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Social cohesion, Participation, and Inclusion through Cultural Engagement

D2.1 INITIAL METHODS FOR INTERPRETATION

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Executive summary

This report describes the first iteration of methods and theories for interpretation that supports the overall objective of WP2 to develop citizen curation methods. The methods for interpretation that are explored in this report are *artefact analysis*, *interactive storytelling and narrative methods*, *collection*, and *visualization techniques*. A review has been conducted for each method along with practical examples of implementation for each method and a set of recommendations for SPICE activities. It must be highlighted that the processes of interpretation work in conjunction with reflection and are conceived in SPICE as an "Interpretation-Reflection loop". The methods presented in this report, is therefore complimentary to the methods of reflection presented in D2.2, as the output retrieved by applying these methods for citizen curation, provides value to SPICE by its processing through the methods for reflection presented in D2.2.

Hence, these methods for interpretation is not expected to be mutually exclusive, and various permutations of these, together with the methods presented in D2.2, will give rise to an assortment of approaches to citizen curation that can be organized through scripted activities and elaborations distributed in the different components of the SPICE platform. The interpretation methods are also targeted to the context of the case studies elaborated in WP7, where workshops with end-user communities, museum mediators, and among SPICE researchers are organized in order to iteratively prospect and evaluate prototypic activities and scripts, which can be incorporated by the work-packages working on the different aspects of the SPICE platform.

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1.0 Introduction

The research conducted in SPICE, revolves around an understanding of *citizen curation* as "citizens applying curatorial methods to archival materials available in memory institutions in order to develop their own interpretations, share their own perspective and appreciate the perspectives of others" (see: 2.1 below). By this understanding, citizen curation is regarded as a tool for enabling greater *social cohesion* and follows the core idea of SPICE that citizen curation can be fostered through a variety of methods which supports these two processes of interpretation and reflection. As such, SPICE wishes to encompass a wide range of different audiences, as well as a wide range of use cases, in order to "promote inclusive participation and social cohesion in a variety of contexts" (Bruni, et al., 2020). The intention of this report is to provide a list of reflective methods to support this idea. By utilizing these methods together with methods of interpretation, WP2 "will explore a repertoire of activities in order to test which ones are more effective in stimulating a variety of audiences to produce interpretations and perspectives that in turn will enable them to participate in a rich and diverse cultural space for reflection" (Bruni, et al., 2020).

Through a combination of *artefact analysis, interactive storytelling and narrative methods, collecting, and visualization techniques* as interpretation methods, a framework is prescribed for their implementation within SPICE and for workshops conducted by case study museums with their end-user communities and mediators. These methods are examined in greater detail from the purview of their history, methodologies, theories, and practical implementations. Ultimately, it is the intent, and expectancy, that the combination of the reflective and interpretative processes, will reveal something about both the artifacts that are being perceived (and their histories), as well as something about the individual or the community that produced the interpretations and reflections - with the idea of constructively evidencing "variety within groups and similarity across groups" (Bruni, et al., 2020).

1.1 Objectives of WP2

The objectives of this deliverable spring from the original objectives formulated for WP2:

> " … developing methods for citizen groups to build representations of themselves through interpretations and associated community vocabularies; developing methods to support reflection within and across groups drawing on similarities and differences among interpretations; developing an understanding of the effects of interpretive and reflective processes on social capital and social cohesion."

Specifically, the objectives that have guided this "initial report on citizen interpretation methods" have been:

- To investigate methods to support reflection within and across groups drawing on similarities and differences among interpretations.
- To investigate how these activities may generate input that can lead to a representation of citizen groups that can be used in the different technical modules of the platform (e.g., interfaces, user/community modelling, recommender, ontological reasoning, etc.).
- To initiate the development of a model for the "Interpretation and Reflection loop" (IRL), which converges towards Social Cohesion and its derivatives.
- To envision how to use the methods to enrich the activities in order to capture richer input from users, which are amenable to treatment and analysis, and that will enhance the objectives of the IRL in terms of social cohesion (and its derivatives or surrogates, e.g., empathy).

- To explore how these methods can be customized and adapted to the different case studies to be subsequently refined and tested during workshops with stakeholders.

2.0 Citizen Curation

Within the broader context of humanities, the term 'curation' has been used to characterize processes that select, annotate, and exhibit different kinds of artworks (Burdick, Drucker, Lunenfeld, Presner, & Schnapp, 2012). In the traditional museum context, the curatorial activities are conducted by museum curators who are responsible for "the acquisition, care, display, and interpretation of works of art" (Schertz, 2015). However, the role naturally exceeds the aforementioned tasks as the curator can also be seen as a medium through whom the museum connects with their audiences, takes part in negotiating and shaping cultural heritage, and fosters community cohesion. As underlined by Christina Kreps (2003), "Museums and museological work do not exist in a vacuum, but are part of larger sociocultural systems that influence how and why curatorial work is carried out." Thus, viewing curating as a social practice allows us to instead shift the focus from the objects, to the people, who give meaning to these objects. Moreover, as cultures of curating continue to evolve, particularly in the world of social media and digital communication, 'curating' has become a somewhat of an ubiquitous term, and subsequently, the curator role has largely transcended the museum setting (Longair, 2015).These new realities have encouraged museums to seek new ways to maintain their active role as disseminators of knowledge and protectors of cultural heritage by providing more engaging and participatory experiences, involving visitors in the curation activities.

In the current project, the uses of the term 'citizen curation' can be organised into three themes: (i) citizen curation as a way of interpreting types of online activity, (ii) citizen curation as the crowdsourcing of collection metadata, and (iii) citizen participation in curatorial activities. These will be considered in turn.

First, the concept of citizen curation has been used as a lens to understand particular types of online activity. Pedersen and Burnett (2018) investigated the activities of contributors to the Mumsnet website who had strong opinions of Donald Trump's presidency. Within the online community they identified a type of behaviour which they described as citizen curation: "the subjective non-professional collection, assessment and criticism of information for the benefit of a group" (Pedersen & Burnett, 2018). Pedersen and Burnett characterise citizen curation as a form of social media curation in which members of the community find and share online resources, such as news items, that support the community's view. Golovchenko, Hartmann, & Adler-Nissen (2018) examine how social media activity was used to spread both information and disinformation related to the downing of a Malaysian Airlines flight over Ukraine in 2014. Golovchenko, Hartmann, & Adler-Nissen draw on a definition of curator as someone who "adds cultural value to artefacts when drawing individual items together into a collection, interpreting their relevance to a theme [and] then re-representing them through a story or visuals". They argue that in the context of social media, curation involves selecting and spreading information online. Therefore, by tweeting and retweeting content, citizens can be "curators of (dis)information".

Thompson and Reilly (2019) propose the concept of "everyday curator" as a way of describing Pinterest users. Drawing on existing accounts of the work of the curator, they identify a set of characteristics of the everyday curator, for example, remixing and reorganising content. O'Neill (2017) applies the concept of curator to work within the Wikimedia Community Ireland (WCI). O'Neill identifies a spectrum of curatorial activity spanning from the traditional, professional practices of memory institutions, to the open, accessible practices of citizen curators within the WCI community. According to O'Neill (2017), the Web can be viewed not as creating citizen curators but rather making their activities visible. It can therefore be argued that citizen curation describes a common activity in which humans engage in order to make sense of the physical or digital World, that has been made visible by social media and related technology. However, Balzer (2015) is critical of the broadening of the definition of curation to incorporate the selection and

presentation of content whether that be music, festivals, food or clothing. He sees this as commercial organisations adopting the term curation to impart additional value and allure to the process by which they create and select their products for the customer.

Second, the term citizen curation has been used to describe the crowdsourcing of collection metadata by memory institutions. Ellwood, et al. (2018) describe as citizen curation an exercise in which fossils were sent out to local schools to be sorted, identified and then sent back to the museum for curation, analysis and research. The exercise was seen as providing valuable support for the museum as well as an educational experience for the students. Woodham, et al. (2017) use the term citizen curation to describe the tagging of historical images and documents by the public. However, they point out that such citizen curation activities focused on annotation may not necessarily provide members of the public with the skills to carry out their own curatorial activities such as keeping a family archive. The crowdsourcing of collection metadata can also be referred to as citizen science rather than citizen curation. For example, Hill, et al. (2012) describe an online tool that the public can use to transcribe data and metadata from biodiversity records stored as images and send their transcriptions back to the museum. They describe this process as citizen science.

