

ICT-Based Participatory Approaches for the Exploitation and Re-use of Intangible Cultural Heritage



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Abstract Cultural heritage, in both its tangible and intangible form, is an important factor for social cohesion, tourism and economic development, and ICT technologies can help significantly to this end. The present paper aims at linking the fields of Intangible Cultural Heritage (ICH) and ICT technologies with an emphasis on participatory approaches, using the EU i-Treasures and Terpsichore projects as case studies. The two projects leverage modern ICT technologies to improve the analysis and presentation of ICH, raise public awareness, provide seamless and universal access to cultural resources, support new services for research and education and recommend new development strategies. After a brief review of the state of the art on participatory approaches from both the ICH and the ICT technologies field, the paper proposes a new set of interventions and approaches, based on the experience gained from the two projects, that aim towards innovative participatory applications for the exploitation and re-use of ICH. It is shown that the implementation of such interventions can have significant economic benefits for cultural organisations. It is also suggested that further research is required to enhance the links between the ICH and the ICT technologies field.

Keywords Intangible Cultural Heritage · ICT technologies · Participatory approaches

1 Introduction

Cultural heritage is an important factor for social cohesion, tourism, and economic development. This is evident not only in the UNESCO World Heritage Sites, but also in off-the-beaten-track sites of national or regional significance. The impact of

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the economic crisis, which is more evident in low-income regions in EU, in addition to other (demographic, structural, immigration, etc.) problems creates a strong need to leverage cultural assets for growth and the benefit of the society. At the same time, the wide use of the internet and the rapid advances in ICT technologies make cultural organisations and their funders increasingly appreciate the importance of digital collections. The prospect of making collections available to new and distant audiences is compelling, and ICT technologies offer a significant promise for enhancing and democratising the access to cultural content. For instance, by exploiting crowdsourcing (e.g. through social media platforms), cultural organisations can enhance their collections with additional content and metadata, and make it more appealing to visitors. Furthermore, a broad range of innovative applications can be defined, such as games, thematic searches and digital walks, which can be very appealing to new audiences and special target groups such as young kids, elderly, minorities and immigrants. Additionally, business-oriented applications can create new commercial opportunities and boost local development by linking culture to other economic sectors. Moreover, cultural organisations can augment the presentation of real exhibits with associated information (data or metadata from the digital surrogates or from external sources, such as Europeana) that provide significant added value to the visitors.

In addition to tangible heritage, such as monuments and artefacts, cultural expressions also include intangible live expressions, which involve knowledge and skills, such as music, dance, singing, theatre, human skills and craftsmanship. These manifestations of human intelligence and creativeness constitute the Intangible Cultural Heritage (ICH), and are a key factor of local cultural identity and sustainable development. However, a large number of such expressions are often not sufficiently safeguarded and are in danger, for various reasons: national heritage protection systems often give priority to tangible heritage over intangible heritage; also globalisation leads to the prevalence of more popular global cultural traditions and habits at the expense of local ones. ICT technologies offer new opportunities to deal with this problem, by documenting, recording and thus safeguarding heritage expressions [1]. Such use of ICT can (a) give rise to a deeper understanding of ICH, (b) unveil unknown correlations between kinds of ICH from different time periods or geographical areas, (c) create new ways for cultural expression that connect the past and have relevance in the contemporary world and (d) break new ground in education, knowledge transfer and research of ICH.

The present paper aims at linking the fields of ICH and ICT technologies with an emphasis on participatory approaches, using the EU i-Treasures [2] and Terpsichore [3] projects as case studies. After a brief review of the state of the art on participatory approaches from both the ICH and the ICT technologies field (Sects. 2 and 3 respectively), the paper presents the two projects (Sect. 4), and then proposes, based on the experience gained from them, a new set of interventions and approaches that aim towards innovative participatory applications for the exploitation and re-use of ICH (Sect. 5). Finally some conclusions are drawn (Sect. 6).

2 Intangible Cultural Heritage: Participatory Approaches

2.1 Living Heritage: Continuity and Change

Heritage is seen and safeguarded in a continual process of evolution and creation, in the context of the community's connection with heritage. This emphasis on the creation of heritage is in accordance with recent trends that tend to see people and buildings as crystallisations of persistent processes, which continually carry on, undergoing continuous birth; heritage is continuously growing [4]. The creation of heritage is also advocated by the UNESCO Convention for the Safeguarding of ICH (henceforth cited as UNESCO Intangible Heritage Convention) and the living heritage approach. The Intangible Heritage Convention safeguards exclusively living—and not dead—intangible heritage, i.e. heritage that is “spontaneously transmitted from generation to generation, . . . liable to change at every manifestation and . . . characteristic for the groups and societies for whose sense of identity and continuity is of primary importance” [5, 6]. The concept of “living heritage” embraces tangible and intangible heritage expressions, and is linked to the concepts of “continuity” and “change/evolution” [7, 8].

In the context of continuity and change, the term “authenticity” is not emphasised or even avoided, as in the UNESCO Intangible Heritage Convention (in differentiation from the UNESCO World Heritage Convention), since this term is considered to lead to the freezing of heritage at a certain point in time [9].

