Activity 4

Final Report

EARK4ALL
AGREEMENT No: LC-00921441 CEF-TC-2018-15 eArchiving

Training needs analysis

Organisational perspectives and conclusions

EARK4ALL: Training Needs

Background

The purpose of the EARK4ALL project is to further develop the open source electronic archiving solutions developed within the E-ARK project in preparation for deployment. In addition, the project will promote the wider adoption of these solutions, with the long-term goal of building an ecosystem of cross-border and cross-sector accessible archives in Europe. An integral part of this process is to begin the development of training services to complement and improve:

- the existing technical specifications and compliant software;
- best practice guidelines for data owners;
- and standards to facilitate implementation.

This is addressed within Activity 4 of EARK4ALL. During the E-ARK project (www.eark-project.com) it became clear that even within the traditional archives community, the skills required to deliver eArchiving effectively and at scale, are not widely available, nor is the topic widely understood among managers and decision makers. The effect of this skills gap is to raise the barriers to entry both among those who would identify themselves as being within the archives community, and perhaps more importantly, to practitioners within other domains where 'archiving' plays an important role but where the focus is not primarily or explicitly on archiving. For examples, the European Network of Cancer Registries (www.encr.eu), which exists to promote coordination and harmonisation of cancer data in Europe, and while it has an explicit interest in collaboration between cancer registries, and data collection standards, does not see itself as primarily working in archiving, but in health care.

Activity 4, needs to produce training support which is of relevance to a very wide constituency. This extends from potential stakeholders with little or no understanding of the basic tenets of archiving, through those who have experience of archiving but know little about eArchiving, all the way to those whose knowledge is already quite extensive but who need support in the deployment and use of the E-ARK and EARK4ALL specifications, tools, and standards. The purpose of this is to promote the uptake of eArchiving for current and prospective users, overcome barriers to entry, improve adoption rates, and assist in meeting the development needs of individuals and organisations engaged in eArchiving, and intending to include or enhance eArchiving DSI services in their own services or products.

In order to ensure that we are properly addressing the needs of our stakeholders, we engaged in discussions with our contacts to get a nuanced understanding of their training needs. To supplement this activity, we developed an on-line survey to explore requirements in greater depth, and in a more structured way.

Training needs

Activity 4 undertook an analysis of the digital archival training requirements in the European context. Between July and October 2018 semi-structured interviews were conducted with relevant personnel, these were complemented by the deployment of a small number of questionnaires. At the macro level, this encompassed meta-organisations such as the EAG (European Archives Group), the DLM Forum and the SAA (Society of American Archivists) which provided a North American context. At the organisational level, appropriate individuals from National Archives and other archival bodies were consulted to gain an understanding of the current training needs of the archival community.

The perspective of meta organisations

Training needs: When asked what type of training is most needed for electronic archiving and digital preservation meta-organisations stressed the importance of the practical implementation of E-ARK tools for archivists. Deeper exploration of this issue revealed that there are a number of reasons for this. The archival community is in a process of transition from paper-based workflows to digital systems. There are still many in the archival community who come from backgrounds with little or no programming experience. These members of our community need training support in order to engage effectively with eArchiving. Also, the growth of digital data means that more and more organisations are faced with archiving challenges (health, retail, etc.). Many of these organisations would not consider themselves to be traditional archives but have a growing archival remit. As time passes these organisations will become potential users of E-ARK tools and standards. Raising awareness in this market sector is one of the benefits of the highly accessible “Ted-type Talks” on archiving issues. All organisations who were asked about the efficacy of the Ted-type Talks thought they were a positive contribution to the learning environment. It has been suggested that initial training could focus on the software included in the DSI. This would then be followed in the longer-term with training in standards as well as digital preservation.

It is apparent that the training depends on the tools that are implemented in the different archival organisations. It was felt that the training projects of the E-ARK CEF within the eArchiving DSI should be broadened during coming years.

The organisational perspective

Outside of the meta organisations different types of stakeholders were contacted in archives, universities, technical solution providers, cultural (heritage) institutions, health institutions, etc. A large number of responses were gained from organisations dealing with geodata which allows a more detailed understanding of the needs of that sector (see Appendix 1). The following broad questions were asked:

1. What is your relation with e-archiving and/or long-term e-records preservation?

All organisations questioned were aware of existence of e-archival records. Academics see it as a source of their research, contact with students or even a topic they are teaching in their classes. Archivists in the archives and in non-archival institutions are noting the emergence of e-documentation. They see this as a challenge, but also as a tool for preserving older data. Some mentioning that it is easier to access or easier to search through digital data. The solution providers (archives and others) are aware of exponential growth of e-documentation, but note that it needs to be kept and preserved in an appropriate manner. They are aware that they will need to provide solutions and knowledge for proper preservation and storage.

2. Name few challenges that you or your organisation encountered on a field of e-archiving (contextual or technical).

Stakeholders noted the following challenges:

- The preservation of photos audio- and video records is seen as particularly challenging.
- Digitisation of records in older formats or keeping and preserving records that were created with older/obsolete technology. Some organisations questioned the cost/benefit of such an endeavour.
- Some addressed the authenticity issue of born-digital material e.g. how to ensure authenticity of electronic records such as contracts and other legally binding documents, or issues of e-business: how to properly manage outgoing and ingoing e-mails, classification of documents.
- Some solution providers mentioned the indifference of public entities to implement regulations, standards and internal policies in their e-business models, and a lack of personnel or funds to ensure proper preservation of e-records.
- Archives mentioned the problem of acquiring e-records in a conformance with the OAIS model and several other standards. They are also aware of complex data types and lack of knowledge and tools for acquiring them.