Third, the term citizen curation has been used to describe citizen involvement in processes more directly related to the development of an exhibition. Ride (2013) uses the term citizen curator to describe members of the public living in London using Twitter to record their personal impressions of the London Olympics. A core group of 20 participants were recruited to send at least 10 tweets per day using the hashtag #CITIZENCURATORS. Other members of the public could join in by using the same hashtag. A video installation presenting contributed tweets was included within a museum exhibition about the Olympics the following year. Moqtaderi (2019) developed an interactive application featuring 125 artworks. The term citizen curator was used to describe members of the public who used the application to vote for a single artwork from the 125 alternatives to be included in a museum exhibition. The final exhibition included the 50 artworks which had received the most votes. Similar initiatives have been tried previously but not associated with the term citizen curation. Balzer (2015) describes the Like It exhibition at the Essl Museum, Austria in which artworks from the collection were presented on Facebook. In this project, an exhibition was constructed using the artworks that received the most Facebook likes. In this context, Balzer's reasoning poses the relevant question on the extent to which such crowdsourcing activities can be considered curatorial.

A more complete involvement of citizens in the exhibition design process can also be found in the work of Mauer (2017) and Hill, et al. (2018). Mauer defines citizen curating as enlisting citizens to curate exhibitions using archival materials available in museums and other institutions. The citizens were supported in curating an exhibition in response to the Orlando Pulse Nightclub shooting in 2016 in which most victims belonged to the LGBTQ community and the Latin community. Rather than framing curation as everyday skills in selecting and organizing content, the citizens were explicitly taught professional curatorial practice and different types of exhibit: educational, rhetorical and experimental. Mauer (2017) defines curating as a form of writing and recalls an observation of his mentor that "a pencil is probably the cheapest technology but the most expensive to learn to use effectively. The literacy required for becoming a professional writer takes years of practice and hard work to attain." (Mauer, 2017). This frames curation as something in which many people can potentially engage but which requires hard work, practice and training.

Hill, et al. (2018) use the term citizen curators to refer to students with little or no background in museum curation creating physical and digital exhibitions. The students were taught different curatorial techniques, methods from film criticism for focusing on often overlooked details, and methods of defamiliarization (Shklovsky, 1965) that enable familiar objects to be looked at anew. Hill, et al. (2018) acknowledges strong ties between this concept of citizen curation and the amateur curators affiliated with the surrealist movement who questioned authority and reacted against the "ways institutions like museums and galleries dominated and dictated the conversation of curated exhibits". The work of Mauer (2017) and Hill, et al. (2018) both involve training citizens in professional curatorial methods. This contrasts with the work of Pedersen & Burnett (2018) and Golovchenko, Hartmann, & Adler-Nissen (2018) that uses curation as a way

of framing the ways in which citizens select, organize and share information that do not necessarily conform to professional methods and standards.

With a focus on the design perspective, an early realization of the concept of online citizen curation included the 3D Gallery created as part of the *Illuminating History: Through the Eyes of Media* project funded by the Academy of Finland (1996–2001). The 3D Gallery allowed visitors to select from contents of an online archaeology archive which were then displayed in a 3D gallery created dynamically. The work was inspired by activities carried on by the artist collective *Group Material* active during the years 1979–1986 and whose members included Jenny Holzer, Julie Ault, Barbara Kruger, Felix González-Torres and Hans Haake, among others. Through their performances and exhibitions, *Group Material* engaged in critical practice seeking to problematize notions such as the concept of exhibition, questioning its role in the commodification of art. Their work included events such as "The People's Choice" exhibition. Here artists' works were combined with works realized by neighbours in the city block where the gallery space was located (Díaz-Kommonen, 2002; 2004; Schramm, 2015). Like in *Group Material's* work the intention of the 3D Gallery was also to "democratize the act of curating exhibitions" [proposing however that] "Instead of the physical domain, the gesture takes place in the virtual dimension" (Díaz-Kommonen, 2002). However, *The People's Choice* exhibition also brought together artefacts from both private and public realms into the visibility of the exhibition space (Schramm, 2015). It could be argued that both cases present a utopian vision towards democratization and transculturality that so far has not been fully realized.

2.1 Citizen Curation in SPICE

In SPICE, the core incentive for involving the public in the curatorial process and encouraging them to share their personal interpretations of cultural artifacts and museum collections is to foster social cohesion and inclusion among the visitors. By applying a more participatory approach to curation activities, the aim is to facilitate understanding and empathy among different visitor groups, but also to give visitors an opportunity to become active participants in the museum experience. Thus, in SPICE, citizen curation was initially defined as "citizens applying curatorial methods to archival materials available in memory institutions in order to develop their own interpretations, share their own perspective and appreciate the perspectives of others" (Bruni, et al., 2020). However, to acknowledge that Citizen Curation may also be applied to objects in a museum's exhibition (which may or may not be part of the museum's collection), this initial definition can be extended as *citizens applying curatorial methods to archival materials available in heritage and memory institutions as well as to items depicted in exhibitions in order to develop their own interpretations, share their own perspective and appreciate the perspectives of others*.

Similar to the work of Mauer (2017) and Hill, et al. (2018), in order to effectively engage in citizen curation, citizens will need some form of support or training. The public are not necessarily able to develop and share their own interpretations of museum objects. Rowe, Wertsch, & Kosyaeva (2002) observe that the interpretations offered by visitors in response to cultural artefacts often only superficially draw on the artefact and the richness of its context. The public can also be expected to need support in appreciating the perspectives of others. As illustrated by the work of Pedersen & Burnett (2018) and Golovchenko, Hartmann, & Adler-Nissen (2018), people are adept at finding and sharing information that conforms to their own view, but are less inclined to seek out and share alternative points of view. This tendency to only consider information that aligns with your own perspective is an example of confirmation bias, which is a common type of error in human reasoning (Nickerson, 1998). Citizens will therefore need support in avoiding such reasoning errors when confronted with alternative perspectives.

However, the support and/or training to enable effective engagement in citizen curation activities needs to be provided in a way that is inclusive and accessible. Support that involves overwhelming citizens with detailed knowledge of curatorial practices before being able to take part, could be expected to restrict participation and visitor engagement, thus making it more difficult for the memory institution to gather multiple voices related to its collection and exhibits (Cameron, 2008). This highlights a key tradeoff in the development of successful citizen curation activities. On the one hand, citizen curation needs to be

accessible and usable by the general public. On the other hand, citizen curation needs to encourage participants to look more deeply at artefacts, develop and articulate their own opinions, and engage productively with alternative viewpoints. These activities can be cognitively, even emotionally, demanding, especially if not sufficiently supported by tools and methods.

Our definition of citizen curation involves the citizen engaging with other people's interpretations and perspectives. However, our definition is agnostic as to the extent to which citizens work individually or in groups. Similar to Mauer (2017) and Hill, et al. (2018), citizen curation may be carried out in a group. Working in groups could potentially offer a solution to the tradeoff between accessibility and the demands of curatorial activity: a participant with greater knowledge of curatorial processes could potentially work with, and support others who do not have the background skills and knowledge. Groups could also be formed further along the citizen curation process, for example, explicitly bringing people together who have similar or different perspective as revealed in their interpretative activities, in order to support groups of citizens in developing a collective view on life through culture and heritage, as well as understanding and appreciating the alternative cultural viewpoints of other groups.

Therefore in order to take part in citizen curation activities, citizens will need methods and tools that support them in:

(1) *developing their own personal interpretations of culture, drawing on curatorial practice*, and
(2) *appreciating the range of responses that cultural objects can provoke among citizen groups*.

Similarly, memory institutions will require methods and tools to enable them to:

(1) *create participatory experiences that engage the public with their collections and exhibitions,* and
(2) *understand how citizens respond to their collections and help citizens engage with the variety of perspectives they provoke*.

The methods and understandings of citizen curation could be arranged based on two parameters, and subsequently placed in a diagram with two axes; the first depicting the amount of agency the *citizens* are afforded or allowed in the curation activity, combined with the second, the amount of guidance provided for the interpretation. The sum of these two, might then be used to describe a degree of freedom of the user in the curatorial process. E.g., a system might restrict the user from any curation activity (no freedom), by having a fixed exhibition, but allow the user full freedom to interpret the items in the exhibition (having no guidance). SPICE can be argued to explore this continuum, as it seeks "to engage citizens in curatorially-inspired activities that personally engage the visitor and promote reflection, and are also accessible and open to all without additional training" (Bruni, et al., 2020).

