



## **Map Digital Skills in Cultural sector**

### ***Comparative analysis***

October, 2019.

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## INTRODUCTION

One of the main objectives of DiCultYouth project is to investigate how culture and technology can work together to drive young people's employability, boost the capability of cultural organizations and unleash the creative potential of technology.

The purpose of this report is to map the current situation and trend in the field of digital technology in the cultural sector and try to investigate how to build capacity (in informal education) for young people in safeguarding cultural heritage. The report is based on the collection and production of evidence-based data and information to be used as a starting point for the development/assessment of the creation of the e-learning programme. To do so this report analyses how cultural organizations are using digital; what impact they are experiencing; what are the actual digital skills in the sector; how social media and data are used; what skills do young people need in order to implement digital in the cultural sector; how is digital impacting cultural organizations. Results are presented in a way that the report highlight differences and communalities of young people's needs with regard to digital skills in the cultural sector and how can the different cultural context of the involved countries may have an impact on the research results.



Map 1. Countries included in the report

The first step was to assess the current situation and conduct a cross-functional analysis to identify current and future roles and required skills. The partners investigated digital maturity level and digital behaviours of youth and culture organizations in the involved countries and explored their demands and required skills in the cultural heritage sector. By conducting the research, the actual digital skills needed for employability and entrepreneurship of youth in the cultural sector are identified. This analysis of the current situation is a preliminary step in a larger effort aimed at developing recommendations that will lead to the design of an e-learning programme that will strengthen the knowledge and learning opportunities of young people and help them develop the skills needed for jobs of the future.

Five **National Reports** are created representing the current situation in all five participating countries and their parts are synthesized in this comparative report. This report ends up with gap analysis and actions that need to be made by cultural organizations with regard to digital skills (digitization) in order to be more competitive than they are today.

To reach the aim of this study a mix of qualitative and quantitative methods were used. Qualitative work with expert interviews in National Reports, a quantitative analysis of the interviews and questionnaires distributed (by e-mail and mobile) and then a qualitative method for analysing and presenting the results.

The identified groups included representatives of disadvantaged young people and young people with humanitarian studies and representatives from cultural organizations. Cultural organizations are selected from a cross-section of the cultural community: performing arts organizations; library; associations; museums, archives, and visual resources organizations; publishing groups; standards initiatives; and humanities centers and projects. Organizations and projects also were selected on the basis of their reputation and the active role they play in their respective sectors.

## TRENDS IN TECHNOLOGY AND CULTURE

The computerization of culture, seen as the translation from analogue to digital sphere, is a permanent process in many countries (Ruthven & Chowdhury, 2015). In particular, cultural heritage of Europe is a rich and diverse mix of cultural and creative expressions, inheritance from previous generations that is seen as a legacy for the future (Rochards, 1996). The year of 2018 has even been proclaimed by the EU as the European Year

of Cultural Heritage aiming at enabling more people to discover and engage with Europe's cultural heritage (Schreiber, 2019). Here, digital technologies are seen as an important asset in reaching this goal, having in mind that previously quite expensive techniques, such as 3D scanning, multi-spectral imaging, virtual reality (VR) are now becoming more affordable to institutions and citizens as well (Ruthven & Chowdhury,

2015). However, digital competencies often pose a significant limitation, both from the side of potential end users of digital cultural goods and from the side of cultural providers (Stankov & Filimonau, 2018). For example, 44% of Europeans lack basic digital skills necessary for everyday life and 37% lack digital skills for work (Filippaios & Benson, 2019). At the same time, ICT prevalence also reshapes the understanding of the role of a cultural institution in the digital era. Most importantly, there is

a need to equip a growing young workforce with skills required for the jobs of the future, not to mention re-equipping the current workforce with the skills required to keep up with a changing world (Cedefop, 2016).

On the highly competitive labour market, cultural institutions in Europe have to compete for skilled workers within more competitive sectors.

## THE NOTION OF DIGITAL CULTURE

In the digital era we live in, it is worth noting that 70% of 15-24-year-olds around the world are linked to the Internet (ITU, 2019). Thus, it is evident that participation in 21<sup>st</sup> century society is increasingly dependent upon competencies related to the use of digital technologies for a wide variety of purposes (Mihelj, Leguina, & Downey, 2019; Van Oostveen, DiGiuseppe, Barber, Blayone, & Childs, 2018). Nowadays, most of the modern societies are connected online over ubiquitous Internet access and mobile devices removing time and space constraints in communication and various types of daily and work activities (Hill, 2016) holding important repercussions for the culture in this digital era. The simplest view on digital culture would suggest that it describes the dynamic relationship between ICTs and creation and consumption of culture and the arts (Giovannelli, 2019). Digital culture or e-culture is often associated to the relationship between new media and culture, emphasizing that this phenomenon has emerged with the new media and the digitalization process (Yegen, 2019). This view is factually correct; however, a deeper inspection of its components reveals possibilities for different interpretations. The definition includes ICTs as one consisting component and the creation/production and the consumption of culture and the arts. By its nature, ICTs is a constantly changing field that frequently offers new opportunities for the improvement of various processes. On the other side, culture and the arts are even more heterogeneous as being present in various forms and being created in various ways and by various types of creators. Finally, the consumption process is even more complex, as it is largely dependent on the consumers' characteristics and preferences (Stankov, Pavluković, Alcántara-Pilar, Cimbalević, & Armenski, 2018).

The prevalence of ICTs in everyday life allowed culture and the arts to exist in a solely digital form, i.e. numerical code. Still cultural creation, production and consumption does not obey strict technological nor physical (for example, space or location) limitations. Thus, digital culture also includes the existing cultural forms and organizational units, that digitize their funds, make use of ICT for better supporting services and transaction related to cultural consumptions, mixing both digital and physical worlds (Rajić, Stankov, & Vujičić, 2017; Vujičić, Stankov, & Besermenji, 2010). Most notable example is the cultural heritage and its relation to ICTs. Here, the question of how digital technology could add value to cultural heritage and hopefully

enhance the access and starts the conservation between stakeholders and consumers is a critical one (Ioannidis, Toli, El Raheb, & Boile, 2014).

In general, cultural heritage encompasses vast variety of tangible objects and materials in the funds of cultural institutions but also the heritage found in landscapes and in the built environment, together with intangible, living heritage such as cultural traditions, customs, authenticity or local knowledge (Borowiecki, Forbes, & Fresa, 2016; Salerno, 2019). Cultural heritage may be mediated through, for example, the exercise of institutional practice or it may be unmediated in nature, as is the case with traditional practices carried out day by day (Blešić et al., 2013; Borowiecki et al., 2016). ICTs created a whole new business philosophy for the organization by creating opportunities for the differentiation of a cultural organization from others and for the execution of the digital transformation (Ulusoy, 2019). Digital technologies allow the dissemination of critical information and as such have the power to add to a better understanding of all types of cultural heritage, allowing them to reach their cultural and economic potential (Salerno, 2019). For example, the European Digital Agenda states that digitization of Europe's cultural resources turns it into an important pillar of the digital economy providing Europe's third largest employer sector - Cultural and Creative Industries (CCIs), which already generate around €509 billion per year (5.3% of the EU's total GDP) and employ 12 million full-time jobs (7.5% of the EU's employment) a fertile ground for further growth and the stimulation for the innovation in other sectors as well (European Commission, 2014, 2018). Not just within inter and intra sectoral interchange, the prevalence of digital culture could be of relevance for geographical redistribution of culture. In particular, many minor and internationally less known countries (including Bosnia and Herzegovina and Serbia) could leverage the potential of digitally mature citizens and institutions that could be engaged in the promotion and dissemination of local cultural heritage (Salerno, 2019).

Cultural institutions were among the first to begin with the process of digitization, i.e. use of existing technologies to improve its performances. However, for the sustainable operation of cultural institutions in a dynamic digital environment, it is necessary to step forward significantly in the process of digital transformation, as a process of acceleration

and deep transformation of organizational activities, processes, competencies, and business models to make full use of the changes and opportunities that digital technology brought to the society (Matt, Hess, & Benlian, 2015). In other words, digital transformation implies the use of digital technologies to innovate business processes and thus become more effective. The main premise is not to use technology in order to replicate existing services in digital form, but to transform that service

into something significantly better, more efficient and easier to use (Herbert, 2017; Samuels, 2018).

While academia and some parts of the cultural sector clearly recognized the need for digitization and digitalization, the adoption of digital transformation as a business model somehow was lagging behind in many countries. One of the main reasons can be looked within the lack of advanced in-house digital skills within institutions of the cultural sector.

## DIGITAL SKILLS FOR CULTURAL SECTOR

Cultural sector is facing a digital revolution, which brought new requirements for employees' skills and competence. In connection to this, Hartley (2017) emphasized the potential of popular productivity through analysis of the use of digital media in various domains, including creative and cultural industries, digital storytelling, *YouTube* etc. He also claims that the time has come for education to catch up with entertainment and for the professionals to learn from popular culture. In the context of this report, this means that cultural institutions are to implement new technologies in their activities, while educational institutions should follow this direction, providing necessary digital skills for employees. The importance of proper digital literacy training adapted to the digital age is of paramount importance, as stressed by the European Commission (2010), who's suggested trainings include "digital competence" referring to: a set of skills, knowledge and attitudes favouring the "promotion of digital literacy, training and inclusion" coming from formal education.

In order to fully grasp the variety of digital skills needed for the cultural sector, here the requirements of the jobs related to cultural heritage sites will be tackled. First, distinction should be made between the terms "presentation" and "interpretation". According to ICOMOS, interpretation refers to the "full range of potential activities intended to heighten public awareness and enhance understanding of cultural heritage site. These can include print and electronic publications, public lectures, on-site and directly related off-site installations, educational programmes, community activities, and ongoing research, training, and evaluation of the interpretation process itself". The other term presentation "more specifically denotes the carefully planned communication of interpretive content through the arrangement of interpretive information, physical access, and interpretive infrastructure at a cultural heritage site. It can be conveyed through a variety of technical means, including, yet not requiring, such elements as informational panels, museum-type displays, formalized walking tours, lectures and guided tours, and multimedia applications and websites" (ICOMOS 2008, 2). As it can be seen from ICOMOS's formulation presentation is in largely a one-way mode of communication while interpretation refers to the totality of activities related to a cultural heritage site (Silberman, 2006). In terms of job requirements, although that professionals play an important

role in both activities, in term of digital skills a wider range is needed in case of interpretation, including not just cultural sector job-specific skills (for example, 3D scanning), but also a variety of skills related to digital marketing and management, social media content creation and other.

There are different approaches in how digital skills for cultural heritage education can be acquired, as it is quite evident that with dynamic nature of digital technologies, digital culture and digital society, just sticking to the traditional ways of education, would not be concurrent anymore. For example, according to Ott and Pozzi (2008), in the field of cultural heritage education, innovative approaches to teaching and learning leverage ICT potential allowing the several approaches, such as: personalized, inquiry-based learning, on-site and anywhere learning, interdisciplinary learning and collaborative learning. All those approaches can be applied at various levels (from basic to advanced) of digital skills needed for the cultural sectors.

There has been a lot of researches and initiatives to evaluate digital skills among the general population. Most of them were motivated by the fact that some digital goods and services cannot be (effortlessly) accessed by the intended audience. In this case, the digital medium represents the main barrier, as the audience does not have enough skills to access and use the benefits of the digital era. In that context, in 2016, the Steering Committee for Educational Policy and Practice (CDPPE) of the Council of Europe (CE) started the project Digital Citizenship Education with the aim of reshaping the role of education in the digital era in order to enable all children to take an active role in the democratic society (Frau-Meigs et al., 2017). To this end, the European Commission has developed DigComp: the European Digital Competence Framework as a reference framework to practically explain what it means to be 'digitally competent'. As such, DigComp is "a flexible reference framework that can be adapted to support the development and understanding of digital competence in any setting" (Stefano and Laia Pujol 2018, 7) with five competence in mind: information and data literacy, communication and collaboration, digital content creation, safety and problem solving. With the same idea in mind, the UK developed the essential digital skills for life and work, that have been distinguished in five categories: communicating, handling

information and content, transacting, problem solving and being safe and legal online (UK Department for Education, 2018).

