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Boost Digi Culture

PROFESSIONAL DIGITAL COMPETENCE PROFILE

FINAL REPORT

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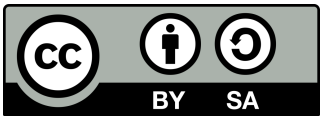

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Executive summary

The Professional Digital Competence Profile (PDP) has been developed as a reference framework for the BoostDigiCulture e-learning platform, which is intended to provide a microlearning upskilling program for enhancing digital competences of cultural professionals, primarily those working in the heritage sector - galleries, libraries, archives, and museums (GLAMs). The primary goal of the PDP is to serve as the starting point for the development of the BoostDigiCulture Self-assessment tool, aimed to help users of the platform assess their competences and select adequate training courses.

The PDP aims to determine critical competences for GLAM professionals within the *Digital Competence Framework for Citizens* (DigComp). DigComp is a set of generic digital competences defined by the European Commission as instrumental for personal, professional and social empowerment (Vuorikari, Kluzer and Punie, 2022). However, to identify specific needs and interests of the cultural heritage sector within the DigComp, it was necessary to carry out a research that comprised two stages: desk research and focus group interviews with GLAM staff.

The goal of the desk research was to gain insight into similar initiatives and best practices in Europe and beyond. A survey of the existing literature has been conducted with the intention to explore similar projects and initiatives in the heritage sector, but also other research that may be useful in adapting the DigComp framework to the needs of GLAM professionals.

During the summer of 2022 project partners conducted online focus group interviews with individuals working in GLAMs. The main objectives were to gain a better insight into how digital transformation impacts heritage institutions, institutional roles and daily professional tasks, to better understand the professionals' needs and current digital skill levels, and to identify possible institutional, cultural or social specificities which should be taken into consideration in learning path design.

The focus groups were conducted as semi-structured interviews with open questions that support discussion. There were six groups with total of 35 participants, who were selected by the method of purposive sampling based on personal invites and call for interest. The participants came from diverse backgrounds, which provided the opportunity to compare

their attitudes and skills based on the factors such as their work environment, experience or the size of the institutions they work in.

Based on the DigComp model, research findings and domain knowledge, the PDP has been developed containing four dimensions: areas, competences, competence elements and proficiency levels. The three main areas are information and data literacy, communication and collaboration, and digital content creation. Each area consists of three competences.
Information and data literacy:

- Data analysis and interpretation
- Data curation and preservation
- Evaluation and ethics of information and data

Communication and collaboration:

- Netiquette
- Digital collaboration
- Audience development

Digital content creation:

- Copyright and licenses
- Management of digital repositories
- Integrating and re-elaborating digital content.

Each competence can be expressed at three levels of proficiency: basic, intermediate and advanced. Competence elements include examples of specific knowledge and skills, which can serve as a starting point for self-evaluation.

It is hoped that the BoostDigiCulture learning program with its competence framework will not only help GLAM professionals upgrade digital competences needed for their daily work activities, but also increase their competitiveness on the labor market within the heritage sector and beyond, giving them the opportunity to develop a set of cross-disciplinary skills in line with the emerging job profiles such as digital curator or digital content manager, which are not limited by the institutional boundaries. It is also hoped that a higher level of cross-disciplinary skills will facilitate collaboration between cultural institutions, and that working on common projects may increase funding opportunities, especially for small and middle-sized organizations.

1. Introduction

The Professional Digital Competence Profile (PDP) has been developed as a reference framework for the BoostDigiCulture e-learning platform, which is intended to provide a microlearning upskilling program for enhancing digital competences of cultural professionals. The primary goal of the PDP is to serve as the starting point for the development of the BoostDigiCulture Self-assessment tool, aimed to help users of the platform assess their competences and select adequate training courses. The upskilling program is focused primarily on cultural professionals working in the heritage sector - galleries, libraries, archives, and museums (GLAMs) – because the services they provide are deeply affected by digital transformation, and their essential societal role - to be centers of knowledge in their community - strongly depends on how they keep up with growing demands of digital environments. The BoostDigiCulture project is aimed at developing a sustainable and inclusive framework of open educational resources and practices that will help GLAM professionals in devising digital strategies, incorporating digital tools and services in their daily work, and addressing social innovation and inclusion through their institutions' online cultural agenda.

It has been acknowledged that in dealing with challenges of digital transformation it is crucial to invest not only in technology, but also and foremost in people and their skills (Finnis and Kennedy, 2020:15). However, both research and anecdotal evidence suggest that digital upskilling of GLAM professionals is often unsystematic and driven by specific questions rather than by strategic thinking (Barnes et al., 2018:27). A survey conducted in public libraries in five European countries (Belgium, Bulgaria, Greece, Italy, Latvia) found that 94% of surveyed librarians felt they needed to update their knowledge and skills to fulfill their daily professional tasks (Massara, 2021:113). Another report has shown that in over a third of museums in England the staff felt they did not have sufficient digital skills, and cultural sector as a whole showed particular gaps around information and data literacy competences such as intellectual property and data analysis (Barnes et al., 2018:1). To effectively build their digital knowledge and skills, GLAM professionals need to have access to practical tools and resources (Malde et al., 2019:19). It is hoped that the BoostDigiCulture framework will not only help them upgrade digital competences needed for their daily work activities, but also increase their competitiveness on the labor market within the heritage sector and beyond, giving them the opportunity to develop a

set of cross-disciplinary skills in line with the emerging job profiles such as digital curator, digital content manager, or information broker, which are not limited by the institutional boundaries. Moreover, it is hoped that a higher level of cross-disciplinary skills will facilitate collaboration between cultural institutions, and that the opportunity of working on common projects may increase funding chances, especially for small and middle-sized organizations.