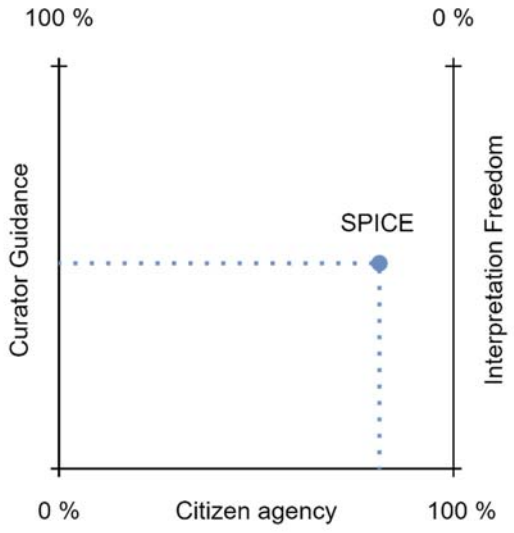


Fig. 1: Proposed continuum of Citizen Curation.

3.0 The Interpretation-Reflection Loop

(Disclaimer: This section also appears in D2.2)

Even though we are reporting the methods for interpretation (D2.1) and the methods for reflection (D2.2) in two separate deliverables, there are good reasons for considering the relation between both deliverables (and kinds of methods) as complementary to each other, constituting a single whole. Interpretation and reflection are ontologically and epistemologically intrinsically related. Considered as cognitive and semiotic processes, at the ontological level would be unnatural to separate them. Therefore, it makes sense epistemologically to explore them in complementarity. This complementarity is what we want to convey by defining the "Interpretation-Reflection Loop" (IRL).

In SPICE, the Interpretation-reflection loop represents the theoretical model for linking the processes of interpretation and reflection, which will be embedded in the different citizen curatorial activities afforded by the SPICE platform. It is also intended to inspire logics for how the semantic intelligence of the system analyses, elaborates and manages citizens-input in order to repropose new activities, visualizations and representations of meanings - which in turn encourage and enhance different aspects of social cohesion in a sort of inclusive participatory loop, or traversal through the system.

Thus, the methods for prompting rich interpretations and eliciting and analysing reflections will become distributed in different temporal phases and components of the SPICE system. This can be in the design of the interfaces that facilitate participation and solicit content from the participants (WP5); or it can be in suggesting new logics to propel dynamic relations within the ontologies and the architectures being defined in the linked databases (WP4, WP6); or inspiring new ways of clustering data in user-models and recommender systems (WP3). All of which should converge towards the project's goal of enhancing inclusion and different aspects of social cohesion. In this sense, the interpretation and reflection methods can be used to:

- Enrich the audience input, by providing opportunities for citizens to contribute content that is rich enough to be amenable to be put in relation to the different dimensions of social cohesion.
- Inspire the logic behind the visualizations, recommender systems, content analysis, ontological reasoning, sense-making systems, etc.
- Structure further audience-activities, once they have gotten recommendations, to catch new meanings, and loop again ...

In SPICE, interpretation and reflection are not conceived to happen in a vacuum. On the contrary, they are always conceived in context. The process is always linked and related to specific cases, which are determined by the five SPICE case-studies elaborated in WP7. In the same vein, interpretation and reflection are not to be thought as autotelic activities, but rather as teleological activities that converge towards the goal of enhancing inclusion and different aspects of social cohesion.

The IRL intends to model the cultural space and the process in which the citizen curation interpretative and reflective activities take place. For the analysis of the dynamics that emerge in such cultural reflective space we are relying on Cultural Semiotics methods to define the internal categories in the "topology" of such space. In this regard, Lotman's model of the semiosphere (see: D2.2 - The Semiosphere Model for Cultural Semiotics) (Lotman, 1990) can generate ideas to model the architecture and the dynamics of the cultural "cloud" in the SPICE platform (see: D2.2 – The Digital Semiosphere in SPICE). In the IRL, the semiosphere represents the cultural space for collective reflection. From the design point of view, what becomes central in such space is how the system "moderates the discussion". This implicit (and somehow unavoidable) normativity is what the design of SPICE intends to make converge towards the goal of facilitating and enabling inclusion and social cohesion.

The collective type of reflection that we are aiming to instantiate, could be seem as "practical reflexivity" (Cunliffe & Easterby-Smith, 2004), i.e.: tacit, practical forms of knowledge questioning and exploring about

how we construct identities and realities. Given the recognized value of narrative methods in the cultural heritage sector (see: 4.2 below), we prioritize methods derived from the field of Narrative Identity (see: D2.2 – Narrative Identity) as a motor for clustering, mining and analysing the representations of the individual and collective selves that arise from audiences interacting with the heritage collections, when empowered with curatorial methods for interpretation (such as artefact analysis, storytelling, collecting, visual thinking strategies and slow looking – see: 4.0 below). Through such emergent narrative identities, we can put different communities and audiences in relation with each other in order to construct shared sense and perspectives. By combining conceptual tools from narrative identity and cultural semiotics we are working on a relational model for the IRL that clusters and relates such emerging individual and cultural narrative identities in "non-categorical" or stereotyped ways, which would otherwise result in rigid, and perhaps clashing or mutually exclusive (i.e., ignored) categorizations. Even though social media has the potential to help people take new perspectives and interact with a broader range of people, in practice the recommendation algorithms quite often fail to address this goal. They are usually limited to characterise groups that can be more effectively targeted with particular content. Additionally, similarity-measures are used to suggest similar content to those previously selected, thereby reinforcing prior choices. Such technology may be effective for marketing purposes but in a cultural context it may harm socialisation and lead to cultural narrowing, rather than helping people to appreciate new perspectives. Such logic may reinforce social fragmentation, stereotyping and exclusion, and may be implicated in other societal problems (e.g., discrimination, polarization, sectarism) which hinder social cohesion.

In the SPICE context, it is advantageous to shift our understanding of reflection from being a mere cognitive activity that gives order to events and situations, to a dialogical and relational activity designed to question static or rigid practices and perspectives (Cunliffe & Easterby-Smith, 2004). In order to introduce such dialogical activities, we are exploring the rich tradition of duoethnography (see: D2.2 – Duoethnography) in the field of cultural heritage. Swan and Bailey (2004) expressed concerned with the way in which encouraging collective reflection was in danger of becoming a mere form of (top-down) "consciousness raising". They perceived that the problem may be that reflection is increasingly linked to a "therapeutic model of public sharing of emotion". This overwhelming use of "sharing of emotions" as a "reflective" or participatory activity has increased exponentially with the advent of social media, often at the cost of intelligibility. In SPICE, while acknowledging the role of sentiment and emotions in signification processes, we are devoting efforts to emphasize intelligibility and understanding.

From the design point of view, the IRL can be seen as the canvas in which we conceive, try and experiment with different permutations and combinations of the methods and activities being considered to be distributed throughout the platform of the project and its temporal processual trajectory (see: Fig. 2, below).

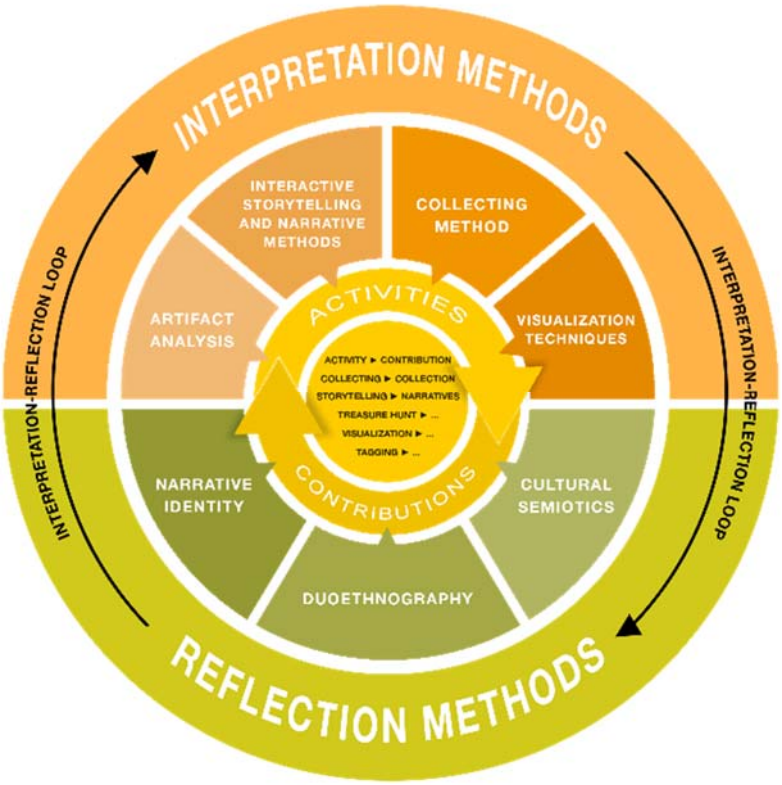


Fig. 2: Methods in the Interpretation-Reflection Loop

To summarize, we propose an initial working definition of the IRL (visually represented in Fig. 3 below):

"The interpretation-reflection loop illustrates the iterative process in SPICE for generating unique citizen curation activities by combining interpretation and reflection methods. These activities are used to encourage citizen contributions prompting interpretation, reflection, and sharing of different perspectives, in order to enhance social cohesion and promote inclusive participation of different citizen groups. The contributions obtained through the activities can also be used, through the SPICE platform, as a foundation for generating new types of activities for new contributions, hence defining the iterative loop.".