Despite existing efforts on the establishing holistic reference models to measure digital skills, there is a constant need for the evaluation considering dynamic nature of digital technology, educational settings where significant part of the digital skills are created and characteristics of specific area of applications. For example, several studies found that the chosen vocation of students interfere with their online behaviour. For example, the study of Stankov, Jovanović, and Dragičević (2014) found out significant differences between students of tourism and psychology in terms of their Facebook travel related usage patterns that could indicate that this behaviour of tourism students is influenced by their tourism educational orientation. Similarly, geography students showed the understanding of the importance of using geographical information systems (GIS) before their actual engagement with the subject after their enrolment in the geography studies (Stankov, Durdev, Marković, & Arsenović, 2012)

In term of digital culture there are several practical endeavours to tackle the problem in the European context. DiCultYouth project distinguishes three types of digital skills relevant to the cultural sector (Table 1). A set of practical digital skills within each type is presented in the National reports and comparative analysis that are parts of this report. In essence, the presented approach will cover skills easily understandable for the self-evaluation by the youth, ranging all the way from essential ones to advanced required for staff highly skilled that are needed for multiplying opportunities for change, acceptability and participation for audience. The study of Silvaggi and Pesce (2018) found out that increasing use of ICTs in the museum sector are starting to allow the emergence of new job profiles. Their study emphasized that more advanced skills are needed for successful digital transformation, in particular the skills related to the job profiles of digital strategy manager, digital collections curator, digital interactive experience developer and online community manager.

**Table 1.** Digital skill of youth relevant for employability in the cultural sector

Level of digital skill	Description
Basic digital skills	Related to basic computer literacy that refers to simple hardware, software and online operations.
Specialized digital skills	Allow youth to critically evaluate technology or create content, software or they are specific job-ready skills.
Advanced skills	Related to specialists in ICT professions and digital entrepreneurship.

## DIGITAL LITERACY OF YOUTH RELATED TO CULTURE SECTOR

### SOCIO-DEMOGRAPHIC PROFILE OF RESPONDENTS

The target group of respondents for this research were from 18 to 40 years old. The data were collected from March to

September 2019. Complete comparative results are shown in the Table 1.

**Table 1.** Socio-demographic profile of respondents

	BA	CY	GR	LU	RS
Gender (%)	male - 31.7 female - 68.3	male - 48.1 female - 51.9	male - 41.5 female - 58.5	male - 52 female - 48	male - 19.1 female - 80.9
Age (mean)	23.21	25.97	28.08	28.08	22.3
Working status (%)	student - 55.8 employed - 31.7 unemployed - 12.5	student - 36.1 employed - 44.4 unemployed - 19.4	student - 31.1 employed - 45.3 unemployed - 23.6	student - 54.1 employed - 32.7 unemployed - 13.3	student - 86.1 employed - 11.3 unemployed - 2.6
Current level of education (%)	HS - completed - 14.4 HS - not completed - 16.3 college/bachelor - 54.8 master/PhD - 14.4	ES - 0.9 HS - completed - 11.1 HS - not completed - 5.6 college/bachelor - 55.6 master/PhD - 26.9	HS - completed - 7.5 HS - not completed - 0.9 college/bachelor - 55.7 master/PhD - 35.8	ES - completed - 1 HS - completed - 10.2 HS - not completed - 8.2 college/bachelor - 59.2 master/PhD - 21.4	HS - completed - 21.7 HS - not completed - 0.9 college/bachelor - 63.5 master/PhD - 13.9
Is your education vocationally related to the culture? (%)	yes completely - 18.3 yes partly - 56.7 not at all - 25	yes completely - 33.3 yes partly - 43.5 not at all - 23.1	yes completely - 23.6 yes partly - 46.2 not at all - 30.2	yes completely - 32.7 yes partly - 50 not at all - 17.3	yes completely - 39.1 yes partly - 48.7 not at all - 12.1
Person with disability (%)	Yes - 1.9 No - 98.1	Yes - 1.9 No - 98.1	Yes - 1.9 No - 98.1	Yes - 3.1 No - 96.9	Yes - 0.9 No - 99.1
Migrant status (%)	no such status - 98 migrant - 1 refugee - 1	no such status - 86.1 migrant - 12 refugee - 0.9 temporarily displaced person - 0.9	no such status - 90.6 migrant - 8.5 temporarily displaced person - 0.9	no such status - 88.8 migrant - 11.2	no such status - 98.3 migrant - 0.9 refugee - 0.9

## BASIC DIGITAL LITERACY

The first part of the questionnaire for the youth was related to respondents' self-evaluation of basic computer literacy/use of IT (software, hardware and online operations). The answers were measured on 5-point scale (1 (Beginner), 2 (Developing), 3 (Competent), 4 (Advanced), 5 (Expert)), while they also had an option to choose 0 if they don't have such skills. The results shown in Chart 1 indicate that they youth evaluate themselves

with higher level of proficiency mainly in using text processing software, software for presentations and web browsing and email, while more should be done in improving skills related to spreadsheets software and scanning image and text documents. In this matter, youth from Cyprus and Luxembourg evaluate themselves much better than other three countries.

**Chart 1.** Self-evaluation of proficiency while using the listed software/operations

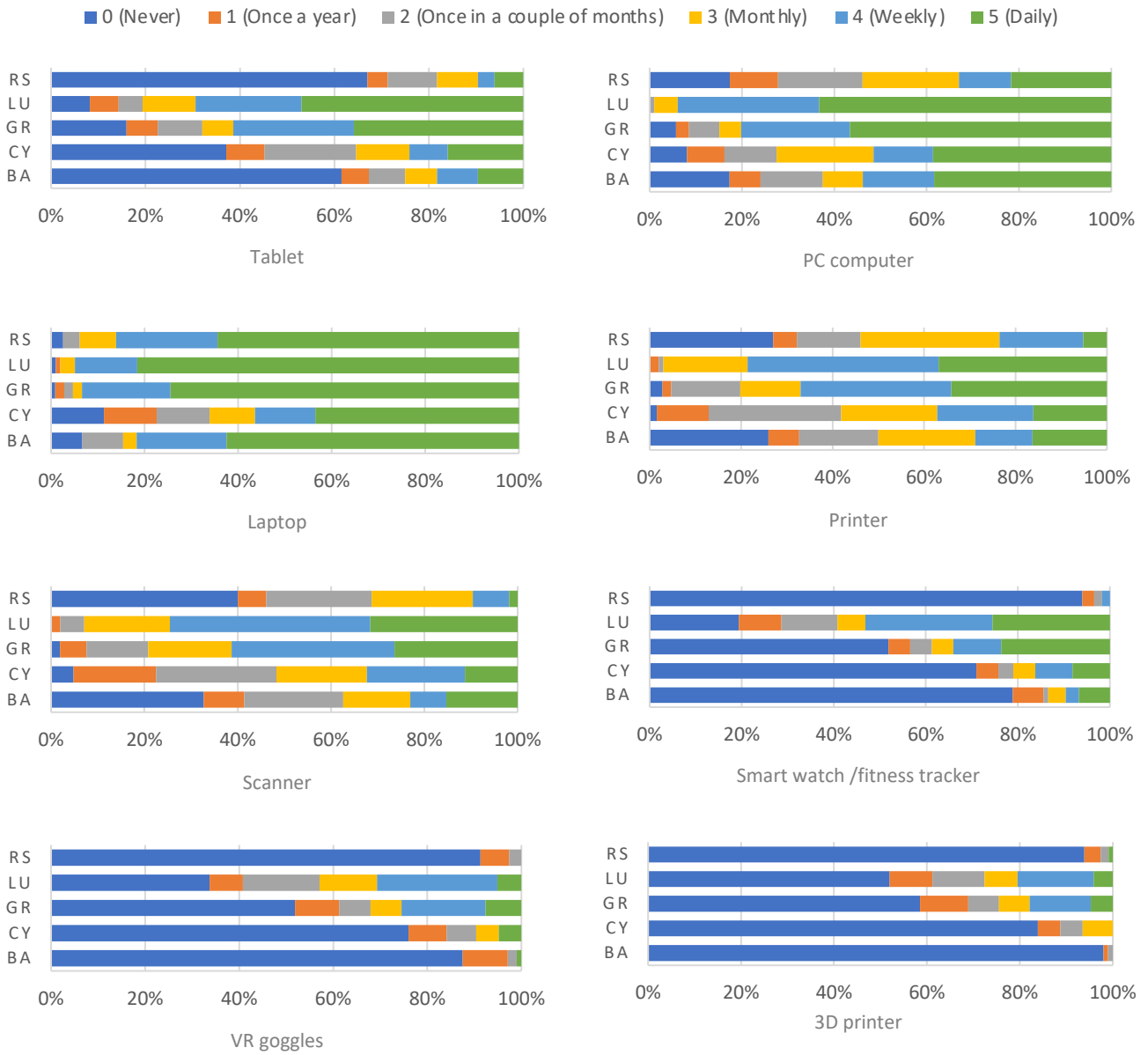


Finding the type of devices that is most frequently used by youth is important for gaining the insight into ways how to approach them both in the process of consuming digital culture content and in the process of educating in this matter. Smartphones are excluded from list of devices as previous studies show that they are most frequent devices among youth. Thus, apart smartphones, laptops are most frequently used on the daily basis. Laptops are followed by PC computers. As a standard input and output devices printers and scanners are among most frequently used devices. As a form of personal wearable devices smart watches/fitness trackers and VR goggles are not used by

majority of youth or they are used less frequently comparing to other most common ICT devices. Similarly, as a relatively new and expensive technology 3D printers are the rarest used ICT device. In general, on a daily, weekly and monthly basis ICT device are usually most used in Luxembourg, Greece and Cyprus, that can be linked to the higher income of youth in those countries. For example, since smartphones are dominant, tablets are not usually used a primary ICT device to access the internet, and it is often not owned by the youth in Serbia and Bosnia and Herzegovina.



**Chart 2.** Frequency of using the listed devices (%)



The use of smartphones is further analysed to determine the purpose of their use and their suitability for cultural content diffusion (Table 2). Communication and email purposes together with social media are most frequent use of smartphones by the

youth. Application of cultural institutions and events are the least among the offered options to respondents, especially in the non-EU countries in this sample – Serbia and Bosnia and Herzegovina.

**Table 2.** The use of smartphone applications by the youth

Country	Email	Communication	Social media	Utility	Lifestyle	News/ information outlet	Productivity	Games/ Entertainment	Cultural institutions or events
BA	91.30%	86.50%	90.40%	81.70%	53.80%	46.20%	31.70%	39.40%	14.40%
CY	88%	93%	81%	58%	59%	57%	38%	52%	37%
GR	93%	93%	79%	60%	65%	52%	40%	34%	36%
LU	92%	94%	81%	40%	57%	57%	39%	64%	43%
RS	98%	94%	96%	63%	58%	34%	31%	13%	11%

Social media are further analysed to determine are there characteristic differences between current general market trend and respondents in this report. The results (Table 3) show that youth follow general market trend, by identifying Facebook, Instagram and YouTube as most frequently used social media platforms. LinkedIn as an employment-oriented online service is

less used comparing to previously mentioned general social media platform, especially in Serbia and Bosnia and Herzegovina. Other photo/image collection, microblogging and content tagging social media are less frequently used, except Pinterest and Twitter in EU countries form this sample.

**Table 3.** The use of social media by the youth

Country	Facebook	YouTube	Instagram	Pinterest	LinkedIn	Twitter	Tumblr	Reddit	Flickr
BA	92.30%	95.20%	83.70%	22.10%	25.00%	14.40%	12.50%	1.90%	1.00%
CY	94%	91%	85%	53%	44%	31%	5%	8%	6%
GR	93%	85%	72%	26%	54%	28%	3%	7%	3%
LU	98%	68%	86%	43%	43%	54%	8%	19%	7%
RS	98%	97%	83%	37%	24%	18%	8%	5%	1%

Apart from smartphone usage, this report determined the general purpose of using all digital media by the youth. The results (Table 4) indicate that communication, networking, publishing images and finding news are general characteristic for

all countries, with the shopping being also characteristic of Luxembourg respondents and publishing text, e-governments services and managing professional digital identity in case of respondents from Greece and Serbia.

