depot institutions. Several challenges are still present. One is, e.g., the need for process improvements when it comes to capture of records and Noark output generation, another challenge is the trend where public offices moves from using general purpose records management systems towards special purpose systems. Several projects are addressing these issues, e.g., a project called Mavod and a program called Samdok.

Over the last few years we have been running a strategic program called Samdok, where the National Archives of Norway has been cooperating with archival institutions from both the
private and municipal archival sector in Norway. Samdok defines each year a set of projects that usually lasts one year each. This cooperation has proven very fruitful. The same can be said about our participation in the EU project E-ARK. How to handle public registers and databases have been on top of our agenda in these project contexts. Here we look at both international approaches and improvements of our own local ones.

One of the main objectives in strategy of the state archives in Poland is to increase access to the archival resources. To ensure that, The National Digital Archive develops and maintains Integrated Archival Information System (database system known as ZoSIA), which is now being used in nearly half of the Polish state archives. By the end of 2017 the Integrated Archival Information System (ZoSIA) will be implemented in all state archives and will become the main archiving system in the network of the Polish state archives. ZoSIA system is strongly related with szukajwarchiwach.pl [search in the archives] on-line portal – web search and browser for state archives (and other cultural institutions) resources. Now there are over 21 millions scans on Search in the state archives. Portal is daily visited by 5000 users. At the same time, the state archives in Poland lead intense digitization program to ensure wide access to the archival resources.

Another priority of the Polish state archives is Digital Records Archive (ADE). By 2018 this system will provide archiving of digital records from ERMSs as well as continued access to records (searching and downloading) by citizens, administration and business. It is assumed that the electronic records as the archival records will be transferred to the ADE system within 10 years after their creation. Until then, electronic records should be stored in the archive of the creator. The Digital Records Archive will be maintained by the National Digital Archives, which is the archive dedicated for gathering digital records from all institutions in Poland.

The next step in the development of an information system on archival resources in Poland will be creating the connection between the system with general information about the traditional materials (ZoSIA) with the system containing electronic records and their metadata (ADE). This connection will result in an information system which allows to share all metadata related to all records created by one creator in one place regardless of whether they have a traditional or digital form.

In Romania, the process of e-government and digital archiving was triggered mostly by business needs and IT sector. The legal framework consists of Law for Digital Signature, Law for Timestamping (consistent with European regulation) and Law for Digital Archiving. In different branches of administration and in business sector the use of electronic records is a common practice, but rather scattered as approaches. However, professional digital archiving is an aspect not fully understood and applied, being treated almost exclusively as an IT matter. National Archives of Romania implemented a platform for hybrid management of records (scopeArchiv), but the extension with digital archiving module is planned to be made available in the next period of time. The institution was also involved in promoting a sound framework for digital records management and preservation, following the good practices in European Union and internationally, but many times professional perspectives are not the most relevant for the political decision takers. The most severe need is a lack of awareness and training for the greatest part of the inner staff, and this is an area where our institution would be the most interested in.

In Slovakia Slovak National Council passed Act No. 305/2013 Coll. on e-Government. The Act is laying down the basic principles upon which electronic public administration operates. The Act does not replace traditional ‘paper’ in the official agenda, but it creates a comprehensive electronic alternative. The Act also describes a number of key elements, such as pursuance by proxy, basic registries, eDesk modules, document conversion, electronic payment of fees, authentication of persons in public administration information systems, eDelivery, eForms modules, electronic personal mailbox, the administration and operation of a central portal for public administration and Integrated Service Points for
assisted public administration eServices. From 1 January 2017 the public authorities will be able to deliver every citizen or legal person the official documents through electronic mailbox. According to the law No. 395/2002 Coll. on Archives and Registries as amended registry creator does not need to keep record from which he created electronic copy by means of trusted conversion.

Since September 2016 is the pilot version of the Electronic Archives of Slovakia available, where citizens and legal persons can communicate with the State Archives and the Department of Archives and Registries electronically, searching of presented archival documents, submitting applications and submitting disposal proposals. State Archives can acquire archives from the registry creator, create finding aids and allow the access to archival documents.

State Archives participated in some national and international projects focused on digitization, but there is still a shortage of digitized documents, lack of knowledge about standards in the field of record management and long term keeping.