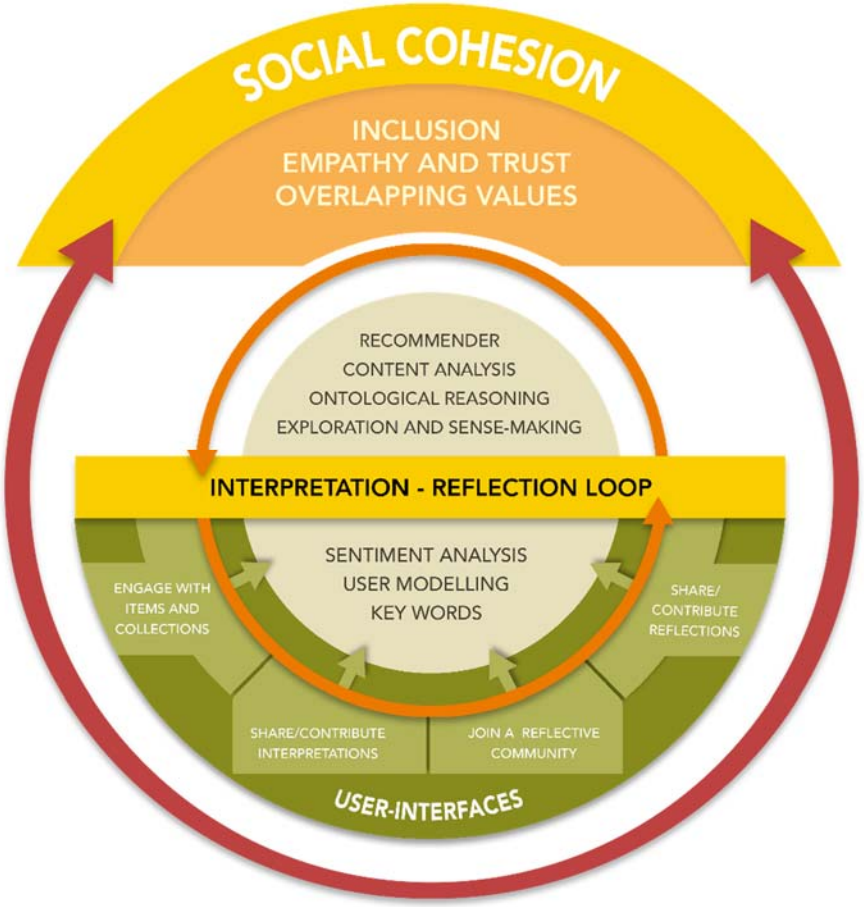


Fig. 3: The process in the Interpretation-Reflection Loop

4.0 Methods for Interpretation

In the following section, key methods for interpretation in SPICE will be presented along with the relevance to SPICE. The section is structured in an introductory definition of the method, before describing its relevance to SPICE. Each section describes practical examples of the method in the cultural heritage domain as well as the domain of interactive and mediated experiences, before providing concrete recommendations for SPICE based on this theoretical research. Concluding each section is a description of workshop activities conducted using the method, and discussion of the result of these activities.

4.1 Artefact Analysis

The study of material culture touches on all aspect of human 'being in the world' and artefacts themselves have been among the primary sources of knowledge about different human societies across time and space. As Daniel Miller (1994) has noted, in anthropology, before the emergence of popular photography, the prime role of the object was to symbolize the society which created it. In this manner, artefacts – perhaps brought from the field – became convenient symbols of peoples "whose presence was neither required nor desired". Interestingly, a reverse process occurred with archaeology where, as Miller writes, how it was the people who produced the objects who came to be used as labels for groups of artefacts who were then subsequently used as prime subject study (Miller, 1994).

In both these examples we can discern traces of the notion of *mediation* described by Lev Vygotsky (1978) when outlining the role that material culture plays in the development of the mind. Related to the human

use of tools, mediation signals a unique transition from a direct to a planned mode of action whereby the human envisages something not yet existing and brings it to fruition. For Vygotsky (1978) the very essence of human existence rests on this capacity to create and manipulate artefacts (including symbols): Written records, weapons and tools, clothing and artworks which remain once their creator has ceased to exist are all examples of human-made artefacts exemplifying the activities which brought them into being. But the intrinsic role of these artefacts– we argue, is more than archival remainders. Combined with our social ways of being they come to form a part of what is now recognized as human distributed cognition.

It was Cassirer (2000) who later noted how though all objects have their place and time, in the sphere of culture something else exists in the object that is a 'meaning' which is "embodied by it and in it" so that when we look, we do not see the colours in Raffael's paintings as merely colours or patches of light, rather we see through them something objective: Not an effect but a work created by an artist through her personal expression that while continuing its life beyond the culture where it was created might afford us with a view *into our own* affective and cognitive processes.

Martin and Hanington (2012) have defined artefact analysis as a "systematic examination of the material, aesthetic, and interactive quality of objects in context". According to Hodges, et al. (2007), artefact analysis is a method used for the study of material culture across different disciplines including art history, archaeology, and cultural history. E. McClung Fleming (1974) proposed an early model for study of artefacts of material culture comprising a five-fold classification of the basic properties of the artefact and a set of four operations to be performed upon these properties". These operations included: Identification (classification, authentication, and description), followed by Evaluation (or judgment) and Cultural Analysis (or examination of the various interrelationships to its contemporary culture); and finally, Interpretation (the meaning and significance of the artifact in relation to aspects of our own culture. The model, that is still in use, was criticized by archaeologist and museum scholar Susan Pearce (1994) for lacking precision. She in turn developed her own model with eight properties shown in Fig. 4.

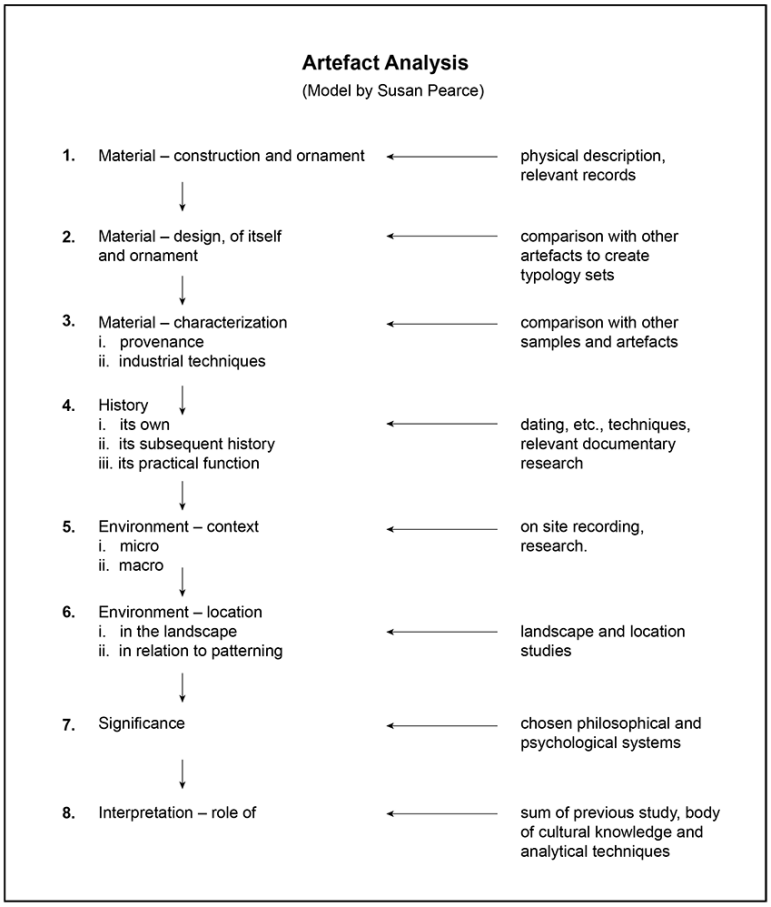


Fig. 4: Susan Pearce's artefact analysis method model.