The PDP aims to determine critical competences for GLAM professionals within the *Digital Competence Framework for Citizens* (DigComp). DigComp is a set of generic digital competences defined by the European Commission as instrumental for personal, professional and social empowerment (Vuorikari, Kluzer and Punie, 2022). However, to identify specific needs and interests of the cultural heritage sector within the DigComp, it was necessary to carry out a research that comprised two stages: 1) desk research, for gaining insight into similar initiatives and best practices in Europe and beyond, and 2) focus group interviews with individuals working in GLAMs. This report summarizes the research methods and findings, and includes a complete competence profile that resulted from the research.

2. Methodology

2.1 Reference framework: DigComp

The first version of the DigComp was published in 2013 and has since become a point of reference for a number of digital competence initiatives across the European Union (Kluzer, Centeno and O'Keeffe, 2020; European Commission Joint Research Centre, 2022). Among specialized contexts so far it has found the widest application in the field of education (Redecker, 2017). However, it has also been referred to in projects regarding digital upskilling in the heritage sector, of which more details are provided in the following section. The BoostDigiCulture PDP refers to the version 2.2 of the DigComp framework, published in July 2022 (Fig.1).

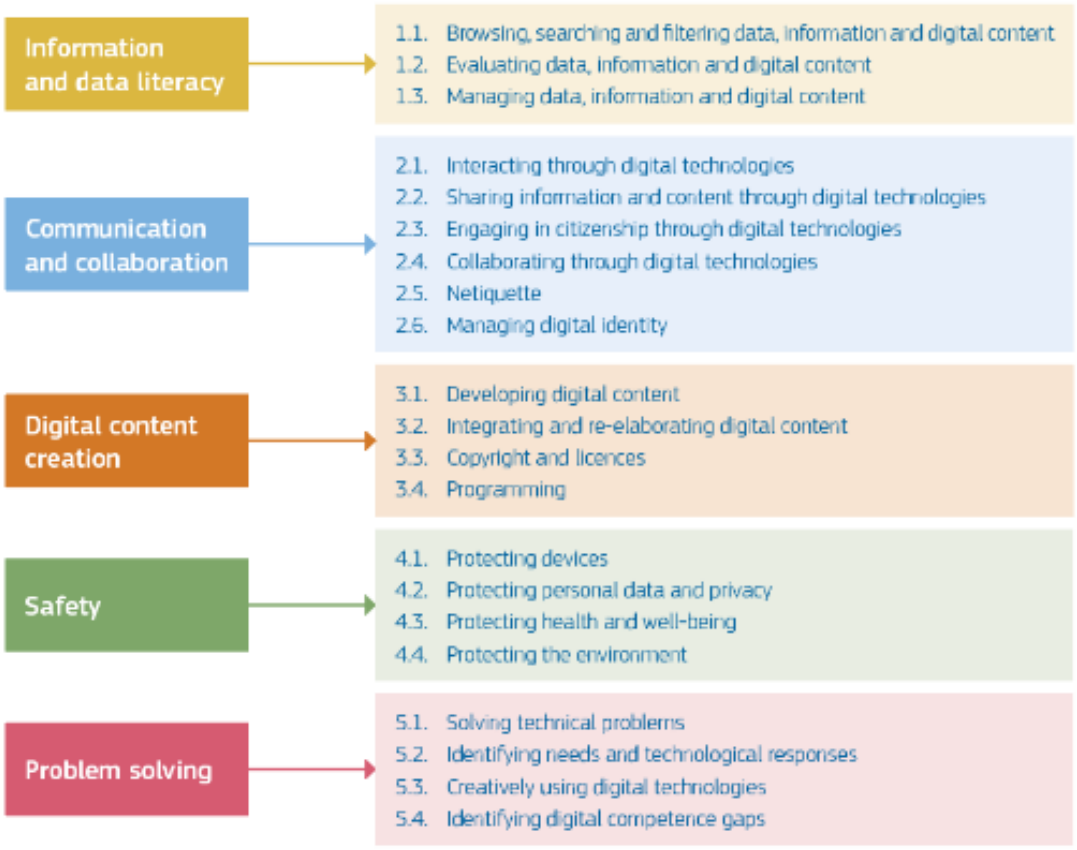

Fig. 1. The DigComp conceptual reference model. Source: DigComp 2.2.
https://publications.jrc.ec.europa.eu/repository/handle/JRC128415

The DigComp defines a set of 5 areas and 21 competences. Each competence covers knowledge, skills and attitudes, i.e. the ability to use digital tools for a certain purpose as well as to review their use in a wider institutional, professional and societal context. For each of the DigComp competence there are four levels of proficiency – foundation, intermediate, advanced and highly specialized – each of which is further subdivided into two sublevels.

The following 3 areas and 9 competences from the DigComp have been deemed relevant for the purpose of the BoostDigiCulture project and referred for further investigation:

1) Information and data literacy
   - Browsing, searching and filtering data, information and digital content
   - Evaluating data, information and digital content
   - Managing data, information and digital content

2) Communication and collaboration
   - Interacting through digital technologies
   - Sharing through digital technologies
   - Collaborating through digital technologies
3) Digital content creation
   - Developing digital content
   - Integrating and re-elaborating digital content
   - Copyright and licences.

2.2 Literature review

A survey of the literature has been conducted with the intention to explore: 1) similar projects and initiatives regarding digital upskilling in the heritage sector and possibly using DigComp as a reference, and 2) other research that may be useful in adapting the DigComp framework to the needs of GLAM professionals.

The need for digital upskilling in the heritage sector has been clearly acknowledged in the literature. Among the principal drivers Barnes et al. (2018:16-17) mention the demand to create and publish digital collections, a growing expectation of digital formats, communication with audiences, stakeholders and colleagues, and the competition from within the sector, or "fear of missing out". All of these factors have also been confirmed in our interviews.