**Table 4.** Purpose of using digital media by the youth

Country	BA	CY	GR	LU	RS
Communication	92.30%	81%	79%	70%	79%
Publishing images	81.70%	63%	50%	59%	50%
Finding news	76.90%	67%	63%	51%	63%
Networking	66.30%	84%	87%	91%	87%
Uploading files	47.10%	43%	48%	26%	48%
Collaboration with others	61.50%	47%	48%	35%	48%
Shopping	44.20%	58%	58%	73%	58%
Publishing videos	53.80%	55%	43%	53%	43%
Evaluating news, information on products	51.90%	44%	39%	22%	39%
Publishing text	45.20%	37%	79%	30%	79%
Sharing locations and event attendance	32.70%	41%	50%	52%	50%
Managing professional digital identity	23.10%	42%	63%	41%	63%
E-Government services	7.70%	38%	87%	58%	87%

The importance of general elements for digital behaviour could indicate the attitudes of youth toward their relationship with digital culture as well. Protecting personal data and privacy and devices are in most cases important and very important for youth in all countries. This is followed with the protection and the

environment of health and well-being. Interestingly, the less important behaviour in the offered set in digital context are using native language and promoting national culture, art, values, customs, etc.

**Chart 3.** The importance of selected behaviours in digital context

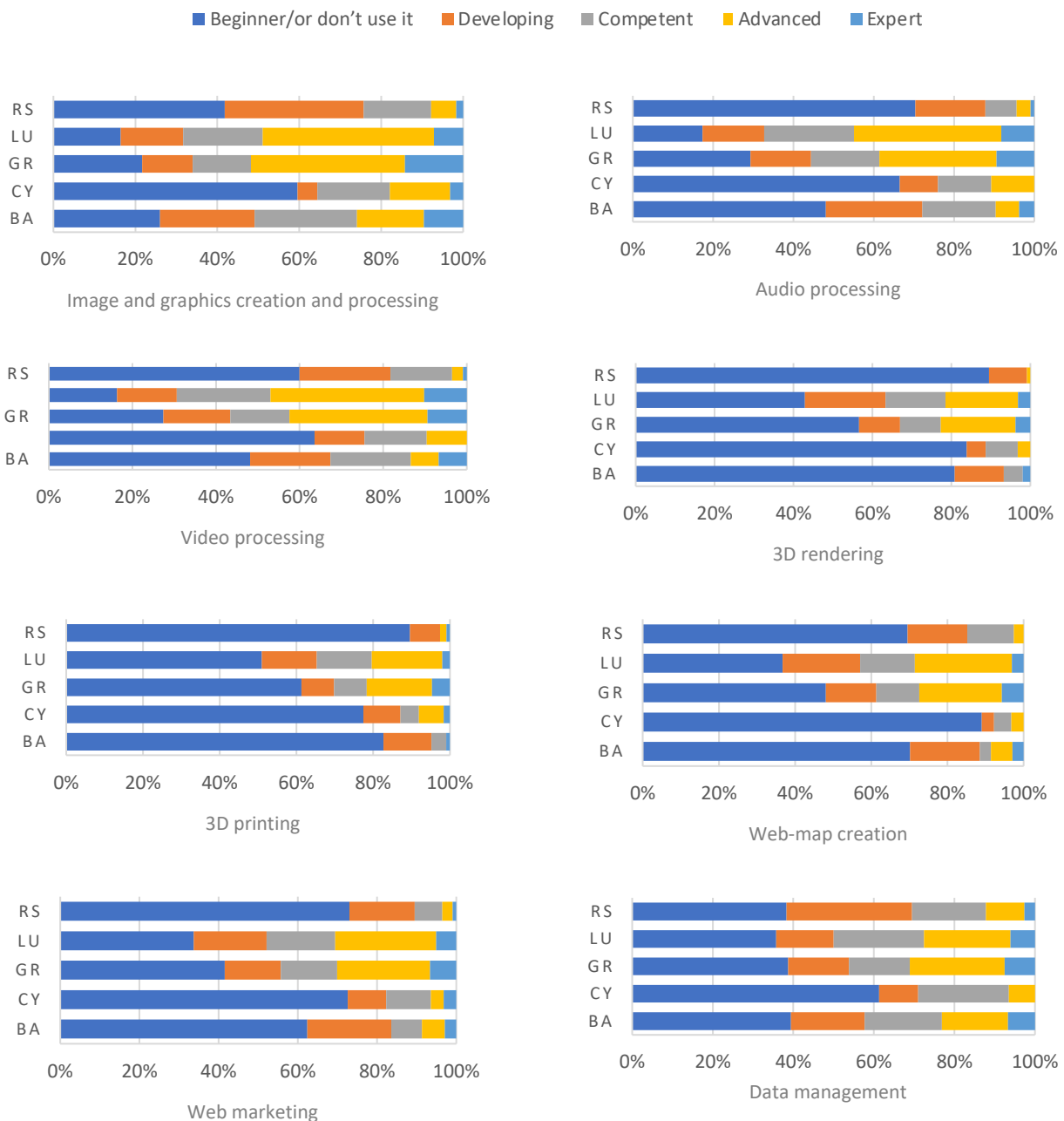


## SPECIALIZED DIGITAL SKILLS

The respondents were also asked to do the self-evaluation regarding their proficiency in specialized software of the highest importance for cultural content creation and management. Their self-estimation was done by using the following scale: 0 (I don't use such software), 1 (Beginner - I have some basic knowledge of using such software), 2 (Developing - I'm learning additional capabilities of the software), 3 (Competent - I can work on project on my own), 4 (Advanced - I know more of software's capabilities than the average user), 5 (Expert - I can critically evaluate the results base on the software characteristics, find errors, notice common bugs). The results presented in chart 4 show that

majority of respondents are beginners in specialized software or even don't use it. The best situation is in case of image and graphics creation and processing, data management, as well as video and audio processing where respondents evaluate themselves also as developing, competent and advanced. Respondents do not use or are beginners in case of 3D rendering and 3D printing. In case of 3D printing, this corresponds to the frequency of the use of ICT device, as a device and additional requirement are needed for the development of such specialized skill.

**Chart 4.** Self-evaluation of proficiency in specialized software

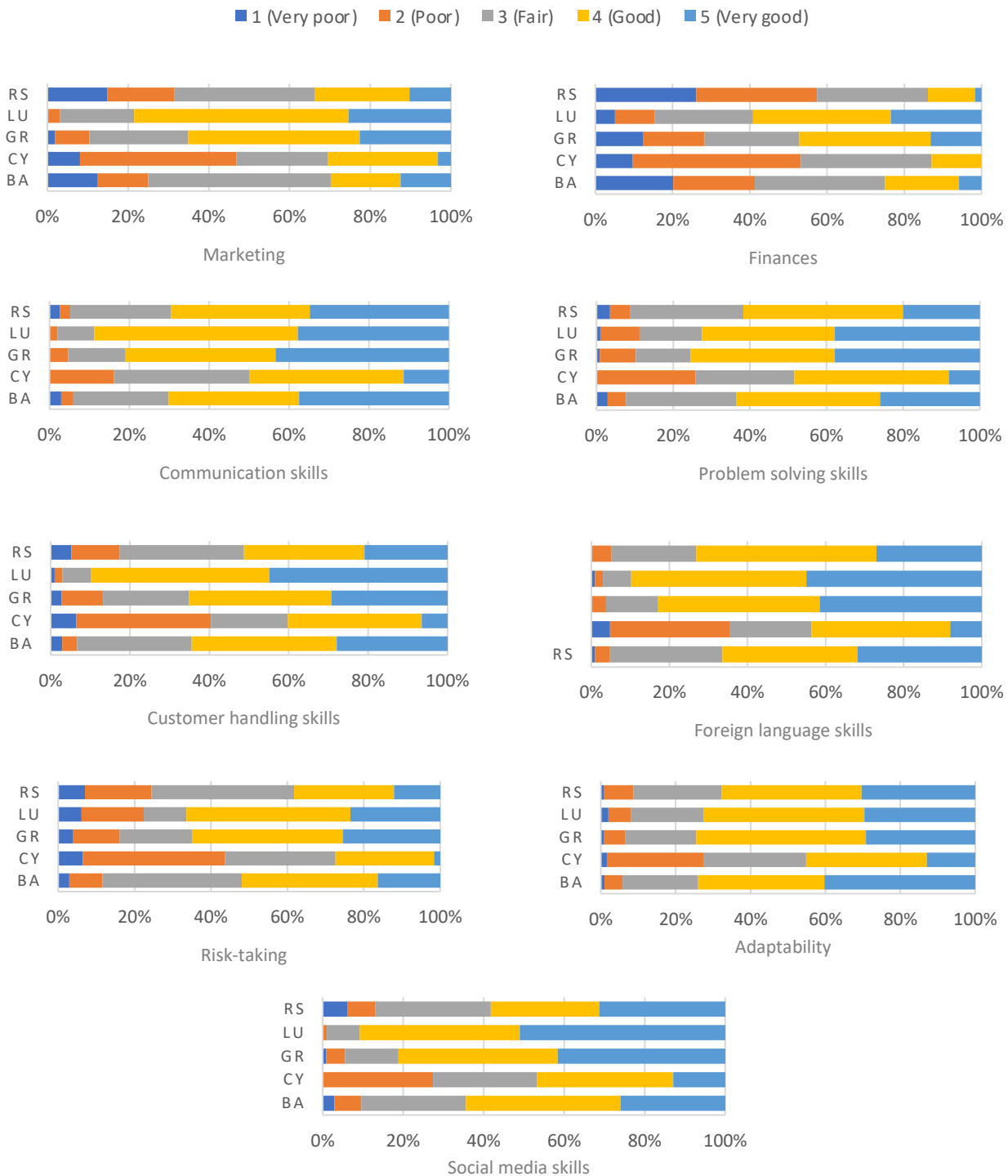


## ADVANCED DIGITAL SKILLS

In this part, respondents were asked to who declare themselves as specialists in ICT professions and digital entrepreneurship. Firstly, they were asked to estimate their general knowledge and skills that can be of use for your digital entrepreneurship on a scale from 1 (very poor) to 5 (very good). Communication and social media skills related digital entrepreneurship is highly

evaluated by the youth. This corresponds to their general digital behaviours. Other personal-related skills, such as consumer handling, foreign language, adaptability, etc., are also highly rated. Finance and marketing skills have the highest frequency of lower level of self-evaluations among digital entrepreneurship skills.

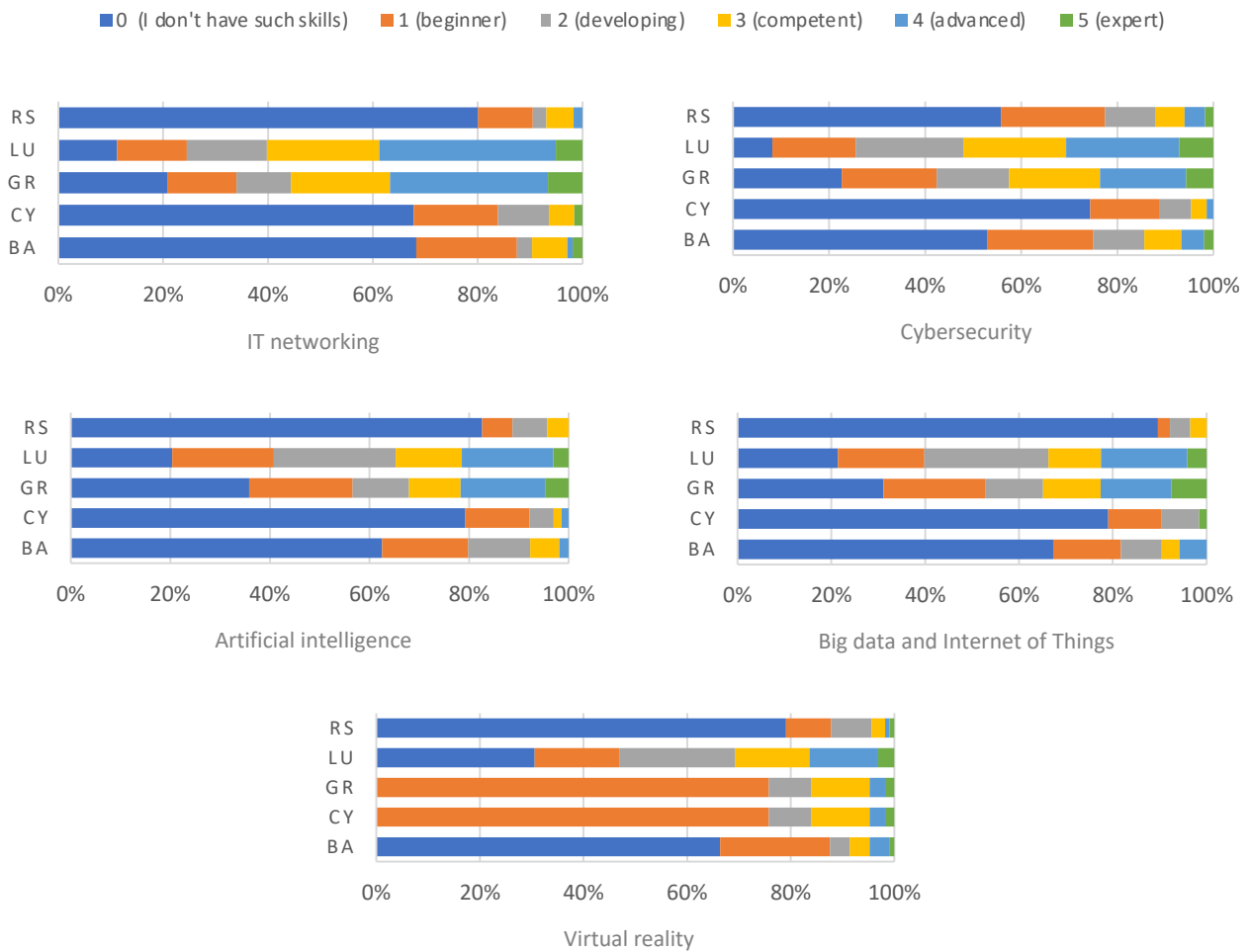
**Chart 5.** Self-evaluation of knowledge and skills that can be used for digital entrepreneurship



As expected, advanced digital skills do not have majority of respondents. The ratio between different advanced digital skills and between countries are almost the same, with the exception

of virtual reality, where none of the respondents declared that they do not possess such skill.