The identification of the artefact's physical configuration is the starting point in the model proposed by Pearce (1994). We start from the information found in Steps 1 and 2 that are categories that propose creating descriptions of the all components (or parts of the artefact) as well as of their ornamental patterns (if any). Steps 1 and 2 also involve gathering relevant measurements, drawings, and images including X-ray photographs or other more advanced representations. The rationalization of the analysis into clusters of significant characteristics (in a non-aesthetic way) and processing of all this data with a computer is also recommended in order to establish object groups. In Steps 3 and 4 the history of the artefact, (its own) including when it might have been created as well as its subsequent history involving its becoming part of a collection, being cited in publications and shown in exhibitions is further documented. In Step 5 the item's existence in relation to where the artefact was found and further description of the local environment and (geographical) landscape is examined. In Step 6 the human geography in terms of the possible patterning of human life through space and time is further described and documented. In Step 7, the significance the artefact might have had in its own time and place, together with the psychological and philosophical components (which would have been different from ours) are considered. The final Step 8 is the moment of Interpretation which as a synthesis brings together all the knowledge and documentation gathered in the previous stages.

The rigor of the model developed by Susan Pearce (1994) can provide the scholar with documentation and data to support in-depth study and analysis using almost any theoretical framework. As she has proposed: "A structuralist following Lévi-Strauss and his disciples, might seek to establish opposed pairs of material types, or object types, and to link these into the binary structure of human society and the human mind".

4.1.1 Practical Examples

As the development of artefact analysis into a research methodology used in the human and social sciences research proceeds, approaches from semiology and cognitive sciences continue to be added. For example, Djindjian (2001) has introduced the notion of 'real' and 'virtual' types of artefacts. Whereas a 'real' type results from a manufacturing design that can be statistically demonstrated on a representative collection of artefacts, a 'virtual' type is the result of a formalization introduced by a scholar who is in the process of constructing a hypothesis. Such proposal seeks to establish a distinction between the ontological and epistemological properties of a given artefact. In the following paragraphs we illustrate the process of doing artefact analysis through the use of 'virtual' types. Whereas in the first example we utilize the same artefact and guide the reader through some of the interpretations that might ensue, in the second we use two different artefacts to arrive at similar yet nuanced, interpretations.

In the first graphic we use the apple, an item that because it has been produced through artificial agriculture systems can be also be regarded as an artefact. Following Costa (1998) and Moles & Janiszewski (1990) the artefact is depicted using five different representation modes ranging from the most iconic – that is the 3D object itself – to a diagrammatic representation that stripped from its sensual characteristics, visually describes the structural organization of the artefact. Among the questions that this type of analysis yields is, How does the use of different (re)presentations entail divergent interpretations? This is a topic that we want to further investigate in SPICE.

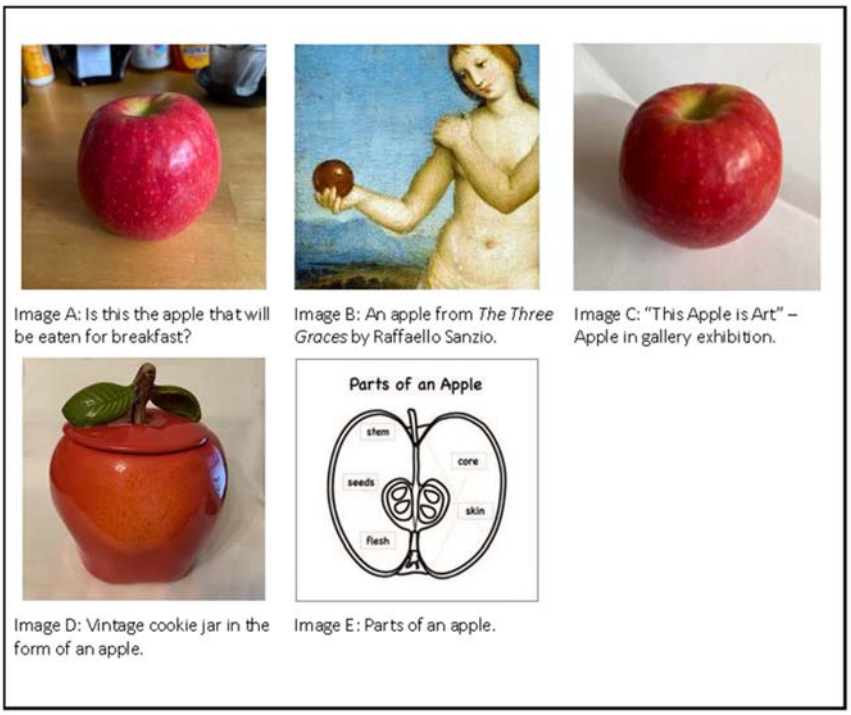


Fig. 5: Five ways of looking and interpreting an artefact.
Each is different depending on its iconic or schematic representation.

Recognizing the object on the Image A to the left (See: Fig. 5) is first carried out visually through the usual process of edge detection that resolves itself into a round sphere separate from its background. Chromatic perception adds an element of the colour which further results in the approximate identification of the object (artefact) possibly as an edible fruit, such as an apple. As we move right, Image B depicts the image of an apple as a detail in a painting by Renaissance artist Raffaello Sanzio D'Urbino. Here the recognition and subsequent understanding of the artefact occurs within the framing of a work from the cannon of Western art which almost by necessity implies accessing myriad narratives regarding the painting, its history and the role that mythology has played in its interpretation. In Image C to the right, the same apple from Image A appears this time propped on a white background on a white pedestal and exhibited as an object of art. Here the interpretation is guided by framing of conceptual Modern art practices, such as in the work of American-Hungarian artist Joseph Kosuth, where linguistic proposals are made regarding the nature of art. Image D shown in the bottom left depicts an apple-shaped cookie jar. Here a designed and manufactured artefact makes use of affordances from the 'real' object: the round shape is a container. The stem growing on the top of the fruit becomes a handle allowing to lift the container's lid. The red colour of the fruit's flesh further helps to identify it as an apple. Finally, the schematic representation shown on Image E reveals the inside and outside parts as well as the structural organization of the artefact.

"Describe it as if you were explaining it to someone who can't see it. Think about: shape, color, texture, size, weight, age, condition, movable parts, or anything written on it." – So reads the instructions in the National Archives website for using the method of Artifact Analysis. But after looking at the examples presented one could argue that meeting the artefact displayed in a vitrine or hung on the gallery walls is neither a one-way encounter, nor a straightforward path from perception to interpretation. Here the perspective of distributed cognition introduced earlier in the section might help us to understand how museum artefacts can operate as clues that entice us to explore, triggers which launch our recollections and points that promote making connections among disparate elements. Perhaps more clearly stated: It is not simply showing of artefacts but in the context and environment in which these objects are brought to the people that meaning-making processes (including interpretation) are instantiated.

To further illustrate the method, in the next example we take a different strategy. Fig. 6, shows two different artefacts used to depict the same concept, namely that one of seating device, or a stool. To the left, a modern *jakkara* stool designed by Alvar Aalto and to the right, a (circa) 16th century *dujo* created and used by the Taíno dwellers of the Caribbean Greater Antilles archipelago are shown next to each other. Both artefacts share the properties of having four (4) supporting parts (or 'legs' of varying width and length) and a seat – or surface – to accommodate the buttocks. The basic material used for both items is wood. In both cases the raw matter has been artificially modified and decorated (albeit differently) at the surface. On the left contemporary polymer materials have been used to display colour (in this case black) and for easy cleaning.

Fig. 6: Two different artefacts from different time periods.
They hold similar affordances and structural characteristics.
However, the dujo on the right bears an ornamental pattern affixed on one side

On the right, the carefully polished curvature of the bare wood might betray its use as an object for seating during ritual ceremonies. When appreciated together both artefacts illuminate the diversity and nuances of material culture. Still, as Shanks (1992) has pointed, "even the act of looking involves an intentional act of giving meaning." Though the four legs do not make the *dujo* into a chair as we know, it might have afforded the *cacique* a more comfortable – raised above ground and the group – way of sitting during their ceremonial encounters. Regardless of differences, heritage artefacts continue to inspire interpretive narratives. And, it is for us to understand and accept that interpretation is a process that occurs in the present.