Supported by EU funded projects (e-ARH.si: OPRR, E-ARK) and by exchange of experience with other European countries, Slovenia has managed to establish the basic infrastructure and services for e-archiving (appraisal, pre ingest and ingest activities, long term digital preservation with enabling of access and use) for the most common types of digital records (DB, ERMS, unstructured data) and also for simple GEO data. The new strategy (project e-ARH.si: ESS 2016-2020) aims to upgrade the existing e-archiving services by using them for new data types and to standardize incoming data packages from different production environments. Special emphasis is placed on the improvement of access service based on open data, on more complex search possibilities (e.g. combining ERMS and DB born data with GEO data) and also on enabling access for users with special needs (people with disabilities, visually impaired and blind).

The biggest challenge for archives in the future is to be able to respond to new forms of data management (e.g. shared data registers) with timely appraisal, correct treatment of new generations of information systems, treatment of additional data types (e.g. scientific and statistical data, social media). Currently we are faced with our first major task, which is to ingest huge amounts of first generation born-digital data that unfortunately are very poorly documented.

In Spain citizens’ e-relationships with Public Administration was standardized by Law 11/2007 and following regulations, such as National Interoperability and Security Schemas (2010). Law 39/2015 establishes e-procedure as the main system for citizens to approach to Public Administrations and digitisation of paper records in order to conform unique electronic archives. The National Interoperability Framework establishes in Article 21 that Public Administrations will adopt the necessary organizational and technical measures to guarantee “the complete and immediate access to records through online query methods”.

Ministry of Education, Culture and Sports (MECD) is in charge to keep, protect and disseminate Spanish Documentary Heritage no matter the media it was created. Royal Decree 1708/2011 defines the roles of State Administration departmental archives, intermediate archives and historical archives. Following the recommendations established in the European and Spanish Digital Agendas, MECD has developed its E-Record Management Policy in 2015. As the MECD has responsibilities and legal competencies over the entire lifecycle of electronic records and files, including their permanent preservation, it must elaborate a record management policy and establish the necessary requirements to deal with any physical and/or custodial change of records so that these modifications will not affect the authenticity, reliability, integrity and availability of records, files or series, nor their context of production and the necessary metadata associated to them.

PARES (Spanish Archives Portal) is the platform for the dissemination on the Internet of Spanish Documentary Heritage preserved in its network of centers. Allows access to databases descriptive document data and image banks digitized them, overcoming the
traditional barriers of access to files and enabling anyone remote access via Internet, free and 24 hours a day.

In Sweden, the government has expressed high ambitions in e-Government and produced a letter of intent for digital renewal of the public sector in Sweden under the name "Digital First" in collaboration with the Swedish Association of Local Authorities and Regions (SKL). It has been created a voluntary member-driven collaboration program eSam, with more than 20 members from the public sector who work together in the area of digital collaboration. The National Archives of Sweden is a member in various working groups within eSam. The Swedish Service Agency in cooperation with the National Archives of Sweden has been commissioned to develop a joint management service intermediate e-archive to the Swedish Agencies. The work from the National Archives of Sweden is focused on aiding in the requirements definition process. Among the mandatory demands are the use of the Swedish Common Specifications (FGS) maintained by the National Archives of Sweden. In this service FGS are used in the form of drafts, the ones decided upon and the ones that will come. The National Archives of Sweden has been commissioned by the government to promote efforts from the agencies to make available information and open data. The assignment includes responsibility to manage the guideline vidareutnyttja.se and to administer the webpage oppnadata.se and to represent Sweden in the European Commission’s working group meetings regarding open data.

In Switzerland the Swiss Federal Archives (SFA) is working on to make the federal records easier and more intelligently accessible for public, government and academic use. It includes not only a better management of different access restrictions but analytics and visualization for professional users. For public use Open Data Portal (opendata.swiss) was established and operated by the SFA, more and more organisations and datasets are incorporating on an ongoing basis. On transfer the SFA devotes significant efforts to streamline the acquisition and ingest processes. Last year the second version of the broadly used database preservation standard SIARD2 was completed in cooperation with E-ARK project. Archiving of geodata on the federal level focuses on the archival storage of geodata for an unlimited period of time. The archived geodata should be made available in a future geo information system. Within the project Ellipse, swisstopo and the SFA developed a solution for archiving geodata. By 2020 all federal authorities have to shift to a common ERMS, leading to several migration projects and concluding with archival transfers. Digital Archiving pose a new challenge for archives, who needed special, highly expensive infrastructure. It is leading to extreme time pressure on the projects endangering their outcomes.