During the past decade a number of projects and initiatives has been focused on how to facilitate the digital transformation of GLAM institutions and improve digital skills of their staff (Sturabotti and Surace, 2017; Finnis and Kennedy, 2020, Massara, 2021), with different approaches and methods. For example, the Biblio project took the approach of creating specialized job profiles for library professionals tasked with improving their institutions' capacity for the digital transition (Massara, 2021). The Biblio defined two profiles - Digital Transformation Facilitator (DIGY) and Community Engagement and Communication Officer (CECO) – and created respective specialization courses at the EQF5 level, based on the DigComp model. On the other hand, the One by One project, aimed at improving digital skills of museum professionals in England, adopted a more decentralized approach, suggesting that instead of being concentrated within one job profile or department - which in small-sized organizations may even prove impossible – digital

responsibilities need to be distributed among teams of people from various departments (Barnes et al., 2018:6-7). This organizational model, it has been argued, encourages the engagement with the digital and fosters creativity, innovation and learning culture (Barnes et al., 2018:6-7, Sturabotti and Surace, 2017:12). This approach is based on the assumption that digital shift affects all kinds of professional knowledge in the cultural heritage sector, which has been supported by some studies on job profiles in libraries (Choi and Rasmussen, 2009; Han and Hswe, 2010; Tammaro et al., 2016). Therefore, GLAM professionals need to include digital competences in their professional development paths regardless of their institutional role or job, since working with digital resources and services is hardly expected to be confined to a specific job position, especially in small-sized institutions. This assumption has also been supported by our focus group interviews. Boosting digital competences across job positions and departments may also enhance the institution's capacity for digital leadership, while the awareness of risks and benefits of digital environments strongly supports GLAM core missions: providing trustworthy information, fostering critical thinking and supporting active participation in the society (Brown, 2017; Sturabotti and Surace, 2017:9; Hazan, 2020).

Some European projects are oriented towards general improvement of institutional capacity for digital transformation. An example is the Mu.SA project, aimed at profiling new jobs in museums and developing corresponding curricula for digital and transversal competences (Kameas and Polymeropoulou, 2020). There are also examples of projects that are not primarily focused on digital transformation of a specific type of institution, but rather on a particular cross-disciplinary area within the cultural sector digital landscape. For example, the DigCurV Curriculum Framework has been set up with the aim to train GLAM staff in the area of digital curation (Molloy, Gow and Konstantelos, 2014). Nevertheless, it is evident (e.g. from the structure of the DigCurV framework) that digital curation – as many other digital competences – includes a range of "traditional" professional competences such as knowledge of archival practices, long-term preservation principles, metadata standards, copyright laws etc. Again, this demonstrates that skills and tasks associated with the digital in the GLAMs are fundamentally interdisciplinary, cross-departmental and cross-institutional.

It should also be noted that much of the research in this area highlights the importance of soft skills, among which persuasion, empathy, resilience, adaptability, social networking, passion for learning and willingness to play (Goss, 2017:41-42, 48-49; Sturabotti

and Surace, 2017:16; Finnis and Kennedy, 2020:16; Malde et al.; 2019: 14-16). However, teaching interpersonal skills remains outside the scope of this project.

2.3 Focus group interviews

Between 18 June and 15 July 2022 each partner in the BoostDigiCulture project conducted one online focus group interview. The main objectives were:

- to gain a better insight into how digital transformation impacts heritage institutions, institutional roles and daily professional tasks
- to better understand the professionals' needs and current digital skill levels, and to map them to the DigComp
- to identify possible institutional, cultural or social specificities which should be taken into consideration in learning path design.

The focus groups were conducted as semi-structured interviews with open questions that support discussion.

There were six groups with total of 35 participants, who were selected by the method of purposive sampling based on personal invites and call for interest. The participants came from diverse backgrounds, as shown on Fig. 2. However, no significant differences were observed in their answers that could be attributed to social, cultural or educational variety in European countries. Their attitudes and experiences seemed to be more influenced by their professional background, particularly by years of experience, size of the institution they work in, and general characteristics of their work environment (e.g. practitioners or scholars, public or private sector, practitioners or scholars). Nevertheless, in spite of different starting points, in the discussions the interviewees generally highlighted the same issues, such as an increased demand for digital content, the challenge of keeping the pace with the technology, and changes they experience in their job tasks.

