Emerging job profiles for the museum professionals

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R2.2 Emerging Job Profiles for museum professionals

Mu.SA - Museum Sector Skills Alliance

Melting Pro Learning

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Abstract:	The Mu.SA research activities aimed at identifying the necessary digital and transferable competences for helping museum professionals to thrive in a digital environment by capitalising on the results of the eCult Skills project. The Mu.SA research results have been presented in the document "Museum Professionals in the Digital Era. Agents of change and innovation" available on the Mu.SA project website in the section http://www.project-musa.eu/results/ This report Emerging Job Profiles for museum professionals focuses on the detailed description of four emerging job role-profiles selected as the most important ones for the museum sector according the research findings in the museum sector in Greece, Italy and Portugal that are directly related to ICT (Information Communication Technology).

	The results are based on the findings of the research activities carried out within the project as part of the Mu.SA project preparation phase Work Package 2, namely "Identification of emerging roles of museum professionals".
	Four emerging job role-profiles have been identified to help museums face the digital challenges: ***Digital strategy manager, Digital Collections Curator, Digital Interactive Experience Developer, Online Community Manager.***
	The Mu.SA training programme aims at developing both digital and transferable skills for ICT-related jobs for museum professionals with the view of creating a network between museums. Some of the important competences that have been identified are strategic and business planning, user needs analysis, audience development, communication, storytelling, creativity and leadership, knowledge of DIGITAL terminology and in-depth knowledge of how a museum works.
	The research results will inform the creation of a training programme, which will include a MOOC (Massive Open Online Course), e-learning, face-to-face and workplace learning activity, with the goal to avoid a mismatch between the job market and professional needs.
Authors:	**Editor** Antonia Silvaggi, Melting Pro Learning **Reviewer** Federica Pesce, Melting Pro Learning **Italian Research Team** **Melting Pro Learning** Antonia Silvaggi Federica Pesce

	Laura Bove
	Symbola Foundation for Italian Qualities
	Romina Surace
	Domenico Sturabotti
	Sabina Rosso
	Link Campus University
	Claudia Matera
	Valentina Re
	Greek Research Team
	Hellenic Open University
	Achilles Kameas
	Panagiota Polymeropoulou
	AKMI
	Ilektra Simitsi
	ICOM - International Council of Museums Greece
	Alexandra Bounia
	Artemis Stamatelou
	Portuguese Research Team
	ICOM – International Council of Museums Portugal
	Alexandre Matos
	Ana Carvalho
	Manuel Pizarro
	Mapa das Ideias
	Ivo Oosterbeek
	University of Porto
	Paula Menino Homem
	Patrícia Remelgado
	Susana Medina

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1 How to read this report

The Mu.SA research activities aimed at identifying the necessary digital and transferable competences that are necessary to support museum professionals and help them to thrive in the digital environment by capitalising on the results of the eCult skills project.

The Mu.SA research results have been illustrated in the document "Museum Professionals in the Digital Era. Agents of change and innovation" available on the Mu.SA project website in the section http://www.project-musa.eu/results/

This report focuses on the detailed description of the four emerging job role-profiles selected on the basis of the research findings in the museum sector in Greece, Italy and Portugal that are directly related to ICT (Information Communication Technology). The results are based on the research activities carried out within the project as part of the Mu.SA project preparation phase Work Package 2, namely "Identification of emerging roles of museum professionals".

The first paragraph outlines the research scope, limitations and data collection within the Mu.SA project. The Mu.SA research aimed mainly at understanding whether the relevance of the five job role-profiles already identified in the eCult Skills project still apply. Out of the five profiles, four more relevant role profiles have been selected. For each of them e-competences (digital) and transferable competences have analysed and based on the research findings decided that need to be updated. The research findings will inform the building of the training in the second part of the project.

This is followed by a description of three different European frameworks: the European Qualification Framework, the e-Competences Framework (devised to improve the mobility and transparency of DIGITAL workers and adopted in the eCult Skills project in order to describe the Mu.SA role-profiles), and DIGCOMP (a framework for developing and understanding digital competence addressed to all European citizens as users of digital technologies).

The next section "Description of the Role profile template" describes the template adapted from the e-Competences framework to illustrate the four emerging job profiles. In order of priority the majority of

respondents, during the Mu.SA research phase, argued that the most important role-profiles in which museums should invest by up-skilling their staff are:

1. Digital strategy manager

Also known as Cultural ICT Consultant, Digital Cultural Manager, Cultural Digital Strategy Manager, Cultural ICT Ambassador, Digital cultural mediator, Cultural ICT Advisor, Cultural ICT specialist.

A strategic role-profile for museums that aim to thrive in a digital environment in line with the overall museum's strategy.

2. Digital Collections Curator

Also known as Digital Cultural Asset Manager, Digital Asset manager, Born-Digital Material Curator, Digital Curator

This role-profile is specialised in preserving and managing born-digital materials. Develop online and offline exhibitions and content for other departments.

3. Digital Interactive Experience Developer

Also known as Interactive Experience Developer, Digital Interactive Experience designer, Exhibit interactive designer.

This role-profile is specialised in designing, developing and implementing innovative and interactive experiences providing a meaningful experience for all types of visitors.

4. Online Community Manager

Also known as Online Cultural Community manager, Online community developer, Online community specialist, Social media specialist, Digital Media curator, Visual Media curator, New Media Manager, Digital Communication Manager, Social media manager.

This role-profile is vital for all museums aiming to invest in developing and engaging diverse audiences online, and should be fully integrated into the institutional structure.

A separate detailed description, based on the research findings, has been provided for each of the role-profiles, according to the e-Competences Framework.

In order to inform the creation and development of the MOOC (Massive Open Online Course), and the training programmes for each role-profile e-competences and transferable competences have been ranked starting from those that are most crucial and that are specific to that profile. The more generic e-competences and digital competences that are an important component of almost all the job role-profiles have been grouped together.

Given the current context in which museums operate in the three countries involved, the majority of respondents argued that the eCult Skills role-profiles are excessively ambitious or projected too far into the future.

It shows also that, although it is important to develop and integrate the profiles described in eCult Skills and revised in Mu.SA into the museum system, there is still some resistance to instituting such a process, given the national contexts. On one hand **all three countries claim that the present levels of investment in infrastructure and resources are inadequate, which represents a tangible limitation** in the sector, and the limited level in digital competences can be a consequence of that, yet not exclusive. On the other hand a lack of a leadership that can see the opportunities given by digital technologies element to help museums thrive in their role. **Therefore, although Mu.SA research focused on emerging job profiles in the museum sector connected to new technologies, the underpinning theme is the need for a mental shift and a cultural change in terms of the planning and visioning of services, so that the digital element can become an integral part of the approach from the outset**. Nevertheless, we trust that the importance of the profiles described in Mu.SA will potentially be recognised not only by the sector but also at policy level.

2 The research framework activities within the Mu.SA project

2.1 Research aim and description of activities

The Mu.SA research activities aimed to identify what are the necessary e-competences/digital and transferable competences to support museum professionals to thrive in the digital environment by capitalising on the results of the eCult skills project[1].

The eCult Skills project investigated the knowledge, digital skills and competences needed for professionals in the museum sector to become proficient in the use of digital technologies in the field of culture. The project outlined five job role-profiles as a response to help museums through their digital journey:

- Cultural ICT consultant
- Cultural ICT Guide
- Digital Cultural Assets Manager
- Interactive Cultural Experience Developer
- Online Cultural Community Manager

At this stage, Mu.SA research aimed to understand whether the five job role-profiles identified in the eCult Skills project were still relevant and which digital and transferable competences needed to be updated and then, based on the findings, select the most important ones.

The specific objectives of the Mu.SA research were as follows:

- to understand the relevance of the eCult Skills five job role-profiles within the museum context of the three countries;
- to identify any mismatch between the current reality and the results of the previous analysis;
- to identify which digital/e-competences (20) and transferable competences (21) are most in need of being developed;

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[1] eCult Skills Project: http://groupspaces.com/eCult/

- to update the five eCult Skills job role-profiles in the light of the latest research findings.

The eCult Skills adopted the e-Competences Framework in the specific field of e-Culture. This is a framework to improve the mobility and transparency of DIGITAL professionals across Europe developed by the working group of the European Standardization organization on DIGITAL skills, according to the EQF - European Qualification Framework. In order to fulfil this aim, i.e. to encourage greater job mobility for museum professionals, the same framework has been adopted in the Mu.SA project.

Digital or e-competence (e-CF) means using DIGITAL skills according to the following definition: *"Competence is the ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development* (**Error! Reference source not found.**).*"* [2]

This is a holistic concept directly related to workplace activities and incorporating complex human behaviours that are expressed as deeply rooted or embedded attitudes.

Instead, transferable competences are those hard and soft skills that relate to many occupations, i.e., creative thinking and communication skills with MS Office Suite applications, or time management by using applications such as Outlook, etc[3].

Another European Framework that the Mu.SA project considered is the DigComp (Digital Competence Framework for citizens)[4], a European framework for developing and applying basic digital competences, which

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[2] Source: Terminology of European education and training policy SECOND EDITION A selection of 130 key terms." CEDEFOP, Luxembourg: Publications office of the European Union, 2014 (Downloaded December 2016)

[3] According to the Online Cambridge dictionary transferable skills are used in one job or career that can also be used in another: *Leadership is a highly transferable skill.*

[4] https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework (Consulted April 2017)

is addressed to all European citizens as users of digital technologies. DigComp with a detailed range of proficiency levels supports the development of learning and training materials while it identifies the key components of digital competence in 5 areas such as: **Information and data literacy, Communication and collaboration, Digital content creation, Safety and Problem solving.** It also helps in the design of instruments for assessing the development of citizens' competence, career guidance and promotion at work.
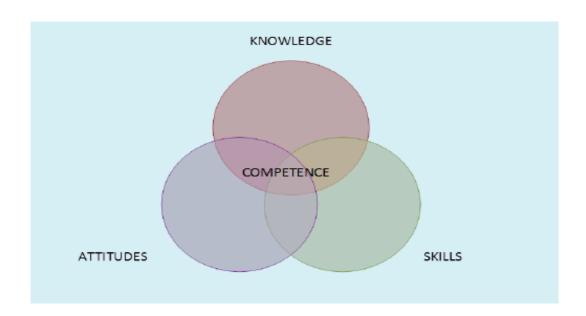
Fig. 1 Competence consists of the intersection between knowledge, skills and attitudes
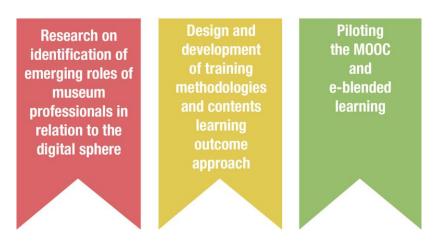
Fig. 2 Illustration of the Mu.SA project activities

Fig. 3 The Mu.SA job role-profiles updated in light of the research findings

2.2 Methodology, tools and limitations

From the outset of the project, the partners shared a common research framework in order to collect comparable data across the three countries. Given this fact, a qualitative approach was seen as the most appropriate

in order to provide useful insights into which role-profiles related digital and transferable competences need to be developed for museum professionals.

Nevertheless, although some general considerations may be applied to the museum sector in Europe, one should be cautious when attempting to generalize the findings of the research, on the one hand because they refer to the specific contexts of the three different countries analysed, and, on the other, because the technologies involved are constantly changing, which leads to ever-new training needs.

The research tasks have been allocated according to the different competences of the organisations involved.

From December 2016 to March 2017 Melting Pro and Symbola in Italy, International Council of Museums (ICOM) Portugal and Mapa das Ideias in Portugal, and ICOM GR in Greece carried out a mapping activity of the needs of museum professionals to identify those that are related to digital skills (or e-competences) and transferable skills, by means of interviews[5] and a focus group in each country.

The interviews started with more general questions, followed by more in-depth ones. At least every two experts in each country were assigned with an eCult Skills job role profile to be analysed. Each expert independently rated each e-competence, giving it a score on a scale from 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[6], ADESTE[7] and CREA.M[8]. The focus group applied also the same methodology.

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[5] Se the annex of the Deliverable R.2.1 - Mapping the skills supply and demand

[6] ARTS – SKILLS FOR THE CREATIVE ECONOMY – COMPETENZE PER UNA ECONOMIA CREATIVAhttp://arts-project.eu/ (Downloaded April 2017)

[7] ADESTE, Audience DEveloper: Skills and Training in Europe
http://www.adesteproject.eu/about (Downloaded April 2017)

[8] The CREA.M project (2011 – 2013)
https://www.encatc.org/en/projects/transnational-cultural-projects/ (Downloaded April 2017)

Since the research was mainly qualitative, the goal was to ensure a balance between various different points of views, ranging from directors and the employees of national and regional museums of all sizes, as well as the viewpoints of people working in the areas of research, education and policy-making.

For both the interviews and the focus group the partners selected participants applying the following criteria:

- Professionals and external collaborators recognised as experts in the museum sector also from the fields of research, policy and ICT;
- Directors of big 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, Hellenic Open University and AKMI in Greece, and University of Porto (U.Porto) carried out a mapping of training provisions for museum professionals, conducting desk research and an online survey. This mapping aimed to present the current situation concerning the global approach and the rate of diffusion of training programmes offered (formal, informal and non formal[9]) related to digital competences and transferable competences in the museum sector.

