

DIGITAL TRANSITION STRATEGIES AND TRAINING PROGRAMS FOR DIGITAL CURATION OF MUSEUM

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ABSTRACT :

Small and medium-sized museums have been particularly impacted by the COVID-19 pandemic, as they often have limited resources and staff to manage the challenges posed by the pandemic but also embracing the extensive use of technology in our everyday lives, museums have to adapt to this new reality. The aim of the Museum-Next project is to provide small and medium-sized museums with a new generation of specialised EU professionals working in the Cultural Heritage sector, equipped with a recognised, cross-cutting and high-level digital skillset: the Digital Curators. In the digital age, museum digital curators play a critical role in preserving, organising, and presenting museum collections online. As part of the project, our research performed a desk analysis on the state of the art on museum digital transition strategies and museum digital curator training programs already implemented at EU scale in order to map good practices and tools already existing so as to highlight the current situation and the gaps that may appear in the topic.

1. INTRODUCTION

Cultural and Creative Sectors (CCS) have been among the most negatively affected since the start of the Covid-19 pandemic. Before, CCS institutions already struggled to respond to the vulnerabilities of this sector, now it has become almost impossible for many of them to continue with their activities. Cultural institutions, especially museums, have indeed faced big challenges over the last years, being closed for prolonged periods or with very reduced access in order to follow the social distancing measures (Clini and Quattrini, 2020). This impossibility of fully experiencing the physical dimension of Cultural Heritage has therefore led to increasing efforts to transfer cultural experiences, products and services in an online format (OSSERVATORI Observatory for Digital Innovation in Cultural Heritage and Activities, 2021) (NEMO Network of European Museum Organisations, 2020). The museums have to rebuild themselves in order to face the new challenges of a post-Covid era, but often they lack resources and concrete possibilities to update themselves and the skills of their staff.

With the return of physical museum audiences, museums might consider this to mean that digital tools are now less relevant, rather than identifying opportunities to strike a measure of equilibrium between the digital and physical going forward (Debono, 2021). Instead, the digital revolution has brought about a new era of museum practice, with digital curation being one of the most innovative areas. Such phenomenon has led to the emergence of a new range of cultural experiences, as people interact with physical and virtual reality, through social media platforms or "phygital" museum exhibitions (Banfi et al., 2023).

Digital may not be the core skill that museums are run on, but the analysis of how digital skills are deployed evidences digital as an established part of what museums do, and will do in the future, museologically and as businesses or organisations (Barnes et al. 2018).

The work presented here is part of the ERASMUS+ project "MUSEUM-NEXT: Stimulating digitization at small and medium-sized museums through the enhancement of the Digital Curator" in the field of Vocational Education and Training. The project partnership consists of six institutions, three museums and three educational institutions, from the Mediterranean area. Specifically, the project partners are Marche Culture Foundation (IT), lead partner, National Museum of Zadar (CR), Museum of Fine Arts of Alicante (ES), Inercia Digital (ES), University of Patras (GR), and Polytechnic University of Marche (IT). The implementation plan of the project first includes the study of the state of the art regarding: a) the digital transformation strategies of museums and b) Digital Curator programs training. This first phase is intended to establish a scenario and raise awareness on potentials and weak points, to be used as a guideline for the design and development of a Pilot Case within the partner museums. At the conclusion of the project, it is expected that a Digital Operation Plan will be formulated to guide museums through the long-term transformation process. Given the fact that the project is currently on-going and about halfway through, the present paper takes advantage of the desk researches carried out for the first Result of the project and tries to depict the current situation in terms of digital transformation strategies as well as in terms of training program for the digital upskilling of museum professionals.