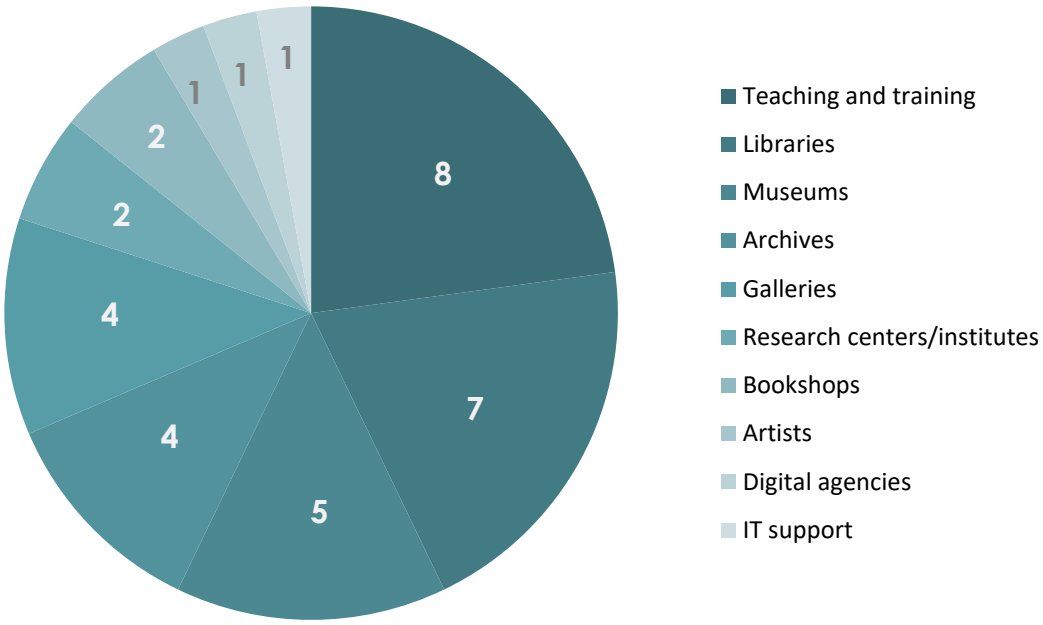

Fig. 2. Focus group participants by professional and institutional background

3. Findings

Our role has evolved together with emerging technologies, and we need to be ready to keep up with the changes to respond to the needs of our profession.

3.1 Information and data literacy

Understanding: The interviewees were generally familiar with the notion of information and data literacy, and mostly related it to the ability of finding, evaluating, selecting, interpreting and using information/data. Some of them emphasized the distinction between data literacy and information literacy, the former being the ability to interpret, analyze, understand and use factual data, and the latter being associated with assessing the trustworthiness of data/information and with using it purposefully and ethically. The notion of information literacy is perceived as changing and evolving with the emergence of new technologies, and thus related to lifelong learning. The distinction between information literacy and IT literacy has also been highlighted.

Knowledge, skills and attitudes associated with information and data literacy that were explicitly mentioned in the interviews included: working with databases, being aware of

context-dependency of data, understanding data as value/commodity, and generally knowing how to assess the accuracy of information and use the right information at the right time or in the right place. The participants also mentioned responsible handling of personal data and familiarity with copyright regulations.

Impact: A majority of the participants agreed that their daily job is affected by an increased need for information and data literacy. Given examples were:

- A growing demand for digitization of collections and services (particularly experienced during the COVID 19 pandemic) raises issues concerning data storage and management.
- Open science initiatives entail questions regarding research data management (especially in university libraries).
- The quantity of available online sources (e.g. relevant databases) can be overwhelming, which makes finding the right information difficult and time-consuming ("the right information" may include an answer to a user's query, but also tools and resources the interviewees need for their own professional development).
- The use of institutional collections is in risk of declining because users prefer easier and faster ways of finding information (Google) even at the expense of accuracy. Users also tend to ignore or underuse analogue collections and resources.
- There is an increased demand for users' education in information and media literacy (e.g. parents who want to foster media literacy of their children or teach them how to use the internet safely).
- The rise of misinformation and disinformation poses additional challenges both in terms of their own professional development (how to verify which information is authentic and accurate) and users' education (how to teach users to evaluate sources of information).

Proficiency: Most interviewees feel confident with their information/data literacy skills. However, they do not feel equally competent in all aspects of information/data literacy. Generally, they feel most confident with information/data searching and browsing, but less competent in data collection, organization, analysis and management. In a survey conducted in one of the groups, the participants were asked to rate their competences as beginner, intermediate, advanced or professional: 60% assessed themselves as advanced in information searching and navigating, with the remaining 40% equally

distributed between intermediate and professional. In comparison, in the area of information/data management 40% ranked as advanced, 40% as intermediate, and only 20% as professional, which is somewhat surprising, considering that information/data management is one of the core activities of GLAM institutions. The greatest differences were observed in the assessment of the ability to critically evaluate sources of information: while some participants feel fairly confident and ready to train others, others perceive it as difficult and challenging. However, the participants are aware that critically assessing sources of information, and particularly recognizing misinformation and disinformation, is essential in today's digital environment. They believe it is their task to help users improve in this area, not least because they think that promoting reliable and trustworthy sources may eventually lead to an increased use of GLAMs collections (both analogue and digital). The participants are also aware of a close relationship between teaching information/data literacy and fostering social inclusion and empowerment, which they understand as their traditional societal role.

Suggestions: The participants implicitly or explicitly suggested the following learning topics in the area of information/data management:

- data curation and preservation (including data archiving and recovery)
- management of research data (including citizen science data)
- data analysis and interpretation
- ethical use of data.

3.2 Communication and collaboration

Understanding: The participants were primarily focused on their interaction with users, particularly on knowing how to use different communication channels to target different user groups. Communication and collaboration were mostly related to digital content and social media, and to a lesser extent to a business environment (teamwork, networking, information exchange and knowledge transfer). Among required communication skills, the participants listed: using emails and messenger apps, managing content on social media channels, using video conferencing apps, using online collaborative tools and platforms, and adhering to the basic standards of netiquette.
One participant described communication as a complex and multilayered area, in which two different forms are crucial to cultural institutions: one is communicating with

audiences, and the other communicating to create and transmit knowledge. The latter is done primarily through creation and maintenance of digital repositories.

Impact: Digital communication and collaboration are inherently present in all aspects of work in GLAM institutions, particularly since the Covid 19 pandemic. There is also a growing tendency to set up joint projects with other national and international institutions and networks. Opportunities for collaboration lead to a more complex work environment, which in turn requires a more transdisciplinary approach to tackle this complexity.
In external communication most interviewees attributed the increased demand for digital interaction to two reasons: 1) the need to reach out to the younger audience, and 2) the need to reach the audience that for various reasons could not be reached otherwise. GLAM institutions need an extensive online presence to be visible in the cultural scene. However, it was emphasized that digital and analogue communication are complementary and should be used seamlessly depending on the occasion. Therefore, the ability to switch to the communication modality and tool that is appropriate for a given context is perceived as one of the essential skills (the concept of "omnichannel", borrowed from marketing specialists, has been brought up to describe an integration of physical and digital interaction, followed by the example of the Cooper Hewitt Smithsonian Design Museum in New York, https://www.cooperhewitt.org/new-experience/).
In internal communication it has become critical to know how to use collaborative platforms such as cloud-based storage systems, wikis etc. They bridge physical distances, save time, provide a safe environment for digital documents, and are thus considered to be the future for all kinds of organizations. Digital collaboration is sometimes complicated by the restrictions related to personal data protection (e.g. some tools do not conform to the GDPR and therefore cannot be used in public institutions).