4.1.2 Relevance to SPICE

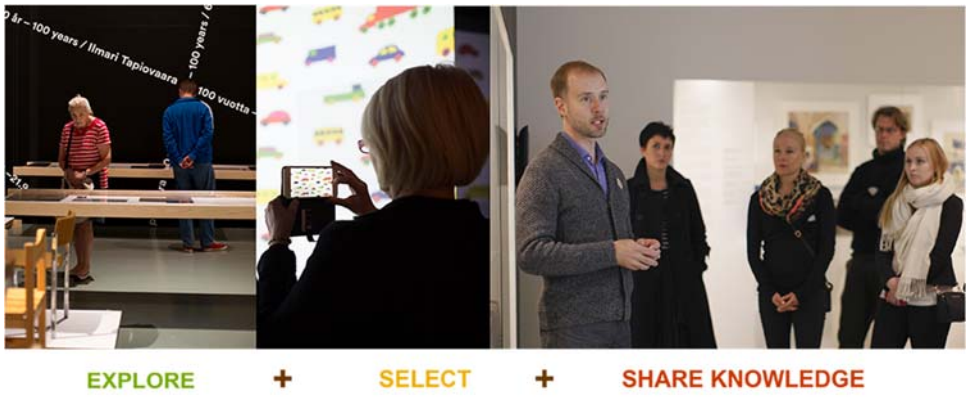
Artifact Analysis as Contact zone

We are not suggesting that museum curators become involved with adapting a method such as Susan Pearce's Artefact Analysis for use in museum visits. Nevertheless, we want to highlight the resemblance of the method with the ontology building done when creating new tools and platforms. For developers, knowledge of the method can afford a possible 'contact zone' with museum experts. For the teacher who is bringing a group to visit the museum the method might provide an opportunity to deepen their knowledge about the subject matter in advance. The method brings cohesion because it offers all parties an entry point into many active learning opportunities, possibly even more than the ones you were aware of. Additionally, as an alternative mode of inquiry that can make the tacit aspects of the cultural experience more accessible, a modified method of artefact analysis tailored to a museum visit can be decomposed into three basic stages. 1. The first stage involves investigation to create the description of the artefact. (In SPICE this stage might be fulfilled by the museum personnel involved with the visitor experience.) The method could be used by the school teacher organizing a learning experience for a group of students. They might provide some training and knowledge to allow a lay person to assume some responsibility for sharing with the other participants. S/he can work with a designer to create an artefact-analysis probe (AAP). The probe could have all the information needed to complete the artefact analysis of selected items from an

exhibition. 2. The second phase might involve sharing and comparison of the data gathered with the probe a face-to-face group session. 3. In the third stage, citizen can curate their own collections from the objects they analysed through the AAP probe and from the objects shared with them by others who also completed the analysis.

4.1.3 Recommendations for SPICE

In our work we are developing a version of the artefact analysis method to be used by groups who are visiting the museum. If clubs (or reflective communities) for citizen interested in curating such as "Citizen Curators Clubs" were established, the museum personnel might work with these groups. Note these engagements with communities is work in progress.



Some concluding thoughts: Artefact analysis is a method based on a long scholarly tradition of documentary research. It is not possible to give a full account of the method's background and viability and at the same time describe its possible applications in a report of this nature. However, during recent times of intellectual upheaval methods like artefact analysis might prove to be fruitful seeds engaged in slow and quiet gestation.

4.2 Interactive Storytelling and Narrative Methods

Narrative studies have been adopted across a large number of scholarly disciplines, extending from the humanities (e.g., narratology, philosophy, anthropology, history, and the arts), and social sciences (e.g., psychology, sociology and economics), to computing (e.g., artificial intelligence and natural language processing). However, it was not until the 'narrative turn' in the 1980's that humanities and social sciences began to more broadly adopt narrative approaches in their work (Kreiswirth, 2000; Kreiswirth, 2010).

Within SPICE we consider narrative methods on three different levels. On one level, we regard it as a methodology for interpretation; on another level we also regard it as a methodology for reflection (see: D2.2 - Narrative Identity); and finally, it is regarded as an ontological foundation of our scientific approach, which considers narrative faculties as a fundamental human cognitive mode. Accordingly, narrative methods can be used in the presentation of cultural objects (an exhibition with a specific theme or order of presentation), as well as an approach for eliciting and empowering citizens' sharing of interpretations of cultural objects or complete exhibitions. Additionally, by collecting and analysing these citizen contributions of interpretation, the citizens can be enabled to build representations of themselves, both as individuals and as part of a community. The analysis of these contributions can also serve to encourage sharing of different perspectives and enhance social cohesion. In this way, narratives can be seen as passing through the entire Interpretation-Reflection Loop (see: 3.0 above).

For elaborating on the levels above, we regard narratives and storytelling from two separate, but ultimately connected, perspectives. Initially, we regard narratives and storytelling from a philosophical and psychological/cognitive perspective as a fundamental cognitive mode for organizing human experience. By

this we adhere to the views of scholars like Jerome Bruner, Keith Oatley, David Herman and Barbara Hardy (to name but a few), by which narrative is regarded as a sense-making faculty and a "mode of thinking" (Bruner, 1991; Oatley, 2011; Hardy, 1968; Herman, 2009; Herman, 2009; Lambert, 2013). Secondly, we regard narratives from a narratological perspective, as a discipline by which we examine the logic, principles, and practices for what we consider the principal or relevant components of a narrative (Meister, 2009; Kreiswirth, 2010). The former serves as a basic premise for any citizen curation activity in SPICE, as it can be regarded as the ontological foundation or reasoning for employing narratives in a project, which seek to enhance social cohesion. The latter serves to inform and structure citizen curation activities involved with storytelling, by techniques and theories from traditional narrative theory and methods. By including both perspectives, we seek to enrich and connect the narrative interpretation activities and citizen contributions of SPICE to our fundamental understanding of human experience as a narrative.

The following sections consider these two perspectives separately, initiating with the ontological perspective, followed by the narratological perspective.

4.2.1 Narrative as a Fundamental Cognitive Mode

Viewing narratives as a way in which humans experience and perceive life events allows for further highlighting the role of narrative in our lives. Barbara Hardy (1968) emphasises this role of narrative in human experience, as she describes how "we dream in narrative, daydream in narrative, remember, anticipate, hope, despair, believe, doubt, plan, revise, criticise, construct, gossip, learn, hate and love by narrative". Jerome Bruner (1991) has likewise argued for this close connection between narrative and experience:

> "As I have argued extensively elsewhere, we organize our experience and our memory of human happenings mainly in the form of narrative-stories, excuses, myths, reasons for doing and not doing, and so on" (Bruner, 1991)

As such, Bruner (2004) have argued how "[n]arrative imitates life, life imitates narrative. 'Life' in this sense is the same kind of construction of the human imagination as 'a narrative' is". In this regard, Bruner suggested that narratives are a way in which humans perceive the world; a way in which we think about the unfolding of life events, and hence a way we construct the world and our experiences within it (Bruner, 1991; Ryan, Narrative, 2010; Schank & Abelson, 1995; Herman, 2009; Oatley, 2011).

Similarly, H.P. Abbott (2008) touches upon this, as he argues that "narrative is the principal way in which our species organizes its understanding of time", from which follows that "wherever we look in this world, we seek to grasp what we see not just in space but in time as well. Narrative gives us this understanding; it gives us what could be called shapes of time. Accordingly, our narrative perception stands ready to be activated in order to give us a frame or context for even the most static and uneventful scenes".

The centrality of time in narrative was pioneered by Paul Ricoeur (1984) as he proposed that "time becomes human to the extent that it is articulated through a narrative mode" and that narratives are "lived in the mode of the imaginary". With this we can argue that Ricoeur describes a similarity between the cognitive functions involved in the perception of narrative events, and the cognitive functions we employ when perceiving the events of our own lives. He (1991) likewise suggested that "life can be understood only through the stories that we tell about it", and in fact became a seminal proponent of the field of Narrative Identity (see D2.2 – Narrative Identity).