**Chart 6.** Self-evaluation of advanced digital skills



## SUPPORTING INFORMATION

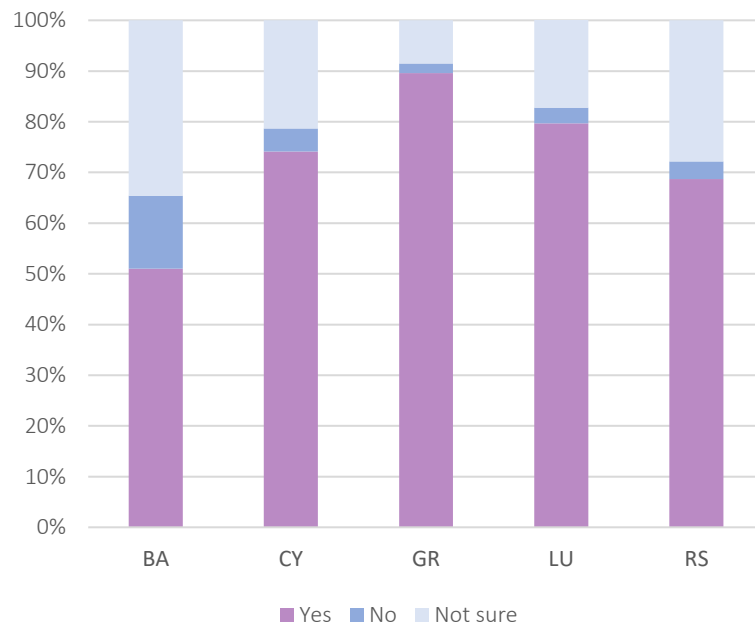
In addition to three sets of digital skills, this report included willingness to work in the cultural sector or pursue a career in the cultural heritage sector, preferences for acquiring new digital skills, and digital skills important for working in culture according to the youth.

In terms of preferences for acquiring new digital skills (Table 5) youth prefer e-learning or webinars mentoring, as an emerging form of education, but also face to face training session and formal education. The least favourable form of acquiring new

According to expressed willingness to work in the cultural sector or pursue a career in the cultural heritage sector (Chart 7) highest interest is Greece, Luxembourg and Cyprus. Youth from Serbia express slightly less interest, while lowest level of interest is recorded in Bosnia and Herzegovina.

digital skills are informal peer to peer support and support from an existing job manager. Volunteering positions in cultural organisation are slightly more interesting to youth from Serbia and Bosnia and Herzegovina.

**Chart 7.** Willingness to work in the cultural sector or pursue a career in the cultural heritage sector



**Table 5.** Preferences for acquiring new digital skills

Country	BA	CY	GR	LU	RS
Formal education	47.10%	46%	62%	44%	58%
Face to face training sessions	56.70%	53%	50%	44%	70%
E-learning or webinars mentoring	40.40%	66%	66%	65%	38%
Informal peer to peer support	10.60%	20%	17%	18%	10%
More support from my existing job manager	17.30%	20%	18%	14%	16%
By volunteering position in cultural organizations	47.10%	33%	41%	42%	50%

Digital skills important for working in culture are summarized in Table 6. In most cases youth identify marketing and promotions, social media management and communication skill as the most

important. This is followed with skills that are related to digital cultural content creation, while some advanced digital skills are less often mentioned.

**Table 6.** Digital skills important for working in culture

BA	CY	GR	LU	RS
<ul style="list-style-type: none"> <li>• Marketing and promotion (24.04%)</li> </ul>	<ul style="list-style-type: none"> <li>• Social media management (28%)</li> </ul>	<ul style="list-style-type: none"> <li>• Marketing and promotion (36%)</li> </ul>	<ul style="list-style-type: none"> <li>• Social media management (39%)</li> </ul>	<ul style="list-style-type: none"> <li>• Marketing and promotion (37%)</li> </ul>
<ul style="list-style-type: none"> <li>• Data presentation (24.04%)</li> </ul>	<ul style="list-style-type: none"> <li>• Marketing and promotion (20%)</li> </ul>	<ul style="list-style-type: none"> <li>• Social media management (33%)</li> </ul>	<ul style="list-style-type: none"> <li>• Marketing and promotion (23%)</li> </ul>	<ul style="list-style-type: none"> <li>• Communicativeness (28%)</li> </ul>
<ul style="list-style-type: none"> <li>• Social media management (23.08%)</li> </ul>	<ul style="list-style-type: none"> <li>• Social media communication and promotion (20%)</li> </ul>	<ul style="list-style-type: none"> <li>• Email communication (15%)</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile application creation (18%)</li> </ul>	<ul style="list-style-type: none"> <li>• Text, images and sound procession (22%)</li> </ul>
<ul style="list-style-type: none"> <li>• Text, images and sound procession (19.23%)</li> </ul>	<ul style="list-style-type: none"> <li>• Text, images and sound procession (19%)</li> </ul>	<ul style="list-style-type: none"> <li>• Graphical design (14%)</li> </ul>	<ul style="list-style-type: none"> <li>• Networking (18%)</li> </ul>	<ul style="list-style-type: none"> <li>• Digitalization of cultural heritage (18%)</li> </ul>
<ul style="list-style-type: none"> <li>• Virtual tour creation (19.23%)</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile application creation (18%)</li> </ul>	<ul style="list-style-type: none"> <li>• Networking (14%)</li> </ul>	<ul style="list-style-type: none"> <li>• Email communication (17%)</li> </ul>	<ul style="list-style-type: none"> <li>• Social media communication and promotion (13%)</li> </ul>
<ul style="list-style-type: none"> <li>• Communicativeness (15.38%)</li> </ul>	<ul style="list-style-type: none"> <li>• Basic computer literacy (17%)</li> </ul>	<ul style="list-style-type: none"> <li>• Video editing and processing (14%)</li> </ul>	<ul style="list-style-type: none"> <li>• Web site creation (12%)</li> </ul>	<ul style="list-style-type: none"> <li>• Basic computer literacy (13%)</li> </ul>
<ul style="list-style-type: none"> <li>• Digitalization of cultural heritage (12.50%)</li> </ul>	<ul style="list-style-type: none"> <li>• Video editing and processing (17%)</li> </ul>	<ul style="list-style-type: none"> <li>• Web site creation (10%)_</li> </ul>	<ul style="list-style-type: none"> <li>• Video editing and processing (12%)</li> </ul>	<ul style="list-style-type: none"> <li>• Social media management (8%)</li> </ul>
<ul style="list-style-type: none"> <li>• Basic computer literacy (10.58%)</li> </ul>	<ul style="list-style-type: none"> <li>• Web site creation (15%)</li> </ul>	<ul style="list-style-type: none"> <li>• 3D processing (9%)</li> </ul>	<ul style="list-style-type: none"> <li>• Virtual tour creation/Virtual reality (11%)</li> </ul>	<ul style="list-style-type: none"> <li>• Data creation and processing (6%)</li> </ul>
<ul style="list-style-type: none"> <li>• Data security maintenance (10.58%)</li> </ul>	<ul style="list-style-type: none"> <li>• Email communication (13%)</li> </ul>	<ul style="list-style-type: none"> <li>• Digital storytelling (7%)</li> </ul>	<ul style="list-style-type: none"> <li>• 3D processing (9%)</li> </ul>	<ul style="list-style-type: none"> <li>• Data presentation (4%)</li> </ul>
<ul style="list-style-type: none"> <li>• Mobile application creation (9.62%)</li> </ul>	<ul style="list-style-type: none"> <li>• Communicativeness (8%)</li> </ul>	<ul style="list-style-type: none"> <li>• Text, images and sound procession (5%)</li> </ul>	<ul style="list-style-type: none"> <li>• SEO (9%)</li> </ul>	<ul style="list-style-type: none"> <li>• Graphical design (4%)</li> </ul>
<ul style="list-style-type: none"> <li>• Internet search (9.62%)</li> </ul>	<ul style="list-style-type: none"> <li>• 3D processing (8%)</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile application creation (5%)</li> </ul>	<ul style="list-style-type: none"> <li>• Graphical design (7%)</li> </ul>	<ul style="list-style-type: none"> <li>• Virtual tour creation (4%)</li> </ul>
<ul style="list-style-type: none"> <li>• Data creation and processing (3.85%)</li> </ul>	<ul style="list-style-type: none"> <li>• Digital storytelling (7%)</li> </ul>	<ul style="list-style-type: none"> <li>• Blogging (4%)</li> </ul>	<ul style="list-style-type: none"> <li>• e-commerce (6%)</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile application creation (3%)</li> </ul>
<ul style="list-style-type: none"> <li>• Team organization (3.85%)</li> </ul>	<ul style="list-style-type: none"> <li>• Digitalization of cultural heritage (6%)</li> </ul>	<ul style="list-style-type: none"> <li>• Virtual tour creation (3%)</li> </ul>	<ul style="list-style-type: none"> <li>• Google analytics (5%)</li> </ul>	<ul style="list-style-type: none"> <li>• Data security maintenance (3%)</li> </ul>
<ul style="list-style-type: none"> <li>• Social media communication and promotion (2.88%)</li> </ul>	<ul style="list-style-type: none"> <li>• Graphical design (6%)</li> </ul>		<ul style="list-style-type: none"> <li>• Big Data (5%)</li> </ul>	<ul style="list-style-type: none"> <li>• Team organization (3%)</li> </ul>
<ul style="list-style-type: none"> <li>• Graphical design (2.88%)</li> </ul>	<ul style="list-style-type: none"> <li>• Cloud service (5%)</li> </ul>		<ul style="list-style-type: none"> <li>• Cultural heritage digitalization (5%)</li> </ul>	<ul style="list-style-type: none"> <li>• Internet search (2%)</li> </ul>
	<ul style="list-style-type: none"> <li>• Gamification (4%)</li> </ul>		<ul style="list-style-type: none"> <li>• Data management (4%)</li> </ul>	<ul style="list-style-type: none"> <li>• Financial management (2%)</li> </ul>
	<ul style="list-style-type: none"> <li>• Virtual tour creation (3%)</li> </ul>		<ul style="list-style-type: none"> <li>• Digital archiving (4%)</li> </ul>	
			<ul style="list-style-type: none"> <li>• Cybersecurity (3%)</li> </ul>	



