

# Developing the COOLTURA Resources-Driven Governance Model for Building Scalable Cultural Services in the COOLTURA Platform

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**Abstract.** Cultural institutions and sites currently debate on how to respond to new trends, such as globalisation, exponential growth of digital cultural content and Apps, and reach technological knowledgeable users. In addition, institutions need to look for new ways of engagement, as the engagement of citizens with their cultural heritage environment remains low. This paper presents the preliminary results of a qualitative research performed to evaluate new opportunities for the COOLTURA Platform (output of TAG CLOUD project); as well as the proposal of developing the COOLTURA resource-driven governance model to support the COOLTURA Platform up-take.

**Keywords:** Engagement · Cultural heritage · Governance in culture · Cultural platform · Cultural apps

## 1 Introduction: Cultural Heritage Changing Environment

Cultural heritage institutions have invested a lot of money in capturing, digitalizing and digitally storing (as well as preserving) high volume of digital cultural objects in order to cope with the increasing growth of heterogeneous and unstructured data within cultural institutional information ecosystems [1]. Globalisation, massive and pervasive usage of electronic devices, together with the profusion of productivity and semantically web2.0 oriented applications, are being deployed as main support for transactions

and communications in order to find new ways to increase engagement, sharing and consumption of cultural content. We can see for example that the use of smartphones, social media and downloadable applications (“Apps”) for mobile devices is growing rapidly in all sectors including the cultural heritage environment and related sectors such as tourism [3]. Altogether, these technologies also shall be able to benefit cultural institutions in managing more efficiently and effectively current, and future, digital cultural objects.

Moreover, cultural heritage institutions are continuously evaluating how to capitalize the investment in digitalization and creation of newly digital content. This process includes changing the way how to produce, present, access, share and consume digital cultural objects [5]. By progressively adopting emerging technologies and putting in place a set of sustainable integrated services to be used before, during and after the visit for lifelong engagement, cultural institutions aim at underpinning and creating cultural experiences, personalisation and customised services [5].

In parallel, many cultural heritage organisations, monuments and cities are also taking a hybrid approach by supporting exhibitions with thousands of digital objects in order to actively encourage cultural learning, debate, action and interaction; furthermore, looking for new and better connections with visitors, and increase engagement of visitors with culture [6].

Under this context, the European Commission co-funded project TAG CLOUD [7] is exploring the use of cloud-based technologies to enable cultural engagement by using cloud-based technologies that leverage adaptability and personalisation of created cultural heritage content, aiming at supporting deeper learning of cultural heritage over time. As a tangible result, the TAG CLOUD project is developing the COOLTURA Platform and COOLTURA App to cope with its objectives.

## **2 COOLTURA by TAG CLOUD: Managing Cultural Content for Engagement**

The COOLTURA Platform and App have been developed following a User-Centered Design (UCD) methodology [8] and using an iterative design cycle that managed a framework of scenarios from three pilot users in Europe: The Monumental Complex of Alhambra and Generalife (Spain), the Barber Institute of Fine Arts (United Kingdom) and the County of Sør Trøndelag (Norway).

The COOLTURA App is the mobile devices oriented application that accesses, uses and re-uses the cultural content processed in the COOLTURA platform. The COOLTURA App aims at exploiting the potential and characteristics of smartphones and mobile devices that allow mobility features, such as geo-location, real time interaction, and thus provide personalised up to date and interactive cultural heritage enriched content. By using embedded tools, the COOLTURA App allows visitors and users to experiment with different types of interactions with cultural objects (e.g. augmented reality), as well as recommend new experiences based on the earlier user behaviour and supporting lifelong experiences. Thus, through the App, visitors are able to experience cultural social interaction, use real-time geographical mapping to increase

their user experience, get content that couples with their preferences and interact or consume the cultural content as curiosity arise.

The COOLTURA Platform is a cloud-based and open data oriented platform that enables scalable services for cultural engagement. It is being tested, piloted and firstly exploited with the COOLTURA App. The COOLTURA platform has been conceived as a suite of services that supports harvesting, semantic treatment and curation processes for digital cultural content and objects.

Semantic, intelligent content and analytic tools have been integrated in the platform as an intelligent layer. This layer grants the platform with the ability to abstract complex data and cultural consumption processes, converting them into content and processes that could be more consumable and manageable by the visitors. This layer allows personalisation, adaptability of content and social interactions based on each visitor likes and personal preferences.