3. What challenges are you going to tackle in the near future or do you already have some issues that need to be resolved in the following months?

Data providers see implementing e-business and digitisation of business as a big challenge to be tackled soon. Some are worried with incompatibility of existing data, updating current data. Others consider that implementing internal policies that would regulate e-business will be a challenge that needs to be tackled.

4. Which types of data do you think we need to provide support (training, knowledge) for? Which types of data are most vulnerable in terms of e-keeping and long-term e-preservation?

Stakeholders were supporting many different data types including audio/video files, mail systems, unstructured documents, physical documents, web pages, ERMS and financial records. The vast majority of stakeholders consider the most vulnerable data types are mail boxes and unstructured documents.

5. Do you think you need additional knowledge or support on the topics of standards, e-archiving procedures, long-term e-preservation and tools? Can you offer any of such knowledge and support to other stakeholders?

The respondents agreed that they need additional knowledge in the e-archiving field. They would need support with implementing standards, regulations and internal policies. Many would also be willing to share their existing and newly acquired knowledge. Archives and record creators both need new and/or better knowledge for basically all steps in the OAIS model. Academics/end users will need simple and effective means of searching, researching and rendering data.

Semi-Structured Interviews: The Conclusions

Conclusions

The archival community is in a transitional state with regard to digital readiness. It is apparent that the national archives, business archives and technical solution providers have the greatest engagement with, and consequently skills in, digital archiving. It is in this community that E-ARK tools and standards are best known. The situation in smaller archival bodies is far more variable. Here far fewer digital skills are evident. E-ARK tools and standards are less well established. E-ARK4ALL is currently conducting a program of dissemination in order to widen the user community (Activity 5). It is apparent that in these 'new' sectors there is virtually no understanding of digital archival practice. Based on this snapshot of the archival sector three distinct types of training/education are envisaged:

1. **Basic introductory training**: As E-ARK4ALL begins to broaden its scope beyond archival organisations very basic training will be required for many of these entities who have almost no background in archiving.
2. **Archival Ted-type Talks**: The archival Ted-type Talks are viewed as a critical means of combining basic training and awareness raising. These will be future looking addressing problems that all archives need to engage with and providing guidance on ways forward. All respondents were positive about the benefits of such a program of talks.
3. **E-ARK-specific training**: Training directly linked to E-ARK outputs detailed, nuanced raining on a tool-by-tool basis (e.g. how do you use the software, how do you implement the specifications, etc.)

On-line survey: Responses

The following training needs questionnaire was developed using the EUSurvey software package (https://ec.europa.eu/eusurvey/home/welcome) and comprised 15 questions. These questions were developed after undertaking a program of semi-structured interviews with members of the archival community. The survey was deployed online between October and December 2018, during which time 70 usable responses were provided. The following appendix analyses the results of each question and provides recommendations for the future.

Question 1: Which of the following most closely describes the governance of your organisation? (Select one)

		Answers	Ratio inc no answer	Ratio exc no answer
Government organisation (national)		22	31.43%	31%
Academic / education		16	22.86%	23%
Government organisation (regional / local)		11	15.71%	16%
Not-for-profit / charity		11	15.71%	16%
Other		7	10%	10%
Business / corporation		2	2.86%	3%
No Answer		1	1.43%	

Table 1: Organisation types represented.

It is evident from the above data that governmental organisations (both national and local) are well represented, accounting for 47% (33) of responses. Academia is the second biggest contributor with 23% (16), followed by the not-for-profit/charity sector with 15% (11) of the respondents. The category labelled 'other' accounted for 10% (7) of the respondents and comprised international bodies, EU institutions and the military. In contrast businesses and corporations are not well represented, accounting for only 3% (2) of responses (Table 1). This balance should be borne in mind in the following analysis.

Question 2: What best describes your role in the organisation? (Select one)

		Answers	Ratio inc no answer	Ratio exc no answer
Subject matter / content expert		30	42.86%	43%
Management		19	27.14%	28%
Other		9	12.86%	13%
Administrative		6	8.57%	9%
IT / technical		5	7.14%	7%
No Answer		1	1.43%	

Table 2: Respondents role in their organisations.

The questionnaire respondents were dominated by subject matter/content experts (43%) and managers (28%). Administrative (9%), technical (7%), and 'other' (13%) staff made up the remaining 29% of respondents (Table 2).

Question 3: Does your organisation have a need for long-term archiving of digital data or documents?

		Answers	Ratio
Yes		68	97.14%
No		1	1.43%
No Answer		1	1.43%

Table 3: Organisational need for long-term archiving of digital data or documents.

As might be expected, almost all of the respondents who responded to the questionnaire had a long-term need for digital data and documents (Table 3). The one exception being a single regional governmental organisation.

Question 4: What types of digital documents/data do you manage currently? (Tick all that apply)

		Answers	Ratio
Text documents		68	97.14%
Digital images		61	87.14%
Video		46	65.71%
Databases		45	64.29%
Audio		41	58.57%
e-mail		40	57.14%
Websites		33	47.14%
Geospatial data		17	24.29%
Other		12	17.14%
No Answer		1	1.43%

Table 4: Types of digital documents and data currently managed.