## RECOMMENDATIONS FOR IMPROVING DIGITAL LITERACY OF YOUTH RELATED TO CULTURE SECTOR

Area	Issues	Solutions/actions
Basic digital skills	<ul style="list-style-type: none"> <li>• The majority of youth find themselves mainly as advanced and expert of basic skills. This goes in line with the fact that majority of youth use digital technologies, both in terms of different types of hardware and software, the Internet and social media on a regular basis (ITU, 2019). However, this is primarily related to the high use of laptops and desktop computers.</li> <li>• The use of more specific devices, such as VR goggles and 3D printers, that are often associated with the presentation and interpretation of cultural heritage, is quite rarely (Rossi &amp; Barcarolo, 2019). This can be explained by the fact that those devices are still scarce within daily life use, however the lack of tablet use, came as a surprise.</li> <li>• Youth are frequent users of most popular social media sites, such as <i>Facebook</i> and <i>YouTube</i>, while more specific one, such as <i>Twitter</i>, <i>LinkedIn</i> or photo sharing sites are less frequently used (Božić &amp; Jovanović, 2017; Jovanović, Božić, Bodroža, &amp; Stankov, 2019).</li> <li>• Employees of cultural institutions skilled in basic digital knowledge are needed in most of job positions, however, in terms of digital transformation; their contribution could be limited to basic operation (service delivery, assistance, data gathering, etc).</li> </ul>	<ul style="list-style-type: none"> <li>• Insist on developing skills for spreadsheet processing, as an important skill of data management.</li> <li>• Provide the access, materials and content, as well adequate guidance, to the less accessible devices with prospect use in cultural sector, such as VR goggles and 3D printers.</li> <li>• Cultural sector could not significantly change digital behaviour of youth. Instead, the use of common media channels is needed to promote, educate and include youth into sector of digital culture.</li> <li>• Explicit information on digital skills needed for current and future digital sector should be provided to the youth interested in engagement with digital sector.</li> </ul>
Specialized digital skills	<ul style="list-style-type: none"> <li>• Specialized IT skills related to proficiency in professional software that will allow youth to critically evaluate technology or create content, showed less existing competence, comparing to basic skills. Here, work skills in specific software for 3D rendering or 3D printing are less known.</li> <li>• Youth are developing image processing skills and data management skills, together with skills for work in software for audio and video processing.</li> </ul>	<ul style="list-style-type: none"> <li>• Invest in further development of specialized digital skills as diverse cultural sector will need these skills, both in absolute and relative numbers. The majority of job positions in cultural sector require specialized digital skills in the process of content creation, marketing, business transactions and this is relevant for many types of cultural institutions.</li> </ul>
Advanced skills	<ul style="list-style-type: none"> <li>• Despite the rise in popularity of technology-related formal and informal education diffusion of the advanced specialized digital skills, such as big data analytics or cybersecurity, are quite rare to detect. These specific skills are still left to be found at a higher level of formal education.</li> <li>• In case of general knowledge and skills related to digital entrepreneurship, youth mainly highly evaluate themselves, with the expectation of marketing and finances skills.</li> </ul>	<ul style="list-style-type: none"> <li>• Promote cultural sector to youth involved technology related disciplines</li> <li>• Leverage youth involved in managerial education, capable of making meaningful connections between cultural and technology sector. While advanced digital skills can be imported</li> </ul>

		<p>from external sources, higher management still must be able to “see the bigger picture” and create the competitive cultural offer.</p>
<p>Supporting information</p>	<ul style="list-style-type: none"> <li>• Youth equally prefer e-learning or webinars mentoring, and traditional also face to face training session and formal education as a way to learn new digital skills.</li> <li>• Youth mostly associate digital skill related to cultural sector marketing, promotion, social media and communication.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide the choice in preferable way for leaning digital skills for cultural sector.</li> <li>• Inform the youth on different job positions in the very diverse cultural sector with the specifics of each job.</li> </ul>

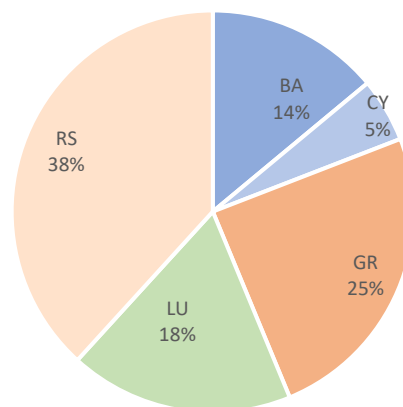
## CURRENT STATE AND NEEDS OF CULTURAL INSTITUTIONS IN THE FIELD OF DIGITAL TECHNOLOGY

The results on the current state and need of cultural institutions in the field of digital technology are based on the questionnaire created for different type of cultural organizations, policy makers, local and regional authorities, labor market which could benefit from digitally literate young people through the provision of high quality non-formal learning. Complete list of types of organization is available in individual National reports that is integral part of this study.

The main goal of the research was to evaluate the current state and needs of cultural institutions in the field of digital

technologies in order to further determine the gap between their needs and current digital skills and knowledge of young people in Serbia.

The online Google doc survey has been distributed to more than 500 cultural institutions and organizations in Bosnia and Herzegovina, Cyprus, Greece, Luxemburg and Serbia in the period from March to September 2019. A total of 272 valid answers have been collected. The highest number of cultural organizations and institutions are from Serbia, Greece, Luxemburg, Bosnia and Herzegovina and Cyprus, respectively (Chart 8).



**Chart 8.** The structure of the sample of cultural institutions by country.

The type of presence of cultural organization on the Internet was the first question in the survey. Websites as a standard way on online presence is a typical type of presence of cultural organization on the Internet. In Greece and Luxemburg, the highest percentage of those websites are adoptive or responsive,

that is, capable of adopting to different devices and usage purposes. Mobile-specific website are less frequent. Smartphone or tablet apps as a form of presence on the Internet are recorded in the frequency less than 8%.

**Table 7.** The type of presence of cultural organizations on the Internet

Type	BA	CY	GR	LU	RS
Static or dynamic web site	42.1%	57.1%	49.3%	51.0	51.0
Adaptive or responsive website	18.4%	42.9%	59.7%	71.4%	28.8%
Mobile-specific site	31.6%	0.0%	6.0%	4.1%	15.4%
Don't know	5.3%	78.6%	1.5%	0.0%	1.9%
Smartphone apps	0.0%	7.1%	6.0%	6.1%	1.0%
Tablet apps	0.0%	7.1%	6.0%	4.1%	1.0%
None of these	5.3%	7.1%	14.9%	0.0%	1.0%

The survey results clearly indicate that the highest percentage of cultural institutions use digital technologies but they don't have a strategic approach. However, a significant portion of cultural institutions have been through digital transformation and embedded it in their activities, while others are also thinking about developing digital strategies or are about to start on digital transformation. On the other side, a specific online marketing

strategy is present in around ¼ of cultural institutions in Luxemburg and Greece, and also in Serbia with 7.7%. Again, among those institutions that already have a digital strategy, a significant number did not start on digital transformation (Luxemburg, Greece and Cyprus), while there are still those institutions that struggle to access basic digital tools.

**Table 8.** The existence of strategic approach towards digital technologies in cultural institutions

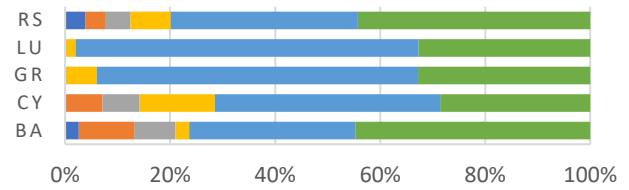
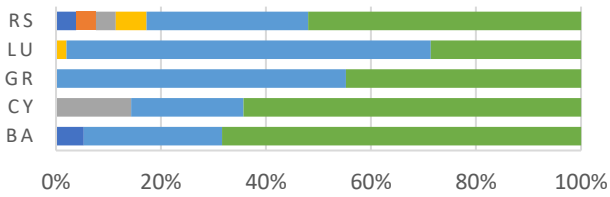
Type of an approach	BA	CY	GR	LU	RS
We use digital technologies but don't have a strategic approach	31.6	42.9	46.3	46.9	37.7
About to start on digital transformation	15.8	7.1	6.0	12.2	23.1
We have been through digital transformation and embedded it in everything we do	21.1	21.4	9.0	14.3	11.5
Thinking about developing a digital strategy	10.5	50.0	7.5	14.3	7.7
Struggling to access basic digital tools (e.g. website, social media)	18.4	14.3	29.9	6.1	7.7
We have an online marketing strategy	0.0	0.0	25.4	26.5	7.7
We have a digital strategy but not embarked on a transformation	2.6	21.4	23.9	34.7	4.8

Respondents from the cultural institutions were asked to rate the importance of the digital technologies in following areas: core activities, audience management/development and external communication, boosting productivity and development of skills, using a scale of answers from 0 (N/A), 1 (irrelevant), 2 (not so important), 3 (I am not sure/can't judge), 4 (important) and 5 (essential).

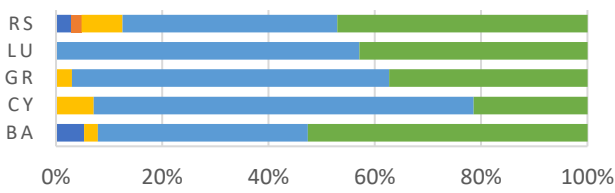
Results presented in the Table 9a clearly indicate that vast majority of cultural institution rate digital technologies as important or essential to their core activities. Only in case of ensuring the overall quality of a creative work a small portion of respondents from cultural institutions rate digital technologies as irrelevant.

**Table 9a. Core activities**

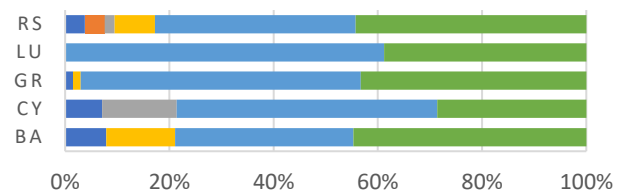
0 (N/A) 1 (irrelevant) 2 (not so important) 3 (I am not sure/can't judge) 4 (important) 5 (essential)



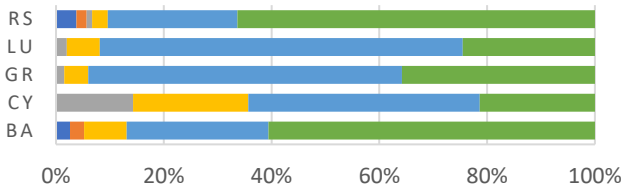
**Production**



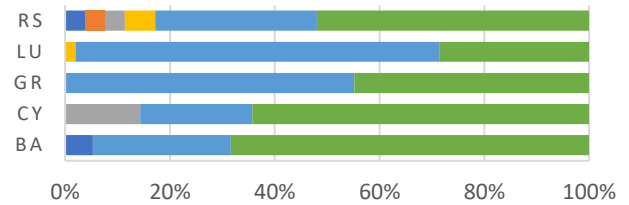
**Overall quality of our creative work**



**Critical response to our work or programmes**



**How we exhibit and distribute our end-product**



**Archiving**

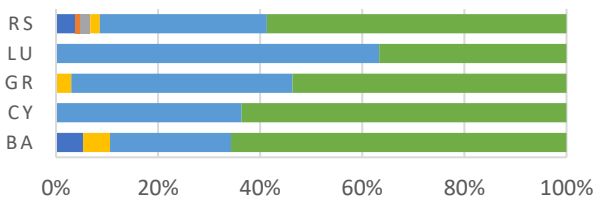
**Collaborating with other organizations on projects**

Similarly, to core activities, the use of digital technologies in activities related to audience management/development and communication with external business environment are rated as

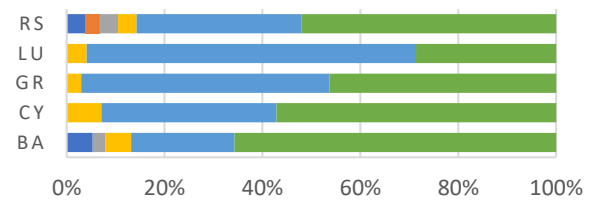
important and essential (Table 9b). This is not a surprise, since the main core activities of cultural activities are tightly related to the audience and external organizations

**Table 9b.** Audience management/development and external communication

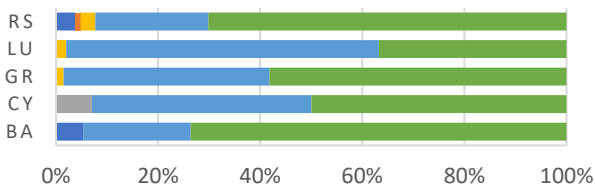
■ 0 (N/A) ■ 1 (ir relevant) ■ 2 (not so important) ■ 3 (I am not sure/can't judge) ■ 4 (important) ■ 5 (essential)



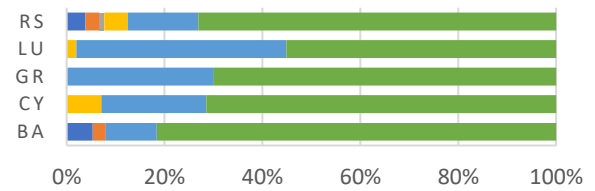
Reaching a bigger audience/consumers/users