Harvesting tools have been integrated, so the platform is able to process curated digital content coming from cultural institutions and other sources, such as Europeana. Through the harvesters, the COOLTURA Platform can map, build and increase the metadata structure moving towards the Open Government Data (OGD) metadata scheme (a standard for the bases for eGovData). This tool shall allow cultural institutions and third parties (software vendors, developers, intermediaries, etc.), to better enrich metadata and benefit from the Open Data eco-systems that will support further use, and re-use, of the curated digital cultural content for cultural engagement in other contexts; such as tourism or smart cities.

In addition, the COOLTURA platform has an analytic layer and a dashboard that allows cultural site curators and managers to get analysed information regarding the usage of the digital content and apps. This layer analyses massive amounts of visitors' data and enable cultural content management decision making in cultural sites, such as support creating/detecting "hot spots" for visitors, as well as creating/improving more demand oriented content and/or new apps.

Thus the COOLTURA platform interoperates with the COOLTURA App, as well as allows the integration of newly and other existing cloud-based tools and/or apps (complying with the platform requirements) developed or managed by cultural institutions registered in the platform. These Apps, also could use innovative tools such as the augmented reality, storytelling or wearable devices. Moreover, the platform enables integration of personalisation, content adaptation and social sharing to the new Apps; allowing cultural institutions to articulate the widest possible reuse of and access to digital content and objects.

### **3 Current Status of COOLTURA and End User Approach**

Both the COOLTURA Platform and COOLTURA App have gone through early-stage evaluations with users, following the scenarios in The Monumental Complex of Alhambra and Generalife, the Barber Institute of Fine Arts and the County of Sør Trøndelag.

Currently, parallel work is being performed: on one hand the TAG CLOUD consortium is working in ways to retrieve information about the user, both passively and

actively, in order to explore various parameters that affect the protocols in different context. Information from the users' devices allows us to investigate their interaction with artefacts, and enables the system to form assumptions of their respective interest levels, working towards an optimal approach for personalisation and content adaptability. On the other hand the interoperability and test of the COOLTURA App with the platform's software developments of personalisation, social sharing and content adaptability is being performed. The usability and design of the App interface is being also tested, reviewed and enhanced with real users. In addition developments of the platform have been performed for allowing the STEDR,<sup>1</sup> as an additional App, to be plugged to the COOLTURA platform. This development also tests the scalability of applications in the platform and evaluates requirements needed for adding applications.

In order to evaluate the potential usage, benefits and constrains for up-taking the COOLTURA Platform and App, a qualitative market research that gathers primary information from 50 in-depth interviews with cultural sites, at European level, has been launched. The process aims at capturing how European cultural sites (institutions and cities) shall uptake a platform and an App, based on the experience of the pilot sites of the TAG CLOUD project.

The COOLTURA platform and App are explained from functional and practical point of view to the interviewees at cultural heritage institutions and sites; insights are collected; and later a small evaluation exercise is performed using the "product box" technique.<sup>2</sup>

Insights comprise, comments regarding functionalities, new ways of using digital curated content, current problems that need to be solved, as well as expectations and plans for the future regarding their cultural tangible and intangible heritage and knowledge based services.

## 4 The Road Ahead: Governance of Apps and Content

Preliminary findings from qualitative market research performed to pilot sites and some cultural institutions in Spain [9], show that cultural institutions and sites debate on how to respond to new trends and changes of society and visitors. Meanwhile these institutions and sites not only suffer of budget constraints, but also look for new ways of engagement with visitors. When approaching what "engagement" means and how should be taken in account for management practices, in general we could infer from interviews that this "engagement need" responds to the fact that cultural institutions and sites have as critical "mission" keeping the perpetuity and the value of the humanity's cultural public and historical heritage; as well as transferring and increasing the knowledge of cultural heritage to current and future generations.

From first insights gathered, we have observed that cultural sites and institutions are clearly influenced by a vast multiplicity of socioeconomically and political processes and trends, which are influencing the structure and dynamics of how these sites interact

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<sup>1</sup> STEDR: application for story telling. <http://stedr.blogspot.com.es/2014/05/about-stedr.html>.