The concept of digital transformation of museums is strictly linked to the term "digitalization"; this is not a process of putting museums online but refers to the process of using digital technologies and strategies to enhance the visitor experience, engage audiences, increase accessibility to collections and for back-office management. To clarify this concept, it is useful to distinguish two related but different processes: "digitization" and "digitalization". The first is the transition from analog to digital form, while the second involves the use of digital technologies to change a business model and provide new opportunities for revenue and value production. On the contrary digitization takes

an analog process and changes it to a digital form without any different-in-kind changes to the process itself (Gartner glossary). This couple of terms and the differences in between were originally debated in economics (Gobble, 2018) and analysing technological trends, while currently in the cultural heritage domain literature emerges highlighting a variety of samples in order to identify different approaches to digitalization processes. Moreover, research provided new insights in order to understand how held or accessible digital skills drive decision-making processes regarding the deployment of technologies (Clini et al., 2019) (Cori and Fraticelli, 2021). Such digital transformation involves the integration of technology into all aspects of museum operations, including curation, exhibition design, visitor engagement, and marketing (Park et al, 2021).

A recent report highlights some interesting aspects and provides some useful definitions: digital transformation is more than just problem solving. It is a profound change for an organisation's framework and permits it to survive and thrive in the internet era. In order to depict strategies, a fundamental aspect is the ability to analyse and understand the level of digital maturity of GLAM's institutions. Digital maturity is defined as an individual's or an organisation's ability to use, manage, create and understand digital, in a way that is contextual, holistic and purposeful (Finis et al., 2020). So, the self-assessment became an essential methodology for examining, through the analysis of internal processes, the state of digital maturity of an organisation and its ability to implement technologies and organisational innovations that make the model of management adopted. As an example, the in DICES project developed the self-assessment tool "Enumerate" for the institutions that would like to better understand their digital transformation, digitisation, organisational capacity, user engagement, audience development and collections reuse. This assessment should thus lead to the choice of digital tools to tackle the challenges of open access, social media presence, widening outreach, reaching diverse audiences and stimulating user participation (Baker Hitzhusen et al., 2022).

In fact, maturing digital institutions should be focused on integrating digital technologies, such as social, mobile, analytics and cloud, in the service of transforming how their businesses work. In other words, strategy, more than technology itself, drives digital transformation (Kane et al., 2015). In the light of that, it is proven that one of the main drivers of digital transformation in museums is the increasing demand for online and on-site digital experiences. As more people rely on digital technologies for information and entertainment, museums are recognizing the need to adapt to this changing landscape to remain relevant and accessible to audiences (Taormina, F. & Baraldi, S. B., 2022).

As mentioned, one goal of the MUSEUM-NEXT project is therefore to contribute to the training of a new generation of professionals, the Digital Curators (Shehade and Stylianou-Lambert, 2020). This aim combines perfectly with the new declaration that the year 2023 will be the European Year of Skills and the EU Commission will promote upskilling and reskilling opportunities.

The Digital Curator is essential for the future of museums in the age of Digital Cultural Heritage (Damala, Ruthven, and Hornecker, 2019). The Digital Curator can apply the most modern digital tools and resources to a variety of aspects essential for museum management, such as: facility management,

cataloguing, management and updating of archives, online dissemination and promotion, creation of new formats and visitor experiences, user support in both physical and digital spaces, among many others (Trant, 2009). The role of a digital curator is to manage and curate digital content for online platforms and social media (Beagrie, 2006). Digital curators are responsible for managing and organising digital content, such as images, videos, and other digital media, in a way that is accessible and engaging for online and onsite audiences (Madrid, 2013). In addition, digital curators are often tasked with developing digital strategies to engage audiences, such as creating online exhibitions, developing interactive experiences, and utilising social media to promote museum collections and events (Dayan et al., 2023). They may also work with other museum staff to develop digital preservation policies and ensure that digital content is accessible to audiences (AAM, 2017). Overall, the role of a digital curator is crucial in helping museums adapt to the digital age and connect with your audiences, not only online. In (Lopes, 2020), the tasks of the Digital Curator are:

- interacting with the digital in the museum space;
- curating the museum in the world wide web;
- curating new media art and new media curating art.

Nevertheless, up to date, there is no single, unanimously adopted reference framework for empowering learners with relevant skills, competences and expertise for this career (Royston and Parry, 2019).

2. METHODOLOGY: TOWARDS A STATE OF THE ART ON MUSEUMS DIGITALIZATION

For this proposal, a survey and desk analysis on the state of the art on museum digital transition strategies and museum digital curator training programs already implemented at EU scale has been realised. In this way, the starting level from which to imagine an increase in digital values (strategies, specialised personnel, tools) is clarified.