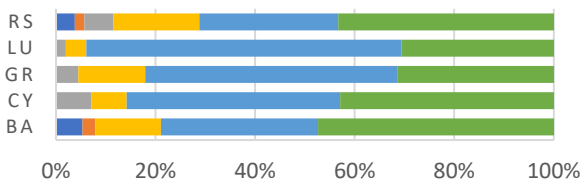
Reaching a more diverse audience



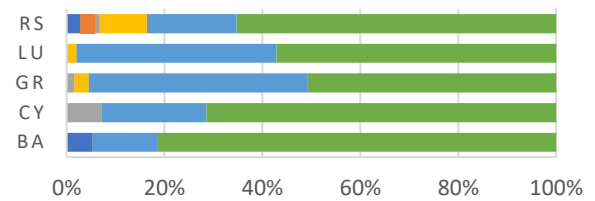
Boosting attendance at events and/or exhibitions



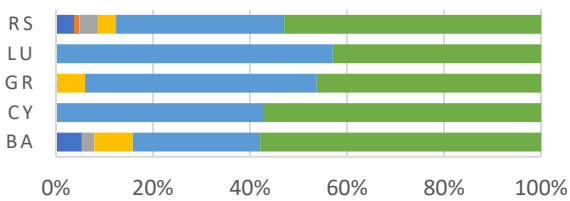
Reaching a younger audience



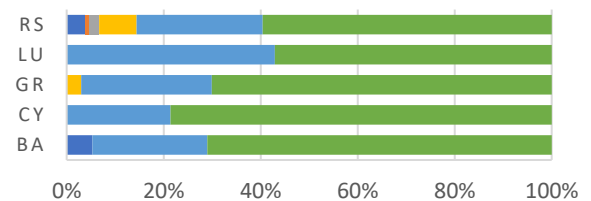
Reaching disadvantages groups



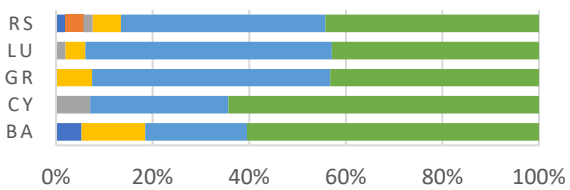
Reaching an international audience



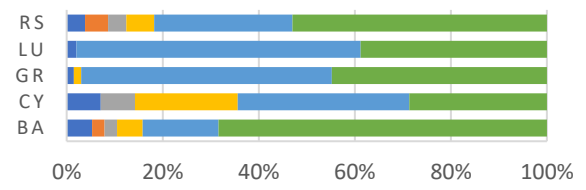
Engaging more extensively with our existing audience



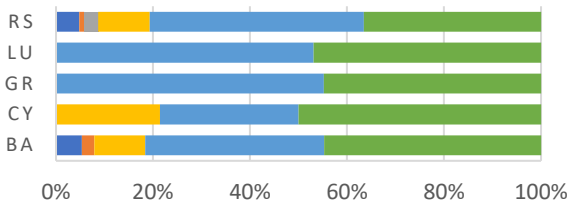
Boosting our public profile



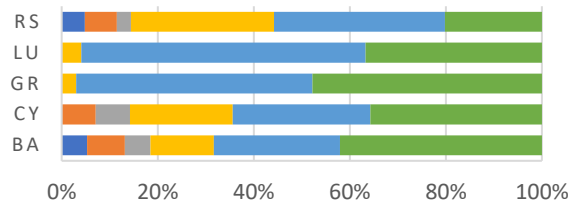
Understanding our audience and what they are saying about us



Improving access



Connecting with new communities



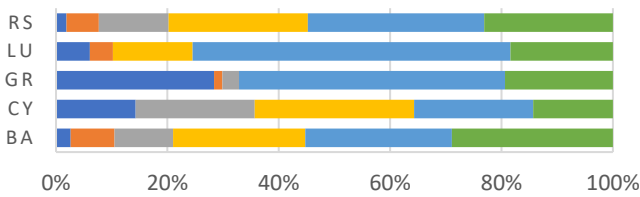
Helping us to deliver against other social and economic objectives

The answers for the question of using digital technologies to boost productivity of cultural institutions showed a lower level of importance. However, it can be attributed to the job positions of

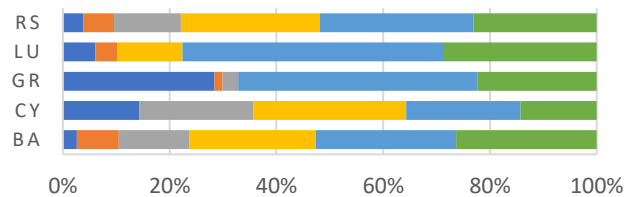
respondents, since a significant portion were not able to give sure answer or they can not judge in this matter.

**Table 9c.** Boosting productivity

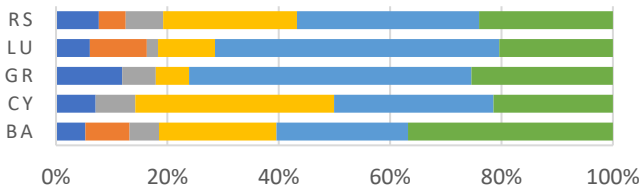
■ 0 (N/A) ■ 1 (irrelevant) ■ 2 (not so important) ■ 3 (I am not sure/can't judge) ■ 4 (important) ■ 5 (essential)



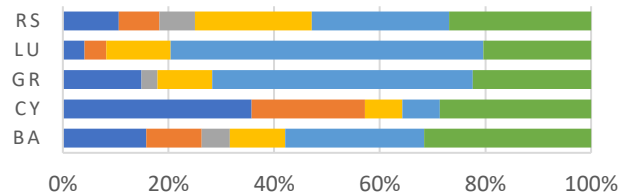
Our organisation's overall revenue



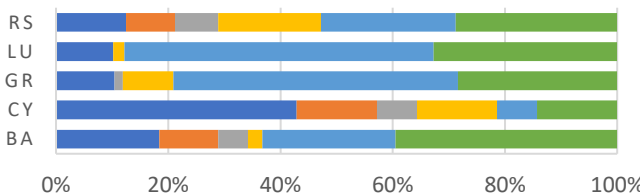
Organisation's overall profitability



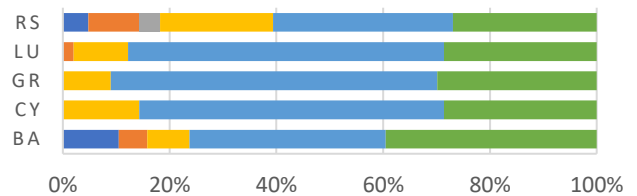
Donations and fundraising



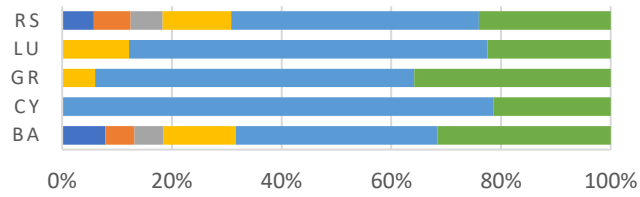
Product sales



Selling tickets online for events and/or exhibitions



Helping us operate more efficiently



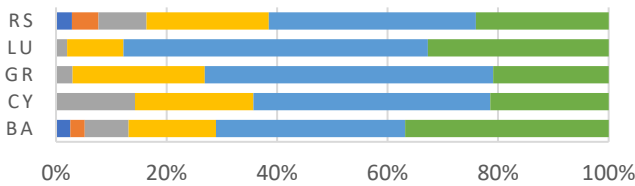
Overall strategy development and prioritisation

Finally, cultural organisations were asked to rate the importance of using digital technologies in the process of developing new

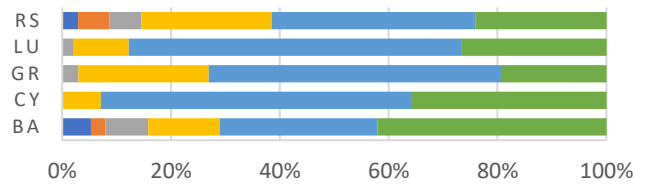
skills. Majority of them pointed digital technologies as important or essential, both for formal and informal education.

**Table 9d.** Development of skills

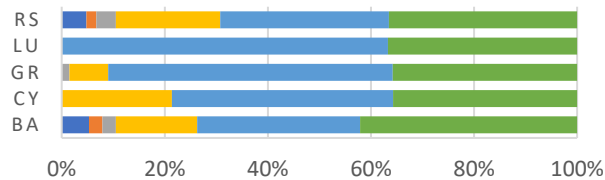
0 (N/A) 1 (irrelevant) 2 (not so important) 3 (I am not sure/can't judge) 4 (important) 5 (essential)



Developing formal skills



Developing informal skills



Creating formal or informal educational resources

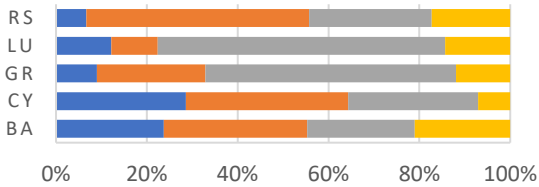
In relation to the activities, available organizational resources and skills of cultural organizations, they had to evaluate if the listed activities are needed for the organization and if they have resources and skills to implement them. The evaluation results are shown in tables 10. Except partly in case of 3D printing, all

other offered activities are marked as need for cultural organization. Thus, majority organizations that do not have specific skills employ external resources. Here, notable higher internal resources for digitizing collection are recorded in case of Serbia and Bosnia and Herzegovina.

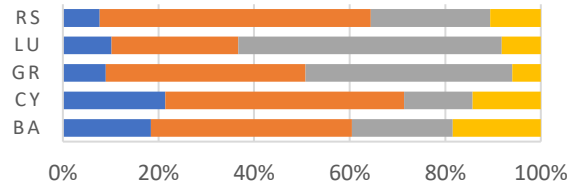


**Table 10a. Core activities**

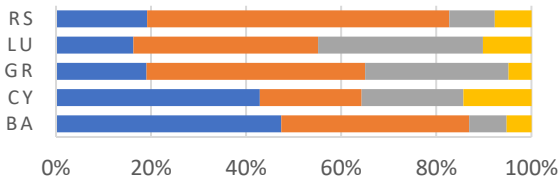
- 1. The activity is not needed in our organization
- 2. The activity is needed but we do not have resources and skills
- 3. Activity is needed (or already done) for the organization and we have necessary external resources and skills
- 4. Activity is needed (or already done) for the organization and we have necessary internal resources and skill.



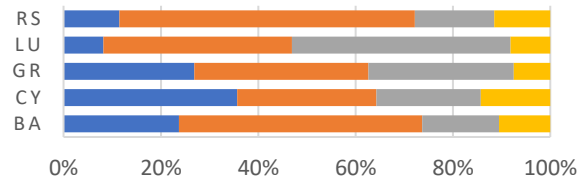
Standalone digital works



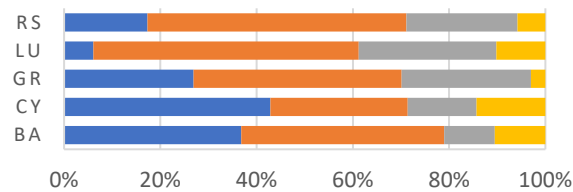
Digital experiences designed to be used alongside and at the same time as the artwork or exhibition



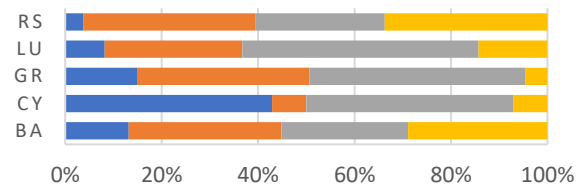
Simulcast / livestream performances



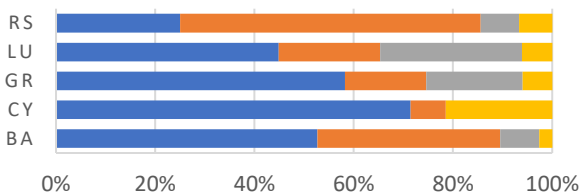
Provide online interactive tours of real-world exhibitions / spaces



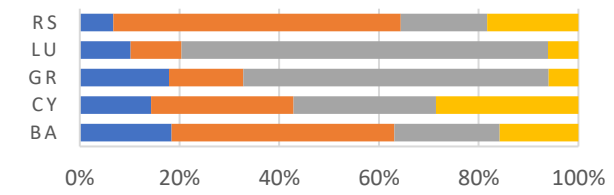
Provide Virtual Reality / Augmented Reality experiences



Digitizing collections – making copies of physical originals (objects or artworks) in digital form



3D printing



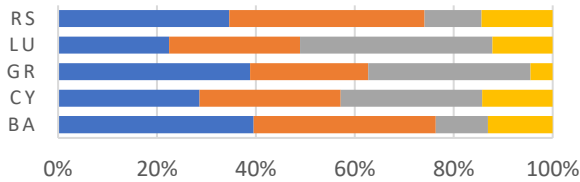
Cyber security

Among marketing and distribution activities cultural institutions are best equipped for simple publishing content onto own websites and free online platforms. Cultural organization have less internal resources for online promotion techniques (such as

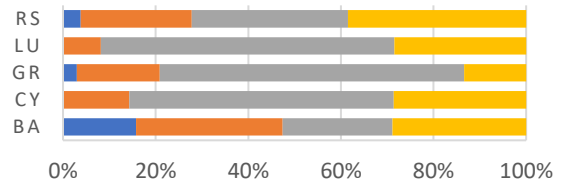
SEO, online advertising, etc). However, the least internal resources are present in case of more advanced digital marketing techniques, but also in case of in-house online distribution).