It is evident that digital archiving is still dominated by text documents and digital images (Table 4). All but one of the respondents who answered indicated that they archived text documents, while 87% archived digital images. Other well-represented groups include video (66%), databases (64%), Audio (58%), e-mail (57%) and websites (47%). The remaining categories were geospatial (24%) and 'other' (17%).

Question 5: How are these digital documents/data created? (Tick all that apply)

		Answers	Ratio
Born-digital		63	90%
Scanned		60	85.71%
Reformatted (from one format to another)		37	52.86%
Deposited		33	47.14%
Licensed		5	7.14%
Other		4	5.71%
No Answer		1	1.43%

Table 5: Creation mechanisms for digital documents/data.

In the organisations represented most of the digital documents and data are either born digital (90%) or scanned (86%). Reformatted documents account for 53%, and licensed 7% (Table 5).

Question 6: What tools do you use? (Tick all that apply)

		Answers	Ratio
Archival management system		47	67.14%
File systems		45	64.29%
ERMS systems		27	38.57%
Proprietary systems		20	28.57%
RDBMS		10	14.29%
GIS systems		4	5.71%
No Answer		3	4.29%

Table 6: Tools currently deployed.

The two predominant tools that respondents use for eArchiving are archival management systems (67%) and file systems (64%). Other tools include ERMS systems (27%), RDBMS (14%) and GIS systems (6%). Proprietary systems make up 29% of the total (Table 6). This later group is beyond the remit of any potential E-ARK4ALL training provision.

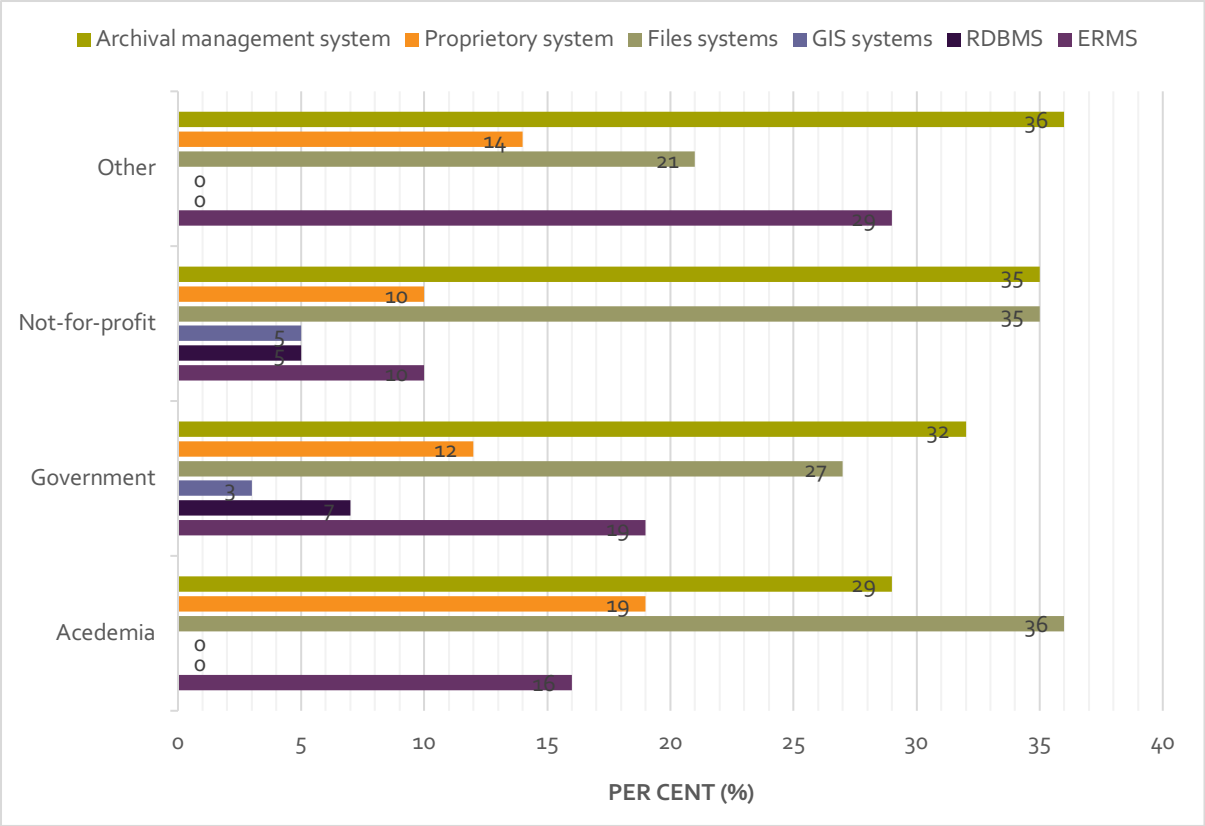


Figure 1: Archival tool use according to organisation type.

There were some differences in tool use across different sectors. The use of archival management systems dominated the government (32%) and 'other' (36%) sectors. In the not-for-profit sector, archival management systems (35%) and file systems (35%) were equally widely used. In contrast, file systems were the main tool-type used in academia (36%).