2.1 Museum digital transition strategies

This section aims to offer a comprehensive overview of the best-known museum digital transition strategies already implemented in European scale. The mapping exercise is part of the R1.1a action of the MUSEUM-NEXT project. The criteria adopted aim to gather the most advertised cases where museums offer innovative experience of visiting leveraging digital strategies. The research was focused on the "big museums" that in the last decade, especially after the COVID19 pandemic, made significant investments on collections' digitalization and dissemination using social media and virtual platforms. These action lines succeeded, in most of the cases, producing a significant increase of the visitors' stream.

A specific framework has been followed for recording the data of the museum digital transition strategies. The data collected related to the following format:

- Title/Institution: The names of the best practice (exhibition or developed app) and the involved institution are inserted.
- Location /Period: The city and the country where practice took place were inserted. The year is included as well.
- Identification: This section is divided in four entries:
 - "Description". A brief description of the main features of the digital practice are inserted;

- "Background". A brief overview of the state-of-the-art and previous works of the institution are inserted;
- "Objectives". The main goals behind the practice are inserted.
- "Target group". It specifies if the practice's accessibility is online or on-site.
- Technical Specification: This section is divided in three entries:
 - "Contents". The contents of the practice are inserted. They could include Images, Videos, Sound-videos, 3D models.
 - "Equipment". It specifies if the equipment is provided by the institutions (Owned by museum equipment) or not ((Bring Your Own Device);
 - "Technological development". The implemented technology is inserted. It can include: Virtual Tour, Cataloguing (Google art and cultural or other platforms), Immersive Virtual Reality (Head Mounted Display - HMD), Immersive Virtual Reality (Cave Automatic Virtual Environment - CAVE), Non-immersive Virtual Reality, Mixed Reality (see-through smart glasses), Augmented Reality (Vision-based), 3D printing, Web/social media, User Guidance
- SWOT (Case-Related): The analysis is specific for the practice.
- SWOT (Technology based): The analysis refers to the implemented technology.
- References: The links to the website or videos concerning the practice are inserted. The bibliography that we used for conducting the SWOT analysis is included as well.

The adopted approach for conducting the SWOT analysis is strictly based on peer-reviewed articles. Since some of the best practices reported in the mapping exercise do not have references in the scientific literature, we decided to provide two typologies of SWOT analysis: "case-related" or "technology-based". In every case study both entries are included. Whenever there is a lack of proper references, at least one scientific-based analysis for each case is provided.

2.2 Museum digital curator training

At this section, the aim is to offer a comprehensive overview of the museum digital curator training programmes already implemented in European scale and online. The mapping exercise is part of the R.1.1b action of the MUSEUM-NEXT project. The relevant criteria of this mapping were to gather the most known and promoted training programmes offered for museum digital curators in European scale and online also. The research was focused on training programs, seminars, workshops, master degrees or postgraduate programs organised, implemented and/or still implementing during the last decade. The research took place through google and the keywords based on which the search was carried out in the search engines are: "digital curation", "museums", "digital curator", "digital cultural heritage training" and so many combinations of the basic concept of the search.

A specific framework was followed for recording the data of the museum digital curator training programs. The data collected related to the following format:

- Identification of training program: Title, Location, Duration, Cost (if any) and Language
- Description (free text from online source)
- Background: Why was the practice started? What problems, needs or issues prompted the action?
- Objectives: What precisely did the initiative set out to do in both the short-and long-term? What were the overall and specific objectives?
- Target groups: The actors are described as well as specific target-group(s) and the direct and indirect beneficiaries of the initiative.
- Results and impact: Direct and indirect results of the practice were described as well as positive and tangible impacts.
- Sources: Images, Videos, Sites, References. Report on the various sources, relevant studies and other references used for the search and development of strategy/program.
- Certification (if applicable)

The results of this research have been collected, evaluated and we produced the following results that picture the museum digital curator training programs. At this point, we should mention that there is not any relevant study with the collection of all museum digital curator training programs in Europe and online so our work is innovative and we can gain important information by its results.