The data that was gathered regarding formal education consisted in graduate and postgraduate programmes (Master and PhD) provided by Higher Education Institutions, as presented in their websites. It was analysed on the basis of specific indicators such as:

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[9] **Formal learning** can be defined as learning in an organised and structured environment (such as in an educational or training institution or in a professional context) and is explicitly designated as learning (in terms of its objectives, time or resources). Formal learning is intentional on the learner's behalf and it typically leads to a qualification. **Non formal learning** may or may not lead to a qualification. **Informal learning** is learning connected with daily activities related to work, family or leisure which is not organised or structured in terms of its objectives, time or learning support. It may even be unintentional on the learner's behalf.

- 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 e-competences of the five job role-profiles (developed in the eCult Skills project) that the programme/ course/ module provides.

In all three countries, it was a very challenging task to retrieve this information, considering the highly specialized role-profiles that needed to be identified and the lack of specification in the academic curricula provided in that sense on-line. 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 [10] 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.

Moreover, in order to gain an international overview of the digital competences needed in the museum sector, Symbola and Melting Pro carried out ten interviews with experts in the museum sector. These are

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[10] See the annex in the Deliverable R.2.1 Mapping the skills supply and demand

included in the report "*The Museum of the Future: Insights and reflections from 10 international museums*"[11].

2.3 Data collected

From December 2016 to March 2017 the research activities carried out in order to map museum professional needs in Portugal, Greece and Italy involved 81 museum experts (from European policy makers to freelancers, researchers and museum professionals, etc.):

Methodology:

Italy – 1 Focus group and 14 interviews.

The focus group with sixteen participants was carried out in Rome, Italy, on 05/12/2016 organised by Symbola and Melting Pro, in collaboration with Link University, Artribune, Maxxi – Museo Nazionale delle Arti del XXI Secolo, Istituto dei Beni Culturali ed Artistici dell'Emilia Romagna.

Greece – 1 Focus group and 11 interviews

The focus group with nine participants was carried out in Athens, on 04/03/2017 organised by ICOM Greece.

Portugal – 1 Focus group and 12 interviews

The focus group with seven participants was carried out in Oeiras, on 22/03/2017 organised by ICOM Portugal in collaboration with Mapa des Ideas

Twelve international experts from around Europe interviewed as seen in the report "*The Museum of the Future: Insights and reflections from 10 international museums*"[12].

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[11] http://www.project-musa.eu/wp-content/uploads/2017/03/MuSA-Museum-of-the-future.pdf

The desk research for mapping museum training provisions analysed 130 formal and informal educational training programmes in all three countries, focussing on their relation with the e-competences of the five role-profiles defined within the European Project eCult Skills.

The online survey collected 275 complete responses. The survey was open for 23 days (06 – 28.02.2017).

The short opening period, together with the lack of knowledge and public discussion related to the five role-profiles under focus and respective e-competences, not recognised by professionals as having application in the national context, may justify the level of participation. However in terms of impact the number was much higher recording 980 people opening the survey.
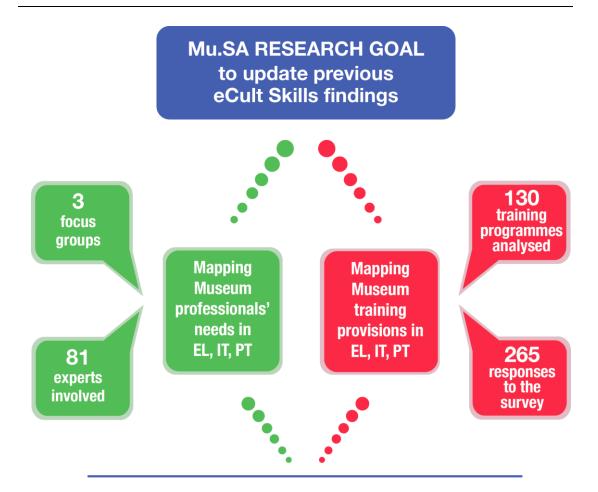
The profile of the highest majority of participants belongs to a museum staff, working full time (36,7%), in small national (34,31%) or private (23,2%) museum (staff 1 - 20) with archaeological, ethnographic and historical artefacts, with more than 5 years museum working experience with the main departments of Education, Conservation, Communication; Library and Research as the most selected.

Fig. 4 Graphic describing the Mu.SA research framework and Key Performance Indicators (KPIs)

3 e-competence Framework 3.0

3.1 Introduction

The four emerging job profiles identified during the eCult Skills project and after, analysed within the Mu.SA research are illustrated according to **the e-Competence Framework [13] 3.0** recommendations. This is a European reference framework, developed by the working group of the European Standardization Organizations on ICT (Information Communication Technology) skills, aligned with the EQF - European Qualification Framework.

Previously adopted in the eCult Skills project, the framework has been identified as the most effective for ensuring a higher degree of mobility and transparency for DIGITAL workers across Europe.

The European e-Competence Framework (e-CF) was devised as a specialised section of the EQF for the Information Technology sector. In fact it is based on the EQF and its descriptors are directly adapted to DIGITAL-related skills.

The e-CF lists 40 DIGITAL competences or e-competences[14] (Tab. 1) that are frequently required in the workplace today, establishing a shared terminology for competences, skills and proficiency levels that can be understood all over Europe.

The definitions of competences and levels within the European e-Competence Framework (e-CF) are mostly generic, and do not tend to specify technical means or tools, so much as the ability to perform professional tasks and resolve issues at work. For example, it does not matter if a graphic designer uses one kind of software or another. The important thing is for him/her to reach a satisfactory outcome, such as

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[13] http://www.ecompetences.eu/
ftp://ftp.cen.eu/CEN/Sectors/List/ICT/Workshops/eCF3.0%20brochure.pdf
(Downloaded April 2017)
[14] digital and e-competence are interchangeable

creating a brand or logo, enhancing sales, and supporting the reputation or image of the organization s/he works for.

The terms used in the e-CF are generic in order to be applicable to a wide range of professional contexts and it is possible to use the same descriptor (also for various different levels). The level of expertise required by the job market can differ even though the descriptors are the same or similar. As mentioned above the e-CF expresses DIGITAL competence using the following definition: 'Competence is a demonstrated ability to apply knowledge, skills and attitudes for achieving observable results'. This is a holistic concept directly related to workplace activities and incorporating complex human behaviours expressed as embedded attitudes.

The e-Competence Framework distinguishes 4 dimensions:

Dimension 1: reflects five e-Competence areas, derived from DIGITAL business processes **PLAN – BUILD – RUN – ENABLE – MANAGE.**

Dimension 2: defines a set of e-Competences for each area (36 competences in total). The relative importance *(***= core, **= additional, *= nice to have)* of the e-Competences for the specific Role Profile is defined in the next column.

Dimension 3: lists proficiency levels for each e-Competence. The levels provide statements of typical expectations of achievements and abilities associated with qualifications. These derive from the European Qualification Framework. Levels escalate from Level 1 to Level 5, which are related to EQF levels 3 to 8. This aims at offering a more concrete description of each of the e-Competences composing the Role Profile.

Dimension 4: contains additional skills, including "soft skills" which qualify the e-Competences of dimension 2. These additional skills are divided in three categories: technical, behavioral, managerial skills. Each e-Competence is coupled with one or more additional skills. Crosses are used to mark the additional skills that correspond to each e-Competence. This demonstrates that each e-Competence can be fully deployed, only if it is accompanied by additional skills.

The format of the table of the second sub-section (**Detailed Profile** Fig. 5) is as follows. The Mu.SA role- profiles have been illustrated following this template, although slightly modified in order to increase readability.

Dimension 1 e---Comp. area		
Dimension 2 e---Competence: Title + generic description		
Dimension 3 e---Competence proficiency levels e -1 to e-5, related to EQF levels 3 to 8	Level 1	
	Level 2	
	Level 3	
	Level 4	
	Level 5	
Dimension 4 Knowledge examples *Knows/Aware of/Familiar with*		
Skills examples *Is able to*		

Fig. 5 Detailed Profile adopted in the e-CF: the e-CF has 5 levels that are directly related to the 8 levels of the EQF

Levels 1 and 2 of the EQF are not appropriate to the DIGITAL sector as they represent very basic skills and competences, while levels 4 and 5 of the EQF are combined to constitute level 2 of the e-CF. **Level 4 of the e-CF "manages complex projects or programmes" and "influences project strategy" refers to "the ability to influence the upper level"**. Specifically it argues "*Manages complex projects or programmes, including interaction with others. Influences project strategy by proposing new or alternative solutions and balancing effectiveness and efficiency. Is empowered to revise rules and choose standards. Takes overall responsibility for project outcomes, including finance and resource management and works beyond project boundary*".

Level 5 "provides strategic leadership". In detailed it says " *Provides ICT strategic leadership for implementing the enterprise strategy. Applies strategic thinking to discover and recognize new patterns in vast datasets and new DIGITAL systems, to achieve business goals/ Challenges the status quo and provides strategic leadership for the introduction of revolutionary concepts/ Applies strategic thinking and organizational leadership to exploit the capability of Information Technology to improve the business"*.

The definitions of competences and levels are mainly generics, and for example do not deal with technical tools, **but the ability to perform working issues**. It does not matter if a software or another is used, what is important for example for a graphic designer is be able to create an outcome, to develop a brand for the organization, supporting and enhancing sales, reputation or image of the organisation.

European e-Competence Framework 3.0 overview

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				X	X
	A.2. Service Level Management			X		
	A.3. Business Plan Development			X		X
	A.4. Product/Service Planning		X	X		
	A.5. Architecture Design			X	X	X
	A.6. Application Design	X	X	X		
	A.7. Technology Trend Monitoring				X	X
	A.8. Sustainable Development			X	X	
	A.9. Innovating				X	X
B. BUILD	B.1. Application Development	X	X	X		
	B.2. Component Integration		X	X	X	
	B.3. Testing	X	X	X	X	
	B.4. Solution Deployment	X	X	X		
	B.5. Documentation Production	X	X			
	B.6. Systems Engineering	X	X	X		
C. RUN	C.1. User Support	X	X	X		
	C.2. Change Support		X	X		
	C.3. Service Delivery	X	X	X		
	C.4. Problem Management		X	X	X	
D. ENABLE	D.1. Information Security Strategy Development				X	X
	D.2. ICT Quality Strategy Development				X	X
	D.3. Education and Training Provision		X	X	X	
	D.4. Purchasing		X	X	X	
	D.5. Sales Proposal Development		X	X		
	D.6. Channel Management			X	X	
	D.7. Sales Management			X		X
	D.8. Contract Management		X	X	X	
	D.9. Personnel Development		X	X	X	
	D.10. Information and Knowledge Management			X	X	X
	D.11. Needs Identification			X	X	
	D.12. Digital Marketing		X	X		
E. MANAGE	E.1. Forecast Development			X	X	
	E.2. Project and Portfolio Management		X	X	X	
	E.3. Risk Management		X	X		
	E.4. Relationship Management			X	X	
	E.5. Process Improvement		X	X	X	
	E.6. ICT Quality Management		X	X	X	
	E.7. Business Change Management			X		X
	E.8. Information Security Management		X	X	X	
	E.9. IS Governance				X	X

Tab. 1 e-CF list 40 ICT competences or e-competences

e-Competence Level	EQF Level
5	8
4	7
3	6
2	5 and 4
1	3

Tab. 2 Reference levels between the e-CF and EQF

3.2 Reference levels: EQF and e-CF Frameworks

The European Qualification Framework (EQF) is a shared framework of reference at a European level and each national education framework is directly related to the EQF. It is based on learning outcomes rather than on the content of learning, so that at the end of the learning process the specific knowledge, skills and competences that have been acquired can be accurately described.

Standardized definitions of skill levels are useful for various stakeholders such as: managers and Human Resource departments in companies and other organizations (in both the public and private sectors), training providers and educational institutions (including higher education), as well as researchers and policy-makers.

The European Qualification Framework was developed at the beginning of the century to improve standardization and comparability of qualifications all over Europe. The traditional approach was content-based and it measured the level of knowledge at the end of the training or learning process. The EQF has 8 levels starting from level 1 (basic) to 8 (high level expertise), which makes it easier to evaluate the levels of knowledge, skills and competencies acquired. The descriptors for the levels are quite straightforward and they also evaluate the level of autonomy that has been gained. The EQF is very adaptable to all sectors of knowledge and kinds of training.

The aim of the EQF is to evaluate how well learners are able to implement their knowledge, skills and competences in their daily working activities, whether they have gained these abilities in training courses, via previous working experience or in a non-formal learning setting.

3.3 Other relevant European Frameworks: DigComp A Framework for Developing and Understanding Digital Competence in Europe

"DigComp: A Framework for Developing and Understanding Digital Competence in Europe" is a European Framework[15] that defines areas of competence that are seen as components of e-citizenship, thereby addressing the issue of the digital divide.

This framework is oriented towards all European citizens as users of digital technologies and it complements the existing e-Competence Framework, which is specifically oriented towards DIGITAL professionals.

The European Digital Competence Framework for citizens describes 21 competences (Fig. 6) that are necessary to use digital technologies in a confident, critical, collaborative and creative way, in order to achieve goals related to work, employability, learning, leisure, inclusion and participation in society.

Digital competence is one of the 8 key competences for Lifelong Learning established by the European Union. It is a transversal key competence, which, as such, facilitates the acquisition of various other key competences (e.g. language, mathematics, learning to learn, cultural awareness). Nowadays, having digital competence and a "digital presence" depends more on knowledge, skills and attitudes than only on having access to various forms of ICT and being able to use them.

In developing the MOOC and the training programmes within the Mu.SA project all of the frameworks we have described will be taken into consideration.