**Table 10b. Marketing and distribution**

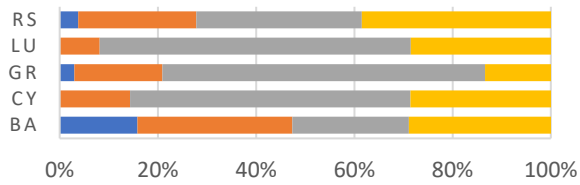
- 1. The activity is not needed in our organization
- 2. The activity is needed but we do not have resources and skills
- 3. Activity is needed (or already done) for the organization and we have necessary external resources and skills
- 4. Activity is needed (or already done) for the organization and we have necessary internal resources and skills.



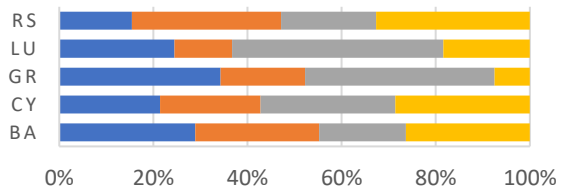
Maintain a blog with commentary and cultural criticism



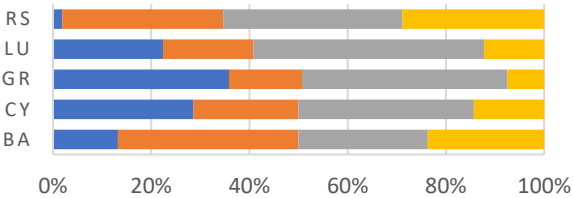
Paid search and/or online display advertising



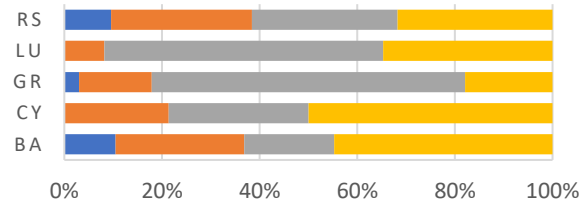
Our own branded website



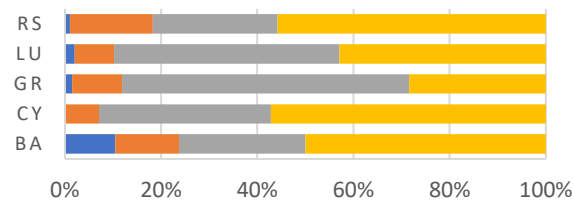
Email marketing



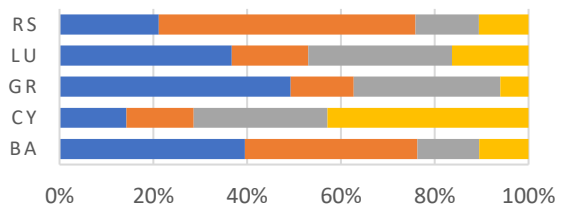
Search engine optimization



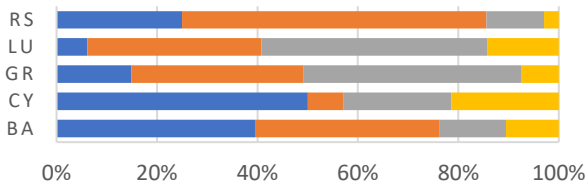
Publishing content onto our website



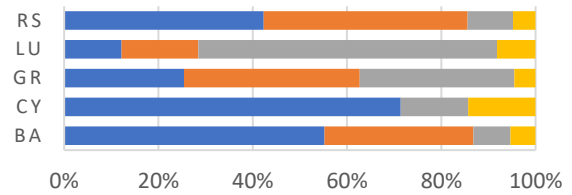
Publishing content onto free platforms



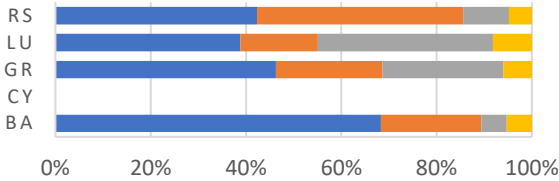
Track discussion about our organization online



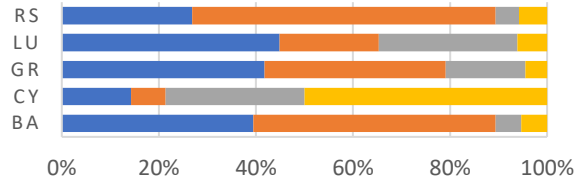
Use cloud computing to run software or host/store data or content



Sell event tickets online



Sell products or merchandise online



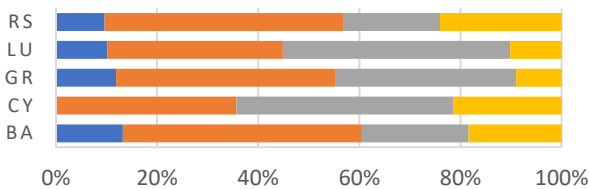
Accept online donations

Of the special interest for this report was the question related to digital educational content. Majority cultural organizations have expressed the need for such a content. Slightly more cultural organizations are equipped with in-house resources for providing

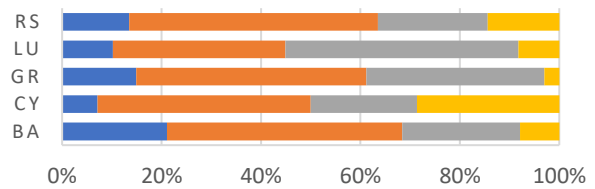
educational content or online events for schools and other audiences, then for providing more interactive educational experiences (including games).

**Table 10c.** Educational content

- 1. The activity is not needed in our organization
- 2. The activity is needed but we do not have resources and skills
- 3. Activity is needed (or already done) for the organization and we have necessary external resources and skills
- 4. Activity is needed (or already done) for the organization and we have necessary internal resources and skills.



Provide educational content or online events for schools and other audiences

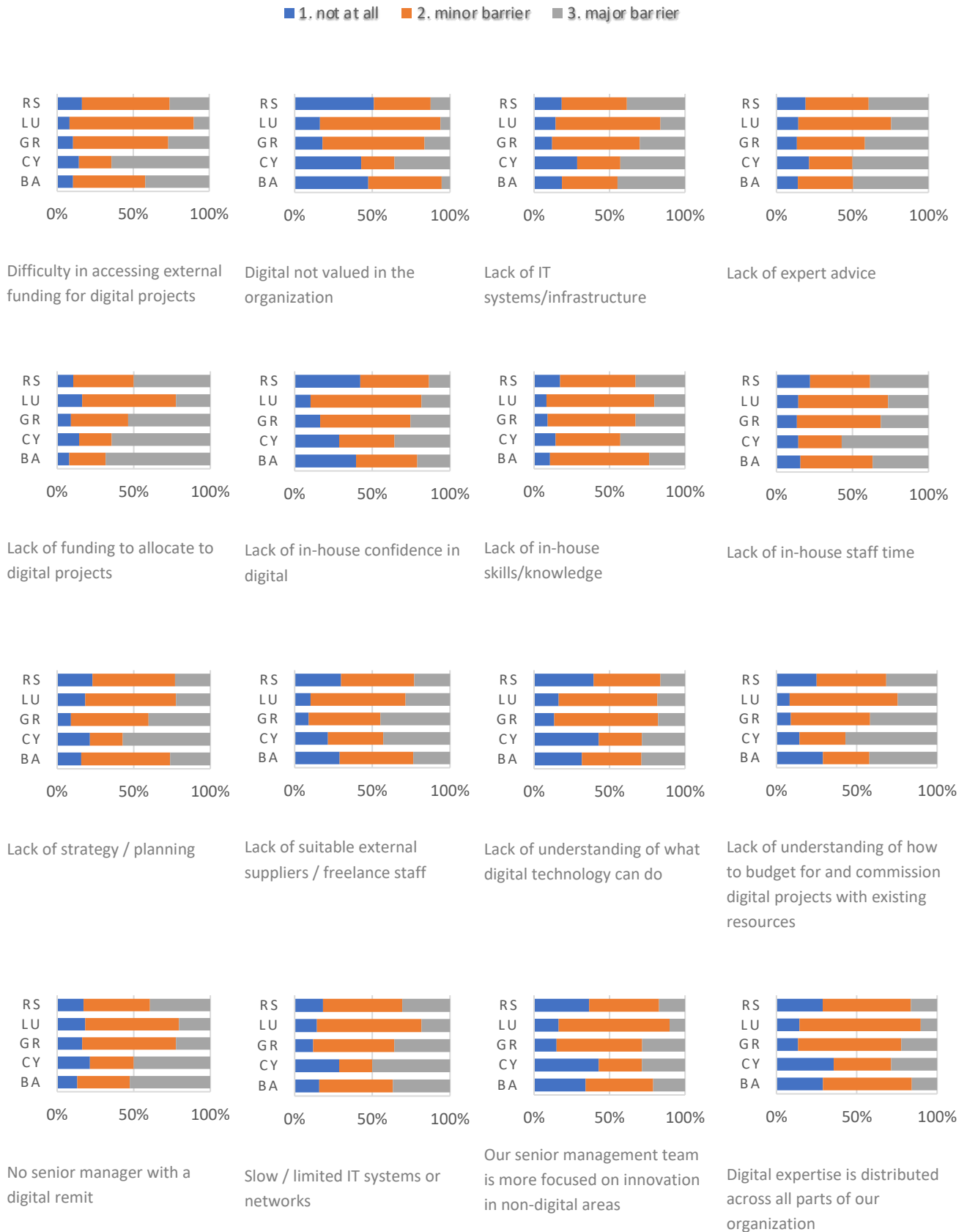


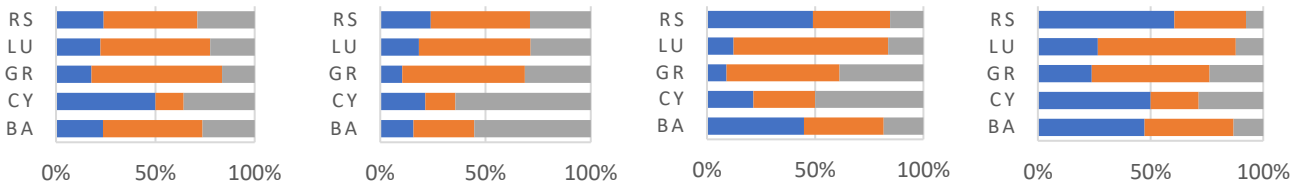
Provide educational interactive experiences (including games) for schools and other audiences

Table 11 shows an extensive list of potential barriers for cultural organization's aspirations for digital technology. On average lack of expert advice, IT systems/infrastructure, in-house staff time,

etc are marked as a potential barrier. However, the largest identified barrier in all countries is lack of funding to allocate to digital projects.