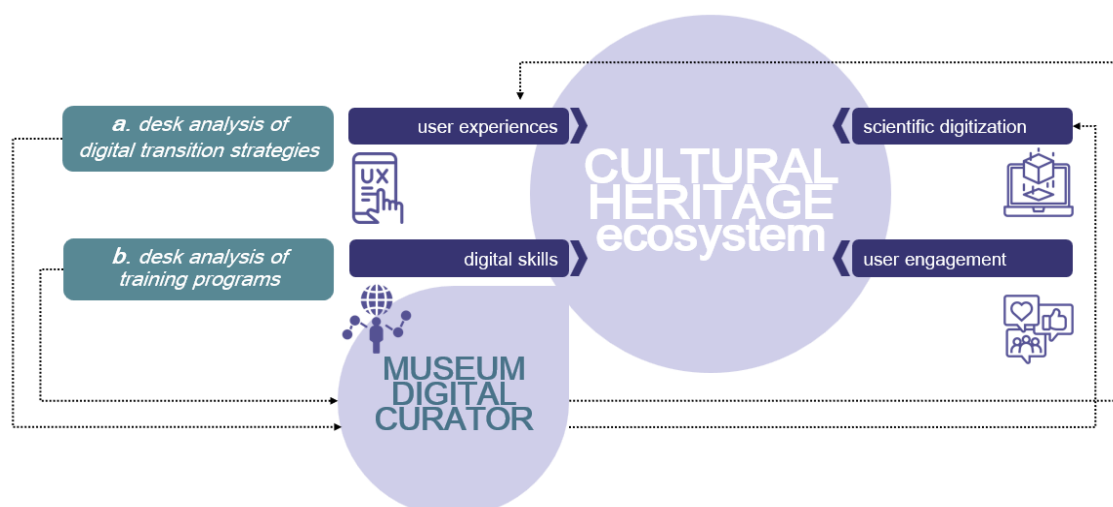


Figure 1 The graphical abstract of the Cultural Heritage Ecosystems and the new professional skills for Digital Curator.

3. RESULTS AND DISCUSSION

The results of survey and desk analysis on the state of the art on museum digital transition strategies and museum digital curator training programs are exposed below. For the present article, the most significant cases are presented in order to provide a suitable and comprehensive overview. It is possible to examine more in depth the complete list of best practices and training programmes and other useful data, by consulting the R1 document "Guidelines for the adoption and proper use of digital technologies" which will soon be available on MUSEUM-NEXT official website.

3.1 Museum digital transition strategies

According to the framework designed for the data collection, a total of fifty-eight museum digital experiences were recorded. Subdividing the collected data according to the technology developed, ten types of digital practices can be classified as follows in the figure 2.

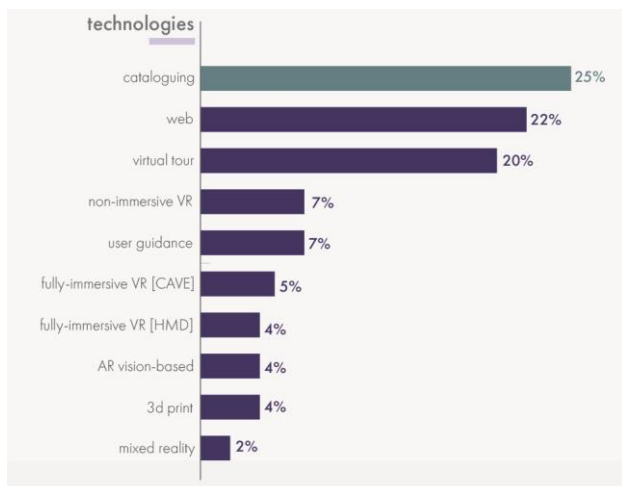


Figure 2 Graph of research findings on digital transformation strategies of museums, according to the technologies implemented.

As shown, the most frequently used digital tool was 'web' (such as a new website or YouTube channel) (22%), 'cataloguing' (25%) and 'virtual tour' (20%). We can hypothesise that the greater prevalence of these three digital practices is due to their ease of implementation and use. In other words, they do not require a high level of digital maturity on the part of both museums and users.

