Job profiles for museums in the digital era: research conducted in Portugal, Italy and Greece within the Mu.SA project

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ABSTRACT

Due to the increasing use of technologies in the museum sector, new job profiles are now emerging within that sector. This paper describes the key findings of the research activities carried out in Greece, Portugal and Italy within the Mu.SA – Museum Sector Alliance – project funded by the European Erasmus Plus Programme – Sector Skills Alliances. Our research addressed the questions of what skills and know-how are needed by museum professionals in the process of digital transformation of their sector and what emerging job profiles would help museums to thrive in the digital environment. The research validated four job profiles such as Digital Strategy Manager, Digital Collections Curator, Digital Interactive Experience Developer and Online Community Manager. It also showed that there are some digital and transferable competences common to the four museum job profiles, but, most importantly, that an awareness of digital culture should be developed throughout the whole of a museum's workforce.

Keywords:

Museum

Job profiles

Digital skills

Transferable competences

Digital culture

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Introduction

In recent years museums have been exposed to the influence of digital technologies and the challenges of economic, social and environmental transformations. According to Peacock (2008: 333), "digital information and communication technologies (ICTs) now pervade the operations if not the strategic visions of most museum and cultural heritage organisations". According to recent research in the UK, in their efforts to meet these new challenges, museums are hiring technical staff and at the same time shifting towards a democratisation of digital skills and digital confidence across the whole museum workforce (Parry et al, 2018). Undoubtedly, in order to continue to be relevant in today's society, museums need to seize the opportunities technology offers to extend the means of pursuing their central purposes (Keene, 2004) and serving their communities. Digital transformation in museums can take many forms, from enabling museum visitors to use smartphones or tablets throughout the site to enhance their experience, to digitising collections and making them available online, or engaging with people before or after their visits via online channels in order to improve internal operational systems (VVAA, 2016).

Today staff highly skilled in digital skills are crucial in order to help museums use new technologies to multiply opportunities for exchange, accessibility and participation for audiences. This is why job roles like the Digital Strategy Manager, Digital Collections Curator, Digital Interactive Experience Developer and Online Community Manager[1] are so necessary. Although the scope is clear, digital skills in the museum sector are still lacking, and in addition to that, according to many museum professionals, the sector is lacking in soft skills (Horjan, 2011), contrary to the trend that has seen in the last decade the growing importance of soft skills such as: empathy, leadership, communication, good manners, sociability, the ability to teach and personal attributes, such as optimism, common sense, responsibility, a sense of humour, integrity, time-management, and motivation (Veselko, 2011). "Today managing contemporary museums is an innovative and creative job. New jobs require new skills" (Garlandini, 2011: 30), including digital ones.

"TODAY STAFF HIGHLY SKILLED IN DIGITAL SKILLS ARE CRUCIAL IN ORDER TO HELP MUSEUMS USE NEW TECHNOLOGIES TO MULTIPLY OPPORTUNITIES FOR EXCHANGE, ACCESSIBILITY AND PARTICIPATION FOR AUDIENCES"

Given this context, the Mu.SA – Museum Sector Alliance – arose from a pressing need to investigate and develop digital competences for museum professionals, with a particular focus in Greece, Portugal and Italy. Mu.SA is a 3-year project (2016-2019) funded by the European Erasmus Plus Programme – Sector Skills Alliances. It aims at developing a training programme in line with the specific needs of museum professionals with respect to updating their digital competences. In order to achieve this goal the project consortium carried out qualitative research aimed at validating the emerging job profiles that resulted from a previous project, eCult Skills[2]. Specifically, four profiles were selected and updated, Digital Strategy Manager, Digital Collections Curator, Digital Interactive Experience Developer and Online Community Manager.

In the second phase of the project, which is still undergoing, a training programme geared towards museum professionals to enable them to update their skills, according to these four profiles, will be delivered in different formats; formats such as Massive Open Online Course (MOOC), e-learning, face-to-face and workplace learning. This paper[3] summarises the key findings of the research activities carried out in Greece, Portugal and Italy from December 2016 to March 2017 within the Mu.SA project and describes the research framework, the data collected and the museum scenarios in these countries in order to contextualize the findings.

From the outset of the project, the partners shared a common research framework, sharing goals, definitions and tools in order to collect comparable data from across the three participating countries. Given the context and the constraints of the project in terms of time and resources, a qualitative approach was seen as the most appropriate, as it would provide useful insights into which job profiles needed to be developed in the museum sector in order for museum professionals to thrive in the digital world. The research should be seen in the light of a European project setting that provided a space for different types of organisations like training centres, consultancies, universities, research centres, and certification centres to work together.

A section is dedicated to the four job profiles, illustrating them in detail according to perceptions

1 For a detailed description of the four profiles please see the tables at the end of this report and the report "Emerging job profiles" available to download on the Mu.SA website.

2 For more information, see http://groupspaces.com/eCult/

3 This paper summarises the key findings from the report Silvaggi and Pesce (2017).

of them in each of the three different countries. The section "Emerging job profiles in the museum sector: a complex scenario" describes the complexity of adopting the job profiles identified in a museum structure. In conclusion the Mu.SA research highlights digital and transferable competences that are common to the four job profiles and others, which are more specific. It also highlights the need for organisation-wide digital culture and digital confidence.