2.2 Heritage Practitioners: An Inseparable Part of Living Heritage

The emphasis on the local heritage practitioners is in accordance with a changing “balance of power” in the discipline of heritage studies, with “the expert increasingly seen as the servant of the public, rather than its guide and educator” [10]. In this context, a specific local community group is often linked to the continual evolution and creation of heritage: it is the one that created heritage and sustains its original function, considers heritage an integral part of its contemporary life (in terms of its identity, pride, self-esteem, structure, and well-being), and sees the caring for heritage as its own inherent obligation [7, 8, 11]. This community group is seen as an inseparable part of heritage, and is given priority over other communities operating on a local, national and international level. Conservation professionals and the other communities provide support to this specific community in the context of the continual evolution and creation of heritage. This emphasis on the local heritage practitioners, supported by the professionals, is in accordance with the concept of “Living Human Treasure” of the UNESCO Intangible Heritage Convention [12] and with the concept of “core community” of the living heritage approach.

2.3 Global Digital Users: Experiencing and Further Creating Living Heritage

There is an increasing recognition of “emerging [digital] modes and technologies for accessing and experiencing heritage” and of the global digital/virtual communities as a stakeholder group in the heritage field, as characteristically noted in the influential Nara+20 Document [13]. Furthermore, these digital modes contribute to the enhancement of the experience of heritage by the users. This follows recent approaches that tend to see and offer heritage as a visitor experience [9, 14].

2.4 The Broader Local Community: Achieving Sustainable Development Through Living Heritage

Sustainable development is still seen as rooted primarily in the broader local level. Hence, it is important to link the increasing recognition of the “emerging [digital] modes and technologies for accessing and experiencing heritage” and of the global digital/virtual communities (see above) to the local community concerns and interests [15].

3 ICT Technologies: Participatory Approaches

Cultural organisations, such as GLAMs (Galleries, Libraries, Archives and Museums), become increasingly interested in the monitoring of the participation of visitors in an attempt to increase the number of visits and by extension revenues, especially at the current times of economic instability/crisis in Europe. To this end, there is a considerable number of ongoing experiments and projects on a European level that aim at identifying best practices, relevant to different types of users and museums, segmented by type of visitors (such as young, seniors, families, children, and bikers), also integrating them with ICT-based participatory approaches. For example, cultural organisations increasingly employ games to advertise and familiarise real or potential visitors to their collections [16]. A number of games also exist for smartphones, such as Tate Trumps [17], YouTell TE [18] and Battleship “G. Averof” [19], which allow museum visitors to create and share through smart phones their own media and stories.

The DigiArt project [20] aimed at providing new, costefficient solutions for capturing, processing and displaying cultural artefacts. Besides the innovative 3D capture systems and methodologies, the project developed a robust and user-friendly storytelling engine [21], which is a web-based tool that allows curators to upload 3D assets, assign behaviours into them, and wrap everything in a Unity3D game. This

software allows the virtual museum visitors to view the museum artefacts—and learn about them—in a 3D first-person view game.

Similar ICT-based approaches are adopted in the field of Cultural Heritage Education, while 3D reconstructions are often used to broaden the opportunity to appreciate cultural contents that are remote in space and/or time. Even though they can be very helpful for widening access to cultural contents, they often are not intrinsically engaging and sometimes fail in supporting active learning, just giving the opportunity to access information. Furthermore, most are just for tangible cultural heritage (not for intangible), and only a few define clear educational goals.

In general, ICT-based approaches can be a powerful tool for cultural organisations and can be applied in many different ways, such as: (1) crowdsourcing applications (e.g. inviting users to correct and/or transcribe digitised texts), (2) educational application targeting specific target groups, (e.g. young, mature audiences, immigrants), (3) applications for tourism and related business sectors (e.g. apps for thematic cultural routes, that may also include local tourist service providers and generate new business models), (4) applications for creative industries and professionals from the field of social sciences and humanities (e.g. applications that can perform complex queries and find relationships in large archives of multimodal media or ICH dance performances).

However, research in the area is still fragmented: there is a strong need to identify best practices [22], which directly address specific user needs, and propose new innovative approaches and applications to fill in this gap. Many additional challenges exist: how to handle different groups of users with various educational, professional or national backgrounds and different competency levels, reluctance of some users to participate and negativity/fear towards new technologies, technical difficulties (esp. in human body capture), rapid pace of technological advancements, etc.

In this context, in this paper we propose three types of interventions to maximize the benefits from the use of digitised cultural assets, taking into account the local situation, along with any applicable requirements and constraints.

