

# Digital solutions in the field of cultural heritage



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## Summary

The objective of this policy brief is to describe the different opportunities created through digital technologies for the preservation and promotion of cultural heritage. The document provides a brief overview of the EU policy documents addressing digitisation of cultural heritage and presents inspiring good practices stemming from the Interreg Europe projects. Digital solutions are also applied in the field of natural heritage, but the focus of this policy brief is on cultural heritage.

## European policy framework and support

Digitisation<sup>1</sup> turns Europe's cultural resources into an important pillar of the digital economy. Moreover, it gives Europe's rich cultural heritage a clear profile on the Internet, promotes regions, protects cultural diversity and contributes to better quality of life. Digital technologies provide huge opportunities for improving public access to different forms of cultural assets and its reuse. It boosts the development of creative learning and educational tools as well as tourism applications, documentaries, etc. In addition, digital tools such as 3D scanning play a major role in the preservation and restoration of physical cultural assets.

Digitising cultural heritage and supporting its economic exploitation are activities promoted by the [Digital Agenda for Europe](#). The agenda calls for better access to cultural content even in remote areas, by implementing smart technologies and more efficient integration of citizens. The [Directive 2013/37/EU \(amending Directive 2003/98/EC\)](#) lays down the general principle that documents from libraries, museums and archives shall be re-usable for commercial and non-commercial purposes, and promotes availability in open, machine-readable format together with metadata and the use of open standards.

The [Commission Recommendation on digitisation and online accessibility and digital preservation of cultural material](#) (2011/711/EU), asked Member States to take action, cooperate and involve the private sector in digitising their cultural material, in order to increase online accessibility of European cultural heritage and boost growth in Europe's creative industries. Additionally, the Member States are encouraged to create the legal framework conditions underpinning licensing mechanisms for large-scale digitisation.

The [EU Work Plan for Culture \(2015-2018\)](#) also raises the issue of digitisation of cultural content and notes that digital services can foster the expansion of trans-European tourism networks. In addition, the [New Agenda for Culture \(2018\)](#) 'prioritises a cross-sectoral approach to EU collaboration' and draws the attention to the role of digitisation for 'breaking down artistic and economic boundaries'. At the same time, a new Digital4Culture is being prepared by the European Commission 'to build on the copyright, audio-visual and broadcasting proposals and the Digital Single Market strategy and make the link to the next Multiannual Financial Framework of the European Union.

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<sup>1</sup> Digitisation is the process of conversion of analog information into digital format.



### **Accessing cultural heritage through digital infrastructures**

One of the main benefits of the digital revolution is that cultural heritage becomes more accessible to people notwithstanding their location or their financial means to actually visit cultural sites.

[Europeana](#), through the Europeana Foundation, is the European Commission arm for developing a digital cultural heritage platform for Europe with digitised cultural material including a digital library, archive and museum. Europeana now provides access to some 30 million cultural objects from more than 2,500 organisations: the resources of Europe's cultural institutions are now more internet-friendly and more widely re-usable. Under the Connecting Europe Facility, Europeana is funded by the EU as a Digital Service Infrastructure that makes culture widely accessible and provides data, technology, tools and services to Europe's cultural heritage sector and the creative industries. The role of Europeana was acknowledged both from a cultural as well as a digital innovation perspective, identify challenges to be addressed and provide recommendations to Member States, the Commission and Europeana.

### **Connecting our heritage and promoting mutual learning**

Besides improving access to cultural heritage and making it widely available, the digital revolution has the potential to stimulate mutual learning between tour operators, regions and cities. Mutual learning and comparison with the frontrunners is a key factor for enhancing regional and local ambitions for improvement of cultural heritage valorisation and preservation.

#### **Tool and mobile web app for cultural and creative cities**

Last year the [Joint Research Centre \(JRC\)](#) of the European Commission released the first edition of the '[Cultural and Creative Cities Monitor](#)', a new monitoring and benchmarking tool for 168 cities in 30 countries, aimed at promoting mutual exchange and learning among cities. The tool shows how the selected 168 cities perform on a range of measures describing the 'Cultural Vibrancy', the 'Creative Economy' and the 'Enabling Environment' of a city, using both quantitative and qualitative data. The tool is designed to help national, regional and municipal policy makers identify local strengths and opportunities and benchmark their cities against similar urban centres using both quantitative and qualitative data.