The research framework

The research carried out addressed three main questions: "*What are the appropriate skills and knowhow needed by museum professionals in the process of digital transformation of their sector?", "Are there any emerging job profiles that would help museums to thrive in the digital environment?", "What type of training is most effective to face this challenge?*". It drew on the results of the eCult Skills project, which had previously investigated the digital technologies needed by museum professionals by adopting the European Framework for e-Competence (e-CF)[4]. The e-CF framework was designed to improve the mobility and transparency of ICT professionals across Europe and was developed by the working group of the European Standardization Organization on ICT Skills, in accordance with the European Qualification Framework (EQF). In order to fulfil this aim, i.e. to facilitate greater job mobility for museum professionals, the same framework has been adopted within Mu.SA. In our research we adopted the e-CF's "digital or e-competence"[5] definition, which considers competence as the "ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development" (CEDEFOP, 2014: 47). Another definition of competence is given by Villa and Poblete (2008: 29): "a competence is good performance in diverse, authentic contexts based on the integration and activation of knowledge, rules and standards". In contrast, by "transferable competences", more commonly understood as "soft skills", we refer to skills that relate to many occupations, e.g. proficiency with MS Office Suite applications, or the ability to manage time using Outlook, and so on (Reeves, n. d.). The online Cambridge Dictionary reports that transferable skills are those used in one job or career that can also be used in another, i.e leadership is a highly transferable skill.

Another European Framework that the Mu.SA project considered is the DigComp (Digital Competence Framework for Citizens)6, which is a European framework for developing and applying basic digital competences to all European citizens as users of digital technologies. DigComp, using a detailed range of proficiency levels, supports the development of learning and training materials while also identifying the key components of digital competence in the following five areas: Information and data literacy, Communication and collaboration, Digital content creation, and Safety and problem solving. It is also helpful in the design of instruments for assessing the development of citizens' competence, career guidance and promotion at work.

The research activities

The research tasks undertaken by Mu.SA were allocated according to the different competences of the organisations involved. From December 2016 to March 2017 Melting Pro and Symbola in Italy, the International Council of Museums (ICOM) Portugal and Mapa das Ideias in Portugal, and the local delegation of ICOM in Greece carried out a mapping of the needs of museum professionals in order to identify those that are related to digital skills and transferable skills. This was done by means of interviews and focus groups in each country.

The interviews started with general questions, followed by more in-depth ones. At least two experts in each country were given an eCult Skills job profile to analyse. Each expert independently rated each e-competence, giving it a score on a scale of one to five, with five being ranked as most important. The experts were provided with a list of transferable competences drawn up on the basis of previous European projects such as ARTS[7], ADESTE[8] and CREA.M[9]. The focus groups applied the same methodology. Since the research was mainly qualitative, the goal was to ensure a balance between various different points of view, including those of the directors and the employees of national and regional museums of all sizes, and of people working in the areas of research, education and policy making. For both the interviews

4 The European e-competence framework identifies 40 e-Competences (digital competences) classified according to five main ICT business areas and related to the European Qualifications Framework. For more information see http://www.ecompetences.eu/methodology/

5 Hereafter "digital or e-competence" will be shortened to "digital competence".

6 The Digital Competence Framework 2.0 can be consulted at: https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework

7 For more information on the European project ARTS – SKILLS FOR THE CREATIVE ECONOMY, see http://arts-project.eu/

8 For more information on the European project ADESTE – Audience DEveloper: Skills and Training in Europe, see http://www.adesteproject.eu/about

9 For more information on the European project CREA.M – Creative blended mentoring for cultural managers project, see https://www.encatc.org/en/projects/transnational-cultural-projects/

Dimension 1 5 e-CF areas (A – E)	Dimension 2 40 e-Competences identified	Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3–8				
		e-1	e-2	e-3	e-4	e-5
A. PLAN	A.1. IS and Business Strategy Alignment				■	■
	A.2. Service Level Management			■	■	
	A.3. Business Plan Development			■	■	■
	A.4. Product/Service Planning		■	■	■	
	A.5. Architecture Design			■	■	■
	A.6. Application Design	■	■	■		
	A.7. Technology Trend Monitoring				■	■
	A.8. Sustainable Development			■	■	
	A.9. Innovating				■	■
B. BUILD	B.1. Application Development	■	■	■		
	B.2. Component Integration		■	■	■	
	B.3. Testing	■	■	■	■	
	B.4. Solution Deployment	■	■	■		
	B.5. Documentation Production	■	■	■		
	B.6. Systems Engineering			■	■	
C. RUN	C.1. User Support	■	■	■		
	C.2. Change Support		■	■		
	C.3. Service Delivery	■	■	■		
	C.4. Problem Management		■	■	■	
D. ENABLE	D.1. Information Security Strategy Development				■	■
	D.2. ICT Quality Strategy Development				■	■
	D.3. Education and Training Provision		■	■		
	D.4. Purchasing		■	■	■	
	D.5. Sales Proposal Development		■	■		
	D.6. Channel Management			■	■	
	D.7. Sales Management			■	■	■
	D.8. Contract Management		■	■	■	
	D.9. Personnel Development		■	■	■	
	D.10. Information and Knowledge Management			■	■	■
	D.11. Needs Identification			■	■	■
	D.12. Digital Marketing		■	■	■	
E. MANAGE	E.1. Forecast Development			■	■	
	E.2. Project and Portfolio Management		■	■	■	■
	E.3. Risk Management		■	■	■	
	E.4. Relationship Management			■	■	
	E.5. Process Improvement			■	■	
	E.6. ICT Quality Management		■	■	■	
	E.7. Business Change Management			■	■	■
	E.8. Information Security Management		■	■	■	
	E.9. IS Governance				■	■

TABLE 1. e-CF LIST OF 40 ICT COMPETENCES OR E-COMPETENCES
Source: http://www.ecompetences.eu/methodology/

and the focus groups, participants were selected according to the following criteria: professionals and external collaborators recognised as experts in the museum sector and those from the fields of research, policy and ICT professionals; directors of large and small, urban and rural museums, as well as regional or national museum networks; professionals with other roles in the context of museums, such as communication strategists, exhibition management experts, and educational experts.