<sup>2</sup> Product Box technique allows participants to imagine they are selling a product or service.

with their visitors; and so respond in different manners to the need of increasing engagement. The interviewed institutions have mainly commented on the following trends: the globalisation process; competition for private or public financial resources, new legally enforced protective measures for intellectual assets while at the same time the rights of citizens – individually or collectively – are also enforced; a shift towards a digitalized society with knowledge-based “*services’ economy*,” massive and pervasive usage of electronic devices; and the beginning of a new generation of youngsters that have never known a world without the Internet, social media, and mobile technology (technologically-native children born in the digital era - Generation Z [10]), that is foreseen as the future generation of cultural heritage visitors.

In order to cope with these trends, the cultural sites and institutions are shifting from non-digital to digital media; and increasing the development of Apps. The shift towards digital media has escalated both, the digitalization of content and the “born digital” content with heterogeneous formats. This has been driven not only for the need to move toward the provision of content for digital means of visitors, but also by a growing number of sources (individuals, tourism enterprises and content suppliers, as well as curators from cultural institutions and sites) with diverse devices (mobiles, cameras, curators tools, etc.). However, according to the European Commission, still only a fraction of Europe’s collections digitised so far (around 12 % in average) [2], on the top to the content that directly is created on digital format. Not only the growth of born digital content is expected to increase, but also the growth of digitalised content. The European Commission has recommended to make the cultural institutions’ digitized material accessible through Europeana [4], setting as an objective to provide direct access to 30 million of digitized objects by 2015.

The following points have also been raised during the interviews by the cultural institutions and sites, as key trends that affect their data management processes and costs:

- Exponential growth of digital cultural content also generates new/additional requirements, overheads and needs; for example much more time is needed to the creation and/or selection of high quality of content and/or valuable data to interact and connect with visitors.
- Some digital content is considered as capital and with unique value, as it cannot be recreated or replicated (e.g. in archaeological sites); thus there are new needs that relate with authenticity, preservation, life-cycle and legal rights for reproduction. Also, some of this content is being thought as a new revenue stream in order to create sustainable processes and services; however this thought is not aligned in many cases with the core mission of cultural institutions, which rest on showing, teaching or transferring the humanity’s information heritage and providing readily access of the digital patrimony to current citizens and future generations. So new opportunities are being evaluated for this kind of unique cultural heritage content.
- Cultural heritage content now has to be continuously available all day, for the mobile devices and digital means, in order not to cause major problems for digital services offered based in the digital content.
- There is an increasing need of managing context and tracing of information paths, as this allows enrichment of current digital content and adds value when linked with

other digital content (value of content increases when linked and related to other sources, methods, images, data or tools).

Regarding Apps, the insights collected from interviewees reported that Apps are becoming somehow “essential” and very practical tool for the cultural institutions. This comprises the increasing creation of Apps by cultural heritage institutions and sites, as well as its increasing usage by visitors. According to the cultural heritage sites interviewees, Apps reduce costs and provide variety of tools in comparison to large software solutions, improve access to local, geo-located and practical information, reach the visitors easily and increase their interaction with the cultural sites through their mobile devices; also in many cases, integrate or interact with social networks.

According to the Seggitur report this cultural, travel or tourism driven Apps might be in its infancy, but they are expected to grow rapidly, as well as notably evolve in functionalities, user value and market. Apps in the cultural heritage and tourism sector are aggressively increasing and the main differences lie primarily in terms of content and functionality. According to the study in 2011, 23 million of Apps for this sector were downloaded worldwide, while in 2012 it was estimated that Apps would grow by 38 %, reaching 32 million of Apps [3].

To a great extent, our findings show that the lack of understanding and/or budget to confront with all this rapid changes and trends is producing a lack of policies and strategies for efficiently managing digital assets and Apps being produced to exploit the digital content. Notwithstanding, these issues are also creating a phenomenon of change with regards to content production, management and archive/storage, which needs to be approached in cultural institutions or sites.

Thus, when showing the COOLTURA platform interface and structure to the cultural heritage institutions and sites, and asking how they think this platform could respond to their needs, interviewees mainly answered that the COOLTURA platform could be an opportunity and a tool to support the management and governance of digital content and Apps in their institutions.

## **5 Next Steps: The Vision of the COOLTURA Governance Model**

The preliminary insights gathered from our pilot sites and additional institutions, have raised the fact that the COOLTURA platform could be used to support digital content and Apps. So, we started to develop the COOLTURA resources-driven governance model based in the case of The Monumental Complex of Alhambra. This model could be used as best management practices by registered cultural institutions in the platform.