Proficiency: Although the interviewees are generally confident with using collaborative tools and platforms, some feel they need additional training in certain aspects. They highly assess their ability to select the right communication channel and modality for a given occasion. However, they expressed a strong need for a training in social media communication. There is a lack of systematic, strategic approach to content creation and dissemination in social media, and their efforts in this area are mostly based on personal experiments with various platforms. Some participants observed that cultural

institutions often have a conservative, even tedious style of communication with the audience, and that it should be improved.

Suggestions: Most of the suggestions in this area, such as training in social media, improving communication style, and learning how to adapt digital content production for different platforms ("create once, publish everywhere"), generally fall under the umbrella term of audience development. Its primary goal is to increase engagement and build stronger relationships with the existing and potential audiences through an interdisciplinary approach that involves at least some basic knowledge of public policies, IT, marketing and design. It was suggested that in this area cultural professionals would benefit from trainings led by business school experts.

3.3 Digital content creation

I had to up my game and learn substantial skills, like Photoshop and creating virtual tours, to maintain the interest of our audience during the pandemic. I hired an expert to develop 3D tours of exhibitions, and this worked to engage with the audience and attract them to the gallery.

Understanding: The participants agree that digital content creation and publishing is closely related to the institution's identity and visibility, and thus important for promoting institutional activities and services. Digital content creation involves, on the one hand, promotional material in a variety of digital forms (websites, social media posts, videos, podcasts, digital events), and on the other hand, digitization and publishing of institutional collections (digital repositories, thematic collections, online exhibitions, virtual tours etc.), as well as creation of educational offerings (e-learning courses, online games, quizzes).

Impact: All types of GLAM institutions are affected by a growing amount of quality online content, because they need to produce and publish their own high-value content to keep the pace. High design requirements put them under pressure to professionalize their online appearance. Most of the institutions maintain their own website and one or more social media profiles (mostly Facebook and Instagram, and more recently TikTok). A growing importance of visual language supported by these media prompts the development of new skills such as digital image and video editing.

The question of how digital content creation affects jobs in GLAM institutions can be approached from two points of view. On the one hand, an increasing demand for digital content means it is necessary to enhance basic digital content creation skills in all institutional roles. This makes GLAM professionals more "up-to-date", but also adds to their workload. On the other hand, some participants pointed out that the digital creates an illusion of being easily communicated, while in fact appropriate quality levels can be assured only if content creation is assigned to experts (IT professionals, designers, animators, PR specialists). In this case job descriptions of GLAM professionals are not affected, but there is an evident financial burden for the organization. The interviewees agreed that GLAM professionals need to be able to produce digital content at a certain level of quality, to know which digital content tools and formats are available, and to be able to assess which tasks require the engagement of specialists.

Proficiency: Most of the participants said they knew how to create and edit digital text files or produce multimedia presentations. Slightly less felt competent in manipulating digital content created by others (e.g. integrating text and video). In a survey conducted in one of the groups, where the participants were asked to rate their competences as beginner, intermediate, advanced or professional, 50% assessed their ability to edit or re-elaborate the existing digital content as beginner or intermediate. There was also a strongly expressed need to enhance knowledge related to copyright restrictions and licencing systems.

3.4 Challenges

The participants were asked to recount the greatest challenges they face in their work with digital content and services. The recounted challenges were:

- a growing amount of work and a shortage of time
- rapid technological changes that require constant adaptation
- lack of digital leadership and training in their institutions
- lack of funding regarding digital content and infrastructure
- prejudices that digital skills do not concern the cultural sector
- issues of digital preservation
- the demand to reinforce the mediator role of GLAMs by developing attractive, appealing digital content.

The participants reported that a lot of responsibilities concerning digital content and services, such as the responsibility for social media, come on top of their other duties, taking time out of their ordinary work and undermining their effectiveness. In almost 80% museums in Portugal social media presence is a responsibility of a person who besides that has a number of other duties. They also mentioned a lack of planning, strategy and preparation for digital activities at the institutional level. Consequently, there is a general lack of systematic institutional training in digital skills, which means the employees have to spare additional time and resources to find adequate upskilling programs or simply to find answers to practical questions that arise during their work with the digital. There is also a lack of funding regarding digitization and digital infrastructure, especially in medium and small-scale institutions (but also in smaller countries, compared to larger and more developed countries in the Western and Northern Europe). In one of the interviews the participants also pointed out a lack of time and know-how to write funding proposals, as they are burdened with other tasks.

One of the issues complicating digital transformation is a negative attitude towards digital technologies, still widely present in the cultural sector. Of more specific challenges the participants mentioned digital preservation and the demands of digital content creation.

3.5 Additional recommendations

All the interviewees have participated in professional development programs. They had attended live and online courses, workshops and webinars. Some of them, usually those working in larger organizations, have had in-house training in various areas, from the use of collaborative tools such as MS Teams to more complex topics such as data management. However, most of the interviewees have acquired digital skills on their own, searching the web to find adequate tools and experimenting with them. They find this method to be extremely time-consuming and feel the need for a more focused guidance. They prefer short, practice-oriented presentations to long tutorials or theoretical courses without a clear implementation scenario. Their suggestions for an e-learning platform include:

- The platform should offer professional development paths through massive online open courses (MOOCs). The MOOCs prepared for the Mu.SA project have been offered as an example of good practice (http://www.project-musa.eu/).
- The development of more technical skills may not work well in an online environment. It should be supported as much as possible by practical tutorials,

workshops and one-on-one trainings, as well as online spaces where trainees could ask questions and get direct answers or advice. One participant suggested the use of chats instead of forums.