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[15] https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework

Competence area 1: Information and data literacy — 23

1.1 Browsing, searching, filtering data, information and digital content
1.2 Evaluating data, information and digital content
1.3 Managing data, information and digital content

Competence area 2: Communication and collaboration — 26

2.1 Interacting through digital technologies
2.2 Sharing throught digital technologies
2.3 Engaging in citizenship through digital technologies
2.4 Collaborating through digital technologies
2.5 Netiquette
2.6 Managing digital identity

Competence area 3: Digital content creation — 32

3.1 Developing digital content
3.2 Integrating and re-elaborating digital content
3.3 Copyright and licences
3.4 Programming

Competence area 4: Safety — 36

4.1 Protecting devices
4.2 Protecting personal data and privacy
4.3 Protecting health and well-being
4.4 Protecting the environment

Competence area 5: Problem solving — 40

5.1 Solving technical problems
5.2 Identifying needs and technological responses
5.3 Creatively using digital technologies
5.4 Identifying digital competence gaps

Fig. 6 DigComp classification of 21 digital competences in 5 areas

1. Information:	Identify, locate, retrieve, store, organise and analyse digital information, judging its relevance and purpose.
2. Communication:	Communicate in digital environments, share resources through online tools, link with others and collaborate through digital tools, interact with and participate in communities and networks, cross-cultural awareness.
3. Content-creation:	Create and edit new content (from word processing to images and video); integrate and re-elaborate previous knowledge and content; produce creative expressions, media outputs and programming; deal with and apply intellectual property rights and licences.
4. Safety:	Personal protection, data protection, digital identity protection, security measures, safe and sustainable use.
5. Problem-solving:	Identify digital needs and resources, make informed decisions as to which are the most appropriate digital tools according to the purpose or need, solve conceptual problems through digital means, creatively use technologies, solve technical problems, update one's own and others' competences.

Fig. 7 The 5 areas identified by DigComp
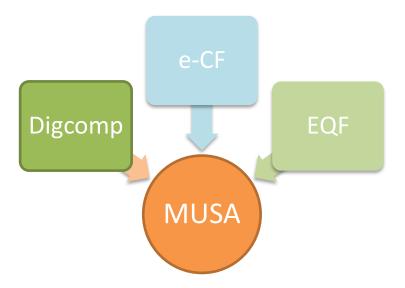
Fig. 8 Overview of the European Frameworks taken into account within Mu.SA

4   Description of the Role profile template

In order to achieve a better understanding of the results this paragraph describes the "role-profile template" (

<table>
<tr><td colspan="3" align="center">Job Role Profile Description</td></tr>
<tr><td>Title</td><td colspan="2">Name of this Role and aliases (meaning other given titles that describe the same role)</td></tr>
<tr><td>Mission</td><td colspan="2">A summary or résumé of the role of the professional in the organization, and the rationale of the role.
The "Summary Statement" briefly sums up what the professional will do in her/his function (Warning: role-profiles are not necessarily job-profiles, as employees in an organisation can have various different roles, even if their jobs are named differently)</td></tr>
<tr><td>Academic qualification Sector (recommended)</td><td colspan="2">The required educational background or provider of the qualification/ educational programme for the role-profiles – School studies/ University course/ Master Programme, etc</td></tr>
<tr><td>Level (according to the EQF)</td><td colspan="2">The level of expertise according to the EQF levels e.g level 6, 7 or 8</td></tr>
<tr><td>Tasks/ Key responsibilities</td><td colspan="2">What the professional will perform in a cultural organization. The responsibilities and activities that this role-profile carries out.</td></tr>
<tr><td rowspan="2">Knowledge (In EQF knowledge is described as theoretical)</td><td>Required</td><td>the standard knowledge required for this role</td></tr>
<tr><td>Desired</td><td>the preferred knowledge for this role</td></tr>
<tr><td rowspan="2">e-skills</td><td>Required</td><td>the standard digital skills required for this role</td></tr>
<tr><td>Desired</td><td>the preferred digital skills for this role</td></tr>
<tr><td>Environment</td><td colspan="2">Brief description of the working environment for the role-profile</td></tr>
<tr><td>KPIs</td><td colspan="2">Key Performance Indicators of the role in the organisation. Indicators for measuring the results obtained by the role-profile</td></tr>
<tr><td>Relationships</td><td colspan="2">Describes with whom the role profile reports to inside the organisation</td></tr>
<tr><td>e-Competence proficiency levels</td><td colspan="2">The e-competence which are A very important and B important, and the ones which are mandatory () or optional<> for this role described according the levels:
e-1 to e-5, related to EQF levels 3 to 8
** Level Required and * Level Desired</td></tr>
</table>

Transferable skills	*Transferable skills that are A very important and B important*

Tab. 3) adapted from the e-competence framework and previously used in eCult skills. It consists of the following table (all entries in italics are the explanations of the items listed in the left hand column), and in the following sections each role profile has been described in detailed using this template.

For each profile e-competences and transferable competences have been listed in order of importance, ranked by the experts who have been consulted during the research activities, and the ones which are mandatory () or optional<> for this role described according the levels Required** or Desired*: e-1 to e-5, related to EQF levels 3 to 8. **According to the research outcomes there are e-competences and transferable competences that should be developed across all job role-profiles and that should be considered essential as a starting point for up skilling**, as illustrated in Tab 4 and Tab 5.

In general, on the basis of the research findings, the respondents consulted during the research believe it is necessary to develop useful skills in order to reach a greater number and diverse museum visitors, while enhancing digital skills with this aim (and not just for their own sake).

Job Role Profile Description	
Title	*Name of this Role and aliases (meaning other given titles that describe the same role)*
Mission	*A summary or résumé of the role of the professional in the organization, and the rationale of the role.* *The "Summary Statement" briefly sums up what the professional will do in her/his function (Warning: role-profiles are not necessarily job-profiles, as employees in an organisation can have various different roles, even if their jobs are named differently)*
Academic qualification Sector (recommended)	*The required educational background or provider of the qualification/ educational programme for the role-profiles – School studies/ University course/ Master Programme, etc*

Level (according to the EQF)	*The level of expertise according to the EQF levels e.g level 6, 7 or 8*	
Tasks/ Key responsibilities	*What the professional will perform in a cultural organization. The responsibilities and activities that this role-profile carries out.*	
Knowledge (In EQF knowledge is described as theoretical)	Required	*the standard knowledge required for this role*
	Desired	*the preferred knowledge for this role*
e-skills	Required	the standard digital skills required for this role
	Desired	the preferred digital skills for this role
Environment	*Brief description of the working environment for the role-profile*	
KPIs	*Key Performance Indicators of the role in the organisation. Indicators for measuring the results obtained by the role-profile*	
Relationships	*Describes with whom the role profile reports to inside the organisation*	
e-Competence proficiency levels	*The e-competence which are A very important and B important, and the ones which are mandatory () or optional<> for this role described according the levels:* *e-1 to e-5, related to EQF levels 3 to 8* *** Level Required and * Level Desired*	
Transferable skills	*Transferable skills that are A very important and B important*	

Tab. 3 Job Role Profile Template adapted from the e-competence framework

e-Competences identified from the European e-Competence Framework 3.0	Digital Strategy Manager	Digital Collections Curator	Digital Interactive Experience Developer	Online Community manager
A.1. IS and Museum Strategy Alignment	x	x	x	x
A.3. Business Plan Development	x	x	x	x
A.4. Product/ Service Planning	x	x	x	x
A.7. Technology Trend Monitoring	x	x	x	x
A.9. Innovating	x	x	x	x

C.1. User Support	x	x	x	x
D.11. Needs Identification	x	x	x	x
E.1. Forecast Development	x	x	x	x
E.4. Relationship Management	x	x	x	x
E.6. ICT Quality management	x	x	x	x

Tab. 4 The most important e-Competences to develop across the 4 MU.SA profiles

The most important transferable competences to develop across the 4 Mu.SA profiles				
	Digital Strategy Manager	Digital Collections Curator	Digital Interactive Experience Developer	Online Community manager
Leadership and change facilitator	x	x	x	x
Time management	x	x	x	x
Creative thinking skills	x	x	x	x
Communication Skills	x	x	x	x
Team working	x	x	x	x

Tab. 5 The most important transferable competences to develop across the 4 profiles

e-Competences	Level of the e-competence for each Role Profile			
	Digital Strategy Manager	**Digital Collections Curator**	**Digital Interactive Experience Developer**	**Online Community manager**
A.1. IS and Museum Strategy Alignment	e-4** e 5*	e-4** e-5*	e-4** e-5*	e-4** e-5*
A.2. Service Level Management	e-3** e-4*			
A.3. Business Plan Development	e-3** e-4*	e-3** e-4 *	e-3** e-4*	e-3** e-4*
A.4. Product / Service Planning	e-3**	e-3** e-4*	e-4**	e-4**
A.6. Application Design			e-3**	
A.7. Technology Trend Monitoring	e-3** (downgraded) e-4*	e-5**	e-5**	e-4** e-5*
A.8. Sustainable Development	e-3** e-4*			
A.9. Innovating	e-4** e-5*	e-5**	e-4** e-5*	e-4** e-5*
B.1. Application Developing			e-3**	
B.3. Testing			e-3**	
B.4. Solution Deployment			e-3**	
B.5. Documentation Production		e-3*	e-3**	e-4** e-5* (Upgraded from level 3)
C.1. User Support			e-3**	e-3**
C.2. Change Support			e-3**	
C.3. Service Delivery		e-3 **		

C.4. Problem Management		*e-4***	*e-4***	*e-4***
D.1 Information Security Strategy Development	*e-3*** *e-4**			
D.2. ICT Quality Strategy Development				*e-5***
D.3. Education and Training Provision	*e-3***			
D.4. Purchasing	*e-3*** *e-4**	*e-3*** *e-4**		
D.10. Information and Knowledge Management	*e-3*** *e-4**	*e-5***		
D.11. Needs Identification	*e-4*** *e-5**	*e-4*** *e-5**	*e-3 ***	*e-4*** *e-5**
D.12. Digital Marketing				*e-4*** *e-5***
E.1. Forecast Development	*e-3***	*e-3*** *e-4**	*e-4***	*e-4***
E.3. Risk Management	*e-3*** *e-4**	*e-3*** *e-4**	*e-3*** *e-4**	
E.4. Relationship Management	*e-4***	*e-4***	*e-4***	*e-4***
E.5. Process Improvement	*e-3*** *e-4**			
E.6. ICT Quality Management	*e-3*** *e-4**	*e-4***	*e-3*** *e-4**	*e-4***
E.7 Business Change Management	*e-3*** *e-e-4**			*e-4*** *e-5**

Tab. 6. E-competence level of proficiency according to the e-CF (*e-1 to e-5*), related to EQF levels (3 to 8) (** Level Required and * Level Desired)

5 Description of the Digital Strategy Manager role profile

A Digital Strategy Manager can be defined as an ICT Consultant. Those with this role-profile have a strategic function in order to help museums to thrive in a digital environment. They are in charge of a digital transformation plan in line with the overall museum strategy. Currently they are most often seen as external collaborators, but in future they could belong to the internal organisational structure, or the same type of assistance could be provided by an external body (such as a Ministry).

Summary statement

In line with the overall museum strategy, Digital Strategy Managers support a museum's technological and digital innovation. They provide museums with comprehensive, updated and unbiased information about digital products, and always work for the benefit of the museum. They must have a good knowledge of how a museum works.

<table>
<tr><td colspan="2" align="center">Job Role-Profile Description</td></tr>
<tr><td>Title</td><td><i>Digital Strategy Manager</i></td></tr>
<tr><td>Mission</td><td>The <i>Digital Strategy Manager</i> has a strategic function in order to help museums to thrive in a digital environment. S/he is in charge of a digital transformation plan in line with the overall museum strategy. S/he is responsible for the museum digital strategy and the financial planning of technological resources at a senior level, alongside the overall museum management. S/he plays a mediating role between the internal museum departments and external stakeholders, and is able to effectively communicate with various different stakeholders, especially high-tech companies. S/he is comfortable with working with both back-end and front-end technologies. S/he has a good knowledge of how a museum works.</td></tr>
</table>

Academic qualification Sector (recommended)	Master degree in Museum Studies or equivalent working experience in museums	
Level (according to EQF)	Minimum 6	
Tasks / Key responsibilities	• To plan the digital strategy and the financial planning of technological resources (budget allocated by the Director) at a senior level, in line with the overall management of a museum • To play a mediating role between the museum and the outside world, and is able to effectively communicate with various different stakeholders, especially high-tech companies • To facilitate the smooth flow from content production to technology in various different departments • To supervise upgrades, installations and backup operations on a day-to-day basis • To supervise the safety of all digital infrastructures • To make strategic decisions based on the relevant evidence and knowledge on new digital products • To provide internal guidelines/policies in compliance with DIGITAL standards and regulations • To conduct benchmarking analyses • To produce periodic reports on the progress of the activities and results obtained • To assess staff training needs and organise training activities • To carry out evaluation reports on audience needs and collect them from other departments • To plan user-centred technology projects and interventions • To foresee the impact of digital solutions while responding to the needs of the museum and its audiences • To advise on digital training and regulations	
Knowledge	Required	Knowledge of:

(*In EQF, Knowledge is described as theoretical*)		☐ Advanced coding, Virtual Reality, Augmented Reality, Application Development, Digitalization of collection, 3D, Metadata Management, Digital Exhibition, XML language, specific software tools, systems of geographic information software, HTML
		☐ Digital terminology and products to assist effective communication with digital collaborators and contractors in the case of joint projects
		☐ The major IT frameworks e.g. COBIT, ITIL, CMMI, ISO and their applications in a museum context
		☐ The different service models (Saas, Paas, Iaas) and operational translational (i.e. Cloud Computing)
		☐ Digital devices and tools for storage and retrieval of data
		☐ The new emerging technologies
		☐ DIGITAL architectural framework
		☐ Museum functions and context
		☐ The principles and regulations of intellectual property rights
		☐ Structured project management methodologies
		☐ How to implement audience development strategies
		☐ The ability to conduct and interpret audience research
	Desired	☐ User Experience
		☐ Knowledge of Agile process management
		☐ Open Data and linked data
e–Skills	Required	The ability to:
		☐ Plan and manage an effective digital strategic plan
		☐ Manage, implement and run digital projects

		☐ Use digital platforms for the analysis and interpretation of user needs ☐ Make decisions based on evidence ☐ Advise on copyright and intellectual property ☐ Implement an audience development strategy ☐ Advise and work in synergy with the other departments ☐ Collaborate with external digital providers
	Desired	The ability to: ☐ Develop software ☐ Apply agile process management techniques ☐ Interpret and use open and linked data
Transferable skills **A Very important B Important**	*Communication Skills A* *Mentoring / coaching skills A* *Analyse and synthetize information A* *Negotiation skills A* *Team working A* *Networking skills A* *Creative thinking skills A* *Sense of initiative and entrepreneurship A* *Resilience A* *Leadership and change facilitator A* *Decision making A* *Time management B*	
Environment	This role-profile is strategic for all those museums that want to thrive in a digital environment. Digital Strategy Managers are in charge of a digital transformation plan, in line with the overall museum strategy. Currently, they are most often seen as external collaborators, but in future they could belong to the internal organisation.	
KPI	☐ Number of digital projects begun, implemented, completed, failed ☐ Number of digital projects delivered on time, within the budget, and within scope and the quality requirements ☐ Number of staff involved in digital projects ☐ Quantity of new and returning audiences reached through the digital strategy ☐ Audience satisfaction online/offline ☐ Number of defined KPI with teams	

Relationships / Reporting line/ Answerable to	Reports to: Director and Head of other departments Interacts with: Curatorial Conservation Department Communication Department ICT Department Education Department Customer Relationship Services

Competence proficiency levels e-1 to e-5, Required** Desired* **A** Very important **B** important **<>** optional **()** Mandatory
A.1. Information Strategy and Organisational Strategy Alignment (A) ***Level e-4** Level e-5**** Anticipates long-term requirements of the museum's digital strategy, and influences improvement of the museum's organisational process efficiency and effectiveness. Suggests strategic digital policy decisions to museum decision makers, in alignment with the museum's conservation, educational, scientific and other goals.
A.2. Service Level Management <> ***Level e-3** level e-4**** Advises on the definition, validation and applicability of service level agreements (SLA) and underpinning contracts for services offered upon implementation of the museum's digital strategy. Accompanies the negotiation of service performance levels taking into account the needs and capacity of stakeholders (audiences, colleagues, educational institution representatives, Cultural Heritage professionals, donors, decision makers, etc.) and museum.
A.3. Business Plan Development (A) ***Level e-3** Level e-4**** Provides advice on the design and structure of solutions supporting the museum's digital strategy, including the identification of alternative approaches, as well as return on investment propositions. Considers the

possible and applicable sourcing models. Presents cost-benefit analysis and reasoned arguments in support of the selected strategy. Ensures compliance between the museum's overall strategy and its digital strategy.

A.4. Product / Service Planning (B)
Level e-3**

Analyses and defines target status. Estimates cost effectiveness, points of risk, opportunities, strengths and weaknesses, with a critical approach, based on the museum's own interpretation of readiness for deploying digital technology. Creates structured plans; establishes time scales and milestones, ensuring optimisation of activities and resources. Proposes change requests. Defines delivery quantity and provides an overview of additional documentation requirements. Specifies correct handling of products, including legal issues, in accordance with current regulations.

A.7. Technology Trend Monitoring (A)
Level e-3** (downgraded) Level e-4*

Investigates latest digital technological developments to establish understanding of evolving technologies that could be deployed in museums. Devises innovative solutions for integration of new technology into existing products, applications or services or for the creation of new solutions.

A.8. Sustainable Development (B)
Level e-3 ** level e-4*

Estimates the impact of digital solutions used for the implementation of the museum's digital strategy in terms of eco responsibilities including energy consumption. Advises different museum teams on sustainable alternatives that are consistent with the museum's goals. Provides advice on a digital purchasing and sales policy, which fulfils eco-responsibilities.

A.9. Innovating (A)
Level e-4** Level e-5*

Devises creative solutions for the provision of new concepts, ideas, products or services that could add value to the museum and enhance the experience of its audiences. Deploys novel and open thinking to envision exploitation of technological advances to address the needs of the museum, its audiences and society as a whole.

D.1 Information Security Strategy Development <>
Level e-3** (downgraded) level e-4*

Advises on the development of a formal organisational strategy, scope and culture to maintain safety and security of information from external and internal threats. Provides the foundation for Information Security

Management, including role identification and accountability. Uses defined standards to create objectives for information integrity, availability, and data privacy.

D.3. Education and Training Provision (B)
Level e-3**

Defines and implements digital training policy to address organisational skill needs and gaps. Structures, organises and schedules training programmes to meet the aforementioned skill needs and evaluates training quality through a feedback process and implements continuous improvement. Adapts training plans to address changing demand.

D.4 Purchasing <>
Level e-3** level e-4*

Advises on a consistent procurement procedure, according to the museum's digital strategy, including deployment of the following sub processes: specification requirements, supplier identification, proposal analysis, evaluation of the energy efficiency and environmental compliance of products, suppliers and their processes, contract negotiation, supplier selection and contract placement. Ensures that the entire purchasing process is fit for purpose, adds business value to the museum compliant to legal and regulatory requirements.

D.10. Information and Knowledge Management (A)
Level e-3** Level e-4*

Investigates latest digital technological developments to establish understanding of evolving technologies that could be deployed in museums. Devises innovative solutions for integration of new digital technologies into existing products, applications or services or for the creation of new solutions.

D.11. Needs Identification (A)
Level e-4** Level e-5*

Interprets audience research reports from other departments. Carries out independent audience research activities to assess the interaction between technology and audiences. Proposes different solutions (e.g. make-or-buy), by performing contextual analysis in support of user centred system design.

E.1. Forecast Development <>
Level e-3**

Interprets museum and audiences needs and evaluates market acceptance of culture tailored digital products or services. Applies relevant metrics to enable accurate decision making in support of the development, implementation and marketing of the museum's digital strategy.

E.3. Risk Management (A)
Level e-3** level e-4*

Advises on the implementation of the management of risk across information systems through the application of a defined risk management policy and procedure. Assesses risk to the museum's operations. Documents potential risk and containment plans.

E.4.Relationship Management (A)
Level e-4**
Establishes and maintains positive relationships between stakeholders (internal or external) deploying and complying with organisational processes. Maintains regular communication with museum, staff and technology providers, and addresses needs through empathy with their environment and managing supply chain communications. Ensures that stakeholder needs, concerns or complaints are understood and addressed in accordance with the museum's digital strategy.

E.5. Process Improvement (B)
Level e-3** level e-4*
Measures effectiveness of existing digital processes (if any). Researches and benchmarks digital process design from a variety of sources. Follows a systematic methodology to evaluate, design and implement process or technology changes for measurable business benefit. Assesses potential adverse consequences of process change.

E.6 ICT Quality management <>
Level e-3** level e-4*
Advises on the implementation of digital quality policy to maintain and enhance museum services. Plans and defines indicators to manage quality with respect to digital strategy. Reviews quality measures and recommends enhancements to influence continuous quality improvement.

E.7. Business Change Management (B)
Level e-3** Level e-4*
Assesses the implications of new digital solutions in museums. Defines the requirements and quantifies the business benefits for the museum. Advises management on the deployment of change taking into account structural and cultural issues. Maintains business and process continuity throughout change, monitoring the impact, taking any required remedial action.

Digital Strategy Manager E-competences
levels ** required / * desired-   A Very important /B important
() Mandatory <> optional

A.1. Information System and Organisational Strategy Alignment (A)
Level e-4** Level e-5*

A.2. Service Level Management <>   ***Level e-3** level e-4***
A.3. Business Plan Development (A)   ***Level e-3** Level e-4***
A.4. Product / Service Planning (B)   ***Level e-3****
A.7. Technology Trend Monitoring (A)   ***Level e-3** (downgraded[16]) Level e-4***
A.8. Sustainable Development** (B)*   ***Level e-3** level e-4
A.9. Innovating (A)   ***Level e-4** Level e-5***
D.1. Information Security Strategy Development <>   ***Level e-3** (downgraded)[48] level e-4***
D.3. Education and Training Provision (B)   ***Level e-3****
D.4 Purchasing <>   ***Level e-3** level e-4***
D.10. Information and Knowledge Management (A)   ***Level e-3** Level e-4***
D.11. Needs Identification (A)   ***Level e-4** Level e-5***
E.1. Forecast Development <>   ***Level e-3****
E.3. Risk Management (A)   ***Level e-3** level e-4***
E.4.Relationship Management (A)   ***Level e-4****
E.5. Process Improvement (B)   ***Level e-3** level e-4***
E.6 ICT Quality management <>   ***Level e-3** level e-4***
E.7. Business Change Management (B)   ***Level e-3** Level e-4***

Tab. 7 Digital Strategy Manager e-competences

Digital Strategy Manager Transferable competences   **A very important**   **B important**
Communication Skills A

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[16] The level is downgraded to the respect of e-CF

Mentoring / coaching skills A
Analyse and synthesize information A
Negotiation skills A
Team working A
Networking skills A
Creative thinking skills A
Sense of initiative and entrepreneurship A
Resilience A
Leadership and change facilitator A
Decision making A
Time management B

Tab. 8 Digital Strategy Manager Transferable competences

6 Description of the Digital Collections Curator role-profile

Digital "objects" that have been developed in a virtual environment are now becoming part of museum collections. The Mu.SA research findings indicate that developing specific skills of curators in this increasingly important sector will soon be a crucial requirement for museums if they are to carry out their mission of preserving cultural resources, conducting research and educating future generations.

Summary statement

The Digital Collections Curator is specialized in preserving and managing digital collections. S/he develops online and offline exhibitions and contents for other departments.

Job Role - Profile Description	
Title	***DIGITAL COLLECTIONS CURATOR*** **Also know as Digital Cultural Asset Manager, Digital Asset Manager, Digital Curator**
Mission	The Digital Collections Curator is responsible for implementing the digital strategy relevant to collecting, storing, archiving, preserving and making accessible the digital collections (either born – digital or digitized). In larger museums this could be a role-profile in itself, while in smaller museums a curator should be up skilled in the area.
Academic qualification Sector (recommended)	*University degree* *Museum degree (desired)*
Level (according to EQF)	*Minimum 6*

Tasks / Key responsibilities	• To improve a museum's digital preservation, management and exploitation plan for all digital cultural content/objects, on an on-going basis
	• To provide information on copyright and protection of digital cultural property according to international standards
	• To supervise the implementation of cataloguing/archiving standards
	• To produce metadata according to recognised international standards
	• To collaborate with museum staff in order to facilitate their work with digital cultural assets
	• To collaborate with other departments and manage projects involving enhancement of digital materials
	• To supervise the security and safety of digital materials
	• To design projects in collaboration with other departments in order to enhance the digital collection
	• To facilitate the use of collections according to museum policies and activities.

Knowledge *(In EQF, Knowledge is described as theoretical)*	Required	Knowledge of:
		☐ Terminology and products to assist effective communication with DIGITAL collaborators and contractors in the case of joint projects
		☐ Web, cloud and mobile technologies
		☐ Devices and tools for the storage and retrieval of digital data
		☐ Good practices and standards for digital asset management
		☐ The new emerging technologies
		☐ The functions and context of the museum
		☐ The principles and regulations of intellectual property rights
		☐ Structured project management methodologies
		☐ Audience development strategies

		☐ The best practices of audience engagement
		☐ Communication strategies
		☐ Knowledge of software
		☐ Open data
	Desired	☐ User experience ☐ Storytelling techniques ☐ Agile process management ☐ Audience research ☐ Implementation of audience development strategy ☐ How to edit Wikipedia entries
e – Skills	Required	The ability to: ☐ Use the support of Software ☐ Edit Wikipedia entries ☐ Digitize collections ☐ Cataloguing ☐ Retrieve information ☐ Preserve the Digital Collections
	Desired	• Apply and understand user experience processes • Apply agile processes techniques
Transferable skills **A Very important** **B Important**		*Time management A* *Management skills A* *Decision making A* *Communication Skills A* *Creative thinking skills A* *Networking skills A* *Interpersonal skills A* *Leadership and change facilitator A* *Teamworking A* *Mentoring / coaching skills A* *Sense of initiative and entrepreneurship B* *Mediation skills B* *Influence/ persuasion skills B* *Active listening skills B*
Environment	The Digital Collections Curator collaborates with external technology suppliers and, within the museum, with the: ☐ Management ☐ Education departments ☐ Communication department	

	Object curatorial departments (if different from own)
KPIs	- Number of digital projects begun, implemented, completed, failed - Quantity of new and returning audiences reached through the digital strategy - Audience satisfaction online/offline - Diversity and size of the collection of digital assets - Extent and frequency of consultation of digital assets by the audience
Relationships / Reporting line/ Answerable to	*Reports to:* *Director and/or Head of other departments* *Digital Cultural mediator* *Interacts with:* *Communication Department* *ICT department* *Education department* *Customer relationship services*

Competence proficiency levels e-1 to e-5
Required** Desired*
A Very important **B** important **<>** optional **()** Mandatory

A.1. IS and Organisational Strategy Alignment (A)
*Level e-4** and e-5**
Anticipates long-term requirements of the museum's digitized heritage/collection strategy and influences improvement of the museum's organisational process. Contributes to the strategic digital policy decisions to museum decision makers, in alignment with the museum's conservation, educational, scientific and other goals.