4 The i-Treasures and Terpsichore Projects: Presentation

i-Treasures project [2] explored the challenges and emerging opportunities when considering the safeguarding of intangible heritage from a technological perspective. i-Treasures developed an open and extendable platform to provide access to digitized ICH resources, which allows both knowledge exchanges among researchers as well as education of new apprentices. The system is based on the identification of specific features or patterns (such as postures and audio patterns) using multi-sensor technology (such as cameras, microphones and EEG) for different ICH types. Subsequently, data fusion is applied to exploit information across different modalities, and probabilistic inference was used to transform the extracted data into a level

of interpretation that is understandable by humans. This information, coupled with other cultural and educational resources, is accessible via the i-Treasures platform, based on an open-source CMS, to enable the wide participation of communities and individuals in the mapping and safeguarding of ICH. Metadata information is (partially) compatible with the Europeana Semantic Element Set, however full integration with Europeana was not possible due to the complex multimodal data/metadata generated from recordings. Furthermore, the project developed—in collaboration with dance experts—a generic framework that provides an easy way to design and develop simple game-like applications for dance or other kind of activities involving human motion. The exploitation opportunities of this tool are numerous, not only in the dance domain (a game for the popular Salsa dance has already been released), but also in other domains such as physical exercise, martial arts, physiotherapy and rehabilitation.

Terpsichore project [3] aims at digitising, modelling, archiving and e-preserving ICH content related to folk dances by integrating the latest innovative results of photogrammetry, computer vision, semantic technologies, time evolved modeling, combined with the story telling and folklore choreography. The proposed framework addresses many different needs of the potential users including dance professionals, dance teachers, creative industries, general public, researchers and media producers.

5 The i-Treasures and Terpsichore Projects: Lessons Learnt

Based on the experience from i-Treasures and Terpsichore projects, three types of interventions are proposed, combining approaches and methodologies from the ICH and the ICT technologies field:

- (a) **New crowdsourcing platforms and applications are required to enhance existing cultural collections.** In [23] an excellent review is provided on the use of crowdsourcing in the cultural domain. Crowdsourcing has a most significant potential to enhance the cultural content with involved consumers and providers. This would require, however, a fundamental change in the management of new data and would involve risks that need to be mitigated. Starting from existing best practices and successful examples reported in the literature, further research is required on designing efficient crowdsourcing applications to enhance the existing cultural collections with content and/or metadata.

Some of the challenges in this area include: (1) Giving appropriate incentives to encourage active participation from a critical mass of users. Such incentives can be social motivations—connectedness and membership—along with altruism, fun and competition [24]; (2) Efficiently combining the input from experts (such as researchers and curators) with feedback from amateurs or general public; (3) Collaboratively synthesising interesting stories and experiences and creating new exciting interactive applications. Examples: annotating or

augmenting performances or highlighting their historical or social context or evolution over time.

- (b) **Applications targeting special groups (such as children, elderly, minorities and immigrants).** Nowadays, a significant challenge for cultural organisations is how to engage with new audiences and expand existing ones. Creating applications that target specific groups (e.g. children) can contribute significantly to this goal. For instance, many organisations offer courses on pottery, which can yet create considerable difficulties: the courses might not be popular among children and teenagers; also, there are high costs related to real pottery platforms. Providing e-courses on pottery via a digital platform that supports gamification and is also accessing from distance (e.g. at home) can encourage children and teenagers become more interested in this ICH expression and find additional motivation to learn pottery, and at the same time reduce costs and give them additional motivation to learn pottery. The option to 3D print their work is expected to increase the motivation and creativity of young learners. For this reason, further research is required on approaches and applications, such as gamification, interactive storytelling, thematic searches, and VR/AR visualisation. Such applications can be used either as standalone learning tools, especially in the cases that the access to educational material, resources and real courses about a specific type of ICH is difficult, or as supplementary learning tools that are complementary to the real courses.
- (c) **New ICT-based approaches and applications for new business opportunities and benefits to local communities.** New ICT-based approaches and applications can address a wide range of sectors, such as: (1) education: technology enhanced learning approaches, such as e.g. educational game applications; (2) tourism and related business sectors (e.g. mobile applications for thematic cultural tourism) that can involve many tourism actors, boost the local economy and create new business models; (3) creative industries: e.g. gaming applications that combine education and leisure; (4) research in culture and other social sciences: ICT applications to efficiently index, search and interrelate data, addressed to researchers and other professionals from the cultural and other social sciences (e.g. cultural historians).

6 Conclusions

Based on the experience from i-Treasures and Terpsichore projects, a series of remarks of broader applicability can be drawn on linking the ICH and the ICT technologies field, with an emphasis on participatory approaches. First, each type of ICH has different safeguarding needs, which require a different combination of technologies and other safeguarding measures. Thus, it is not useful or productive to apply a single safeguarding model to each case. Second, technologies should not drive the safeguarding projects; instead, the safeguarding projects should be driven by the user needs identified by heritage practitioners and professionals as they are in

a better position to identify the most useful course of action. Therefore, heritage practitioners and professionals should be involved from the very beginning and throughout the ICT-led projects. Third, ICT technologies can offer less expensive, and thus easier to introduce, means that can contribute significantly to ICH safeguarding and transmission: (a) by enhancing of cultural collections with new data and metadata using crowdsourcing, (b) by further encouraging existing audiences e.g. by providing open, distant ways of accessing and exploiting the cultural content, and also through addressing new, specialised audiences (such as children and immigrants) and (c) by creating new business opportunities and benefits to local communities. Thus, using ICT technologies and participatory approaches for the safeguarding of ICH is very relevant, particularly in times of economic instability/crisis.

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