United Kingdom. The National Archives, covering England and Wales, is a multi-channel archive with a range of digital services. TNA’s Discovery service enables people to search the catalogue and also descriptions of records held by other archives in the UK. TNA maintains the UK Government Web Archive as a comprehensive record of government on the web. Through commercial partnerships they have digitised a significant portion of their holdings. TNA is a fully functioning digital archive with a Digital Records Infrastructure capable of safely and securely preserving very large quantities of data. TNA also lead the maintenance of an essential register of file format signatures, PRONOM. TNA views itself as a first generation digital archive, simulating digitally a body of archival practice devised for physical records. Its vision is to become a second generation digital archive with new archival practice rethought for digital records. Archivists are currently working to improve TNA’s existing services to better meet users’ needs. TNA is also developing its digital skills and culture, with increasing use of agile methods to deliver its projects. TNA is keen to work with other archives to develop new approaches to appraisal, selection, sensitivity review, transfer and record description for digital records of all types.

Scotland, as a devolved nation within the UK, has its own broad ranging Digital Strategy published in Scotland’s Digital Future: A Strategy for Scotland. In delivering this strategy The
Scottish Government is transforming public services to be “Digital First” and The National Records of Scotland is likewise undertaking its own digital transformation. For example as the Scottish Nations Census body we aim to take the 2021 Census predominantly online and preserve it digitally. In the archival context, as Scotland’s national archive, we are delivering our Digital Preservation Programme to transform our capability and approach to archiving in a digital world, in ways we hope will sustain us into the third decade of the 21st century and beyond. We are ambitious about the opportunities that our programme can bring and hope to be able to extend its benefits across the whole of the Scottish archive sector.

In delivering the transformation of our archival function for a digital world we foresee a number of significant challenges and opportunities. These include:

- A shortage of digitally skilled resources in the archival profession, and a lack of archival and preservation awareness within the wider pool of IT resource that we can call on, reflects a general absence of multidisciplinarity that we perceive is needed for e-archiving.
- The continual pressure on public spending and consequent limits on our resources (both capital funding and number of staff).
- The pace of change in technology in our records creator / depositor community; as an archival community we need to run to catch up in our development of archival practice, but we will also need to continue to drive a pace of change of that practice which is unprecedented in the context of the past history of archives.
- The opportunity that the 2011 Public Records (Scotland) Act gives us to transform our digital relationship with depositing organisations and transform the way they manage their digital records prior to transfer.
- The opportunity to draw on the experiences and lessons learned across the UK, European, and wider international archival and related communities, which will help us build our approach on the shoulders of giants.
- Finally the opportunity to influence the approach to digital matters across the whole of the Scottish public sector through our relationship with the wider public sector digital

The Public Record Office of Northern Ireland (PRONI) completed a project to preserve digital records in March 2015. Since then, the focus has been on streamlining the system and considering how best to integrate digital records into the traditional records management function within the organisation. The challenges facing PRONI include: developing the skills within the staff working with paper material to handle digital records, reviewing the feasibility of applying existing archival / records management processes to the digital environment, especially appraisal and sensitivity review, reviewing the system(s) used to disseminate digital content to staff and users, on-site and on-line.

Cross-border initiatives

The Document Lifecycle Management Forum decided at its meeting in The Hague that it would foster collaboration with European Archives Group around three challenges: Digital Archiving, Data Protection and Education. It set out to incubate further collaborative projects around the protection of current and future digital holdings. It also set up a Knowledge Center to develop shared terminology as well as self-evaluation tools for ERMS systems and Digital Archives.

The Open Preservation Foundation has started a special “Archives’Interest Group” (AIG) for its members. So far, the national archives of Estonia, Denmark and the Netherlands are participating. Among the first priorities of the AIG is to work on the criteria for the selection of appropriate formats for long-term preservation.

Over the last three years the 'European Archival Records and Knowledge Preservation' or E-ARK project has synthesised existing international and national best practices for keeping records in digital archives. It has developed a methodology, created specifications and built a full range of open-source tools for digital archiving. E-ARK had the ambitious goal of
harmonizing processes and specifications at a European level, and has successfully piloted new approaches in several national real-life contexts.

Both DLM and OPF are committed to supporting the outputs of the E-ARK project. DLM decided to set up DLM Archival Standards Maintenance Board (DAS) at the meeting in Oslo in November 2016. DAS Board will be responsible for the ongoing maintenance, dissemination and use of the specifications developed by the E-ARK project. OPF will provide the home for the software and documentation developed by E-ARK.