Meanwhile, Link Campus University in Italy, the Hellenic Open University and AKMI in Greece, and the University of Porto in Portugal carried out a mapping of training provisions for museum professionals, using desk research and an online survey. This mapping aimed at presenting the current situation concerning the global approach and the rate of diffusion of training programmes offered (formal, informal and non-formal) relating to digital competences and transferable competences in the museum sector. The data that was gathered regarding formal education consisted in graduate and postgraduate programmes (Masters and PhD) provided by higher education institutions, as presented on their websites. It was analysed on the basis of specific indicators such as:

- information about the provider (name of university/department, course/module, description, type of training, methodology, subjects, target group, prerequisites, duration, assessment methods, etc.);
- identification of the specific digital competences of the five job profiles (developed in the eCult Skills project) that the programme/course/module provides.

In all three countries, retrieving this information was very challenging, given the highly specialised job profiles that needed to be identified and the lack of specification in that respect in the academic curricula provided online. The risk of misinterpretation should therefore be taken into account. As regards non-formal and informal training programmes in the three countries involved, there are no lists, either official or non-official, of the relevant education providers, nor is there a database that specifically focuses on the museum sector. The research therefore focused on those training activities for the museum sector provided by relevant national associations which the organisations conducting the research already knew about. The online survey was brought to the attention of museum professionals, external collaborators and people seeking to work in the sector through a number of different channels such as direct e-mailing, newsletters, social networks, national museum associations and other relevant networks.

Data collected

The research activities carried out from December 2016 to March 2017 involved 81 museum experts (from European policy makers to freelancers, researchers and museum professionals, etc.). In Rome, Italy, a focus group with 16 participants was carried out on the 5th December 2016 and was organised by Symbola and Melting Pro, in collaboration with Link University, Artribune, Maxxi – Museo Nazionale delle Arti del XXI Secolo, and Istituto dei Beni Culturali ed Artistici dell'Emilia Romagna. In Athens, Greece, a focus group with nine participants was carried out on the 4th March 2017, organised by ICOM Greece. And in Oeiras, Portugal, a focus group with seven participants was carried out on the 22nd March 2017 and was organised by ICOM Portugal in collaboration with Mapa das Ideais. A total of 14 interviews were conducted in Italy, 11 in Greece and 12 in Portugal. In order to gain an international overview of the digital competences needed in the museum sector, Symbola and Melting Pro also carried out interviews with experts in the museum sector. These are included in the report "The Museum of the Future: Insights and reflections from 10 international museums" (Sturabotti & Surace, 2017).

The desk research for mapping museum training provisions analysed 130 formal and informal educational training programmes in all three countries, focussing on their relation to the e-competences of the five role profiles defined within the European Project eCult Skills and the online survey collected 275 complete responses. The survey was open for 23 days (from the 6th to the 28th February 2017). The short running time for the survey, together with a lack of knowledge and public discussion relating to the five role profiles under focus and their respective e-competences, may account for the relatively low level of participation. However, in terms of impact, the number of participants who looked at though did not complete the survey was much higher: 980 people. The majority of respondents were full-time museum staff (36.7%), working in small (staff 1-20) national (34.31%) or private (23.2%) museums with archaeological, ethnographic and historical artefacts, and having more than five years museum working experience. The departments of Education, Conservation, Communication, Library and Research were the most selected.

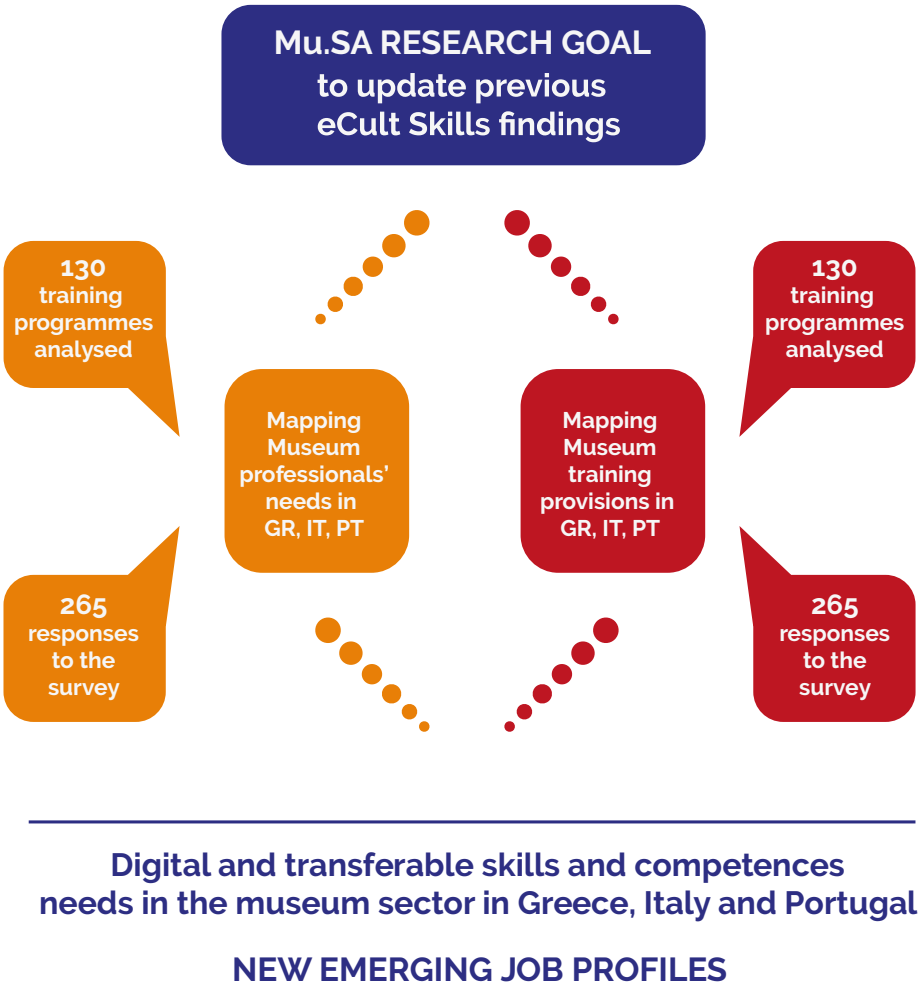

FIGURE 1. THE MU.SA RESEARCH FRAMEWORK AND KEY PERFORMANCE INDICATORS (KPIS)
Source: Authors' own elaboration.