In order to simplify the reading of the data, the target groups can be grouped according to three categories, as shown in the following figure.

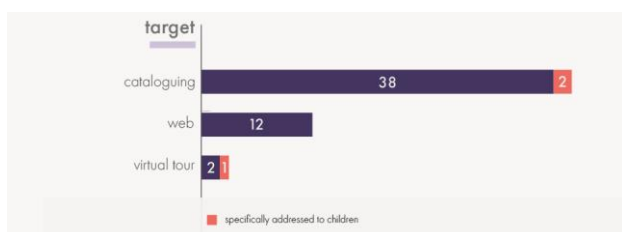


Figure 3 Histogram of research findings on digital transformation strategies of museums, according to the Target Group.

Most of the experiences are designed to be enjoyed online, and two of them are dedicated specifically to children. Certainly, this result is due to the increase in digitization during the pandemic period as a response to the forced closure of museums. In fact, looking at the distribution of digital practices over time, despite the effort to collect previous data, the most significant increase detected is after 2019.

Regarding the duration, most of the digital experiences collected are permanent, while five lasted less than a year and four more than a year.



Figure 4 Histogram of research findings on digital transformation strategies of museums, according to the exhibition duration.

Another interesting result concerns the ownership of the tool used. In the majority of cases (78%), the digital experience is done through one's own device, a choice that is certainly more cost-effective than having the devices provided by museums and shared during the visit. This is consequent to the greater presence of online experiences among those catalogued.

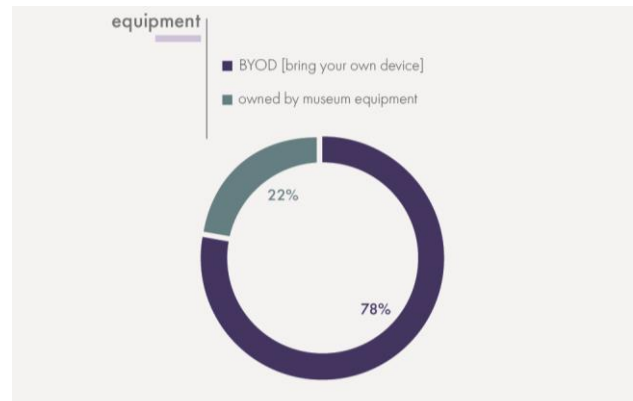


Figure 5 Graph of research findings on digital transformation strategies of museums, by type of equipment in use.

If it comes to on-site experiences, one advantage is related to the fact that the usability of one's own device is greater; the user does not struggle to use their smartphone or tablet. On the other hand, this finding indicates that, for example, fully-immersive VR HMD experiences, which are not possible with one's own devices, are still not widespread. Moreover, in order to use one's own device, the app to download or the content to browse must be very light, and the museum must have a stable Internet connection.

The evaluations in the SWOT analysis carried out on the specific experiences provide a very interesting critical reading. For example, the "EGO-TRAP" installation at the Experimentarium in Copenhagen is one of the first game-like installations (2006) facilitated through interaction with visitors' cell phones, which guide them through the exhibits and provide interactive tests at each one. It is an exhibition which uses mobile technologies as the technical platform for creating Augmented Reality. The

SWOT analysis shows that this exhibit enables a new line action where museums embrace the physical/digital narrative very explicitly, but it will be possible that mobile phones steal all of the attention from existing interactive exhibits and prevent the visitor from interacting with them (Giannini and Bowen, 2019) (Kahr-Højland, 2007). In another case, the experience of using the Mona Lisa VR app of the Louvre Museum, has not only increased the desire to see it applied to other works, but has also increased the intention in users to reuse and recommend its use to others. At the same time, from this extraordinarily successful experience it emerged that the role of technology in integrating with museums is difficult to measure and evaluate (Rea, 2019). The British Museum's 'I am Ashurbanipal' was extraordinary in many of its display strategies, providing a blueprint for developing an attractive setting for curatorially challenging artefacts, particularly cuneiform tablets and large-scale reliefs. Using imposing set design and simple digital overlays, the curatorial team gave these relatively plain items a greater holding power, increasing their effect and the length of time that visitors spent engaging with them (Van de Ven, 2019). In the Casa Batllo Museum, an augmented reality video guide allows you to see the rooms on the device change during the period in which the Battle family resided in the building. All the furnishings are reproduced with an extremely high coherence, as they are recreated from photos and historical material provided by the Batllo family. The AR technology used combines the direct and indirect typologies: in some rooms a traditional AR technology is used, in the more restricted ones the application opts for an indirect AR. Although apps enable visitors to have an enriched experience during their visit, this case of study highlights a low level of usability as regards the direct AR application also due to the simplified contents compared to the indirect AR (Gimeno et al., 2017).