However, these approaches to narrative should not necessarily be understood as if asserting that narratives are ubiquitous in all human sense-making operations. Marie-Laure Ryan (2006) suggests that while a number of cognitive processes can be considered as 'constitutive of narrative', such as "thinking of events as situated in time," or "re-constructing the content of other peoples' minds as an explanation of their behaviour," (and we naturally rely on these mental operations when for instance, taking part in social interactions), it is only when these types of mental processes come together to form a 'stable mental

image', that they offer representations, which suffice for fulfilling the conditions for being considered narrative (Ryan, 2006).

Following this, all narrative methods or techniques within SPICE are built on these considerations. Likewise, as this rationale permeates many aspects of our approach, we also consider narrative methods with regards to identity forming, self and personality, as we regard narratives as a way by which we reflect upon our experience (see: D2.2 – Narrative Identity).

Having established the centrality of narrative as a fundamental cognitive mode, the next sections will consider structural components of narratives, primarily from a narratological perspective, as many theories of narrative across disciplines build upon this work. Along with this analysis, the still emerging field of interactive storytelling will be explored, before delving into specific narrative methods of relevance to SPICE.

4.2.2 Narrative Representation - i.e., What Constitutes a Narrative?

At the core of narrative approaches and methods lies the thick notion of "narrative". However, an overarching definition of narrative is yet to be agreed upon. Given the wide range of disciplines that deal with narratives, a multitude of meanings and interpretations of the concept have been developed, from their various points of departure. Even within the domain of narratology there is a myriad of definitions. Roy Sommer (2010) expresses this polysemy in a well-described summary of some of these various definitions:

> "From a narratological point of view, narrative has been defined as the recounting of at least two real or fictive events, neither of which logically presupposes or entails the other (Gerald Prince; Shlomith Rimmon-Kenan), as a series of statements that deal with a causally related sequence of events that concern human (or human-like) beings (Dorrit Cohn), as a representation of a series of causal events or situations not limited to human agents or anthropomorphic entities (Brian Richardson), as verbal (as opposed to visual or performative) transmissions of narrative content (Gerard Genette), or, from a cognitive point of view, as a mode of naturalising a text or performance in the reception process (Monika Fludernik)" (Sommer, 2010)

These different approaches to narratives are individually diverging conceptualizations, but it is apparent from the above, that they are also converging and overlapping on multiple elements. Hence, the following sections will examine principal components of narratives through an eclectic approach, by considering them from a cognitive approach to the perception (i.e., interpretation and reflection) of narratives.

In colloquial speech 'narrative' is often referred to as story, and the two are often used interchangeably or as a single entity (Dictionary.com & Oxford University Press, Narrative, n.d.; Ryan, 2010). However, following a more structuralist approach - i.e., the narratological principles - a more formal description of the elements of which a narrative consists can be further elaborated (Kreiswirth, 2010). For SPICE, which utilizes narratives on multiple levels, such a structuralist approach is regarded as suitable, as it can both inform and enrich singular activities of citizen curation (see: D5.1), as well as the ontology network modelled for the semantic intelligence of the system of SPICE (see: D6.2 and D3.2). Therefore, it is pertinent to initially introduce the concepts of *story* and *discourse*, as they relate to a widely accepted distinction between *what* is represented and *how* it is represented. Following this, we will explore, what is regarded as the two main components of narrative, in the form of *events* and *characters* respectively, before we examine how these components through *causality* can be regarded as formulating the *plot* of a story. Closing the investigation of the principal components of narratives, we utilize these as we examine various perspectives of defining a *minimal narrative* as well as consider the notion of *levels of narrativity,* as we seek to determine and define narratives in SPICE. Before then going into the *narrative methods*, we will examine the concept of *interactive storytelling*, as to how the addition of *interaction* affects a narrative.

4.2.3 Story and Discourse

A widely used distinction for the concept of narratives is the separation into *story* and *discourse*. This conception of narratives consisting of a story and a discourse, stems from the terms of *histoire* and *discours*, suggested by the French structuralists, which in turn is informed by the Russian Formalists understanding of *fabula* and *syuzhet* (Toolan, 2006; Shen, 2010; Abbott, 2008).

The russian formalists regarded *fabula* as the story by means of its chronological ordering of events, and *syuzhet* as the narrative discourse from which the plot was constructed (Petrov, 2010). However, as has been pointed out by H.P. Abbott (2008), this distinction is problematic as a general distinction. Abbott, argues that the view on story in *fabula* is restricted, as it confines itself to chronology. He further argues that the view on syuzhet as concerned with plot, is directly at odds with other conceptualizations of this term, as plot often "refers not to the order of events in the narrative but to its opposite, story" (Abbott, 2008). As such, the distinction of *story* and *discourse* as proposed by the French structuralists, are able to draw a broader and more inclusive articulation of these components, as *story* refers to *what* is being represented, and *discourse* refers to *how* the story is being presented (Toolan, 2006; Shen, 2010; Abbott, 2008). In this view, the story is still regarded as separate from its mediation, and thus serves a transmedial view of narratives, e.g., the story of Cinderella can be represented in multiple forms of media but is nevertheless recognizable as the same story. Chatman (1978) likewise refers to this, as he argues that "[t]his transposability of the story is the strongest reason for arguing that narratives are indeed structures independent of any medium". Ryan (2006) concurs with this property of transposability of the story, although she argues that the *narrative potential* of a story differs from medium to medium, as she argues how "[a] core of meaning may travel across media, but its narrative potential will be filled out, actualized differently when it reaches a new medium".

Albeit widely applied, the distinction of story and discourse has been argued to be in potential conflict with itself. As the distinction determines that the narrative discourse presents the story, it can be argued that it in turn implies that a story must exist in order to be presented. However, since the only knowledge we have of the story is what we get from the discourse, it has been suggested that the story cannot exist until it is narrativized through the discourse (Abbott, 2008). Jonathan Culler (2002) describes this ambiguity as the "double logic" of narrative: the story seems to at once both precede and supersede the narrative discourse (Abbott, 2008).

Considering this paradox, Keith Oatley (2011) described how a story can seem to have a life of its own and emerge as it is being written. For this, he presented a study of Marjorie Taylor, Sara Hodges and Adele Kohányi (Taylor, Hodges, & Kohányi, 2003), based on 50 interviews of fiction writers, which explored the phenomenon of seemingly autonomous characters in narratives, i.e., the characters do things that the authors do not seem to control. The study showed that "all but four reported some experience of characters exhibiting autonomous agency" (Oatley, 2011). This might suggest that even an author himself does not always consciously know the complete story as he/she is writing it, which in turn can serve as an argument for a story existing in some "virtual" space before its mediation (and retrieved bit-by-bit by the author in the writing process). It can be argued that Ryan follows this suggestion of a story existing in a "virtual space", as she argues how "[n]arrative, in this view [of Abbott (2008)], is the textual actualization of story, while story is narrative in a virtual form" (Ryan, 2006). However, the result of the study presented above, could also be viewed as an argument that the story is being brought to life as it is being mediated, thus not existing beforehand, but being constructed (more or less consciously) in the mind of the mediator. This view is mirrored by David Sims (2005) as he describes how "[a] story is not imagined and then subsequently told; like other actions (Weick 1984), it is imagined during narration". Thus, it neither confirms nor denies the idea of a story pre-existing its mediation, but we do argue it substantiates the notion of a narrative being mentally constructed. Ryan (2006) has a similar view, as she suggests that "[s]tory is a mental image, a cognitive construct that concerns certain types of entities and relations between these entities" and how "it is its ability to evoke stories to the mind that distinguishes narrative

discourse from other text types". With this, we circumvent the discussion of the "double logic" of narratives, but maintain that the distinction between story and discourse, is an important and relevant distinction for SPICE. Since the project deals with cultural heritage artifacts through a wide range of media, the same story might be represented through a plethora of different discourses. Hence, the notions of *story* and *discourse*, combined with Ryan's view of the core meaning being transferable between media, despite differences in the ability of each medium to actualize the narrative potential of the story, are important concepts to consider when applying methods for interpretation through storytelling activities. For example, one might consider citizen contributions of interpretation in the form of textual narratives being curated as an exhibition in itself. However, such an exhibition does not necessarily present these contributions in their original form. Such an exhibition might use various visualization techniques (see: 4.4 below) to *represent* these contributions in a different form through a visual medium. In such a case, it would be decidedly important to consider the differences in the original and the new mediums abilities to actualize the narrative potential of the contributions.

Another example by which story and discourse can be used in SPICE, is in the formulation of the Narrative Knowledge Area for the ontology network developed in WP6 (see: D6.2 – Narrative Knowledge Area). As the distinction of story and discourse, and their properties and content, can be described in a hierarchical manner, connections might be made with other elements of narrative to aid in the analysis and possible classification of citizen contributions in the form of narratives.