Establishing the context of the museum sector in Portugal, Italy and Greece

The museum sectors in Portugal, Greece and Italy share many common characteristics. Museums are mainly owned by the state, and national, regional or local authorities are in charge of their management. In these three countries there are many local museums which are directly linked to local authorities and privately owned museums are in the minority. In Portugal there are 1,223 museums, with a growth of 68%, according to data collected in 2000 (Neves, Santos & Lima, 2013). The post-2008 economic crisis had a strong impact on the budget set aside for museums, leading in some cases to the loss of qualified human resources, as we discovered as a result of some of the interviews we conducted. According to a report published by the Official National Statistical Institute in Italy in 2015, Italy at that time had 4,158 (ISTAT, 2016) museums, galleries and collections, as well as 282 archaeological sites and 536 monuments, both public and private[10]. Generally, museums in both Italy and Portugal have very small teams, and therefore staff are multitasking. The Greek museum sector is affluent and although most museums are located in the two largest Greek cities, Athens and Thessaloniki, there are many museums of various sizes all over mainland Greece and the Greek islands. There are now over 300 professionally run museums in Greece, more than 200 of which are archaeological museums owned and run by the Hellenic Ministry of Culture and Sports. In Portugal, the main organisation currently responsible for developing a national policy and strategy for museums is the Directorate-General for Cultural Heritage (DGPC)[11]. Working at a central administration level, this organisation also supervises

10 The policy document of the Italian Ministry of Culture, inspired by the international ICOM policies, specifies another area, "relationship with the landscape", for the development of specific standards.

11 The DGPC was created in 2012 after a process of restructuration and fusion at central administration level that lead to the centralization of many areas of expertise within the same organization, including museums. This tendency was also observed in many other European countries after 2009 (see Camacho, 2015).

"THE DIFFICULTIES IN EMBRACING THE DIGITAL WORLD ACROSS THE THREE PARTICIPATING COUNTRIES ARE NOT EXCLUSIVE TO THE MUSEUM SECTOR, BUT ARE SHARED BY MANY OTHER ORGANISATIONS IN THE PUBLIC AND PRIVATE SECTORS. MANY ORGANISATIONS ARE SLOW TO REACT TO CHANGES AND DEVELOPMENTS IN THE FIELD OF DIGITAL TECHNOLOGIES"

and manages 15 national museums. The Portuguese Network of Museums (RPM)[12], founded in 2000, also belongs to the DGPC. This network, which aggregates 146 museums of various different types with several different administrations and management, promotes certification and cooperation between Portuguese museums, with an annual training program targeted at museum professionals as one of its key activities. In Greece, following the reforms that took place in the public administration in 2014, there are now five General Directorates within the Hellenic Ministry of Culture and Sports: the Directorate of Antiquities and Cultural Heritage; the Directorate for Restoration, Museums and Technical Works; the Directorate of Contemporary Culture; the Directorate of Financial Services, and the Directorate of Administrative Support and e-Governance. Most issues relating to museums are dealt with by the General Directorate of Antiquities and Cultural Heritage, which consists of Central, Regional, and Special Regional Services, as well as eight major public museums. In 2014 the Italian Ministry of Cultural Heritage, Cultural Activities and Tourism initiated a process of extensive transformation (in accordance with the law issued by the so-called Commissione Franceschini) aimed at establishing a long-term national museum system. The reform has had a huge impact on the Italian museum sector at both national and local level. One of the measures required 20 national museums[13] to become autonomous in terms of their administration and organisation, and managed by a specially appointed director. It became necessary for all Italian state museums to draw up a mission statement, manage an independent budget, and employ a minimum number of professional staff, in accordance with the ICOM's international standards. The law also stipulated that a General Directorate be developed along the lines of Portugal's DGPC, which would be responsible for developing a national strategy for museums. In the future, museums would be expected to invest more in communication, social media, and technology with a focus on tourism. The public would be allowed to take photographs free of charge, which represented another major change.

The majority of Greek museums embarked on a digital shift after 2000, digitising a significant proportion of their collections and going online through websites, digital exhibitions and apps, with the support of the EU co-funded operational programmes "Information Society 2000-2006" and "Digital Convergence 2007-2013". In Greece very few museums have IT departments, though, with the exception of a few large private institutions (the same applies in Italy).

The difficulties in embracing the digital world across the three participating countries are not exclusive to the museum sector, but are shared by many other organisations in the public and private sectors. Many organisations are slow to react to changes and developments in the field of digital technologies. This data is reflected also by the Digital Economy and Society Index (DESI) (European Commission, 2018), a report that keeps track of the current state of progress in digitalisation in European countries and finds that the greatest challenge to digitalisation is the raising of levels of digital skills in their citizens.

A recent survey that looked into the information and documentation systems in Portuguese museums revealed that in a sample of 222 museums, a small percentage (2.7%) of professionals have a specific ICT background (university degree) (Santos, Serôdio & Ferreira, 2017). Furthermore, the Portuguese report remarked that neither postgraduate museum studies courses nor the existing short, non-formal training courses available to the museum sector are approaching digital competencies in a sufficient manner, which confirms the need identified by many of the interviewees for ongoing and updated professional training in this area. Although in Italy there is the same perceived need, the 2015 data (ISTAT, 2015) shows that only 43.9% of the museums and institutions interviewed declared that they had organised ongoing professional training programmes for their employees over the last five years. In the same report only 0.8% of them declared that, if they received a 10% budget increase, they would use the sum to provide ongoing professional training. This is despite the fact that "The national museum professional chart (2006)"[14] underlined the importance of continued professional