Currently the JRC is developing '**Cultural gems**', a **Mobile Web App** that will:

- allow city residents and tourists to share and discover hidden cultural and creative treasures of the 168 cities included in the Cultural and Creative Cities Monitor through treasure hunts.
- enable City Administrators to make use of the online discussion tools to engage with citizens on issues of public interest.

The Mobile Web App will be made available without charge to city administrators, citizens and tourists in Europe. JRC is carrying out a [short survey](#) to better assess the needs and interests of potential users of the Mobile Web App. to better assess the needs and interests of potential users of the Mobile Web App.



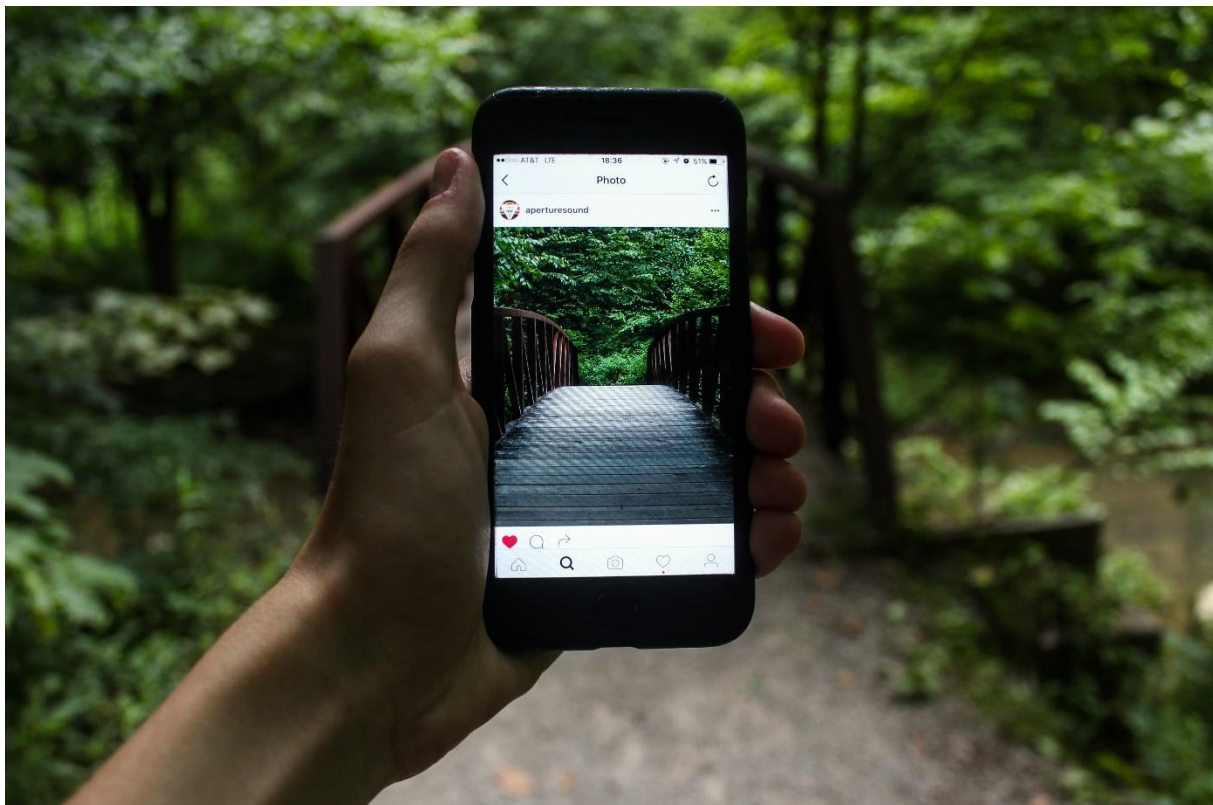
### **Digital solutions for cultural tourism**

ICT revolutionise the way we travel and enjoy tourism. With regards to cultural tourism, ICT add economic value through tourism applications that provide quality information about heritage sites and enhance visitors' experience. In addition, harnessing innovation and digital solutions contributes to a more sustainable and responsible tourism sector.

#### **European Capital of Smart Tourism**

A new initiative to reward innovative and smart tourism in European cities has been launched by the EC. The [European Capital of Smart Tourism](#) recognises outstanding achievements in four categories: sustainability, accessibility, digitalisation as well as cultural heritage and creativity by European city destinations. Two cities will be awarded the title of European Capital of Smart Tourism, and additional four cities will receive European Smart Tourism Awards for their outstanding achievements in the individual categories. This new EU initiative encourage innovation in EU tourism destinations and sustainable tourism development.