**Table 11.** Evaluation of potential barriers for organization’s aspirations for digital technology





Most of our senior management are not that knowledgeable about digital technologies

Our organization is facing other challenges and they are seen as a higher priority than digital

We are competing with new organizations - not just non-profits - who are digitally savvy

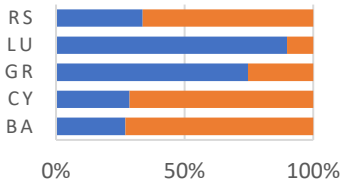
We don't know how youth is using digital

The evaluation of in-house skills or imported skills sufficiency for the key areas relating to digital technology and digital research and development showed that the areas of data analysis, database management / customer Relationship Management (CRM), digital strategy and planning, user interface design and

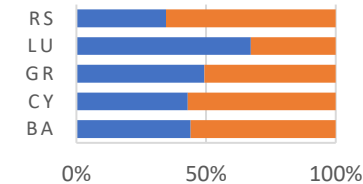
user testing are now well served. Still, some of the most common core activities such as Digital production (including A/V Production, audio and film production and editing) or digital archiving are not also well served as it would be expected in case of cultural organizations.

**Table 12.** Evaluation of sufficient in-house skills or imported skills for the key areas relating to digital technology and digital research and development

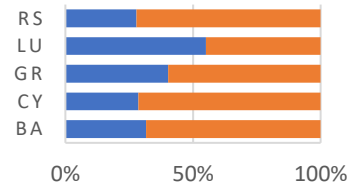
■ 1. Well served ■ 2. Not well served



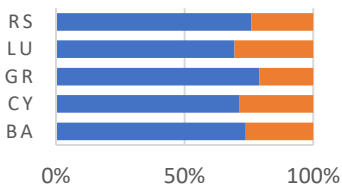
All forms of digital commissioning and partner management (e.g. creative, services)



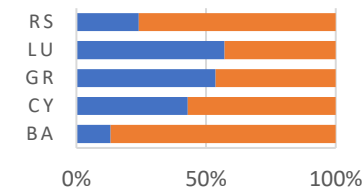
Data analysis



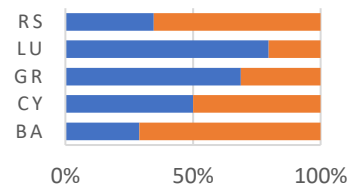
Database management / Customer Relationship Management (CRM)



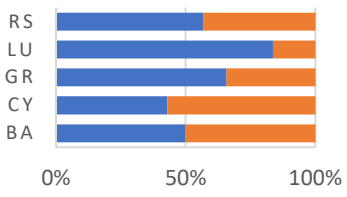
Digital marketing (including use of Facebook and Twitter, email newsletters)



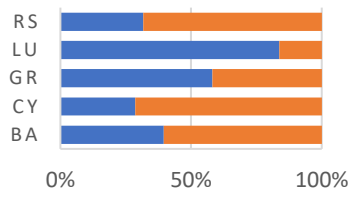
Digital production (including A/V Production, audio and film production and editing)



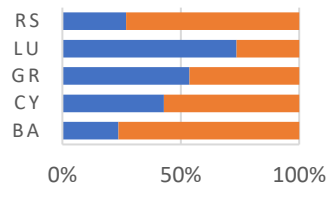
Legal advice around intellectual property rights (e.g. in relation to collaborative projects)



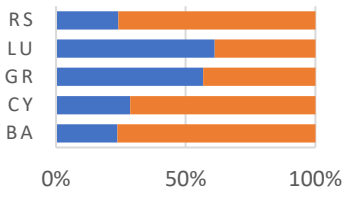
Multimedia / website design (including audio, graphics, text, animation, video)



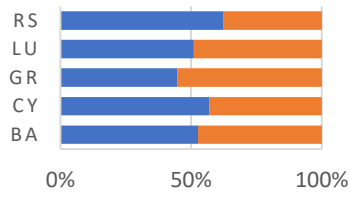
Project management (including agile development methodologies)



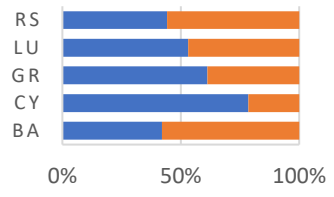
Software development (including website and app development)



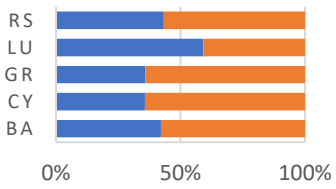
User interface design and user testing



Digital archiving



Research and evaluation



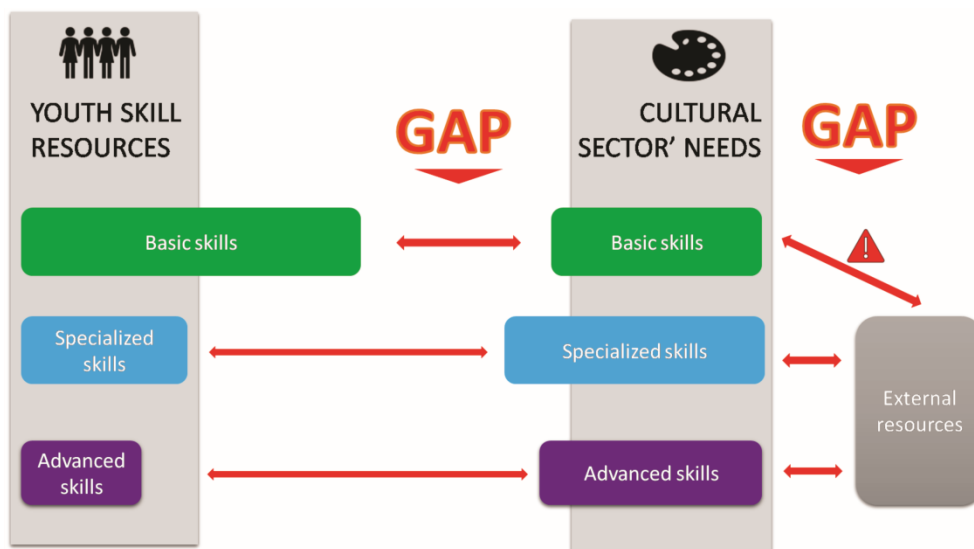
Digital strategy and planning

## DIGITAL SKILLS IMPORTANT FOR WORKING IN CULTURE IDENTIFIED BY THE CULTURAL ORGANISATIONS

BA	CY	GR	LU	RS
<ul style="list-style-type: none"> <li>Analytical data processing skills</li> <li>Strategic planning skills</li> <li>SEO</li> <li>Coding</li> <li>Development of web-based and android applications,</li> <li>Cloud management,</li> <li>Use of adequate applications and photo processing tools and design tools</li> <li>Planning, project writing</li> <li>Data analytics</li> <li>Education, seminars, practice</li> <li>Web Design</li> <li>Graphic design</li> <li>Security</li> <li>Skills related to Photoshop, web design and databases</li> <li>GIS</li> <li>Word processing, spreadsheets, creating presentations, etc.</li> <li>Big data</li> <li>Social network management</li> <li>Virtual reality</li> <li>Web optimization</li> <li>Data based fundraising;</li> <li>Digital archiving</li> <li>Understanding QR code; understanding how augmented reality works</li> <li>3D animation, video editing illustration, etc.</li> <li>Office365 work</li> <li>Designing, data analysis</li> <li>Multimedia design</li> <li>Video posts, live posts, administration chat</li> </ul>	<ul style="list-style-type: none"> <li>Knowledge of how to create and update a webpage (not Facebook page),</li> <li>Digital production</li> <li>Teaching through simulations/augmented reality, micro-learning skills, research skills</li> <li>Visual communication skills</li> <li>Software development skills</li> <li>IT Skills</li> <li>Data analysis</li> <li>Coding</li> <li>Data analytics</li> <li>Good knowledge of project planning tools.</li> <li>Creation of virtual reality tools</li> <li>Digital Strategy and planning,</li> <li>Cloud computing,</li> <li>Multimedia design</li> <li>Creating digital content,</li> <li>Digital advanced analytic tools of data</li> <li>Digital archiving</li> </ul>	<ul style="list-style-type: none"> <li>Website development</li> <li>Social media management</li> <li>Digital design</li> <li>Digitization of art work,</li> <li>Image/video/audio editing,</li> <li>Creation of digital portfolios (Digital production), digital restoration, livestreaming and podcasts</li> <li>Digital archiving</li> <li>Copyrights protection,</li> <li>Digital marketing</li> <li>Virtual exhibitions and livestreaming events</li> <li>E-books production, digitization of printed books</li> <li>App development</li> <li>Digital transformation and planning</li> <li>Gamification</li> <li>Cybersecurity</li> <li>Big data analytic, Google ads</li> <li>Google AdWords, Google Analytics, Facebook, Facebook Ads</li> </ul>	<ul style="list-style-type: none"> <li>Search engine marketing</li> <li>Digital production</li> <li>Social media advertising</li> <li>Data protection and copyrights management</li> <li>Multimedia resources editing</li> <li>Web tools for promotion</li> <li>Data analysis,</li> <li>Digitalisation of archives</li> <li>Coding, processing tools</li> <li>Multimedia design</li> <li>Digitization of exhibits</li> <li>Livestreaming software</li> <li>Virtual reality tools</li> <li>Digital writing and publishing</li> <li>Development of digital strategy</li> <li>E-commerce</li> <li>Digital transformation of cultural institutes</li> <li>Big data analytic</li> <li>Excellent knowledge of SEO</li> <li>Data analytics, Google AdWords</li> <li>Blogging</li> </ul>	<ul style="list-style-type: none"> <li>Screening, analytics, designing</li> <li>Basic digital knowledge and skills</li> <li>Skills for analysis and research</li> <li>Creating databases; training for SPSS;</li> <li>Data management</li> <li>Coding, "big data"</li> <li>Digital archiving</li> <li>Digital strategy and planning</li> <li>Planning, Coordination</li> <li>Knowledge of multimedia design and digital marketing.</li> <li>Project management and strategy</li> <li>Digital marketing</li> <li>Sound and images processing</li> <li>Knowledge of IT resources, analytics, technological literacy</li> <li>VR and 360-degree spherical photography,</li> <li>3D modelling</li> <li>Working with SKL databases</li> <li>Digital signal management</li> <li>Managing and updating the site and placing materials on social networks</li> <li>Programming</li> <li>Digitization of cultural heritage</li> <li>Cloud computing</li> <li>Livestream</li> <li>creating digital content, security</li> <li>Photography and video production</li> <li>Python programming language, Blender cubes, and working in the Uniti program</li> <li>Site maintenance and placement of materials on digital platforms,</li> <li>Photogrammetric training</li> </ul>

Based on the results from the questionnaire for the youth and survey of cultural organization the logical framework for the gap

between youth digital skills and cultural sector's needs base on three levels of digital skills is graphically shown in the Figure 1.



**Figure 1.** The gap between youth digital skills and cultural sector's needs

The digital culture requires skill-sets that can keep up the pace with its dynamic nature. Those skill-sets can be acquired both internally and externally. The focus of this chapter was on the youth that can be a fruitful poll for cultural institution, which can tailor skilful workers according to their own needs within the digital era. In order to do so, a survey of existing skills was needed with the aim to determine its structure by the level of expertise, from basic to most advance ones.

This report revealed the significant gap between cultural sectors' need and youth skills resources in terms of advanced and specialized digital skills. This indicates that the cultural sector is facing the challenges of the digital era which brings new requirements and competence much faster than education currently follows. Thus, the results of this chapter clearly indicate the future direction of formal and informal education courses and training needed for people willing to work in the cultural sector, as well as the learning preferences of youth. Moreover, the report sheds light on the current state of digital literacy of the youth in five European countries. It indicates the major lack of skills and competence that young people need to develop in order to efficiently work in the sector of culture, thus increasing their opportunities for employability but also entrepreneurship

in this sector. Practically, if the results are implemented as suggested, this could be a tool of regional economic development based on the improved digital skills of young people willing to work in the culture.

Moreover, questionnaires we used in this study could be beneficial for cultural institutions in terms of selecting new employees for the job positions that require high digital literacy including high advanced and specialized digital skills. Specifically, in this way, cultural institutions could easily evaluate are the skills and competence of potential employee in the line with their requirements and needs.

This report showed some expected and some surprising results for the non-EU countries, such as Serbia and Bosnia and Herzegovina that currently hold a position below EU average in term of ICT usage, comparing to EU countries – Cyprus, Greece and Luxembourg. It would be interesting to find out if there are more significant pan-European differences, or even on a more global scale. Nevertheless, this report tackled an important issue for digital culture and how digital technologies are used among the youth and cultural institutions, allowing enough insight for practical implementations and for further research.



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