12 For more information on the DGPC and the RPM, see, respectively: http://www.patrimoniocultural.gov.pt/pt/museus-e-monumentos/dgpc/ and http://www.patrimoniocultural.gov.pt/pt/museus-e-monumentos/rede-portuguesa/

13 During the writing of this article, another 10 museums were added in Italy.

14 The chart is available in: "Temi in discussione in preparazione dell'assemblea di fine mandato 2010-2012. Carta delle Professioni museali e riconoscimento delle Professioni museali", Seminario di lavoro del consiglio direttivo e del gruppo dirigente di ICOM ITALIA 26 January 2013, Villa Emo (Castelfranco Veneto, Italy). For more information http://www.icom-italia.org/professioni-museali/

training as a vital factor in the survival of a museum. Recently in Greece, a preliminary study was conducted by the British Council to identify the learning needs and skills gaps in the Greek museum sector (Roscoe, 2016). This study confirmed the fact that the average employee in a Greek museum "holds qualifications more closely related to the collections, such as archaeology and art history, rather than the museum itself, and that a strong knowledge of the collections across the whole museum staff is considered invaluable to the organisation" (Roscoe, 2016: 10). The respondents to this research also claimed that young graduates are "under-qualified for business support roles and technical roles compared to more academic roles, such as curatorial or archive related roles", and that they lack competences in areas such as marketing, project management, general museum management, business and management skills, entrepreneurship, finance and audience development.

Description of the four job profiles

In this section we summarise the results that were collected through the interviews, focus groups and online questionnaire. In all three of these contexts we asked our respondents to offer their perspectives on the need for training in digital competences in their countries and on the relevance of the eCult Skills profiles. For each profile we asked them to validate the list of related e-competences[15].

Out of the five eCult Skills profiles we started with – Cultural ICT consultant, Cultural ICT Guide, Digital Cultural Assets Manager, Interactive Cultural Experience Developer and Online Cultural Community Manager – four were recognised by our respondents as being the most important. The titles of these profiles were changed as seemed most appropriate in respect of the findings – the role of Cultural ICT Consultant was retitled "Digital Strategy Manager", for example, since from the research undertaken it was found to be important to implement a digital strategy in line with the museum's overall strategy. In order of priority, the role profiles that the majority of respondents thought were the most important for museums to invest in when upskilling their staff were: Digital Strategy Manager, Digital Collections Curator, Digital Interactive Experience Developer and Online Community Manager. The role of Digital Strategy Manager was selected as the most significant to be developed across the three countries[16]. Some of the experts we interviewed in Italy questioned whether a Digital Strategy Manager would fit into a museum's organisational chart, whether this role should be internal or external, whether s/he should be employed by the Ministry and what specific tasks s/he should undertake. In the Italian museum sector, the task of leading and guiding a museum's digital strategy would usually fall to the museum director, as part of the development of an overall strategy. In Greece the role of Digital Strategy Manager was recognised as a useful role and respondents agreed that the person fulfilling this role should have an overall view of a museum's technological needs and solutions and would support the museum director by providing comprehensive, updated and unbiased information about ICT products that benefit the museum. In Portugal the role of Digital Strategy Manager was considered fundamental to assessing the options of strategic digital plans that best suit a museum, and to implementing other types of professional profiles in the digital sector. It was also suggested that a Digital Strategy Manager could create guidelines and procedures manuals. Our Portuguese respondents thought this role should be an external one.

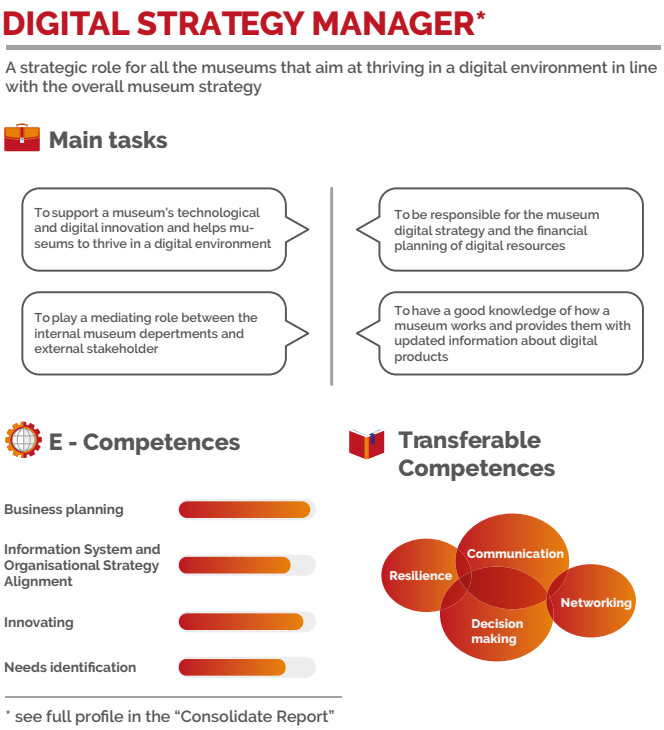

FIGURE 2. DIGITAL STRATEGY MANAGER, KEY CHARACTERISTICS
Source: Authors' own elaboration

In Portugal and Greece the profile ranked second in importance was the role of Digital Collections Manager, reflecting the importance of digitising collections as a basis for developing a museum's strategy. According to the internal project

15 As listed, the e-competences, in the European e-competence framework: http://www.ecompetences.eu/methodology/
16 In Italy, only for three points, the Online Community Manager was seen as the most important one, hence we can argue that the Digital Strategy Manager and the Online Community Manager are both very important roles / profiles to be developed in Italy.

report for Greece, "good knowledge of digital and digitised collections is the strength of this profile, and, in this sense, it could be a permanent museum post, especially for the tasks of organizing, managing, and preserving the digital collections. It's been almost 20 years since the majority of Greek museums started to develop digital collections and, unsurprisingly, one of the main concerns nowadays is the sustainability and effective diffusion of these digital assets".