Question 7: What archival standards do you have implemented? (Tick all that apply)

		Answers	Ratio
ISADG		35	50%
OAIS		31	44.29%
EAD		23	32.86%
PREMIS		20	28.57%
METS		18	25.71%
Other		13	18.57%
SIARD		9	12.86%
No Answer		11	15.71%

Table 7: Currently implemented standards.

The most commonly adopted standard among respondent organisations is ISADG (50%) developed by the ICA. This standard is widely used in conjunction with EAD (33%). There is also widespread implementation of OAIS (44%), PREMIS (29%) and METS (26%). SIARD (13%) implementation is another indicator that there is an increasing need to archive databases (Table 7). This is corroborated above in question 4 which indicates that databases are the fourth most common type of digital document/data that respondents currently manage. This list provides a guide regarding what standards that should be included in the E-ARK4ALL training provision.

Additional standards used by the organisations surveyed included individual mentions of: AS ISO 15489 Information and documentation – Records management; the DIN 31644 'Criteria for trustworthy digital archives' standard; the Norwegian standard for documentation management NOARK (Norsk Arkivstandard); Dublin Core (2 mentions); the French Data Exchange Model for Archiving (MEDONA/SEDA), the Canadian archival descriptive standard RAD (Rules for Archival Description) and an "in-house standard".

Question 8: Do you expect that the amounts of data / documents that you will need to manage in the future will:

		Answers	Ratio
Increase		64	91.43%
Stay the same		1	1.43%
Decrease		2	2.86%
No Answer		3	4.29%

Table 8: Future expectations for the amount of data/documents types that organisations need to manage.

There was a clear indication that respondents expected the quantities of data and documents that will need to be managed in the future would increase. Only two respondents (3%) expected this to decrease (Table 8). This is driven by the ubiquity of digital devices and the data that they generate.

Question 9: Do you expect that the types of data / documents that you will need to manage in the future will:

		Answers	Ratio inc no answer	Ratio exc no answer
Increase		48	68.57%	72%
Stay the same		19	27.14%	28%
Decrease		0	0%	0%
No Answer		3	4.29%	

Table 9: Future expectations for the quantity of data/document types that organisations need to manage.

All respondents expected the types of data that their organisations would need to manage would either increase (72%) or stay the same (28%) (Table 9).

Question 10: Do plan to deploy new tools for managing archival data?

		Answers	Ratio
Yes		52	74.29%
No		16	22.86%
No Answer		2	2.86%

Table 10: Plans to deploy new tools for managing archival data.

Nearly three-quarters of respondents (74%) indicated that their organisations were planning to deploy new tools for managing archival data (Table 10). This is another key indicator that additional training may be required to support the deployment of these tools.

Of the 52 organisations who did intend to deploy new tools 15% (8) were undecided about which ones, but were in varying stages of evaluating the options. 23% (2) of organisations intended to deploy specific proprietary tools or platforms, of which (4%) were for web archiving subscription services. 12% (6) were considering tools related to databases, of whom three were looking deploy SIARD-based tools. 31% (16) of respondents provided more generic answers such as “digital preservation software solutions” or “tools/systems for long-term data preservation”, and the remainder provided no details.

There is some evidence of significant upgrades to eArchiving infrastructure such as the not-for-profit organisation that intended to deploy a “proper digital repository as opposed to shared drives.”

Question 11: Do you plan to implement new standards for managing archival data?

		Answers	Ratio inc no answer	Ratio exc no answer
Yes		39	55.71%	60%
No		26	37.14%	40%
No Answer		5	7.14%	

Table 11: Plans to implement new standards for managing archival data.

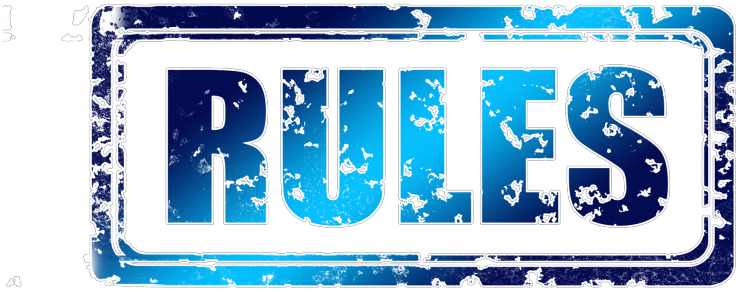
Overall more organisations are planning to implement new standards for managing archival data (56%) compared to 37% who were not (Table 11). As with the deployment of new tools the associated adoption of new standards could mean that there will be a need for training to support such implementations. This assumption is supported in question 14 below which indicates that technical training in standards was the second most sought after training type.

	PREMIS	OAIS	METS	SIARD	RiC	EAD	Others
Academia	1	1	–	–	1	–	–
Governmental	5	5	3	3	1	1	ISAD-G, ISAAR-CPF, ISO 16175 Module 1-3
Not-for-profit	–	–	–	–	1	–	–
Other	3	2	1	1	–	1	–

Table 12: Number of references to proposed standards according to organisation type.

The data regarding future standards implementation are subtly nuanced according to organisational type. Government (67%), not-for-profit (70%) and 'other' (86%) organisations were more likely to be planning to implement new standards compared to organisations in academia. Here only 37% of respondent organisations indicated that they intended to implement new standards.

Respondents who indicated that their organisations intended to deploy new standards were asked to elaborate on which types (Table 12). It is evident that government organisations intend to deploy a greater variety of standards than academia, not-for-profit or 'other' organisations. In addition to the above, one government organisation was seeking solutions and standards to support the long-term preservation of digital signatures.