The first competition call of this new European initiative was launched on 11 April 2018, aimed at awarding the first set of cities in 2019.





### **The question of funding**

The EU structural funds can be used to co-fund digitisation activities as part of projects having an impact on the regional economy. However, such use could be more widespread and systematic. Mass digitisation processes can gain in efficiency due to scale. Therefore, the efficient use of digitisation capacity and, where possible, the sharing of digitisation equipment between cultural institutions and countries should be encouraged.

Opportunities for funding heritage-related research and innovation are also available under the three pillars of the Horizon 2020 Programme: excellent science, industrial leadership, and societal challenges. The Programme supports the development of demonstration projects that explore and present the potential of cultural heritage for urban and rural regeneration in Europe. Projects funded under Horizon 2020 are characterised by involving a wide range of stakeholders, including local and regional authorities, private sector, civil society as well as cultural heritage professionals and researchers. For example, under [Societal Challenges 6](#) of the Horizon 2020 programme, there are actions on Cost-effective technologies for advanced 3D modelling (2014), Innovation Ecosystems of Digital Cultural Assets (2015), Virtual Museums (2016) and on Semantic Gap (2017), with an EU funding of around EUR 40 million. The Horizon 2020 [Call for Research and Innovation Actions on cost-effective technologies for advanced 3D modelling](#) to enhance the understanding of cultural heritage, resulted in the selection of projects with an EU funding of EUR 2 to 4 million /project.

The [Joint Programming Initiative on Cultural Heritage and Global Change](#) (JPI CH) is a collaborative research initiative supported by the EU with the aim to ensure coordination between Member States, associated and third countries to help achieve the European Research Area (ERA) in the field of cultural heritage. The initiative promotes a joint multidisciplinary approach to cultural heritage sustainability which arises from research. To this aim, JPI CH developed a common Strategic Research Agenda and funded 26 transnational R&I projects on tangible, intangible and digital heritage under two joint calls. In 2017 JPI CH launched new funding opportunities for transnational proposals with thematic calls on 'Digital Heritage' and 'Heritage in Changing Environments'. Currently 19 Member States, 2 associated countries and 1 non-EU country are part of this initiative.

### **Challenges at regional and local level**

In 2016, the Commission published a [report](#) assessing the overall progress in the implementation of the Commission Recommendation on digitisation and online accessibility and digital preservation of cultural material (2011/711/EU). According to this evaluation, an increasing number of countries are supporting open cultural heritage data and promoting its reuse. Nevertheless, there are still great differences across Member States, and cultural heritage digitisation remains widely dependent on cultural institutions' initiatives and funding.<sup>1</sup>

At regional level a number of challenges remain to be addressed. These range from the management, maintenance and preservation of digital cultural content to the availability of material in machine-readable formats, according to open standards, with minimum resolution,

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<sup>1</sup> [http://ec.europa.eu/information\\_society/newsroom/image/document/2016-43/2013-2015\\_progress\\_report\\_18528.pdf](http://ec.europa.eu/information_society/newsroom/image/document/2016-43/2013-2015_progress_report_18528.pdf)



interoperability and rich metadata. A major hindrance is the lack of common approach or standard of how to digitise cultural content.

Digitisation requires not only technical knowledge, but also organisational capacity and understanding of how it could be beneficial to the organisations, regions and sectors. Limited knowledge understanding of the benefits that digitisation brings leads to low penetration of digital approaches. Consequently, the development and implementation of digitisation strategies for cultural heritage is considered a challenge for many regions across Europe.

At the same time, continuous disappearance of traditional skills and crafts which are part of the intangible cultural heritage is a key problem in heritage sector. Besides, in many regions across Europe there are no specific regional policies on digitisation of intangible cultural heritage or there are only sporadic activities initiated by cultural centres, municipalities, etc.

### Good practices from European regions

The current Interreg Europe programme provides support to partners which intend to work together on themes like enhancing digital knowledge among tourism actors, improving the adoption of digital approaches in cultural heritage and contribute to establishing uniform standards in the mass digitisation of heritage. Recently launched projects from the third call of the Interreg Europe programme also address the uptake of digital technologies from different perspectives. The [THREET](#) project, for instance, looks at the improvement of trail accessibility and visibility by ICT technology, while [INNOCASTLE](#) focuses on digital means for connecting and promoting historic castles, manors and estates. Communities at risk of digital discrimination are a central topic for the [CHERISH](#) project.