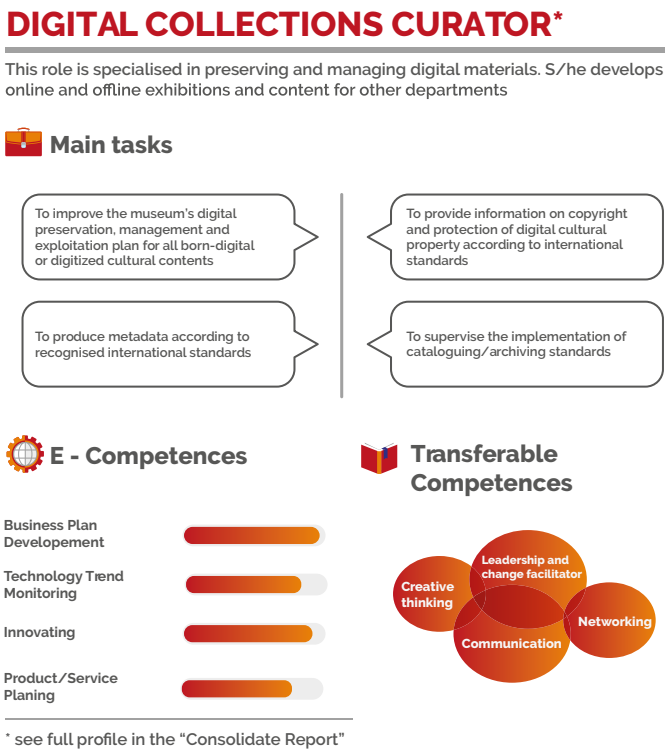

FIGURE 3. DIGITAL COLLECTIONS CURATOR MANAGER, KEY CHARACTERISTICS
Source: Authors' own elaboration

In Italy, the role of Online Community Manager, was instead ranked second. This is probably because the new museum reforms in Italy push museums to invest in communication and address the undervaluing of communication and audience engagement museums had previously been criticised for. As one of the respondents in the Italian research claimed, "Technologies are largely undervalued because the communicative role of the museum is undervalued. We need to create a digital culture that is above all a culture of communication, rather than just being digital". There is a greater need to make museum institutions understand how important it is to engage in modern forms of communication and to recognise their value to the public, regardless of whether the public is online or offline. Across the three participating countries, the area of communication was seen to have been greatly affected by the digital shift: social media platforms are now being used and explored by many museums, for example, the most commonly used platform in all three countries being Facebook. However, some interviewees underlined the fact that social media is not being utilised in a strategic manner or purposely implemented to facilitate good communication and make museums more accessible. The task of engaging with social media is usually carried out by professionals who accumulate several other tasks or by interns. Furthermore, there are cases where at the administration level museums are not allowed to manage their social media platforms autonomously. In general, communication, whether it is digital or traditional, is an integral part of a museum strategy, and it needs adequately integrated and trained staff.

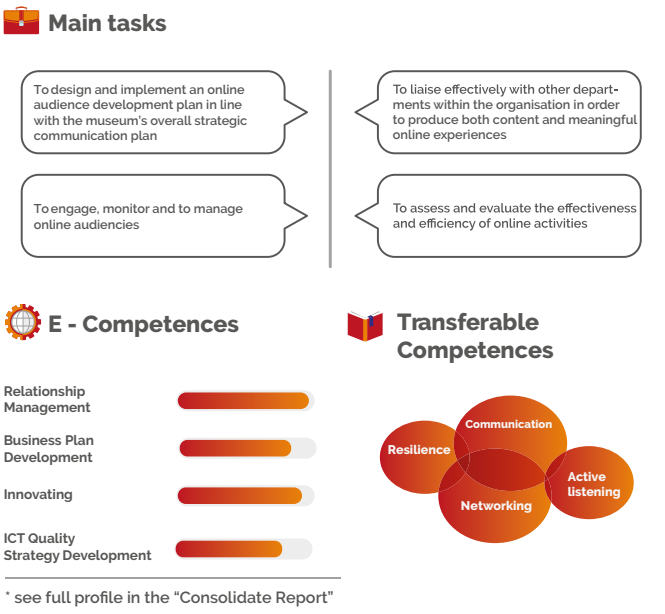

FIGURE 4. ONLINE COMMUNITY MANAGER, KEY CHARACTERISTICS
Source: Authors' own elaboration

The role of Digital Interactive Experience Developer was ranked in third place in Greece and Italy, with the majority of respondents pointing out that all the professional profiles analysed should also have a good understanding of how a museum works. Use of digital technologies in exhibitions and educational programmes was found to be fragmentary and selective. One respondent from Greece mentioned "the importance of implementing online educational activities in order to fulfil the social role of museums". Regarding the use of ICT in exhibitions, in the form of digital displays, for instance, one interviewee pointed out that it is necessary to be able to regularly update their style, the content and the operation.

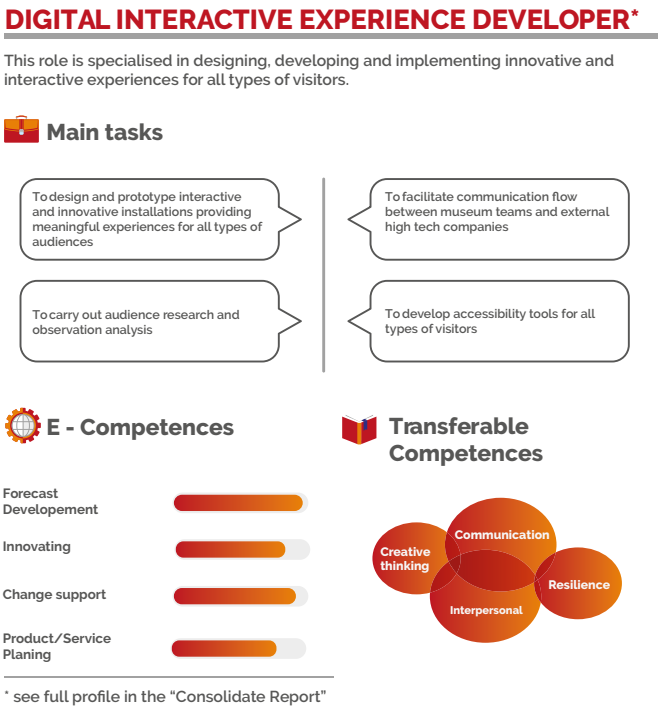

FIGURE 5. DIGITAL INTERACTIVE EXPERIENCE DEVELOPER, KEY CHARACTERISTICS
Source: Authors' own elaboration