A.3. Business Plan Development (A)
*Level e-3** and e-4 **
Addresses the design and structure of a digital collections management plan including the identification of alternative approaches as well as return on investment propositions. Considers the possible and applicable sourcing models. Presents cost benefit analysis and reasoned arguments in support of the selected plan. Ensures compliance with the museum's business and IS strategies. Communicates this plan to museum management board.

A.4. Product / Service Planning (A)
Level e-3** and e-4*

Analyses and defines current and target status of the digital collections management plan. Estimates cost effectiveness, points of risk, opportunities, strengths and weaknesses, with a critical approach. Creates structured plans; establishes time scales and milestones, ensuring optimisation of activities and resources. Manages change requests. Defines delivery quantity and provides an overview of additional documentation requirements for the digital collections management plan. Specifies correct handling of products, including legal issues, in accordance with current regulations.

A.7. Technology Trend Monitoring (A)
Level e-5**

Investigates latest technological developments in her/his field of competence to establish understanding of evolving technologies that could be deployed in managing digital collections in museums. Devises innovative solutions for integration of new technology into existing products, applications or services or for the creation of new solutions aiming at supporting the digital collections management plan. Is able to identify the articulations between emerging technologies and museum staff and audience requirements, in accordance with the digital collections management plan.

A.9. Innovating (A)
Level e-5**

Devises creative solutions for the provision of new concepts, ideas, products or services that could add value to the museum and enhance the experience of its audiences. Deploys novel and open thinking to envision exploitation of technological advances to address the needs of the museum, its audiences and society as a whole.

B.5. Documentation Production (B)
Level e-3*

Produces documents describing products, services, tools or applications used for digital collections management to establish compliance with relevant documentation requirements. Selects appropriate style and media for presentation materials. Creates templates for document-management systems. Ensures that functions and features are documented in an appropriate way. Ensures that existing documents are valid and up to date.

C.3. Service Delivery B <>
Level e-3**

Ensures service delivery in accordance with established service level agreements (SLA). Takes proactive action to ensure stable and secure digital collections management applications to avoid potential service disruptions, attending to capacity planning and to information security. Updates operational document library and logs all service incidents. Maintains monitoring and management

tools (i.e. scripts, procedures). Maintains digital collections management infrastructure. Takes proactive measures.

C.4. Problem Management (A)
Level e-4**

Deploys a knowledge system based on recurrence of common errors. Resolves, in consultation with Digital Strategist and support by other experts, if necessary, or escalates incidents linked to the use of digital collections management applications and tools.

D.4. Purchasing (A)
Level e-3**, e-4*

Applies a consistent procurement procedure on products and services that would improve the digital collections management, including deployment of the following sub processes: specification requirements, supplier identification, proposal analysis,, suppliers and their processes, contract negotiation, supplier selection and contract placement. Ensures that the entire purchasing process is fit for purpose, adds business value to the organisation compliant to legal and regulatory requirements.

D.10. Information and Knowledge Management (A)
Level e-5**

Identifies and manages structured and unstructured digital collections and considers policies related to the provision of access. Understands appropriate tools to be deployed to organize, preserve and provide access to digital collections in order to capitalise from them and facilitate their discovery, access and use.

D.11. Needs Identification (A)
Level e-4** and e-5*

Interprets audience research reports from other departments. Carries out independent audience research activities to assess the interaction between technology and the audiences. Proposes different solutions (e.g. make-or-buy), by performing contextual analysis in support of user centred system design. Manages the relationship with all stakeholders to ensure that digital collections management is in line with museum requirements. Advises the museum's management team on appropriate solution choices. Acts as an advocate engaging in the implementation or configuration process of the chosen solutions.

E.1. Forecast Development B <>
Level e-3** and e-4*

Interprets museum staff and audience needs and evaluates market acceptance of digital collections management tailored products or services. Assesses the museum potential to meet future production and quality requirements. Applies relevant metrics to enable accurate decision making in support of the organization, preservation and exploitation of the museum's digital collections.

E.3. Risk Management B <>
Level e-3** and e-4*

Implements the management of risk across digital collections management system through the application of the museum defined risk management policy and procedure. Assesses risk to the museum's business, including web, cloud and mobile resources. Documents potential risk and containment plans.

E.4.Relationship Management (A)
Level e-4**

Establishes and maintains positive relationships between stakeholders (internal or external) deploying and complying with organisational processes. Maintains regular communication with museum, staff and technology providers, and addresses needs through empathy with their environment and managing supply chain communications. Ensures that stakeholder needs, concerns or complaints are understood and addressed in accordance with the museum's digital strategy.

E.6. ICT Quality Management (A)
Level e-4**

Implements digital collections management quality policy to maintain and enhance museum services related to digital collections management. Plans and defines indicators to manage quality with respect to digital collections management and curatorial strategy. Reviews quality measures and recommends enhancements to influence continuous quality improvement.

Digital Collections Curator E-competences levels ** required / * desired A Very Important /B important <> optional () Mandatory
A.1. IS and Organisational Strategy Alignment (A) Level e-4** and e-5*
A.3. Business Plan Development (A) Level e-3** and e-4 *
A.4. Product / Service Planning (A) Level e-3** and e-4*
A.7. Technology Trend Monitoring (A) Level e-5**
A.9. Innovating (A) Level e-5**
B.5. Documentation Production (B) Level e-3*
C.3. Service Delivery B <> Level e-3 **
C.4. Problem Management (A) Level e-4**
D.4. Purchasing (A) Level e-3**, e-4*
D.10. Information and Knowledge Management (A) Level e-5**
D.11. Needs Identification (A) Level e-4** and e-5*
E.1. Forecast Development B <> Level e-3** and e-4*
E.3. Risk Management B <> Level e-3** and e-4*
E.4. Relationship Management (A) Level e-4**
E.6. ICT Quality Management (A) Level e-4**

Tab. 9 Digital Collections Curator e-competences

Digital Collections Curator transferable competences
A very important B important
Time management A
Management skills A
Decision making A
Communication Skills A
Creative thinking skills A
Networking skills A
Interpersonal skills A
Leadership and change facilitator A
Teamworking A
Mentoring / coaching skills A
Sense of initiative and entrepreneurship B
Mediation skills B
Influence/ persuasion skills B
Active listening skills B

Tab. 10 Digital Collections Curator transferable competences

7 Description of the Digital Interactive Experience Developer role-profile

On the basis of the Mu.SA research findings curators with specific skills as Digital Interactive Experience Developers will soon be a crucial requirement. They will have a key role to play in using technology to provide meaningful experiences to audiences, since the inappropriate use of technology can represent an obstacle to the narrative to be conveyed. This could either be an internal employee on the museum staff, or an external collaborator.

Summary statement

The Digital Interactive Experience Developer designs, develops and implements innovative and interactive experiences based on audience needs, providing meaningful experiences for all types of audiences.

Job Role-Profile Description	
Title	***Digital Interactive Experience Developer*** *Also known as Interactive Experience Developer, Digital Interactive Experience designer, Exhibit interactive designer*
Mission	The Digital Interactive Experience Developer designs, develops and implements innovative and interactive experiences based on audience needs, providing meaningful experiences for all types of audiences.
Academic qualification Sector (Recommended)	*University degree (Architecture, Humanistic)* BA/MA in Information Technologies *Museum degree (desired)*
Level (according to EQF)	*Minimum 6*
Tasks/ Key responsibilities	☐ To design and prototype interactive and innovative installations providing meaningful experiences for all types of audiences

		To carry out audience research and observation analysis To develop accessibility tools for all types of visitors To facilitate communication flows between various different museum teams and external high-tech companies To facilitate relations between various different museum teams and departments: curatorial, ICT, education, marketing, communication, etc.
Knowledge *In EQF, Knowledge is described as theoretical*	Required	Knowledge of: Devising creative solutions for the provision of new concepts, ideas, products or services that could add value to the museum and enhance the experience of its audiences. DIGITAL terminology and products to assist effective communication with DIGITAL collaborators and contractors in the case of joint projects (Augmented Reality, Application Development, Digitalization of the collection, 3D, Metadata Management, Digital Exhibition, XML language, specific software tools (Adobe Photoshop, digital drawing software, AutoCad - architecture software; systems of geographic information software, HTML). The functions of how a museum works The principles and regulations of intellectual property rights Structured project management methodologies Audience development strategies The techniques and best practices of audience engagement Storytelling techniques Communication Audience research and interpretation/ analysis of the data Interactive storytelling/storydoing
	Desired	User experience Agile process How to implement an audience development strategy

e – Skills	Required	The ability to:
		□ Use technology to provide meaningful experiences based on the needs and motivations of different types of audiences □ Design, implement and evaluate interactive digital exhibitions □ Interpret and analyse reports on user needs □ Collaborate and cooperate with other departments □ Apply analysis techniques of user experiences Apply agile process management
	Desired	Familiarity with interactive software
Transferable skills **A Very important** **B Important**	*Creative thinking skills A* *Sense of initiative and entrepreneurship A* *Leadership and change facilitator A* *Storytelling A* *Active listening skills A* *Networking skills B* *Interpersonal skills A* *Communication Skills A* *Resilience B* *Time management A* *Team working A* *Fact-driven A* *Negotiation skills A* *Decision making B* *Analyse and synthetize information A* *Mediation skills B*	
Environment	The Digital Interactive Experience Developer works closely with exhibition curators and educational services, attempting to detect and capitalize on interactive potential in exhibition	

	plans. S/he works with the DIGITAL team, acting to combine and integrate the exhibition design, ICT, education, marketing and communication.
KPIs	☐ Number of digital projects begun, implemented, completed, failed ☐ Quantity and frequency of new and returning audiences reached through the digital strategy ☐ Audience satisfaction/External evaluation of the museum experience (based on a qualitative and quantitative analysis) ☐ Diversity of relevant means (supports, installations, etc.) used to connect audiences with the exhibition content
Relationships / Reporting line/ *Answerable to*	*Reports to:* Director and/or Head of other departments Digital Strategy Manager *Interacts with:* Curatorial department Communication Department ICT department Education department Customer relationship services/ Visitor services

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Competence proficiency levels e-1 to e-5
Required****** Desired*****
A Very important **B** important **<>** optional **()** Mandatory

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A.1. IS and Organisational Strategy Alignment (A)
Level e-4** and level e-5*
Anticipates long-term requirements of the museum's digital and curatorial exhibition strategy, and influences improvement of the museum's organisational process. Contributes to the strategic digital policy decisions to museum decision makers, in alignment with the museum's conservation, educational, scientific and other goals.

A.3. Business Plan Development (A)
Level e-3** and level 4*

Addresses the design and structure of a business plan related to the development of an interactive multimedia installation/tool/application, which is in line with the museum's digital strategy, including the identification of alternative approaches as well as return on investment propositions. Considers the possible and applicable sourcing models. Presents cost benefit analysis and reasoned arguments in support of the selected plan. Ensures compliance with museum and digital strategies. Communicates this plan to different museum teams and addresses political, financial, and organisational interests*.*

A.4. Product/Service Planning (A)
Level e-4**

Analyses and defines current and target status of a plan related to the development of an interactive multimedia tool/application. Estimates points of risk, opportunities, strengths and weaknesses, with a critical approach. Creates structured plans; establishes time scales and milestones, ensuring optimisation of activities and resources. Manages change requests. Defines delivery quantity and provides an overview of additional documentation requirements of the plan related to the development of an interactive multimedia tool/application. Specifies correct handling of products, including legal issues, in accordance with current regulations.

A.6. Application Design <>
Level e-3**

Analyses, specifies, updates and makes available a model to implement applications in accordance with Information System policy and museum and audience needs. Selects appropriate technical options for application design, optimising the balance between cost and quality. Design data structures and builds system structure models according to analysis results through modelling languages. Ensures that all aspects take account of interoperability, usability and security. Identifies a common reference framework to validate the models with representative users, based upon development models (e.g. iterative approach).

A.7. Technology Trend Monitoring (A)
Level e-5**

Investigates latest DIGITAL technological developments in her/his field of competence to establish understanding of evolving technologies that could be deployed in museums. Devises innovative solutions for integration of new technology into existing products, applications or services or for the creation of new solutions. Is able to identify the articulations between emerging technologies and audience and museum staff requirements, in accordance with the asset management plan.

A.9. Innovating (A)
Level e-4** and e-5*

Devises creative solutions for the provision of new concepts, ideas, products or services that could enhance interaction with the audience. Deploys novel and open thinking to envision exploitation of technological advances to address museum / society needs.

B.1. Application Development B <>
Level e-3**

Interprets the application design to develop a suitable application in accordance with audience needs. Adapts existing solutions. Codes, debugs, tests and documents and communicates product development stages. Selects appropriate technical options for development. Optimises efficiency, cost and quality. Validates results with audience representatives, integrates the overall solution.

B.3. Testing (A)
Level e-3**

Constructs and executes systematic test procedures for interactive and multimedia installations/tools/applications or audience usability requirements to establish compliance with

design specifications. Ensures that these perform to expectation. Ensures meeting of internal, external, national and international standards; including health and safety, usability, performance, reliability or compatibility, eco-friendly standards, i.e. low energy consumption. Produces documents and reports to evidence certification requirements.