The COOLTURA resources-driven governance model aims at linking the resources allocated in the COOLTURA Platform (Apps, digital cultural content, technological developments such as personalisation processes or new linked technologies such as augmented reality or storytelling.) and the cultural heritage’s institutional framework.

This governance model comprises three main and preliminary steps: planning, implementation and monitoring; and rely on the fact that the COOLTURA platform allows integration of new Apps in a highly scalable way and provides feedback for

Apps and cultural content through the platform's dashboard. These steps are recursive and aim at supporting cultural institutions to manage new scalable cultural services that engage with visitors, the local community and new audiences.

The planning step relates with the fact of linking cultural heritage digital content with institutional policies that address the tangible and intangible value of digital heritage, as well as with making a participatory design of the digital offering, taking in account the feedback and better knowledge of preferences of visitors and locals provided by the COOLTURA platform.

The implementation step will allow identifying new models that provide digital services and cultural content through the different functionalities of the Apps connected to the COOLTURA Platform. The implementation stage should pave the way to connect the digital cultural content and provide:

- New technologies and Apps with “narratives” that link with visitors’ enjoyable experiences and to more consumable digital cultural content.
- Exploitation of intangible cultural heritage opportunities through narratives and content that strengthen the identity of local communities and the shared European heritage values; as well as educational values that support sustainable behaviours towards the direct and indirect preservation, re-construction, maintenance and transference of knowledge of cultural heritage.

The monitoring step will identify the valorisation enjoyment, usage and perspectives of visitors (according their profile) regarding the digital services offering (digital cultural content and Apps) through the COOLTURA platform dashboard.

The COOLTURA resources-driven model will also allow to the COOLTURA platform users to build scalable cultural services over the platform in an organized way and support decision-making for selecting, high quality and visitor driven, cultural digital content. Through this governance model, which allows feedback (through monitoring and the COOLTURA Platform) the cultural institutions will be able to manage, in a controllable and visitor driven way, the increasing digital content and applications.

In consequence, through the COOLTURA resources-driven model, the cultural institutions and sites shall be able to manage the potential to improve the management of the user experience and enjoyment of culture, the capacity of building new audiences, increase shared heritage, identity and citizenship, as well as provide new cultural-driven learning environments and narratives.

## 6 Conclusions

TAG CLOUD project puts users/visitors at the centre of the project, from its inception. All evaluations experiences insights feed not only the TAG CLOUD outputs (COOLTURA Platform and App) but also pilot sites.

From interviews performed with cultural institution pilot sites and additional cultural heritage sites in Spain [9], we perceive the impact of socio-political and technological trends, not only on the way to consume cultural heritage digital content, but the creation and management of this digital content.

Institutions and cultural heritage sites are willing and ready to adopt emerging technologies related with personalisation and customised services, but also there is a need for new processes and technologies that somehow support in an organised way the increasing trend of digital cultural content and Apps. This need is not only driven by above mentioned trends, but also for the need of greater engagement with local communities and visitors; as the visitors experiences need to be untapped by driving differentiated activities and participation, as well as access to new narratives and technologies that allow to digest digital cultural content in an easier way.

In addition cultural heritage institutions and sites also need to link and exploit intangible cultural heritage opportunities to strengthen the identity of local communities, European heritage values, and support sustainable behaviours towards the direct and indirect preservation, re-construction, maintenance and transference of knowledge of cultural heritage.

Thus, the generation of a COOLTURA resources-driven governance model for the COOLTURA platform aims at supporting the growth of planned scalable cultural services and faster take-up of the platform,. This governance model connects and answers to the above needs by linking the resources allocated in the COOLTURA Platform (Apps, digital cultural content, technological developments such as personalisation processes or new linked technologies such as augmented reality or story-telling.) and the institutional framework of the cultural institutions and sites.

Insights and results from evaluations, coupled with above conclusions, are seen as very valuable information for the TAG CLOUD project, the adoption of COOLTURA Platform and App and providing new cultural-driven learning environments that will support the mission of keeping the perpetuity and the value of humanity's public and historical heritage.

Next steps comprise to finish gathering of information of the qualitative approach for the exploitation of the COOLTURA platform and App, as well as complete the COOLTURA resources-driven governance model.

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