In Italy the experts who were consulted suggested that each e-competence at proficiency level should also be considered within an organisational organigram, finding it difficult to rank the e-competences if they were not contextualised in an organisational relationship. According to some of the respondents, a number of skills such as programming, software development or infrastructure installation, were widely considered as external skills with no real relevance to the elaboration of the digital strategy of a museum. In contrast, some of the participants in the Portuguese focus group identified another role profile: an internal technical expert, such as an ICT expert employed as a member of the staff with responsibilities for day-to-day operations of upgrading, installation, backup, and maintenance. These roles, especially those of Digital Strategy Manager and Digital Interactive Experience Developer are often carried out by external collaborators. Whereas the role profile of Online Community Manager is becoming increasingly present in museums, one of the major problems lies in the fact that even the person filling this role is usually not fully integrated into the museum structure.

In general the areas identified as most important in assisting museum professionals in their current positions were (in order of priority):

- Audience development and engagement, storytelling, visitors' opinion/evaluation, monitoring, assisting people with special needs, inclusion, accessibility;

The most important e-Competences identified for the four job profiles
A.1. IS and Museum Strategy Alignment
A.3. Business Plan Development
A.4. Product/Service Planning
A.7. Technology Trend Monitoring
A.9. Innovating
D.11. Needs Identification
E.1. Forecast Development
E.4. Relationship Management
E.6. ICT Quality management

TABLE 2. THE MOST IMPORTANT E-COMPETENCES (e-CF 3.0) TO DEVELOP ACROSS THE FOUR Mu.SA PROFILES
Source: Authors' own elaboration

The most important transferable skills identified for the four job profiles
Leadership and change facilitator
Time management
Creative thinking skills
Communication Skills
Team working

TABLE 3. THE MOST IMPORTANT TRANSFERABLE SKILLS TO DEVELOP ACROSS THE FOUR Mu.SA PROFILES
Source: Authors' own elaboration

- Digitisation, digital archiving, preservation, preventive conservation, digital exhibitions, database;
- Fundraising, crowdfunding, networking;
- Management, team building, problem solving, leadership (change-making and risk-taking), business planning, time management;
- Promotion, tourism, communication, creative writing;
- Social media, web design, online accessibility of collections, photography, digital innovation, marketing, copyright, gaming, semantic web;
- Museum education (also online);
- Creative skills/lateral thinking and entrepreneurship skills.

In the online survey, when respondents were asked to specify which basic ICT skills they needed to develop the answers they gave were (these in general, not related to any of the job profiles): web content management, familiarity with blogging platforms, software for calculation, writing and graphic tools, word processing, spreadsheet management, presentation, knowledge of free and open-source software, as well as database skills and skills in the use of digital archives, video making, sound design, digital archive, platforms dedicated to collection, semantic web. When asked to specify advanced ICT skills (always in general, not related to any of the job profiles), the answers given were: familiarity with communication devices or applications encompassing: radio, television, cellular phones, computers, videoconferencing and distance learning, coding, knowledge of Virtual and Augmented Reality (VR and AR), application development, digitalisation of collections, 3D, metadata management, digital exhibitions, XML, and specific software tools (Adobe Photoshop, digital drawing software, AutoCad – architecture software, systems of geographic information software, and HTML, among others). Our respondents thought training programmes for museum workers should include the following transversal digital and transferable competences, which are needed in all of the four role profiles:

- strategic and business planning (IS and strategy alignment and business plan development, ICT quality management);
- user needs analysis/audience research offline and online (needs identification, product/service planning);
- communication (basic and advanced use of social media) and relationship management;
- storytelling;
- audience development[17];
- audience engagement[18] (user support) which includes all aspects of the visitor experience (before, after and during) ranging from education to communication and the management of customer relations;
- creativity and leadership;
- team working;
- innovation;
- knowledge of ICT terminology/existing digital tools that are useful for behind-the-scenes museum work, which includes all aspects of management, research, collections, infrastructure, etc. (technology and trend monitoring and forecast development);
- knowledge of the museum context (museums and tourism, museum policies and the roles and purposes of museums today, museum management, copyright and intellectual rights).

In general, our research findings point to the importance of developing the skills needed in order to reach a greater number and diversity of museum visitors and the idea that digital skills should be developed with this aim, not just for their own sake. On the basis of our research outcomes, the Mu.SA will provide a training programme with basic digital skills applying the Digital Competence Framework for Citizens (DigComp) in combination with the essential e-competences in different levels of expertise from the European e-Competence Framework (e-CF). The MOOC programme will train participants in eight e-competences, important in all four job profiles. In the e-learning programme educational content for 26 digital and 16 transferable competences, which are considered fundamental to the museum sector, will be developed. In other words, after completing the first stage of education in digital competences, the interested museum professionals will be able to attend a more specialised training programme focusing on the advanced competences, digital and transferable, needed for employment, personal development and social inclusion.