Question 12: Is training in eArchiving of interest to your organisation?

		Answers	Ratio inc no answer	Ratio exc no answer
Yes		65	92.86%	97%
No		2	2.86%	3%
No Answer		3	4.29%	

Table 13: Organisational interest in eArchiving training.

Training is clearly a priority amongst respondents (Table 13). Of the respondents who answered this question 97% (65) indicated that training was of interest to their organisations, only 3% (2) felt that it was not of interest (these were a commercial and a national governmental organisation).

Question 13: What type of training would most suit you? (Tick all that apply)

		Answers	Ratio
On-line training (self-paced)		46	65.71%
Instructor-led training (on site)		35	50%
On-line instructor-led training		33	47.14%
Training organised specifically for your organisation		28	40%
Instructor-led training (off site)		26	37.14%
Other		2	2.86%
No Answer		5	7.14%

Table 14: Preferred training delivery mechanisms.

Respondents indicated that the most appropriate delivery mechanism for training for their organisations was on-line self-paced training (66%). 50% of respondents stated that their organisations would prefer on-site instructor-led training, while 47% indicated that on-line instructor-led training was preferable. Bespoke training (40%) and off-site instructor-led training (37%) were the least sought-after delivery mechanisms (Table 14).

The four organisation types reveal differences between their preferred mechanisms for training delivery. Academic organisations show a clear preference for self-paced online training (30%). Similarly, respondents from the not-for-profit sector also exhibit a clear preference for self-paced online training (46%), which is almost double the next highest choice for off-site instructor-led training. In contrast, the profile of government organisations is more evenly balanced with off-site instructor-led training (14%) being the least sought after option. The 'other' organisations exhibit a preference for on-site instructor-led training. This highlights the importance of sector segmentation in understanding the training market.

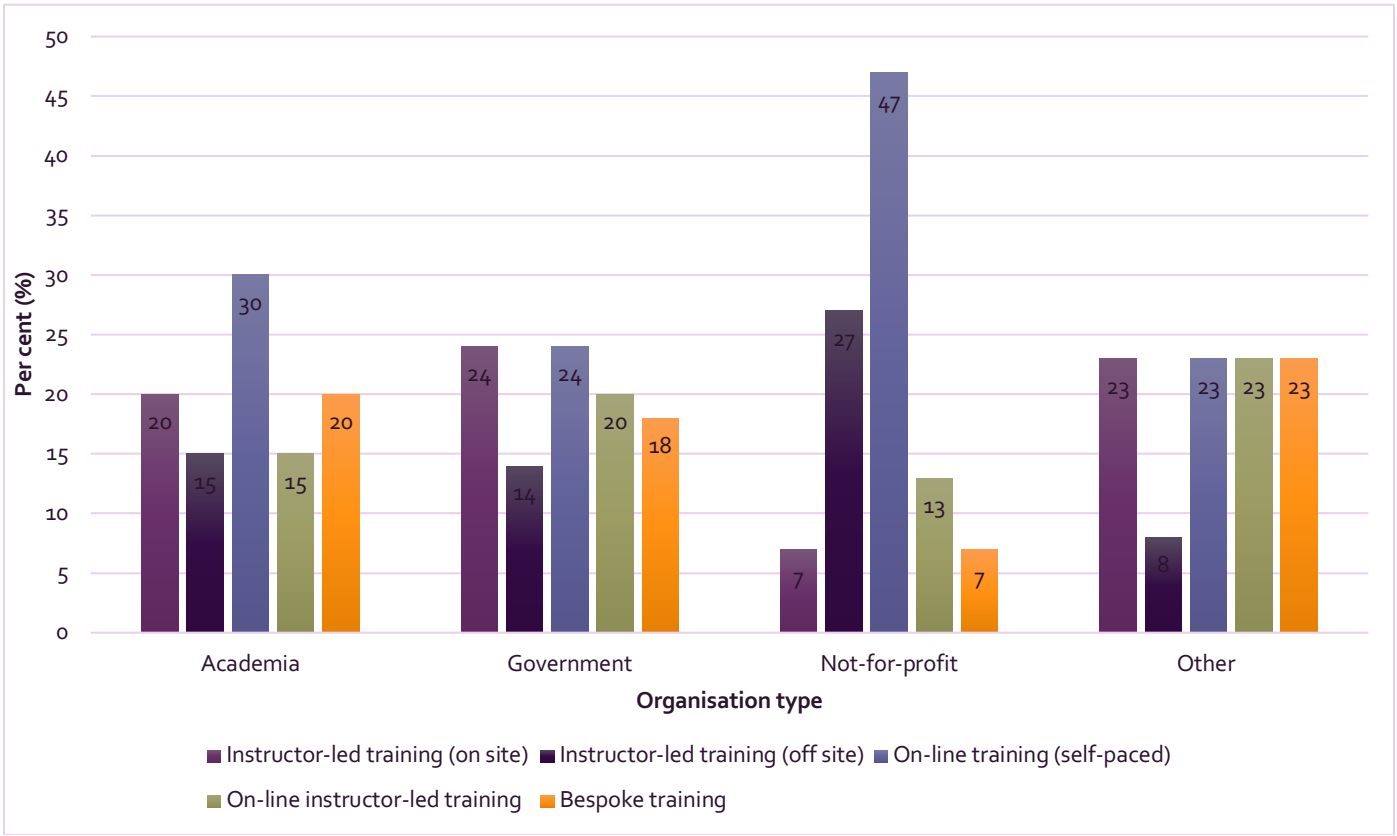


Figure 2: Preferred training delivery mechanisms according to organisation type.