Moreover, Interreg Europe projects approved under the first and second calls for proposals offer insights and inspiration for the digitisation of cultural heritage assets:





- *Cultural heritage communication and valorisation*



### **New media for cultural heritage: the experience of competence centre NEMECH, [CD-ETA](#)**

The Competence Center [NEMECH](#) (New Media for Cultural Heritage) was established by the Tuscany Region in Italy and the University of Florence. Connecting research centers and institutions, the Centre promotes the transfer of research know-how from the university to the places where cultural assets are exposed and accessed by the public. NEMECH responds to the demand for innovation and provides tools and applications of digital technologies for cultural heritage. Through the direct contact with the research developed at MICC Media Integration and Communication Center of the University of Florence, NEMECH develops projects and builds innovative experiments on the use of information and communication technology in the field of cultural heritage. Among others, 3D Modeling, Computer Vision, Computer Graphics, Multimedia Presentation, Natural Interactivity, Mobile applications, Sensor Networking and Smart Computing are areas of experimentation and implementation. Examples of recent projects:

- The Hero project, Academia Museum, Florence, 2015: mobile application with proximity sensors to understand contemporary art;
- The Bahnlandschaften project, Forte di Fortezza, Bolzano, 2015-2016: automatic people detection based on computer vision to display introductory visualizations;
- The MNEMOSYNE project, Bargello Museum, Florence, 2013 – 2016 computer vision and multimedia solutions to understand people interests during a visit to the museum;
- The See\_for\_me project 2016-2017: mobile computer vision-based smart audioguide to provide information about the observed items both indoor and outdoor

Taking as example project MNEMOSYNE, the system offered personalized in-depth information based on the visitor's interests. It was installed at the Bargello Museum in Florence. It used video cameras and an artificial vision software to detect the visitors' paths in the room, understand the artworks to which they were most interested, and support the definition of their individual profiles of interests. When the visitor approached an interactive table at the exit of the room, he was re-identified and could access more in detail information on the artworks he was interested in during the visit and explore links to other similar works in the same museum or in Florence. The system was non-intrusive and privacy respectful and the visitor was not required to carry any mobile device. Overall, the system provided good evidence of the opportunities that computer vision technology offers to understand people's interests and support real-time profiling with instantaneous feedback. Such computer vision capabilities were further developed in the mobile audio-guide of new generation See\_for\_me project.

[www.interregeurope.eu/cd-eta/](http://www.interregeurope.eu/cd-eta/)



- *Enhancing people's connection with heritage*



### ***Coastlight - digital dissemination of coastal heritage, [HERICOAST](#)***

In Agder (Norway) more than 50% of the house owners in the cultural environment of Lyngør live in the capital Oslo, while only less than 17% live within the county located approximately 200 km from the capital. The coastal cultural landscape is made up of vast historical maritime infrastructure that is difficult to interpret and access for the general public. At the same time, the responsibility for the dissemination of these landscape values is not limited to one single institution.

To meet these challenges, Lindesnes Lighthouse Museum developed [Coastlight.net](#) as a website that combines flexibility, easy access and qualitative content on the maritime history presented through films, photos and text. The stories are linked to their geographical position with digital maps. The platform aims to deliver high quality content and to cover a growing geographical scope. However, the museum has neither the resources nor knowledge to produce all content. Therefore, the museum has encouraged other stakeholders (mainly other cultural heritage institutions) to provide content. Main user groups are tourists and local students and schools but more user analysis is needed in order to properly estimate the social impact of the initiative. In addition, the platform is used by the regional public authorities to raise awareness amongst policy makers on specific coastal landscape of high value. In 2018 the platform offers 115 videos, 464 text and photo based descriptions. 28 institutions use the platform to share content. As a next step, opportunities for better integration in regional online tourism marketing can be explored.

[www.interregeurope.eu/hericoast/](http://www.interregeurope.eu/hericoast/)







- *Protecting intangible cultural heritage*



### ***Register of the Intangible Cultural Heritage of Slovenia, [CD-ETA](#)***

The [Register](#) is a technical list of intangible cultural heritage from Slovenia. It includes elements connected with intangible cultural heritage and the bearers of that heritage. Currently, there are 58 elements and 170 bearers included in the register. Elements that are Slovene or characteristic of a specific region in the country may have a number of bearers, while local elements may have only one. Proposals for inclusion in the register are drawn up by the Coordinator for the Safeguarding of the Intangible Cultural Heritage, while the register is maintained by the Ministry of Culture of Slovenia.