Emerging job profiles in the museum sector: a complex scenario

Thanks to the interviews and the focus groups that were conducted, we were able to observe that across the three participating countries a fragmented experience of the digital shift is evident, due to the different contexts, governance, competences and resources invested. Respondents from all three countries claimed that the present levels of investment in infrastructure and resources were inadequate, and this was seen as a tangible limitation. A widespread practice is for museums to rely on external firms to develop their technological resources and a majority of respondents, especially in Italy and Portugal, underlined that the lack of basic knowledge of ICT among museum professionals sometimes leads them to engage in inadequate technological solutions that may not be suited to the museum or the needs of its visitors. As a consequence, the digital transformation process of a museum – how it embeds digital aspects in its overall strategy in order to improve internal

17 "Audience development" is a term used to describe the way in which relationships between audiences and cultural organisations are managed. It is a planned, organisation-wide approach to extending the range and nature of relationships with the public, it helps a cultural organisation to achieve its mission, balancing social purpose, financial sustainability and creative ambitions. For more information, see http://www.adesteproject.eu/about

18 "Audience engagement" is an expression used in practice and literature in a very different and uncodified way, like the many expressions that belong to the semantics of audience development (audience building, audience participation, etc.). In particular, it is used to highlight the dimensions of involvement that sound less explicit in the concept of "development" and more mechanistic in that of "building" (Bollo et al, 2017).

"RESPONDENTS FROM ALL THREE COUNTRIES CLAIMED THAT THE PRESENT LEVELS OF INVESTMENT IN INFRASTRUCTURE AND RESOURCES WERE INADEQUATE, AND THIS WAS SEEN AS A TANGIBLE LIMITATION"

processes – was seen to be affected by its ability to establish a clear vision, as well as by the availability of necessary resources and conditions for investment – financial, logistical, and human. When these conditions are met, it was suggested, there is a snowball effect, leading to increased investment in training courses that then enables museum professionals to develop digital and transferable competences.

Discussion of job profiles initiated interesting debates around the different job roles and the need for these roles. The reality of the museum sector in each country, as regards investment in digital infrastructures and training, especially for publicly-owned museums, comes up against some limitations. As mentioned above, most museum teams are small and multitasking and their human and financial resources are low. Most of the respondents stressed a lack of strategic vision and inability to envision the opportunities offered by digital technologies. All of the job profiles were considered important and useful, although it was felt that their tasks and the necessity of their functions needed to be further clarified. It should also be borne in mind that in the three countries analysed, recruitment for state-owned museums is carried out through public open examinations, where candidates are tested only on their disciplinary knowledge and not on other competences or working experiences in museums (nor on museology, as requested by the International ICOM standards) (Ruge, 2008), let alone their digital skills. Moreover, only the more well-known museums can afford to appoint someone internal to their museum's organisation to be in charge of digital strategy.

In all three countries it is clear that virtually all aspects of museum activity need to be improved at various different levels. Many interviewees agreed that the digitisation and digital management of museum collections and archives is one of the most basic requirements needing to be satisfied before moving on to intervention in other areas. This process would enable the creation of content, which consequently would need to be communicated. It is important to develop an overall strategy in which the different elements are considered and connected to the museum's mission. There should be a synergy that unites various dimensions, especially between the digitisation and the management of collections, as well as between digital and analogical aspects, and the audience. Also, more investment should be sought to enable museums to use ICT for audience research and evaluation, which is considered fundamental in order to make museums relevant and attractive to all target groups.

In order to assist with the digitisation process it is important for museums to think strategically about the possible wider benefits of a digital approach. There needs to be a mental shift and a cultural change in terms of the planning and visioning of services, so that digital elements can become an integral part of the thinking and planning process from the outset. The existing processes also need to be reconstructed in a way that is relevant in a digital world. Museums should assess the digital competences of their staff and build up what can be defined as digital cultural awareness and digital confidence.

The research shows that, although it is important to develop and integrate the profiles described in eCult Skills and revised in Mu.SA into the museum system, in the contexts we have considered, there is still some resistance to instituting such a process due to many elements remarked upon by the research. One possible hindrance is the lack of financial resources and the merging of museum departments and roles which makes any expectation of employing new expert staff unrealistic. Other problems include the difficulties encountered by small museums in terms of financial and human resources, the low salaries of people working in the museum sector, making it unattractive to ICT professionals, and above all a lack of a national strategy for digital investment and a leadership unable to seize the opportunities offered by digital technologies. As a result of these factors, we detected a general sense of discouragement among the respondents, as much more investment in digital infrastructure and hence training was seen to be required at a policy level.

Conclusions

This paper points out the key findings of the research activities carried out by the partners involved in the European Museum Sector Alliance project (Mu.SA) funded by the Erasmus+ programme Sector Skills Alliances in Greece, Portugal and Italy from December 2016 to March 2017. The consortium investigated which digital and transferable competences are fundamental in order to support museum professionals and help them in their efforts to enable museums to thrive in a digital environment. The research carried out capitalised on and revised the results of the eCult Skills project.

Given the aim of the research, a qualitative approach was seen as the most appropriate in order to

provide useful insights into which job role profiles and related digital and transferable competences need to be developed by museum professionals in order to help them face current and future challenges. On the basis of the previous five eCult Skills role profiles, four emerging role profiles were validated and updated by the Mu.SA project: Digital Strategy Manager; Digital Collections Curator; Digital Interactive Experience Developer and Online Community Manager.

Our research showed that there are digital and transferable competences that should be developed across all of these job role profiles and that these should be considered essential starting points for upskilling. These transferable and digital competences include: strategic and business planning; user needs identification/analysis; product service planning; technology and trend monitoring; innovating; user support; forecast development; relationship management; ICT quality management; audience development, communication; storytelling; time-management and creativity; leadership; active listening; team working and fact-driven. The role profiles we identified require an in-depth knowledge of how a museum works. Moreover, many of the functions and competences attributed to them should be embedded in the context of teamwork.

Adequate investment should therefore be sought for on-going upskilling as regards new technology for all museum staff, in accordance with their existing roles and tasks. An awareness of digital culture and a confidence and familiarity with digital approaches should be developed throughout the whole of a museum's organisation and workforce.

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