B.4. Solution Deployment B <>
Level e-3**

Following predefined general standards of practice carries out planned interventions of a specific museum exhibition/collection, including installing, upgrading or decommissioning. Configures hardware, software or network to ensure interoperability of system components and debugs any resultant faults or incompatibilities. Engages additional specialist resources if required, such as third party network providers. Formally hands over fully operational solution to user and completes documentation recording all relevant information, including equipment addressees, configuration and performance data.

B.5. Documentation production (A)

Level e-3**

Produces documents describing interactive installations/tools/ applications, to establish compliance with relevant documentation requirements. Selects appropriate style and media for presentation materials. Creates templates for document-management systems. Ensures that functions and features are documented in an appropriate way. Ensures that existing documents are valid and up to date.

C.1. User Support A <>

Level e-3**

Responds to user requests and issues regarding installations/tools/applications, recording relevant information. Assures resolution and optimises system performance in accordance with predefined service level agreements (SLAs). Understands how to monitor solution outcome and resultant audience satisfaction.

C.2. Change support (A)

Level e-3**

Implements and guides the evolution of digital solution that meets audience needs. Ensures efficient control and scheduling of software or hardware modifications to prevent multiple upgrades creating unpredictable outcomes. Minimises service disruption as a consequence of changes and adheres to defined service level agreement (SLA). Ensures consideration and compliance with information security procedures.

C.4. Problem Management (A)

Level e-4**

Identifies and resolves the root cause of incidents. Takes a proactive approach to avoidance or identification of root cause of problems related to interactive and multimedia installations/tools/applications. Deploys a knowledge system based on recurrence of common errors. Resolves or prioritizes incidents. Optimises system or component performance*.*

D.11. Needs identification (A)
Level e-3 **

Actively listens to internal / external key stakeholders, e.g. museum staff and representatives of its audience,

articulates and clarifies their needs. Manages the relationship with all stakeholders to ensure that the solution is in line with museum and user requirements. Proposes and applies different solutions (e.g. make-or-buy), by performing contextual analysis in support of user centred system design. Advises the museum's management team on appropriate solution choices. Acts as an advocate engaging in the implementation or configuration process of the chosen solution.

E.1. Forecast Development (A)
Level e-4**

Interprets museum and audience needs and evaluates their acceptance of digital tools/applications aiming at offering an interactive experience to the audience. Reviewing the museum's potential to meet future production and quality requirements. Applies relevant metrics to enable accurate decision making in support of the development of digital tools/applications that will attract new audiences.

E.3. Risk Management (B)

Level e-3** and e-4*

Implements the management of risk across information systems of tools/applications to boost interaction with the audience through the application of a defined risk management policy and procedure. Assesses risk to the museum as far as interactive and multimedia installations/tools/applications are concerned. Documents potential risk and containment plans

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E.4. Relationship Management (A)

Level e-4**

Establishes and maintains positive relationships between stakeholders (internal or external) deploying and complying with organisational processes. Maintains regular communication with museum, audience and technology providers, facilitates interaction between different museum teams and addresses needs through empathy with their environment and managing communications. Ensures that stakeholder needs, concerns or complaints are understood and addressed in accordance with organisational policy.

E.6. ICT Quality Management (A)
Level e-3** and level 4*
Implements DIGITAL quality policy to maintain and enhance museum tools/applications aiming at enhancing digital interaction with the audience. Plans and defines indicators to manage quality with respect to DIGITAL strategy. Reviews quality measures and recommends enhancements to influence continuous quality improvement.

Digital Interactive Experience Developer E-competences levels ** required / * desired A Very Important /B important () Mandatory <> optional
A.1. IS and Organisational Strategy (A) Alignment **Level e-4** and level e-5***
A.3. Business Plan Development (A) **Level e-3** and level e-4***
A.4. Product/Service Planning (A) **Level e-4****
A.6. Application Design B <> **Level e-3****
A.7. Technology Trend Monitoring (A) **Level e-5****
A.9. Innovating (A) **Level e-4** and e-5***
B.1. Application Development B <> **Level e-3****
B.3. Testing (A) **Level e-3****
B.4 Solution Deployment B <> **Level 3****
B.5. Documentation production (A) **Level e-3****
C.1. User Support A <> **Level e-3****
C.2. Change support (A) **Level e-3****
C.4. Problem Management (A) **Level e-4****
D.11. Needs identification (A) **Level e-3 ****

E.1. Forecast Development (A)   **Level e-4****
E.3. Risk Management (B)   **Level e-3** and e-4***
E.4. Relationship Management (A)   **Level e-4****
E.6. ICT Quality Management (A)   **Level e-3** and level e-4***

Tab. 11 Digital Interactive Experience Developer e-competences

Digital Interactive Experience Developer Transferable competences A very important/B important
Creative thinking skills A
Sense of initiative and entrepreneurship A
Leadership and change facilitator A
Storytelling A
Active listening skills A
Networking skills B
Interpersonal skills A
Communication Skills A
Resilience B
Time management A
Team working A
Fact-driven A
Negotiation skills A
Decision making B
Analyse and synthesize information A
Mediation skills B

Tab. 12 Digital Interactive Experience Developer Transferable Competences

8 Description of the Online Community Manager

The Mu.SA research findings indicate that museums have to deal with ever-increasing numbers of online users through social media platforms. While some museums exploit this potential, many others are still not aware of the possibilities it offers. This role-profile is becoming increasingly valuable for museums to thrive in a digital environment. Online community development and care is a responsibility often carried out by professionals that cumulate several tasks within the organisation. We believe, however, it should gradually become a specialised task and a profile integrated in the communication department/team.

Summary statement

As a member of the team for communication, marketing and audience development and in line with the museum's overall strategic plan, and mission, the online community manager:
- is responsible for development and implementation of an online audience development plan (e.g. social media, interactive platforms, events,…)
- creates a sense of community between the museum and its online stakeholders/communities.

S/he also
- works in close collaboration with other professionals in the museum team and its departments (e.g. communication, curatorial, management, and ICT).

  S/he must have an extensive knowledge of how a museum works.

	Job Role-Profile Description
Title	***Online Community Manager*** Also known as Online Cultural Community Manager, (as in the previous project Cult skills, which Mu.SA is a follow up), Digital Communication Manager, (as stated in interviews) Digital Media Curator, Visual Media curator, New Media Manager, Social Media Specialist or Online Community Developer.
Mission	The online community manager answers to the needs of both the online and offline communities. S/he creates and manages accessible and collaborative online communities for all stakeholders (audiences, colleagues in museums and cultural heritage sector, educational organisations, donors, sponsors, decision makers, etc.).
Academic qualification Sector (Recommended)	*University degree (Communication/Art/etc.)* *Museum specialisation (desired)* *Web manager vocational training*
Level (according to EQF)	*Minimum 6 -7*

Tasks/ Key responsibilities	☐ To design and implement an online audience development plan in line with the museum's overall strategic communication plan (including KPI and Smart Objectives)
	☐ To engage, monitor and to manage online audiences
	☐ To liaise effectively with the other departments within the organisation in order to produce both content and meaningful online experiences
	☐ To carry out online surveys tracing audience needs
	☐ To carry out and monitor online activities
	☐ To assess and evaluate the effectiveness and efficiency of online activities (e.g. write periodic reports on online insights, conduct web analytics and analyse them, in order to assess whether objectives are being achieved)

Knowledge *(In EQF, Knowledge is described as theoretical)*	Required	Knowledge of:
		☐ Marketing (Unconventional and Digital Marketing)
		☐ Digital tools for online events (Chat, Webcast, Facebook, live streaming, among others)
		☐ Legal aspects in Copyright, Creative Commons, Royalties
		☐ Web content accessibility
		☐ Web analytics (Google analytics, Facebook insights, etc.)
		☐ Effective communication, mediation
		☐ Knowledge of how a museum works
		☐ Project management methodologies
		☐ Audience development strategies
		☐ Storytelling techniques
		☐ Audience research data interpretation
		☐ Extensive knowledge of social media platforms
	Desired	☐ Online user experience
		☐ Knowledge of the use of graphic tools
		☐ Knowledge of graphic design programs
		☐ Knowledge of web publication tools (e.g. CMS, Blog and Editor)
		☐ Knowledge of Mark-up and style sheets (e.g. XHTML, HTML and CSS)

		(depending on each organization requirements)
e – Skills	Required	The ability to ☐ Plan an effective online communication strategy ☐ Effectively engage with audiences online ☐ Monitor and evaluate digital projects ☐ Undertake user needs analysis online and interpret reports on audience research from other departments ☐ Identify needs and problems, and to resolve conceptual problems and problematic situations in digital environments ☐ Use digital tools to innovate processes and products ☐ Keep up-to-date with the evolution of digital technologies ☐ Improve and integrate information and content into an existing body of knowledge with an understanding of how copyright laws and licenses are to be applied.
	Desired	• Ability to use visualising tools to create graphic representations
Transferable skills **A Very important** **B Important**	*Creative thinking skills A* *Sense of initiative and entrepreneurship A* *Leadership and change facilitator A* *Storytelling A* *Active listening skills A* *Interpersonal skills A* *Communication Skills A* *Integrity/Ethical A* *Resilience A* *Communication Skills A* *Negotiation skills A* *Management skills A*	

	Team working A *Decision making A* *Time management A* *Analyse and synthetize information A* *Mentoring / coaching skills B* *Influence / persuasion skills B* *Networking skills B*
Environment	As a member of the team for communication, marketing and audience development, the Online Community Manager is responsible for developing and implementing an online audience development plan in line with a museum's overall strategic plan and mission.
KPIs	☐ Number of online audience projects begun, implemented, completed, and failed ☐ Quantity and frequency of new and returning audiences reached through the digital strategy (audience engagement) ☐ Audience satisfaction score ☐ Digital traceability
Relationships / Reporting line/ Answerable to	Reports to: Head of Communication and marketing Interacts with*:* Curatorial department ICT department Education department Customer relationship services Management department

Competence proficiency levels e-1 to e-5 Required****** Desired***** **A** Very important **B** important **<>** optional **()** Mandatory

A.1. IS and Organisational Strategy Alignment (A)
Level e-4** and e-5*

Anticipates long-term requirements of the museum's communication strategy and influences improvement of the museum's organisational process. Contributes to the strategic digital policy decisions to museum decision makers, in alignment with the museum's conservation, educational, scientific and other goals.

A.3. (Business plan development)(A)
Level e-3** and e-4*

Uses web technology, especially social media, for the museum's benefit. Designs online communication plan (a component of the museum's overall communication plan) including the identification of alternative approaches as well as return on investment propositions. He/she considers applicable funding sources. Defines KPIs for the online communication strategy. Presents cost benefit analysis and reasoned arguments in support of the selected strategy. Ensures compliance with organisational and technology strategies. Communicates and promotes the online communication plan to relevant stakeholders and addresses financial and organisational interests.

A.4. Product/Service Planning (A)
Level e-4**

Analyses and defines current and target status of the online communication plan. Estimates cost effectiveness, points of risk, opportunities, strengths and weaknesses, with a critical approach. Creates structured plans; establishes time scales and milestones, ensuring optimisation of activities and resources. Manages change requests. Defines delivery quantity and provides an overview of additional documentation requirements for the online communication plan. Specifies correct handling of social media products, including legal issues, in accordance with current regulations.

A.7. Technology Trend Monitoring (A)
Level e-4** and e-5*

Awareness of latest DIGITAL technological developments to establish solutions that could be used in museums, and the ability to integrate them into the online communication plan. Devises innovative solutions to integrate new technologies into existing products, applications or services or to create new ones. Is able to identify emerging technological platforms that answer the needs of the museum.

A.9. Innovating (A)
Level e-4** and e-5*

Conceives creative solutions for providing new concepts and ideas for the online communication strategy. Deploys novel and creative thinking, envisioning the exploitation of advanced technological means/tools (i.e. social platforms), in order to address the needs of the museum, the society as a whole.

B.5. Documentation production (A)
Upgraded to Level e-4** and 5*

Produces documents describing interactive installations/tools/ applications, to establish compliance with relevant documentation requirements. Selects appropriate style and media for presentation materials. Creates templates for document-management systems. Ensures that functions and features are documented in an appropriate way. Ensures that existing documents are valid and up to date.

C.1. User Support (A)
Level e-3**

Responds to online user requests and issues, recording relevant information. Assures resolution or escalates incidents and optimises system performance in accordance with predefined service level agreements (SLAs). Understands how to monitor solution outcome and resultant online user satisfaction.

C.4. Problem Management (A)
Level e-4**

Identifies online incidents. Takes a proactive approach to avoidance or identification of root cause of DIGITAL problems. Deploys a knowledge system based on recurrence of common errors. Resolves, in consultation and support by experts if necessary, or escalates incidents linked to the use of online communication applications and tools.

D.2. ICT Quality Strategy Development (A)
Level e-5**

Defines, improves and refines a formal strategy to satisfy the museum and audience expectations and improve business performance (balance between cost and risks). Identifies critical processes influencing online communication applications delivery and performance. Uses defined standards to formulate objectives for service management, application and process quality. Identifies online communication applications quality management accountability.

D.11. Needs identification (A)
Level e-4** and e-5*
Actively listens to internal/external key stakeholders (e.g. museum staff and representatives of its audience), and identifies their needs. Manages the relationship with all stakeholders to ensure that the solution is in line with museum and user requirements. Proposes different solutions (e.g. make-or-buy), by performing contextual analysis in support of user centred system design. Advises the museum's management team on appropriate solution choices. Acts as an advocate engaging in the implementation or configuration process of the chosen solution.