3.2 Museum digital curator training

Based on the research methodology, a total of thirty-three training programs for museum digital curator was recorded. These training programs came from three main categories:

- results from Erasmus+ projects;
- results from other kind of EU funded projects;
- results from seminars.

Specifically, we collected information from: Twenty-five (25) results from Erasmus+ projects; Four (4) results from other kinds of EU funded projects (Leonardo Da Vinci, Interreg, etc); Four (4) results from seminars.

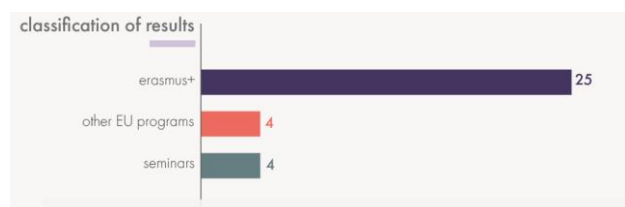


Figure 6 Histogram of research findings on digital curator training, according to the classification of results

According to the projects'/seminars' description, the content of training programs could be classified into the following topics: Digital marketing; Digital content & publishing; Data protection & open licences; Digital safety, security, and ethics; Digital audience & analytics; Social media; Augmented & Virtual Reality; Mobile apps & mobile user experience; Exhibitions guides, User guides, Pedagogical use of exhibitions guides; Digital Storytelling; Accessible Museums.

The most important reasons that led to the implementation of digital museum educational programs are:

- Increasing disconnection between formal education/training and the world of labour because of the emergence of new job roles and associated skill needs, due to the quickening pace of the adoption of ICT in the museum sector.
- Low emphasis in CCI education on the use of digital technologies, with recent graduates and existing employees lacking important skills.
- Among the over 20.000 museums in Europe, very few have the necessary digital skills (e.g. to create a virtual tour or an e-shop) that could sustain them in trouble periods, (e.g. health crisis or other) and accelerate their development in times of growth.
- The recent pandemic proved to be especially challenging for creative industries (CCI) stakeholders.
- Visiting exhibitions as a learning process, remains fairly passive as an experience and is based on following a path of discovery decided by somebody else - as the museum curator, not on the visitor's preferences.
- Many museums in Central Europe, encounter difficulties to be accessible to all due to a lack of organisational knowledge as well as due to limited financial resources, both for investments and adequate promotion (especially small- and medium-sized museums).

The target group that these training programmes offered to are: Current and prospective museum professional (such as administrative, managerial, back office, and front desk employees, curator); Cultural organisations' staff (cultural heritage sites, tourist attractions etc.); People with limited digital skills (especially CCI sector); Train the trainers and their organisations; Stakeholders in creative industries.

The most preferable technique for integration of educational programs is the online method. Beside this fact, we also record five (5) blended courses (which consists of a combination of Face-to-Face learning, on-line and self-study), six (6) mobilities (knowledge transfer, pilot actions) and two (2) online training programs that contain internship.

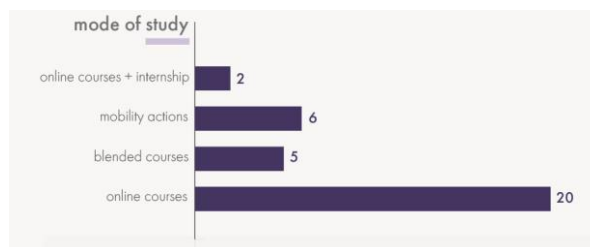


Figure 7 Histogram of research findings on digital curator training, according to the mode of study

Most training programs last for 3 to 8 weeks (which are mainly online training programs). Also, the "Short Training Period" (less than 5 days) contains programmes which are related to mobility actions. Of course, there are training programs with a training period of six or more months. These are mainly seminars which lead to the acquisition of a certification.