- There should be a possibility for attendees to find out about new tools and practices in the field and experiment with them. The Teaching with Europeana workshops have been given as an example of good practice (https://teachwitheuropeana.eun.org/).
- Presentations should be focused, dynamic, not too long, and include videos and animations to facilitate understanding.
- The learning program should foster design thinking.
- The learning program should not neglect basics. People are often confident in their knowledge and skills because they regularly use certain tool, but this does not necessarily mean that they use it correctly or know how to use all the available options. The program should find a way to target "those who think they know" and help them improve their competences.
- Acquired competences could be tested through teamwork to stimulate attendees' creativity and problem-solving skills.

4. Conclusion

Based on the research findings, the following decisions have been made regarding the development of the PDP competences and their relationship with the DigComp framework:

- Some DigComp competences have been left out, because it has been estimated that the level of proficiency among GLAM professionals in these areas is already high, and additional training is not needed. For example, a majority of focus group participants claimed they felt fairly competent in browsing, searching and filtering data, information and digital content, and demonstrated high familiarity with key concepts in this area.
- Some of the DigComp competences have been granulated into subsets, because the focus group participants expressed a need for more focused sets of skills. For example, the competence of managing data, information and digital content has been subdivided into data analysis and interpretation, and data curation and preservation.

- Some DigComp competences have been transferred from the DigComp into the PDP as they are, because the focus group findings suggested their importance for the cultural heritage sector and revealed that GLAM staff still needed training in these areas. The examples are copyright and licencing, and integrating and re-elaborating digital content.
- Additional DigComp competences have been included in the PDP (besides those initially referred for research; see 2.1) because the focus group participants expressed a need for them (e.g. netiquette).

In conclusion, the PDP comprises 3 areas with 9 competences (Fig. 3). The elements for each of the competences have been defined based on the DigComp, desk research, focus group findings and domain knowledge.

For the reasons of simplicity the PDP reduces DigComp competence levels to three – basic, intermediate and advanced. The reason for this is the observation that not all of the PDP competences require a high specialization in the GLAM sector. Some situations are complex to the point that to assure appropriate quality levels GLAMs need to engage specialists such as IT developers, data analysts, PR specialists or designers, and it is not feasible to expect such a specialized level of proficiency from the GLAM staff. However, possessing advanced skills in the field enables GLAM professionals to strategically determine their tasks, to carry out most of these by themselves, and to communicate more easily with the experts if need be.

The levels in the PDP are generally defined as following:

BASIC LEVEL:

- general awareness of a given area
- ability to recognize and describe fundamental concepts
- ability to work with basic tools within a given workflow.

INTERMEDIATE LEVEL:

- deeper understanding of a given area
- ability to apply knowledge and skills in various professional contexts

ADVANCED LEVEL:

- detailed knowledge of a given area

- ability to integrate knowledge and skills into a wider context of institutional and supra-institutional practices, strategies and polices
- ability to create innovative practices and create solutions to complex problems
- ability to train others.

Not all the competence elements proposed in the profile are needed at the highest proficiency level.

The proficiency levels in the PDP contain some examples of competences, but a more detailed mapping of competence elements to specific levels should be done in collaboration with domain experts engaged in the training course development.

5. Professional Digital Competence Profile (PDP)

5.1 Profile overview

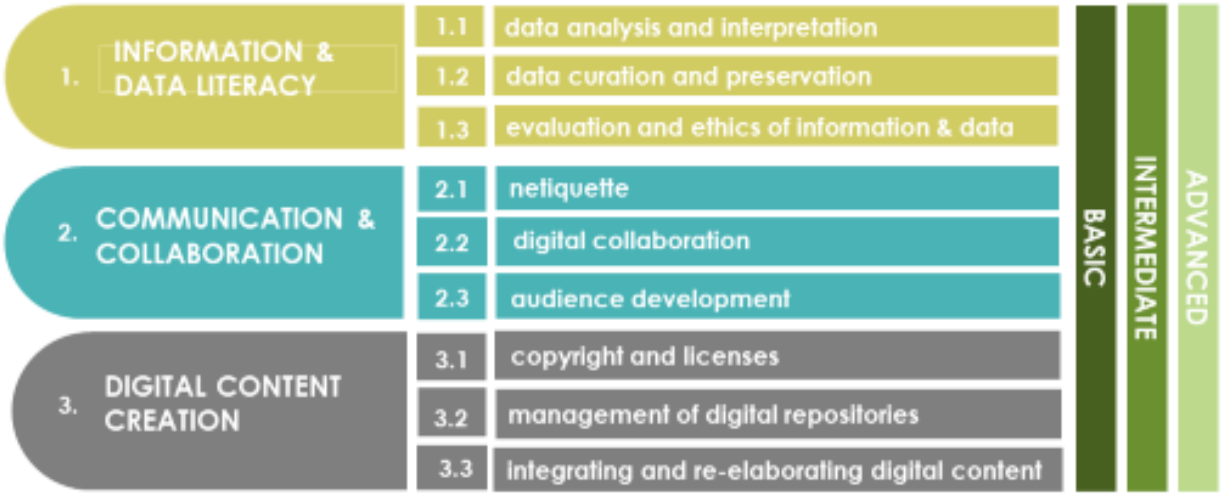

Fig. 3. Professionals Digital Competence Profile (PDP) – overview. Infographics template by https://slidesgo.com/, https://www.freepik.com