Question 14: What kind of training content would be most helpful to your organization? (Tick all that apply)

		Answers	Ratio
Technical training (general)		48	68.57%
Technical training (standards)		46	65.71%
Introduction to eArchiving		41	58.57%
Technical training (E-ARK tools)		37	52.86%
Management level training		35	50%
Legal issues		28	40%
Other		4	5.71%
No Answer		5	7.14%

Table 15: Most appropriate training content for the organisation.

It is apparent that technical digital archival training is the most sought after topic, with a broadly equal need for general (69%) and standards (66%) training. Training in E-ARK tools (53%) is the fourth highest category overall. The most requested non-technical training was introductory training (59%), followed by management level training (50%) and training in legal issues (40%) (Table 15). This breakdown provides a clear hierarchy of training needs:

1. Technical
2. Introductory
3. Management, and
4. Legal

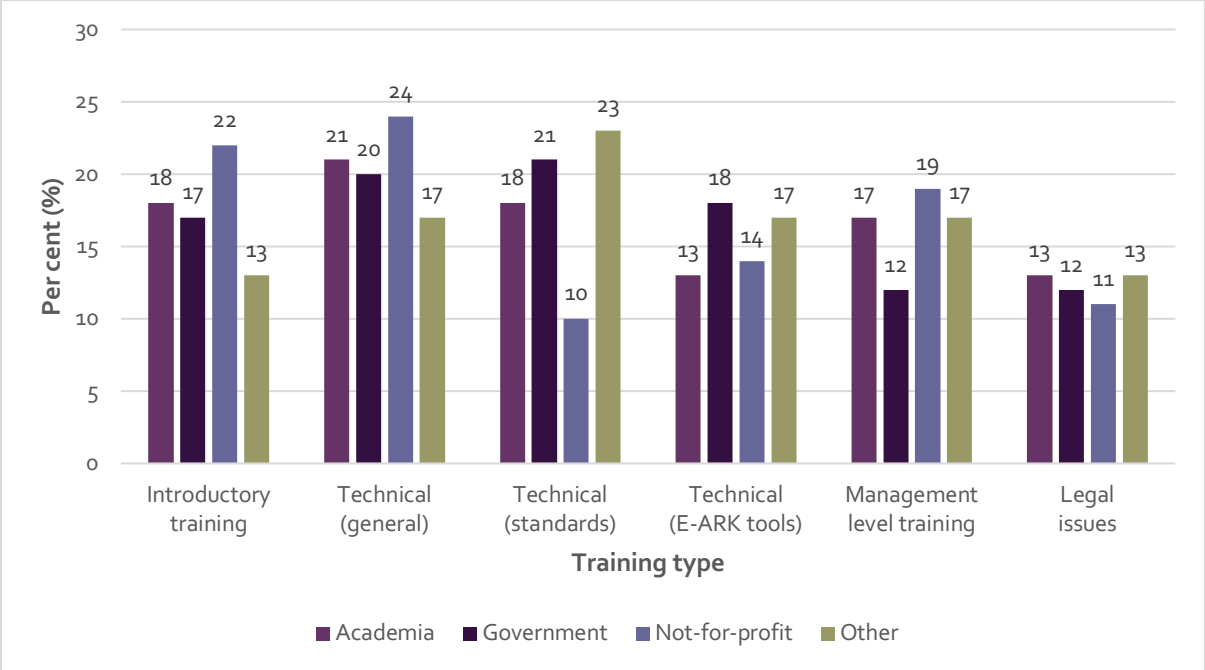


Figure 3: Preferred training content according to organisation type.

There is some limited variability between the different organisation types. Of all the sectors the not-for-profit sector had the highest demand for introductory training (22%), management level training (19%) and general technical standards training (24%). It also had the lowest demand for technical standards training (10%). The government bodies surveyed were broadly consistent with the other sectors except in their perceived need for management level training (12%) which was the lowest of all the groups. Demand for legal training was

broadly consistent across organisational groups. The free text comments provided by participants provide further detail regarding the specific training needs of their organisations (Table 16):

Comment	Organisation type
“We would prefer training based on practical examples.”	Commercial
“Training would be especially helpful to bring new staff up-to-speed on digital preservation, and for highly specific topics we are just not tackling, i.e. content-specific courses for web-archiving tools or similar.”	Government
“As eArchiving is also an organisational challenge, perhaps your training portfolio can be expanded to include policy and strategy making.”	Government
“Important to make it accessible to people who lack technical expertise, but could collaborate with IT. Need an understanding and a shared language.”	Not-for-profit
“The "DPTP free OAIS course" was good and very helpful. Something like this for other topics I could imagine as useful.”	Other

Table 16: Free text comments regarding specific eArchiving training content for the organisation.

There is a clear demand for training in eArchiving, however, some concerns were raised about the potential cost of training (Table 17).