Conclusions

Archives are essential to digitally enabled societies that wish to preserve information and provide access to it over the long term. New communication technologies and ever higher expectations of users is shifting the role of administrative, intermediate and historical archives.

Different Member States and their archival institutions are at different stages of development. Some are working to devise an appropriate legislative framework, some are running pilot projects, others are just beginning to establish their digital archiving infrastructures. In many countries large volumes of digital records are now held in archivial collections but there are still only a few fully functioning digital archives. Even here the capabilities are limited in comparison to the scale of the task.

There are significant challenges ahead for archives if we are to ensure the survival of the plethora of record types (like emails, relational databases or geodata) that make up our digital universe.

In government almost everything is digital nowadays. The exponential increase in the quantity of data and the ability to analyse it questions notions about what has value. Traditional archival practice around description, transfer, preservation and access are all challenged.

Archives are becoming more intertwined in e-government initiatives as governments progress their wider digital transformation. Archives also have to adapt to new regulatory environments and to finding new ways to exert their influence. There are new trends like the growth of more centralised of government digital services or the rise of open data portals.

The Digital Single Market strategy views open and reusable public data as a key driver for economic growth. It is encouraging that more and more archives are taking a formal role in the development and maintenance of national open data portals.

The wider landscape is changing too. In the 20th century archives were seen primarily through the lens of the cultural sector. Today, by accumulating terabytes and exabytes of data, archives are increasingly part of the information industry. It is a new role with new demands that are not easy to reconcile within the budgetary constraints cultural institutions typically operate under.

Cross-border initiatives, membership organisations and EC funded projects are making an increasingly important contribution to the archives’ effort to secure and provide access to trusted, authentic digital records.

Our knowledge of digital preservation has matured. Questions about 'how to do it' have been replaced by 'how to do it effectively'? The main issue is no longer confined to technological obsolescence but the wider development and sustainability of digital archiving services.

Archives are increasingly affected by the growing and unmet demand for people with digital and technology skills. These are skills at a premium in today’s labour market. Many archives worry that they cannot offer competitive salaries to their digital and IT staff. Many also struggle to maintain the level of knowledge due to the lack of professional development opportunities in fields like archival technology standards, records management, e-discovery,
data governance, information rights law, risk management, IT management, information security, business management.

The question for national archivists is how do we respond?

**Recommendations**

R.1. **Change how people think about archives.** The web makes it possible for archives to reach new and wider audiences. Digitisation transforms public access to an archive. There are huge opportunities to raise awareness about the importance of archives and to increase use.

R.2. **Automate more.** We have to rethink archival practice if we are to meet the challenge of digital records. Archives are now part of the information industry. That means moving beyond the traditional models of periodic transfers of records from public agencies to archives. Users need continuous, permanent access. The challenge is finding the right new approach (centralized, decentralized, cloud based, service based) to meeting these new demands.

R.3. **Collaborate more.** Even after decades of cooperation between European Archives, we do not work together as much as we could. We have to cooperate more if we are to respond to the digital challenge. Instead of regarding international cooperation as a marginal activity, archival institutions should **put cooperation at the forefront of their plans.** This means **committing more resources** to fostering collaboration, facilitating knowledge transfer, sharing tools and harmonising practices.

R.4. **Educate more.** Digital Archiving implies some major changes to how archives work. We need to teach new skills to people controlling and managing digital records, as well to those processing and preserving them in repositories or digital archives. Training activities should be designed for everyone involved in records management and archiving to disseminate knowledge and share new practices.

R.5. **Win the argument for funding.** It is becoming evident that archives will be unable to meet these new demands without proper funding. Without adequate resourcing archives will be unable to deliver their primary functions or their legislative role. Against the backdrop of often declining resources, EU funded projects have proven especially important for many countries. This type of investment and support must continue for the digital record to survive. Future EU programmes should actively support archives to meet the digital challenge.

**Specific actions**

A1. **Gather and share information about our progress.** We should repeat the 2012 Danish survey and survey archives more regularly (e.g. every two years). The “E-ARK e-archiving wiki” gives a sense of the questions and scope of a possible questionnaire. Just an example from one country with the request “create something similar” is not sufficient and not going to generate the response that we need. A new survey needs to be well thought through and to make good use of the respondents time to complete it.

A2. **Share the EARK findings and tools.** To share resources and achieve economies of scale we need to further harmonise our digital archival practice. The E-ARK methodology needs to be widely shared and communicated. The E-ARK tools need to be packaged and presented so they are easy to use, particularly for smaller archives.