5.2 Competence elements

AREA: 1. Information and data literacy

1.1 Data analysis and interpretation	
Related competences: 1.3 Evaluation and ethics of information and data	
PDP COMPETENCE ELEMENTS	**LEVEL OF PROFICIENCY**
▪ to understand possible benefits of data analysis in cultural institutions' workflows ▪ to know how to collect relevant data (e.g. creating a survey) ▪ to use available tools for data collection and analysis ▪ to know how to prepare data for analysis (data cleaning) ▪ to apply basic statistical procedures to quantitative data ▪ to know how to evaluate and interpret data ▪ to use available tools for data visualization ▪ to be aware of ethical issues associated with data analysis and data-driven decision processes ▪ to improve current professional practices, tools and services (e.g. information systems, institutional repositories, learning courses, websites, social media profiles etc.) based on data analysis and interpretation	**BASIC:** -working with basic tools for data collection, analysis and visualization (online forms, spreadsheets. PowerPoint etc.) **INTERMEDIATE:** -working with more complex data analysis and visualization tools in a structured environment (databases) **ADVANCED:** -working with data mining tools and techniques -making predictions based on data -improving existing practices based on data

1.2 Data curation and preservation	
Related competences: 1.3 Evaluation and ethics of information and data 3.2 Management of digital repositories	
PDP COMPETENCE ELEMENTS	**LEVEL OF PROFICIENCY**
▪ to be familiar with relevant policies, regulations and guidelines on data preservation and reuse, especially in the public sector (including FAIR principles, intellectual property laws etc.) ▪ to distinguish between types and formats of data, to understand the requirements for their storage and preservation, and to be able to assess which data type or storage system is the most appropriate in a given context	**BASIC:** -curating data in simple environments -understanding and applying basic archiving and access tools and techniques (file naming conventions, versioning, basic organization principles etc.)

▪ to be familiar with relevant models and standards for data archiving (OAIS, PREMIS etc.) ▪ to be familiar with relevant identifier systems and metadata schemes ▪ to understand data preservation technologies ▪ to understand and avoid data security risks (e.g. unauthorized access, data breaches, data loss) ▪ to be able to verify data integrity ▪ to be able to express system requirements to software developers and providers ▪ to be able to assess the trustworthiness of open data repositories and select those that are most appropriate for institutional needs ▪ to be able to ensure reliable data transfer (from one format or storage system to the next, from one business process to the next etc.) ▪ to be able to create data management plans and to include data management in institutional and supra-institutional strategies	**INTERMEDIATE:** -curating data in more complex, structured environments (e.g. relational databases) -understanding and applying more advanced archiving and access tools and techniques in an open data environment **ADVANCED:** -planning for integrity and security of data -improving existing data curation practices -creating data management strategies -including data curation principles and procedures in institutional and supra-institutional policies and strategies

1.3 Evaluation and ethics of information and data	
PDP COMPETENCE ELEMENTS	**LEVEL OF PROFICIENCY**
▪ to be familiar with relevant policies, guidelines and legislatives concerning ethical data use (e.g. GDPR, open government, sensitive research data, open source code initiatives etc.), and to be aware of their implications in the cultural heritage sector ▪ to be familiar with the notions of disinformation and misinformation ▪ to be able to define clear purposes and boundaries for data collection, access, sharing, use and reuse in different institutional workflows and services (e.g. cultural data curation, research data management, data analysis and interpretation) ▪ to understand and avoid risks associated with sensitive data ▪ to analyse and critically assess data, online information sources, search results or social media activity streams	**BASIC:** -detecting the credibility of information sources -managing information and data responsibly within a given workflow **INTERMEDIATE:** -analyzing, comparing and critically assessing trustworthiness of various kinds of information sources -analyzing, comparing and evaluating information and data use throughout institutional practices and policies

▪ to know how to verify information found on the internet (e.g. checking multiple sources, using fact-checking services) ▪ to understand the role of AI algorithms in information & data management and distribution ▪ to be aware of possible biases in controlled vocabularies, classification schemes and other metadata standards used in GLAMs ▪ to guide users on how to evaluate information and data	**ADVANCED:** -guiding others on how to analyze, compare and evaluate information sources -understanding and evaluating ethical implications of information & data use and presentation in a wider institutional and societal context

AREA: 2. Communication and collaboration

2.1 Netiquette	
PDP COMPETENCE ELEMENTS	**LEVEL OF PROFICIENCY**
▪ to be aware of cultural and generational diversity in digital environments ▪ to be familiar with basic behavioural norms in digital environments ▪ to be familiar with meanings of non-verbal messages used in digital environments (e.g. emojis) ▪ to be able to adapt communication strategies to specific audiences (children, young people, senior citizens etc.) ▪ to be able to adapt communication to specific situations (online business meetings, remote presentations, comments on social media etc.) ▪ to be aware of accessibility requirements when communicating in digital environments so that communication is inclusive and accessible for all users ▪ to recognize hate speech and other forms of hostile messages or activities ▪ to successfully manage inappropriate online behaviour both in business communication and communication with the users/audience ▪ to understand implications of content sharing and to share content purposefully and responsibly	**BASIC:** -adhering to basic norms of netiquette -differentiating and adapting to simple diversities in online communication **INTERMEDIATE:** -differentiating and adapting to general cultural or generational diversities in online communication **ADVANCED:** -proficiently using a variety of communication strategies depending on the context