Comment	Organisation type
“The level of understanding and concern for e-archiving is very low and so funding the training may be difficult.”	Government
“We need it, but we don’t have budget.”	Not-for-profit
“Training needs to be cost effective so it can be accessed by people from smaller organisations with smaller budgets.”	Other

Table 17: Free text comments regarding the potential cost of eArchiving training.

Question 15: Would you be willing to help us with any of the following? (Tick all that apply)

		Answers	Ratio inc no answer	Ratio exc no answer
Beta testing the training material		30	42.86%	60%
Providing content for training materials		20	28.57%	40%
No Answer		34	48.57%	

Table 18: Organisational willingness to contribute to eArchiving training.

It is apparent that the archival community is willing to contribute to the eArchiving Building Block training program. 51% of the respondents expressed a willingness to support this training in some way (Table 18). Of these, 60% (30) offered to help beta test the training material, while 40% (20) were prepared to contribute content.

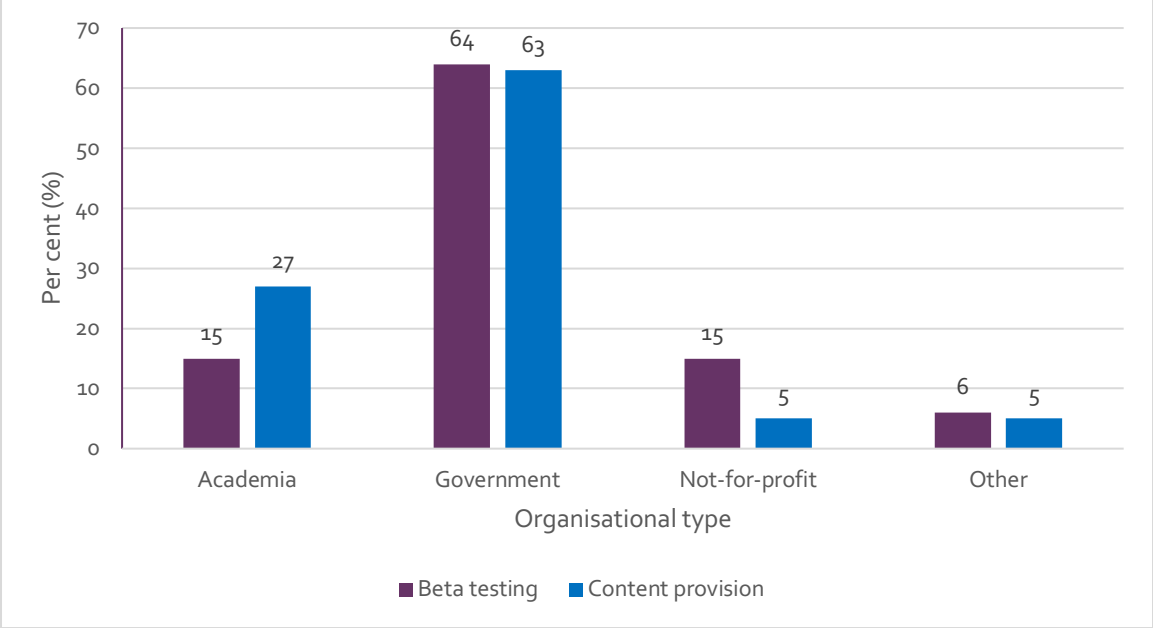


Figure 4: Willingness to contribute to eArchiving training according to organisation type.

When broken down according to organisational type (Figure 4), it is apparent that government entities were most willing to contribute to both beta testing (64%) and content provision (63%). Although there were fewer respondents from academia, it is evident that this sector could be an important source for the provision of training content (27%). Overall this is positive evidence of support for the eArchiving training initiative.

Summary and recommendations

The following conclusions and recommendations are made:

- **Training need**: Almost all organisations who responded to the questionnaire (97%) indicated that training in eArchiving would benefit their institutions. This clearly highlights that there is a market need that E-ARK4ALL and the eArchiving Building Block is well-positioned to exploit.
- **Training support:** The archiving community is prepared to support the E-ARK4ALL eArchiving training program through both beta testing and provision of content. This could mean that some organisations may become more than simple end users. There is the potential for partnership with members of the eArchiving community and even the co-creation of content.
- **Delivery mechanism**: It is apparent that self-paced online training is the most sought-after training delivery mechanism (65%). The development of online training should, therefore, be a priority for E-ARK4ALL.
- **Training content**: Organisations sought technical training content most of all (general technical 69%; standards 66%; E-ARK tools 53%). This was followed by introductory (59%), management (50%) and legal training (40%). E-ARK for all intends to address all four areas of training need in its training offer.
- **Content provision:** The results indicate that government (63%) and academia (27%) are important sources of content for training provision. The organisations that responded positively to providing content will be followed up.
- **Standards training**: An important component of technical training for organisations is training in standards. The questionnaire responses indicate that ISADG, OAIS, EAD, PREMIS, METS and SIARD are potential candidates for inclusion in E-ARK4ALL training provision.
- **Standards**: The relatively widespread use of PREMIS (29%) amongst respondents is an important finding. These respondents may be able to contribute to the development of the E-ARK4ALL PREMIS profile.
- **Not-for-profit**: This industry group has characteristics that could help define sector-specific training requirements. The most sought-after training for respondents from the not-for-profit sector was introductory, management and general technical rather than the more advanced standards and E-ARK tools training. This hints at a sector that is not as far down the road of eArchiving as others. It is also apparent that cost is more of an issue for not-for-profits compared to other industry sectors.
- **Understanding business**: The responses came from three distinct organisational groups – government, academia and the not-for-profit sector. Commercial enterprises were not well represented. It is therefore recommended that future research on training needs specifically targets commercial organisations in order to create a more holistic understanding of the training marketplace.