D.12. Digital Marketing (A)
Level e-4**
Understands the fundamental principles of digital marketing. Recognizes the differences between traditional and digital approaches. Recognizes the range of channels available and its potentialities. Assesses the effectiveness of the various approaches and applies rigorous measurement techniques. Plans and implements a coherent strategy that boost interaction with the online community using the most effective means available. Understands the data protection and privacy issues involved in the implementation of the marketing strategy.

E.1. Forecast Development (A)
Level e-4**
Interprets the museum and user needs and evaluates market acceptance of culture tailored DIGITAL products or services. Applies relevant metrics to enable accurate decision-making in support of the development, and implementation of the museum communication strategy.

E.4. Relationship Management (A)
Level e-4**
Maintains regular communications with online audiences, museum staff and technology providers, and addresses their needs while being aware of the overall environment, and by managing supply chain communications. Ensures that stakeholders' needs, concerns or complaints are understood and addressed in accordance with the museum's organisational policy.

E.6. ICT Quality Management (A)
Level e-4**
Implements DIGITAL quality policy to maintain and enhance museum tools/applications aiming at enhancing online digital interaction with the audience. Plans and defines indicators to manage quality with respect to the communication strategy. Reviews quality measures and recommends enhancements to influence continuous quality improvement.

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E.7. Business Change Management (B)
Level e-4** and e-5*

Assesses the implications of new digital solutions in the museum online communication. Defines the requirements and quantifies the benefits for the museum. Maintains process continuity throughout change, monitoring the impact, taking any required remedial action and refining approach.

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Online Community Manager ***E-competences levels ** required / * desired*** ***A Very Important /B important <> optional () Mandatory***
A.1. IS and Organisational Strategy Alignment (A) **Level e-4** and e-5 ***
A.3. Business Plan Development (A) **Level e-3** and e-4***
A.4. Product / Service Planning (A) **Level e-4****
A.7. Technology Trend Monitoring (A) **Level e-4** and e-5***
A.9. Innovating** (A) **Level e-4** and e-5***
B.5. Documentation production (A) **Level e-4** and e-5* ([17]Upgraded from level 3)**
C.1. User Support (A) **Level e-3****
C.4. Problem Management (A) **Level e-4****
D.2 ICT Quality Strategy Development (A) **Level e-5****
D.11. Needs identification (A) **Level e-4** and e-5***
D.12. Digital Marketing (A) **Level e-4****
E.1. Forecast Development (A) **Level e-4****
E.4. Relationship Management (A) **Level e-4****
E.6. ICT Quality Management (A) **Level e-4****
E.7. Business Change Management (B) **Level e-4** and e-5***

Tab. 13 Online Community Manager e-competences

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[17] The level is upgraded to the respect of e-CF

Online Community Manager Transferable competences A Very Important /B Important
Creative thinking skills A
Sense of initiative and entrepreneurship A
Leadership and change facilitator A
Storytelling A
Active listening skills A
Interpersonal skills A
Communication Skills A
Integrity/Ethical A
Resilience A
Communication Skills A
Negotiation skills A
Management skills A
Team working A
Decision making A
Time management A
Analyse and synthesize information A
Mentoring / coaching skills B
Influence / persuasion skills B
Networking skills B

Tab. 14 Online Community Manager Transferable competences

9 Conclusions

The Mu.SA research activities aimed at identifying the necessary digital and transferable competences for helping museum professionals to thrive in a digital environment by capitalising on the results of the eCult Skills project.

The Mu.SA research results have been presented in the document "Museum Professionals in the Digital Era. Agents of change and innovation" available on the Mu.SA project website in the section http://www.project-musa.eu/results/

This report Emerging Job Profiles for museum professionals focuses on the detailed description of four emerging job role-profiles in the museum sector in Greece, Italy and Portugal that are directly related to ICT (Information Communication Technology) selected as the most important ones for the museum sector according the research findings. The results are based on the findings of the research activities carried out within the project as part of the Mu.SA project preparation phase Work Package 2, namely "Identification of emerging roles of museum professionals".

Four emerging job role-profiles have been identified to help museums in to thrive in the digital transformation: *Digital strategy manager, Digital Collections Curator, Digital Interactive Experience Developer, Online Community Manager.*

In order to inform the creation and development of the MOOC (Massive Open Online Course), and the training programmes for each role-profile e-competences and transferable competences have been ranked starting from those that are most crucial and that are specific to that profile. The more generic e-competences and digital competences that are an important component of almost all the job role-profiles have been grouped together.

Based on research findings, many of the experts consulted recognised the need to develop useful skills to create meaningful experiences for visitors **by enhancing digital skills, and therefore help to achieve the museums' role in a more integrated way and with more effective results.** It is important for museum staff to think strategically about the possible wider opportunities offered by a digital approach. Since a museum is more likely to include digital assets **in its overall strategy if**

it has a clearly established vision, political options and priorities, as well as the availability of the necessary resources and conditions for investment (financial, logistical, and human).

Given the current context in which museums operate in the three countries involved, the majority of respondents argued that the eCult Skills role-profiles are excessively ambitious or projected too far into the future. It shows, that due to the national contexts where financial and human investment in the sector are considered still to be limited, there is still some resistance to instituting such a process. It should be borne in mind that in Greece, Italy and Portugal only the biggest museums can afford, for example, to appoint a person in charge of the digital strategy, as a part of their internal organization or organogram.

10 Annex Mapping Job profiles to European Frameworks Initial Guidelines

The cultural sector encompasses a variety of occupations, some of which may seem irrelevant to the purposes of the Mu.SA project, which focuses primarily on museum professionals. The cultural sector, in general, employees around 3.7% of the entire working population and it involves occupations in creative and artistic production, heritage collection and preservation. These occupations involve tasks and duties undertaken:

- to generate, develop, preserve or reflect cultural or spiritual meaning;

- to create, produce, disseminate cultural goods and services, which generally contain intellectual property rights;

- to develop artistic expression (e.g., visual, music, written, dance or dramatic arts).

So when it comes to economic sectors (described by NACE classification), cultural employment relates to activities such as: "creative, arts and entertainment activities", "libraries, archives, museums and other cultural activities", "publishing of books, periodicals and other publishing activities", "printing", "programming and broadcasting activities", "motion picture, video and television programme production, sound recording and music publishing activities" or "specialised design activities".

In terms of the mapping exercise for the following job profiles, i.e. **Digital strategy manager, Digital Collections Curator, Digital Interactive Experience Developer,** it can be said that a University degree (Bachelor- EQF level 6) is considered the minimum entry level qualification for the majority of museum professions, hence the proposed acknowledgement of level 6 (described also in terms of LOs in the above mentioned profiles) attests to this choice. Moreover a study of the Mu.SA partner countries' referencing report (Greece, Italy, Portugal) identifies level 6 (bachelor degree) as the minimum entry level for museum

professionals (with the exception of handicrafts[18]). The levels in all three referencing reports coincide with EQF leveling and the level descriptors are almost similar to the ones used in the EQF framework.

10.1.1 Mapping to European Tools

10.1.2 The challenge of qualification diversity

The disruptive changes of the labour market and society foster a qualification diversity in terms of new combinations of knowledge, skills and competencies within the different EU countries, while they raise the challenge of how to understand these new qualifications. The main problem is that the national systems cannot 'talk' to each other because they lack a common reference language. This implicit weakness undermines in a paradox way the transparency and visibility of the qualifications and block the mobility of learners and employees.

In this context, the diversity of the cultural sector as presented above makes the mapping exercise of the developed job profiles to other European tools a very challenging task. It is therefore crucial here to try to identify the problems and limitations and also to present future challenges.

Several issues should be taken under consideration. The need to develop cultural statistics has been underlined by the European Commission and Council on several occasions. As mentioned above the cultural sector encompasses various economic activities and diversified occupations, not only in terms of their "thematic" conception but also in terms of classifying an occupation to the cultural sector per se. An argument in favor of this point could be the example of a chef (of local cuisine); it can be argued that his duties and activities have to do with preservation of local knowledge. Another problem is the constant evolution of the cultural field, evolution showcased somewhat by the identification of the three

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[18]ICOM (International Council of Museums), Museum Professions – A European Frame of Reference, see especially page 12, http://icom.museum/fileadmin/user_upload/pdf/professions/frame_of_r eference_2008.pdf

emerging job profiles, which are under elaboration in this chapter. Last but not least the diversity of occupational structures amongst EU countries and/or classification systems/taxonomies and the "depth" of analysis between EU countries poses the challenge of defining and accepting common reference languages, namely tools, that can establish and guarantee common understanding of the different qualifications.

10.1.3 ESCO as Common Reference Language

In order to create a common space of understanding and to enable providers, learners, employers and employees to make use of the qualifications in a practical and institutionalized way, the European Commission, and more specifically the DG Employment, Social Affairs and Inclusion launched the initiative of the European Skills, Competences and Occupations (ESCO) system.

ESCO is a multilingual classification for the European Skills, Competences and Occupations, translated in 27 languages (24 EU official languages, Norwegian, Icelandic and Arabic). It works as an online database, free accessed by employers, employees, training providers and organizations.

Since it was established, it works like a Common Reference Language, e.g. like a European dictionary, describing, identifying and classifying professional occupations, skills, and qualifications relevant for the EU labour market and education and training. The ultimate goal and mission is to support bridging the communication gaps between different countries and between the domains of employment, education and training. It increases transparency of occupations, qualifications, skills/competences and learning outcomes. This transparency and common reference will help people to exchange information with unambiguous and shared meaning, independent of the language and the electronic systems used.

It is important to stress that ESCO supports 2 of the EU's key strategies in this field, namely **Europe 2020** and **Skills agenda for Europe**. Furthermore, as a tool for classifying qualificationw it is linked to relevant international classifications and frameworks, e.g. the International Standard Classification of Occupations (ISCO) and the European Qualifications Framework (EQF).

10.1.4 The three pillars: Occupations, Skills and Qualifications

In order to proceed to the mapping exercise to ESCO it's essential a) to explain briefly the pillars of this tool and point out where applicable its relationship with other classifications, the most important one being ISCO-08; b) to point out similarities or differences in terminology, pillars used by ESCO/ Mu.SA and try to reach a common usage of terms.

ESCO comprises of three pillars:

- **The Occupations pillar:** this pillar includes today **2.942** occupations. It uses hierarchical relationships between them, metadata as well as mappings to the International Standard Classification of Occupations (ISCO) in order to structure the occupations. Generally, in ESCO, each occupation is mapped to exactly one ISCO-08 code. ISCO-08 can therefore be used as a hierarchical structure for the occupations pillar. ISCO-08 provides the top four levels for the occupations pillar. ESCO occupations are located at level 5 and lower. Each occupation relates to an occupational profile[19].

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[19] In order to avoid confusion it is important to provide the definitions of occupation and jobs, and also explain how the ISCO grouping corresponds not only to ESCO occupations but also to other similar terms.
Occupation: a 'set of jobs whose main tasks and duties are characterised by a high degree of similarity' Sometimes the term profession is also used
Job: a 'set of tasks and duties carried out, or meant to be carried out, by one person for a particular employer, including self-employment'. Sometimes the term Occupational Unit may also be used.
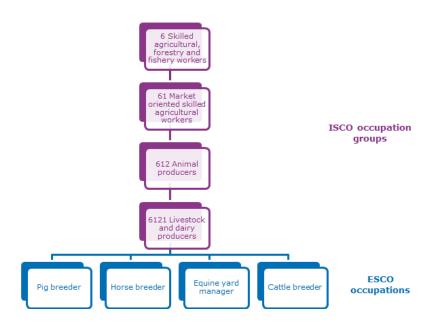
Figure 1: Relation of ISCO occupation groups and ESCO occupations

- **The skills and competences pillar:** The skills and competences pillar, also referred to as the "skills pillar", provides a comprehensive list of skills that are relevant for the European labour market. ESCO v1 contains 13 485 skills. The skills pillar distinguishes between i) skill/competence concepts and ii) knowledge concepts by indicating the skill type. There is however no distinction between skills and competences. Each of these

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Example: Being the "pilot of Boeing 747 aircraft for the route Paris-New York" is a job. "Commercial pilot" or "airline transport pilot" are occupations (i.e. groups of jobs, to which this job belongs). Occupations can be used as job titles. An employer recruiting for the above-mentioned position might entitle the vacancy notice with the name of an occupation, e.g. "airline transport pilot". For the MuSA project the term Job role profile is used. As shown by Figure 1. Code no 6 refers to an ISCO-08 major group, code no 61 to a sub-major group, 612 to a minor group and finally 6121 to a unit group (the relation of ESCO occupations with ISCO-08 Unit groups is explained above).

concepts comes with one preferred term and any number of non-preferred terms and hidden terms in each of the ESCO languages. It also includes an explanation of the concept in the form of description, scope note and definition. The skills pillar of ESCO does not contain a full hierarchical structure but is structured in four different manners:

- Through their relationship with occupations, i.e. by using occupational profiles as entry point;

- In the part of the transversal knowledge, skills and competences through a skills hierarchy;

- Through relationships indicating how knowledge, skills and competences are relevant to other knowledge, skills and competences (in particular in cases of skill contextualisation);

- Through functional collections that allow to select subsets of the skills pillar.

The MuSA R.2.2 report contains the terminology used widely in the ESCO knowledge, skills and competences pillar and the templates draw to a great extent from ESCO and Cedefop's proposed dimensions (with minor different usage). It is important though to point out that the e-competence framework is also taken into account (extremely thorough approach), and transversal skills and competences also play a vital role in the job profiles descriptions. It is anticipated that the future planning will take this common approach to a step further.