Another important factor is the cost of these training programs. Due to the fact that most training programs are actions related to a European project there is no cost for the participants. The previous fact however, does not apply to seminars that cost from \$1,860 to \$25,752).



Figure 8 Graph of research findings on digital curator training, by training period

Regarding the objectives of the training programs, we notice that there are several common elements like:

- Support museum staff in improving their digital competences, in order to become more productive in the new digital era, efficient in collaborating with other professionals and organisations inside and outside of their sector, and successful in managing emerging challenges.
- Training museum professionals in the use of ICT.
- Support museum operations and preserve cultural heritage and local development in a sustainable way.
- Creation (or adoption) of good practices opportunities which can basically influence a museum's new strategic development.
- Increasing the capacities of small and medium size museums, by making them accessible to a wider public of people.

English is the main language for all training activities (for all entries). However, at EU projects some of the Open Educational Resources have been translated in every partner's language. Most open courses/modules have been implemented in MOOC Platforms and contain certification procedures through e-assessment leading to Open Badges and Certificates for digital skills. Each language version was integrated into the universities' own MOOC platforms (in Austria in imoox.at, in Ireland in Academy, Denmark in VBN, in Lithuania in open.ktu) for DigiCulture trainings programmes. Some other options are Virtual Learning Environments (VLE) and Canvas.

There is an increased interest in participating at training programmes: 5.291 people from all over the world enrolled and 1.371 finished successfully receiving their certificate (Mu.Sa courses); 1.587 learners involved to access knowledge, gain new digital skills and intercultural competences, and improve their chances of finding employment or performing better in their current employment through 1.201 open badges and certificates (DigiCulture).

The seminars and training programmes in Digital Curation appear to have common modules with MAs in Museum studies and Cultural Heritage Management (e.g. Johns Hopkins University, 2022). Many of the recorded training programmes/courses were part of EU projects identified as a good practice in the field. The online training programmes/courses are not available after the completion of the EU projects of which they were part of. However, a lot of OER is accessible, such as guides for exhibitions, e-book, videos with subtitles, etc.

4. CONCLUSIONS

As shown in the present paper, the European scenario currently offers many opportunities oriented on learning, education and training of new professional figures. Many similar projects are currently providing intense agendas where museum personnel are able to acquire or improve new digital skillset (Charter-Alliance, 2022; NEMO, 2020). In particular, the European Commission declared 2023 as the European Year of Skills, stating 'Helping people get the right skills for quality jobs and helping companies, in particular small and medium enterprises (Weber, 2023). The present research is in line with this prolific international scenario, aiming to guarantee that Europe has the necessary digital cultural heritage skills to support sustainable societies and economies. Although the first steps of the MUSEUM-NEXT project are here exposed, the research has permitted the implementation of a sound base regarding methodological and technical work packages.

The first part of the research shows a wide range of digital transition experiences. However, they must always be related to the specific local context; in other words, they are not considered as a model to be scaled uncritically in different territories, but as a predictive scenario to be consciously aimed at. Following the implementation of the research on Museum digital curator training, we produced some conclusions and proposals. First of all, it seems that there is a significant positive impact on the end users of the educational activities, on mobility participants and on the institutions. Additionally, it is important to establish a curriculum framework for vocational training in digital curation so more professional and well-structured initiatives on training on museum digital curation will be offered.

In conclusion, the guidelines which include the digital transformation strategy and the skills and competencies that museum staff, provide a useful planning tool, also if must be continuously updated and improved for updating their museums' activities in the new digital era. Furthermore, the results of this research are of great benefit for VET providers as it provides information of what is offered in the "educational market" in this specific sector but also it provides info on the lack of specific programs that the market needs in order for the VET providers to design VET qualifications and programs, planning, and executing learning processes, and additional services.

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