Conclusions

Conclusions

The research indicates that there is a need for eArchival training across the industry sectors surveyed (government, academia and not-for-profit entities). Moreover, there is evidence of practical support from those who engaged with the online questionnaire and the interviews. This includes offers to help beta test software and to provide content. This is suggestive of significant buy-in from the community.

The situation 'on the ground' is complex. The 'traditional' archival community is in a transitional state with regard to digital readiness. It is apparent that the national archives, business archives and technical solution providers have the greatest engagement with, and consequently skills in, digital archiving. It is in this community that E-ARK tools and standards are best known. The situation in smaller archival bodies is far more variable. Here far fewer digital skills are evident and E-ARK tools and standards are less well established.

E-ARK4ALL is currently conducting a program of dissemination in order to widen the user community (Activity 5). It is apparent that in these 'new' sectors there is virtually no understanding of digital archival practice. Consequently, broad generalisations about training needs can be problematic. However, based on the research, the following types of training/education are envisaged:

a) **Technical training**: Technical training was the most sought after. Under this broad umbrella there is a need for general technical training and training about standards. There is also a need for **E-ARK-specific** training that is directly linked to E-ARK outputs. This would be detailed, nuanced training on a tool-by-tool basis (e.g. how to use the software, how to implement the specifications, etc.). These different technical training types clearly need to be incorporated into the E-ARK4ALL training portfolio.

b) **Basic introductory training**: As E-ARK4ALL begins to broaden its scope beyond archival organisations very basic training will be required for many of these entities who have almost no background in archiving. The need for introductory training was clearly evident in both the interviews and the questionnaire responses.

c) **Other training**: There was also an expressed need for both management level training and legal training. These should be incorporated into the training portfolio. Initially this could be under the aegis of the introductory training or as part of the Archival Ted-type Talks.

d) **Archival Ted-type Talks**: The archival Ted-type Talks are viewed as a critical means of combining basic training and awareness raising. These will be future looking addressing problems that all archives need to engage with and providing guidance on ways forward. All respondents were positive about the benefits of such a program of talks.

Appendix 1: Training needs assessment for archiving geodata

Archiving geodata

A considerable number of detailed interviews were conducted with organisations engaged with (or wishing to be engaged with) archiving geodata. These were segmented into four different stakeholder groups: archives, geodata producers, technical solution providers and academics. These stakeholders raised the following questions:

1. **Archives**
    1. Archivists (based on interviews and discussions with archivists in National and regional archives) raised the following detailed questions
        - What is geodata and what elements of it are important when archiving it?
        - Which producers would possibly produce it and what types of legal records are geodata used in?
        - What documentation do we need to gather along with the geodata and what questions do we need to ask the producer when evaluating geodata?
        - How to provide access to geodata once the archives become the custodian of records?
        - How can archival geodata be used to present other information?
        - Can geodata contain sensitive information (personal information, secret information) and how do we anonymize it or exclude the information?
    2. IT professionals
        - Which geodata formats can we accept and which of them can be used for long-term preservation? What type of rendering information is needed for rendering geodata?
        - What types of systems / environments are geodata stored and used in?
        - What tools can we use, to export geodata from their initial systems?
        - What tools can we use, to convert geodata into long-term preservation formats for geodata?
        - How can we validate geodata in the ingest process (content validation and technical validation)?
        - What kind of tools can we use to enable access to geodata?
        - How can we search based on geodata?

2. **Producers of geodata**

Based on interviews and discussions with some of the producers, that produce geodata records – a surveying and mapping agency, Environmental Agency, Ministry of Culture, Ministry of Public Administration, Geological Institute, MoD, etc.

- How do we prepare geodata before turning them over to archives?

- Which geodata formats are allowed in archives?
- How do we store geodata that is not a simple vector or raster type?
- How do we store application logic, which is part of the GIS System and cannot be stored as geodata?
- How do we manage the data before turning it to the archives (can we keep them in our current systems)?

- What documentation is necessary in order to enable interpretation of geodata in the future? How do we describe the data?
- How do we prepare our systems in order to ensure that we gather all the information needed for archiving geodata?
- How do we store the records that change continuously, how often do we make archival copies?
- What do we need to demand from technology providers in when ordering new systems in order to have a system suitable for archival data management?
- What tools would you recommend for transforming geodata to archival formats?

3. Technical solution providers

Based on discussions with a GIS Solution provider and a provider of technical solutions for archives.

- How do we design a new GIS systems in order to have a system suitable for archival data management?
- What tools would you recommend for transforming geodata to archival formats?
- Can we utilize existing metadata to harvest them when filling out archival content metadata (EAD, ISADG …)?
- Is there a special coordinate system that we need to transform the geodata into?
- What are the long-term preservation formats for geodata?
- How do records need to be structured when preparing them for archiving?

4. **Academics** (University level)
   - Why is it important to archive geodata?
   - How do we archive GIS Systems, since we don't archive applications?
   - Why do we need long-term preservation data formats?
   - How can we use historical geodata in a business context?

These questions provide a foundation upon which to create a geodata training offering.