- **Qualifications pillar:** The qualifications pillar aims to collect existing information on qualifications. The final objective of the pillar is to provide a comprehensive list of qualifications relevant for the European labor market. The ESCO Qualification pillar includes 8.677 qualifications. Qualifications displayed in ESCO come from databases of national qualifications that are owned and managed by the European Member States. Member States provide this information to ESCO on a voluntary basis. It therefore depends on each Member State to ensure information on its qualifications in ESCO is available, complete, correct and up-to-date. The Mu.SA

project has also mapped training provisions and qualifications from the partner countries in order to ensure that the proposed job role profiles (and the future steps regarding the training) are taken into account.

10.1.5 Conclusions and Mapping Proposal

One can safely conclude that methodological tools, surveys and guidelines relevant to overarching European tools for VET were taken into account for the report of R.2.2. As far as it concerns the mapping exercise (particularly for ESCO), the Mu.SA consortium would roughly propose the creation of new unit groups as follows.

(a) It may be possible to improve the visibility of cultural and specifically museum professions by grouping together cultural categories as much as possible. This proposal is based on the following elements:

- review "arts, entertainment, design and sports occupations";

- group together as much as possible or emphasize cultural occupations;

- separate as much as possible culture from sports occupations;

(b) It is also possible to merge unit groups (specifically those connected with the digital unit groups identified with the ICT – digital and e-competence framework with unit groups related to the cultural sector.

For example, a new unit group named "cultural and other services managers" could be merged with the "developer (Web)" or "other ICT relevant unit groups" in order to comply with the "combinations" proposed in the three emerging job profiles. Thematic grouping can play a vital role for the success of this merging, a thematic grouping which is proposed to take into consideration the following characteristics/variables.

Four groups of cultural occupations can roughly be identified for the thematic view of cultural occupations:

- Core cultural professions (of the museum sector)

- Cultural occupations hidden within other occupations (non-identifiable within ISCO but may be identifiable in national classifications)

- Related/peripheral cultural professions

- Occupations related to traditional and local knowledge

Further development of ESCO and full mapping of the sector by national authorities, through a close cooperation of relevant working cross-sectoral groups (and working groups like (ESSnet-Culture) are strongly recommended not only for preventing delays in the evolution of museum professions (namely the translation of LMI to education and training programmes) but also for reliable data collection, training provision and enhanced mobility for the entire cultural economic and occupational sector.

This mapping exercise will therefore attempt to "merge" major, sub-major, minor and unit groups (where applicable of course) in order to produce the proposed job profiles mentioned above.

To provide a short historical review, the effort started in 1997. A short look into ISCO classification will demonstrate that under cultural occupations a diversity is represented. The important thing is to analyze the dimensions (these dimensions will make mapping more effective however it is highly recommended that national classification may play a more extended role).

Another clarification deemed necessary is that the term occupation means a group of jobs, a clarification that is important also in terms of the mapping exercise attempted here. Mapping should not be identified with referencing by all means, as referencing is a completely different procedure, however the job profiles identified as emerging focus on individual jobs.

11 References/ websites

ADESTE, Audience DEveloper: Skills and Training in Europe http://www.adesteproject.eu/about (Downloaded April 2017)

ARTS – SKILLS FOR THE CREATIVE ECONOMY – COMPETENZE PER UNA ECONOMIA CREATIVAhttp://arts-project.eu/ (Downloaded April 2017)

Cambridge online dictionaryhttp://dictionary.cambridge.org/

CEDEFOP (2014), *Terminology of European education and training policy. A selection of 130 key terms*.", Luxembourg: Publications office of the European Union, SECOND EDITION. Available at: http://www.cedefop.europa.eu/en/publications-and-resources/publications/4117 (Downloaded December 2016)

CONNECT : https://www.encatc.org/en/projects/transnational-cultural-projects/ (Downloaded April 2017)

CREA.M - CREATIVE BLENDED MENTORING FOR CULTURAL MANAGERS http://culturalmanagers.com/crea-m-creative-mentoring-for-cultural-managers-italy/

e- CF : European framework for ICT competences (e-CF):http://www.ecompetences.eu/

e-CF DIGCOMP - Digital Competence Framework for citizens *https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework* *(Consulted April 2017)*

e-Competence Framework: User guide http://www.ecompetences.eu/wp-content/uploads/2014/02/User-guide-for-the-application-of-the-e-CF-3.0_CEN_CWA_16234-2_2014.pdf

e-Cult Observatory platform: http://www.e-jobs-observatory.eu/sites/e-jobs-observatory.eu/files/eCultSkills_Role_profiles_EN.pdf

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http://groupspaces.com/eCult/pages/project-results

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EQF -Descriptors defying levels of expertise in the European Qualification Framework (EQF):
https://ec.europa.eu/ploteus/en/content/descriptors-page

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http://www.ecompetences.eu/

Symbola and Melting Pro (2017) *The Museum of the Future: Insights and reflections from 10 international museums".* Available:http://www.project-musa.eu/wp-content/uploads/2017/03/MuSA-Museum-of-the-future.pdf

User guide for the application of the European e-Competence Framework: http://www.ecompetences.eu/wp-content/uploads/2014/02/User-guide-for-the-application-of-the-e-CF-3.0_CEN_CWA_16234-2_2014.pdf

12 Glossary of Vocational Educational Terms

Assessment of Learning Outcomes

Process of appraising knowledge, know-how, skills and/or competences of an individual against predefined criteria (learning expectations, measurement of learning outcomes). Assessment is typically followed by certification. *Comment:* in the literature, 'assessment' generally refers to appraisal of individuals whereas 'evaluation' is more frequently used to describe appraisal of education and training methods or providers.

Attitudes are conceived as the motivators of performance, the basis for continued competent performance. They include values, aspirations and priorities.

Certification of learning outcomes. Process of issuing a certificate, diploma or title formally attesting that a set of learning outcomes (knowledge, knowhow, skills and/or competences) acquired by an individual have been assessed by a competent body against a predefined standard**.**

Competence. There are two slightly different definitions of 'competence' in the recent European policy recommendations. In the Key Competences Recommendation, 'competence' is defined as a combination of knowledge, skills and attitudes appropriate to the context (European Parliament and the Council, 2006).
In the European Qualifications Framework recommendation, 'competence' is seen as the most advanced element of the framework descriptors and is defined as the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development.
Furthermore, in the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy (European Parliament and the Council, 2008).

DIGICOMP The European Digital Competence Framework for Citizens, also known as DigComp, offers a tool to improve citizen's digital competence for work and employability, learning, leisure, consumption and participation in society. https://ec.europa.eu/jrc/en/digcomp

E-competence or digital competences are interchangeable
Europass defines Digital Competences (self assessment tool):
http://europass.cedefop.europa.eu/sites/default/files/dc-en.pdf

ECVET European credit system Technical framework for transfer, validation and, where for vocational education appropriate, accumulation of learning outcomes by individuals, and training to achieve a qualification. ECVET tools and methodology comprise a description of qualifications in units of learning outcomes with associated points, a transfer and accumulation process and complementary documents such as learning agreements, transcripts of records and ECVET users' guides. *Comments:* This framework aims to promote

– mobility of people undertaking training;
– accumulation, transfer and validation of learning outcomes
(either formal, non-formal or informal) acquired in different
countries;
– implementation of lifelong learning;
– transparency of qualifications;
– common trust and cooperation between providers of
vocational training and education in Europe.
ECVET
http://www.ecvet-secretariat.eu/en

European framework for ICT competences (e- CF): Please see
Transfer of outcome of project eCult Skills
http://www.ecompetences.eu/
User guide for the application of the European e-Competence Framework:
http://www.ecompetences.eu/wp-content/uploads/2014/02/User-guide-for-the-application-of-the-e-CF-3.0_CEN_CWA_16234-2_2014.pdf

 European qualifications Framework for Lifelong Learning (EQF).
Reference tool for describing and comparing qualification levels qualifications systems developed at national, international or sectorial levels. *Comment*: The EQF's main components are a set of eight

reference levels described in terms of learning outcomes (a combination of knowledge, skills and/or competences) and mechanisms and principles for voluntary cooperation. The eight levels cover the entire span of qualifications from those recognising basic vocational education and training. EQF is a translation device for qualification systems.

European Skills, Competences, Qualifications and Occupations (ESCO). ESCO is the multilingual classification of European Skills, Competences, Qualifications and Occupations. ESCO is part of the Europe 2020 strategy. The Commission services launched the project in 2010 with an open stakeholder consultation. DG Employment, Social Affairs and Inclusion – supported by the European Centre for the Development of Vocational Training Cedefop – coordinates the development of ESCO. Stakeholders are closely involved in the development and dissemination of ESCO. The ESCO classification identifies and categorises skills, competences, qualifications and occupations relevant for the EU labour market and education and training. It systematically shows the relationships between the different concepts. ESCO has been developed in an open IT format, is available for use free of charge by everyone and can be accessed via the ESCO portal. The first version of ESCO was published on 23 October 2013. This release marks the beginning of the pilot and testing phase, including the ESCO mapping pilot. Until end of 2016 the classification will be completely revised. The final product will be launched as ESCO v1.

https://ec.europa.eu/esco/portal/home

Formal learning. Learning that occurs in an organised and structured environment (such as in an education or training institution or on the job) and is explicitly designated as learning (in terms of objectives, time or resources). Formal learning is intentional from the learner's point of view. It typically leads to certification. (CEDEFOP - Terminology of European education and training policy Second edition, 2014)

Informal learning. Learning resulting from daily activities related to work, family or leisure which is not organised or structured in terms of

objectives, time or learning support; it may be unintentional from the learner's perspective. Comments:
• informal learning outcomes may be validated and certified;
• informal learning is also referred to as experiential or incidental/random learning.
Source: cedefop, 2008.
(Source Erasmus plus Guide 2016 + CEDEFOP - Terminology of European education and training policy Second Edition, 2014)

Key competences. The basic set of knowledge, skills and attitudes which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment, as described in Recommendation 2006/962/EC of the European Parliament and of the Council. (Source Erasmus Plus Guide 2016)

Knowledge means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual.

Learning outcomes/ learning attainments. Set of knowledge, skills and/or competences an individual has acquired and/or is able to demonstrate after completion of a learning process either formal, non-formal or informal. *Or* statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and competence.

Modules . Are components of education and training programmes

Non-formal Learning: Learning which takes place through planned activities (in terms of learning objectives and learning time) where some form of learning support is present, but which is not part of the formal education and training system. (Source Erasmus plus Guide 2016); learning embedded in planned activities not explicitly designated as learning (in terms of learning objectives, learning time or learning support). non-formal learning is intentional from the learner's point of view. Comments:
• non-formal learning outcomes may be validated and may lead to certification;

• non-formal learning is sometimes described as semistructured learning.
Source: Cedefop, 2008. (CEDEFOP - Terminology of European education and training policy Second Edition, 2014)

Occupation. Set of jobs whose main tasks and duties are characterised by a high degree of similarity. *Source:* ILO, 2008.

Occupational profile. An occupationalprofile(skillsprofile) summarising essential characteristics required for a given job: the level of education and training required (and hence the complexity of the occupation); the field of education,training or youth concerned; and other requirements in terms of knowledge, skills, occupational interests, and work values.

Qualification. A formal outcomes of an assessment and validation process which is obtained when a competent body determines that an individual achieved learning outcomes to given standards. (Source Erasmus plus Guide 2016)

Skills means the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualifications Framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).

Skills Cross-sector skills and competences in ESCO. Within the skills and competences pillar, cross-sector skills and competences are organised in a hierarchical structure with the following five headings:

- Thinking
- Language
- Application of knowledge
- Social interaction
- Attitudes and values

Skills- Hard Skills are unique to the occupation, i.e., a Carpenter has specific skills that are very different from an Accountant. Carpenters measure, cut, build. Accountants calculate, audit, analyse, marketers do marketing, ecc.

Skills Soft skills, also referred to as communication skills, transversal skills or talents, are transferable skills that everyone has and that everyone uses, like the ability to work in a team, leadership, creativity, self-motivation, the ability to make decisions, time management and problem-solving. According to:
https://ec.europa.eu/esf/transnationality/content/how-boost-soft-skills-recognition

Skills transferable skills are those HARD and SOFT skills that relate to many occupations, i.e., proficiency with MS Office Suite applications, or the ability to manage time using Outlook, etc. Some skills are more transferable than others so you need to determine how your skills relate to   each   new   job opportunity. http://cds.sdce.edu/Assessment/Understanding-Skills *Transferable skills (Cambridge dictionary)* used in one job or career that can also be used in another: *Leadership is a highly transferable skill.*

Skills Transversal Skills and competences are relevant to a broad range of occupations and sectors. They are often referred to as *core skills*, *basic skills* or *soft skills (or self management skills)*, the cornerstone for the personal development of a person.
Transversal skills and competences are the building blocks for the development of the "hard" skills and competences required to succeed on the labour market."
According ESCO website:
https://ec.europa.eu/esco/portal/escopedia/Cross-sector_skills_and_competences

Units. Are a set of learning outcomes (knowledge, skills and/or competences) which constitute a coherent part of a qualification.

Validation of learning outcomes. Confirmation by a competent body that learning outcomes (knowledge, skills and/or competences) acquired by an individual in a formal, non-formal or informal setting have been assessed against predefined criteria and are compliant with the requirements of a validation standard. Validation typically leads to certification. *Or* process of confirmation by an authorised body that an individual has acquired learning outcomes measured against a relevant standard. Validation consists of four distinct phases:

• identification through dialogue of particular experiences of an individual;

• documentation to make visible the individual's experiences;

• formal assessment of these experiences; and

• certification of the results of the assessment which may lead to a partial or full qualification.