A3. **Exploring the intersection of data protection and archives law.** Archival experts should work together with data protection specialists to explore more deeply how data protection regimes and archival law interact. Specific “low-level” working groups are needed to discuss the detail and explore the practical problems archives face. Codes of practice may also be necessary. We should create an inventory of past and present practical problems, together with possible solutions. A database of relevant case law
could also be created. Archival experts should establish regular contacts with data protection expert groups, national Data Protection Authorities, and EU bodies, such as the EDPS or the European Data Protection Board. A specific expert group should be established (or an existing group extended) to give expert opinion, frame recommendations and communicate with national and EU bodies. There is an opportunity here as the issues and problems at the intersection of archives and data protection also appear at data protection/privacy conferences, such as the annual CPDP conference in Brussels.

A4. **In education there is a need for a database of trainers.** This could be provided as a service of DLM Forum Knowledge Center which could maintain and provide information on trainers in the major professional development areas (archival theory, standards, specifications, technology etc.). Establishing a pool of training experts could be a driving force for sharing knowledge. Peer learning opportunities should also be created. To understand the training gaps a needs analysis should be undertaken. This would enable the development of training blueprints for different groups as well as providing a starting point for the development of training programmes and training materials.

A5. **Collaborative projects** – analyse opportunities, influence work programmes and EC working groups on e-government, open data and digitization.

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<tr>
<th>Challenge</th>
<th>Solution</th>
<th>EC Instrument</th>
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<tr>
<td><strong>Open Data and re-use of data.</strong> In order to enable governments, citizens and enterprises to benefit from the availability of public data, new archival services are needed to facilitate the use, reuse and interpretation of archived datasets.</td>
<td>Develop methods and re-usable tools for the compilation, datamining, analysis and visualisation of public data in archival environment, to provide easy, user-friendly access and reuse of open data.</td>
<td>H2020 Societal Challenges/Europe in a changing world EEA/Norway Grants – Good governance</td>
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<td><strong>Digitising Europe’s cultural heritage.</strong> Culture is one of Europe’s greatest strengths. Making archival materials accessible online and preserving it for future generations is not only the primary goal of the archival institutions, but identified as one of the challenges of the Digital Single Market.</td>
<td>Make the collections held by Europe’s archives available online, develop further APE services and increase the amount of data on the portal. Focus on services to help creative industries, and to support cultural, social and political cohesion of member states.</td>
<td>H2020 Societal Challenges/Europe in a changing world Creative Europe European Regional Development Fund/InterregV Danube Transnational Programme EEA/Norway Grants – Good gov/Sust development</td>
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<td><strong>Research in Digital Archiving.</strong> The consequences of the fast and inevitable obsolescence of ICT. As most applications, data formats and infrastructures become obsolete within a decade there is the need to proactively manage the lifecycle of digital data, making sure that the data is appropriately archived, preserved, and made available to crucial users for conducting business, scientific research or policy support regardless of the management or preservation location of the information in question. New technologies, like data mining, data warehousing, processing of</td>
<td>Digital sustainability and digital archiving research and development with a special attention on the cross-border standardisation of policies, specifications and tools for the transfer of information to long-term repositories, and the reuse of the information.</td>
<td>H2020 Industrial Leadaership/LEIT/ICT</td>
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<td>Big Data pose a huge challenge for archives opening up a big area of research archives involve in with their need, social role and huge amount of data.</td>
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<td>As of now the approaches towards the long-term preservation of crucial digital information are fragmented across member states and <strong>there is no common solution for transferring valuable digital information to trusted digital repositories</strong> and reusing it afterwards in a secure, authentic and cost-effective way. This can lead to the loss of valuable digital information (i.e. digital black hole) which can in turn lead to the loss of trust and transparency of governments, and lost business and research opportunities.</td>
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<td><strong>Digital Archiving Interoperability.</strong> This building block includes a series of best practices and technical standards for exporting information out of source systems, delivering it to secure repositories and reusing by the means of (public) services.</td>
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<td><strong>CONNECTING EUROPE FACILITIES</strong></td>
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<td>Lack of skilled digital archivists, data curators, constant change of expected skills.</td>
<td>Cross-country education. New ways of learning, non-formal and informal education, online training materials to support local and intnl courses (Digital archiving, EAD, standards, tools, processes), adult education to gain new forms of knowledge, skills, attitudes. in cooperation with universities and training providers.</td>
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<tr>
<td><strong>ERASMUS+</strong></td>
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</table>
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