2.2 Digital collaboration	
PDP COMPETENCE ELEMENTS	**LEVEL OF PROFICIENCY**
Related competences: 2.1 Netiquette	
▪ to use digital tools for teamwork planning and scheduling (e.g. digital calendars, online meeting schedulers) ▪ to use digital tools for content co-creation, including document uploading, sharing, editing, commenting ▪ to use video conferencing apps and to be familiar with behavioural norms in online meetings ▪ to be familiar with collaborative e-learning tools and methods ▪ to understand which is the most appropriate tool for a given task or communication need ▪ to understand limitations of online collaboration and to know how to compensate for them ▪ to understand how to use benefits of online collaboration to improve work processes (e.g. access to information, knowledge sharing) ▪ to be aware of and to avoid downsides of online collaboration that can negatively affect motivation and productivity (e.g. digital fatigue)	**BASIC:** -using simple digital collaboration tools within a given workflow **INTERMEDIATE:** -using digital tools and processes in various workflows -assessing which collaborative digital tool is the most appropriate for a given task **ADVANCED:** -creating digital collaboration strategies -enhancing institutional workflows (e.g. project management, information flow) through collaborative tools

2.3 Audience development	
Related competences: 1.1 Data analysis and interpretation 3.3 Integrating and re-elaborating digital content	
PDP COMPETENCE ELEMENTS	**LEVEL OF PROFICIENCY**
▪ to be able to identify ways in which different community members/groups might benefit from institutional resources and services ▪ to create engaging digital content related to institutional resources and services ▪ to be able to communicate successfully with the users/audience through a variety of channels, depending on a target group ▪ to create content strategies and to use web analytics for content planning ▪ to participate in the community online activities	**BASIC:** -using basic communication tools (websites, social media) to transmit content based on institutional collections and services -using different platforms to target different audiences (e.g. young people, other GLAM professionals, scholars)

▪ to use tools for creating virtual exhibitions, tours etc. ▪ to develop innovative practices that put GLAM institutions at the centre of community interaction (e.g. to connect with local cultural events, to develop platforms and apps based on local heritage) ▪ to collaborate strategically with other GLAM institutions to develop new services that would help increase outreach in the community	**INTERMEDIATE:** -using a variety of communication forms and channels to target different audiences and connect institutional offerings into engaging stories about cultural heritage -using data analytic tools to enhance content planning and outreach
	ADVANCED: -developing innovative practices and strategies to position a cultural institution at the center of community interaction

AREA: 3. Digital content creation

3.1 Copyright and licenses	
PDP COMPETENCE ELEMENTS	**LEVEL OF PROFICIENCY**
▪ to be familiar with licensing systems, rules and restrictions (e.g. copyright protection, Creative Commons licenses, public domain) and their implications for GLAM institutions ▪ to be aware of legal limitations of using and sharing digital content and to know how to use and share digital content legally (e.g. check the terms and conditions and licencing schemes) ▪ to be aware of mechanisms and methods for blocking or limiting access to digital content (e.g. passwords, geo-blocking, Technical Protection Measures, TPM) ▪ to know which exceptions from copyright protection can be applied in which situations (fair use) ▪ to differentiate between models of licensing software (e.g. proprietary, free and open-source software) ▪ to be able to check and understand the right to use and/or re-use digital content created by a third party ▪ to be able to choose the most suitable licensing strategy for sharing and protecting institutional content	**BASIC:** -to be familiar with simple rules of copyright and licenses that apply to data, digital information and content -to know how to use and share digital content legally in simple environments (e.g. finding free online images for the purpose of presentation)
	INTERMEDIATE: -to choose and apply appropriate rules of copyright and licenses in various workflows and institutional practices -to know how to use and share digital content in more complex environments (e.g.

	institutional projects, repository management)
	ADVANCED: -create solutions to complex problems related to applying copyright and licenses to data, digital information and content -guide others in applying copyright and licenses

3.2 Management of digital repositories	
Related competences: 1.2 Data curation and preservation 3.1 Copyright and licenses 3.3 Integrating and re-elaborating digital content	
PDP COMPETENCE ELEMENTS	**LEVEL OF PROFICIENCY**
▪ to differentiate between various types of digital repositories (e.g. institutional, thematic) ▪ to be familiar with relevant guidelines and standards related to digital repository infrastructure ▪ to analyse and assess digital repository software requirements in the context of institutional needs (e.g. open software vs. proprietary software) ▪ to express system requirements to software developers or providers ▪ to understand the requirements of good interface design ▪ to understand fundamentals of digital preservation ▪ to understand how search engines work and how repository content can be made more visible and discoverable in search engines ▪ to develop policies that address digital repository development, management, access and preservation ▪ to use digital repositories in activities, projects and initiatives associated with audience development ▪ to be able to assess impact of a digital repository in institutional and supra-institutional context	**BASIC:** -familiarity with basic requirements of digital repositories **INTERMEDIATE:** -developing and managing digital repositories **ADVANCED:** -to create innovative practices regarding development and use of digital repositories -to use digital repositories to improve institutional impact

3.3 Integrating and re-elaborating digital content	
Related competences: 3.1 Copyright and licenses	
PDP COMPETENCE ELEMENTS	**LEVEL OF PROFICIENCY**
▪ to use available tools for digital image editing ▪ to use available tools for video editing (e.g. adding captions, music, voiceover) ▪ to be able to create infographics, posters, presentations etc. by combining different kinds of content (e.g. text, images, videos, animations, statistical data) ▪ to be aware of various possibilities of modifying images and videos (from filters to deep fake techniques) and to use available tools to verify their integrity ▪ to know how to integrate digital technologies, hardware and sensor data to create a new (digital or non-digital) artefact (e.g. makerspace and digital fabrication activities) ▪ to understand basic processes of AI content generation, and potentials and drawbacks of using such content	**BASIC:** -using simple tools to edit digital images, sound and videos **INTERMEDIATE:** -assembling and re-elaborating different kinds of digital files (images, videos, sound, text, statistical data etc.) to create new and original items of content -assessing the most appropriate ways to modify, refine, improve and integrate digital content **ADVANCED:** -create solutions to complex problems related to modifying, refining, improving and integrating digital content

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