In 2009 and 2010 the role of Coordinator was carried out by the Institute of Slovene Ethnology at the Scientific Research Centre of the Slovene Academy of Sciences and Arts, and since 2011 by the Slovene Ethnographic Museum. Elements of the intangible cultural heritage in the register with special significance can, in a further procedure, be declared as intangible cultural heritage of special local or national importance, and the latter can apply for UNESCO Representative List of the Intangible Cultural Heritage of Humanity.

[www.interregeurope.eu/cd-eta/](http://www.interregeurope.eu/cd-eta/)





## What can regions do next?

### *Embracing digital solutions for cultural heritage promotion and preservation*

- Regions and cities need to take up the opportunities brought in by digitalisation and digitisation as a means to valorise and preserve their cultural heritage. This should be done through translating the EU policy framework and digital ambitions in regional and local strategic documents and action plans.
- At local and regional level more efforts are needed to preserve the intangible cultural heritage and to promote digital tools as a way to disseminate and safeguard it. The example of Slovenian register on intangible cultural heritage is a positive step in this direction that could be replicated elsewhere.
- There is a need to foster collaboration and create partnerships between regional authorities, museums and academia to increase the attractiveness of the museums and visitors' experience. The example of NEMECH demonstrates how to respond to the demand for innovation and applications of digital technologies for cultural heritage can be inspirational for other regions and cities.
- In many cases, heritage assets presented in the current form are unappealing for young people. At the same time young people are active users of modern technology and digital solutions will be helpful in raising their interest in historical areas, cultural heritage and museums. The example of Coastlight is a positive step in citizen engagement and raising the interest of young people in the maritime history of the county.

### *Strengthening knowledge and competences*

- There is a need to build the knowledge base and enhance capacity of public authorities and institutions for developing and implementing digitisation strategies for cultural heritages artefacts based on common standards and approaches. Insufficient knowledge on legal issues concerning data protection in local public entities needs to be addressed as well. Interregional cooperation can contribute to this process by providing a platform for mutual learning and exchange between regions and cities across Europe.
- There is a need to strengthen the digital competences of museum professionals in order to allow museums to become more accessible and interesting including in a cross-border and European context.

### *Digital technologies and cultural tourism*

- Regions and cities, in cooperation with businesses from tourism sector and cultural institutions, need to take further steps in supporting and encouraging the use of digital technologies in cultural tourism. Good examples from frontrunners could serve as an inspiration for regions that are lagging behind. For example, virtual resources, 3D experience tools, video games, mobile apps are funded under the Operational Programme of the Spanish Extremadura region, thus supporting access and experience of information and history of the sites (Extremadura region is a partner in Interreg Europe [INNOCASTLE](#))



project). Another example is a good practice from Sweden identified by Interreg Europe [Green Pilgrimage project](#) on a [website based application](#). The application has been developed by Visit Ostergotland and allows users to explore the natural and cultural heritage of a famous pilgrimage route in an innovative way. It also allows local businesses to upload their details and to provide regular business updates for users to access food, accommodation and activities near the trail.

### Financing

- The preparation of the next Multiannual Financial Framework of the European Union is an opportunity for regions and cities to attract significant financial resources for digital solutions in the field of cultural heritage. In order to do so, the strategic task of digitisation needs to be included in the regional strategic frameworks. Higher awareness among regional and local administrations about the benefits of digitisation is a pre-condition for this.
- Regions need to explore opportunities for encouraging partnerships between cultural institutions and the private sector in order to create new ways of funding for digitisation of cultural material and to stimulate innovative use of the material.

### Sources of further information

- [European Agenda for Culture](#)
- [Work Plan for Culture \(2015-2018\)](#)
- [Digital Agenda for Europe](#)
- EC, [Getting cultural heritage to work for Europe](#), a Report of HORIZON 2020 expert group on cultural heritage, 2015
- EC, [Mapping of Cultural Heritage actions in European Union policies, programmes and activities](#), 2017
- [EC, Implementation of Commission Recommendation on the digitisation and online accessibility of cultural material and digital preservation, Progress report 2013-2015, 2016](#)

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*#Culturalheritage*  
*#Digitisation*  
*#Digitalpreservation*  
*#cooperation*



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