The distinction between story and discourse also serves as an important element, when considering one of the principal components of narrative, in the form of *events*.

4.2.4 Events and Event-types

Events have been regarded as one of the principal elements of narrative since the time of Aristotle (Oatley, 2011; Abbott, 2008). Much like many other elements of narratives (e.g., plot, character, causality, gaps, focalization among others), events are regarded and defined by varying theorists, and other closely related terms have likewise been proposed. Hence, when discussing events in narratives, the terms of actions and incidents are likewise often used (sometimes interchangeably). Common for all, however, is that they deal with something occurring over time (Herman, 2010; Oatley, 2011; Abbott, 2008; Herman, 2002). I.e., "[a]ction is the unfolding of an event or sequence of events" (Abbott, 2008).

Following this, we regard events as an overarching term, encompassing both *actions* and *incidents*. For defining events another term that is often applied, is state. Genette (1988) utilizes this, as he describes an event as "a transition from an earlier state to a later and resultant state". In this regard, events are classified as the change of state, and it is argued that this temporal transition from one state to another is a necessity for a narrative (Meister, 2010; Herman, 2010; Herman, 2002).

Going from this, events can further be divided into constituent and supplementary events, following the ideas of Roland Barthes and Seymour Chatman. Barthes used the terms 'nuclei' and 'catalyzers' respectively, whereas Chatman used the terms 'kernels' and 'satellites'. Both described similar ideas though. In this regard, constituent events are the essential events of the story. The events, which makes the story the story that it is. They are necessary events for the progression of the story. It can be argued that the constituent events make the plot (as defined by Forster and Ricoeur - see section of "Plot and Causality"). The supplementary events, on the other hand, are essentially unnecessary for the recognition of the story. It is events that can removed without affecting if the story will be recognized as it is. The supplementary events are not irrelevant to a narrative though but are instead connected to the narrative discourse. I.e., if a constituent event is removed then the story is altered, but if a supplementary event is removed, then the discourse changes (Abbott, 2008).

Additional expansion of this framework on events, have been proposed in recent times, by which a distinction between action and events start to form. Marie-Laure Ryan (1991) has thus proposed a distinction between *happenings*, *actions* and *moves*. *Happenings* are directly related to the previous

definition and division of events, with the exclusion of actions and moves. *Actions* are performed by human (or human-like) agents and are defined as goal-oriented and deliberate (Herman, 2010; Herman, 2002; Ryan, 1991). *Moves*, on the other hand, are a type of action, which seeks to resolve conflicts in the story. They are focused on accomplishing high-priority goals in the story, and there is a high risk of failure to obtain this. For Ryan it is the moves, which have a high narrative interest, and it is important to distinguish these from "incidental or habitual doings" (Herman, 2010). Following this, a person opening a door can be seen as an *action*, but a door opening (e.g., by a gust of wind) is a *happening*. If the action of the door opening, was an action which was done to, for example, free the princess, and consequently conclude the narrative, then this action is instead viewed as a *move*. Action has likewise been defined in action theory as "intentionally bringing about or preventing a change in the world", and within the field of action theory, there has similarly been made a distinction between happenings and actions (Herman, 2002).

Understanding events and the various event types in narratives can be considered important to SPICE, as it both serves as the content of any narrative, but considering events, or more specifically *actions* and *moves*, from a personal perspective of the author of the narrative (i.e., the author of a citizen contribution in narrative form), can be useful in the reflection processes of the IRL (see: 3.0 above and D2.2). If we regard *moves* in personal narratives, from the perspective of Ryan, we argue that these can be seen as salient experiences of high personal interest. With this consideration we might draw parallels to psychology and more importantly to Narrative Identity (see: D2.2 – Narrative Identity). If *moves* are of high personal interest, and it is a form of *action*, which in turn can be regarded as *intentional*, it can be argued that they are closely related to the motivations of a person, i.e., *motives*. As such, motives have been defined as "a strong affective association, characterized by an anticipatory goal reaction" (McClelland, 1951) as well as being "the basis for personal [..] intentions" (Maddi, 1996). As such, especially *moves* might serve as an important indicator of personal motives, which in turn might provide insight into the values of the citizen, and aid in the building of the user-models, currently being developed in WP3 (see: D3.1).

4.2.5 Character

Another principal component of narratives is suggested to be 'character' (Oatley, 2011; Toolan, 2006). Aristotle regarded incident and action as the primary component, and character as the secondary component of narrative. H.P. Abbott (2008) have described how this idea was later reversed in the 19th century by Leslie Stephen, who suggested that character is the main component, and that the objective of actions is to reveal character. A similar focus on character as a primary component of interactive narratives, has been suggested by Aarseth (2012), as he argues that there are indications that "the most effective way of creating ludo-narrative content is to invest in character-creation, by making the characters rich, deep and interesting". Henry James (1884) on the other hand, suggested that this prioritization is void, as he considered character and action to be inseparable. This led to his famous rhetorical question regarding the structuralist attempt to separate event and character:

> "What is character but the determination of incident? What is incident but the illustration of character?" (James, 1884)

It has further been proposed that Shakespeare envisioned similar close connections between action and character. As such, Keith Oatley (2011) suggested that Shakespeare did not exclusively regard actions as a means to forward the plot, but instead applied actions in order to determine incidents, which in turn would illustrate character. Within the domain of narratology, character can be defined as "a storyworld participant, i.e., any individual or unified group occurring in a drama or work of narrative fiction" (Margolin, 2010). Abbott (2008) has further argued that *characters* have agency; "they cause things to happen". This follows the perspective on character as proposed by the semantic (possible-worlds) theories, by which it is considered that character as a minimum "must possess an agential capacity" (Margolin, 2010).

Generally, the theoretical models concerned with character span three paradigms: the semantic (possible-worlds theory), cognitive (readers' mental models), and communicative (the process of narrative

mediation). All three paradigms divide character into *mimetic* and *non-mimetic*, by which the former regards character as representational (i.e., treating character as a human or human-like entity), whereas the latter reduces character to a "text-grammatical, lexical, thematic, or compositional unit" (Margolin, 2010). Albeit, similar in this regard, each of the three paradigms, naturally have separate considerations of character.

The semantic possible-worlds perspective argues that the human-like properties of the characters diverge from actual real-world individuals, as all the traits of the character is limited to the information given about them in their representation (Margolin, 2010). Consequently, they are incomplete in many respects, and we (as readers/viewers/interpreters/users etc.) need to infer, and continuously fill the gaps, and adapt our understanding of the characters as new information is revealed (Oatley, 2011; Abbott, 2008). Hence, it has been argued as a requisite of character that "[b]eyond bare existence, it should be possible to assign at least one property to the individual for every state in which it exists" (Margolin, 2010).

The cognitive theories regard character as a mental model of participants in the story world. With this view, character is likewise regarded as an incomplete entity, which is "constructed by the reader incrementally in the course of reading [..] on the basis of constant interplay between specific textual data and general knowledge structures [..]" (Margolin, 2010). Phelan (1989) has made similar arguments as he states how "[c]haracters are not heroes, villains, or helpers; they are simply subjects of a group of predicates which the reader adds up as he goes along''.

For the communicative theories, character is regarded as "an occupant of one or more constitutive roles in the two-levelled process of narrative transmission, being either a narrative agent, a focalizer [..], a narrator, or a narratee" (Margolin, 2010). The communicative theories focus on the communication act, and more specifically on the transmission of the information about the character; how the information about the character is communicated to the recipient of the narrative. Within these theories, this information can be both explicit and implicit, where the former directly ascribe traits to an individual character, and the latter relies on inferences of these traits based on implicit information.

With this, we see notions of character overlapping and converging across all three paradigms, with the element of inference especially evident. Consequently, an integrative model of character has also been proposed by James Phelan (1989), who divides character into three parts: (1) *mimetic*, (2) *thematic*, and (3) *synthetic*. Simply put, this model construes character respectively as *person*, as *idea*, and as *artificial construct*. The *mimetic* part of character can be seen as the traits and features of characters, by which we identify them as "images of possible people". The *thematic* part of character can be regarded as "a representative figure, as standing for a class". By this, it can be argued that we are able to categorize a character into for example a specific social layer or similar grouping. The *synthetic* part of a character is the part concerned with the fictionality of the character, and how we regard the character as "being artificial in this sense". It is the extent to which we recognize the character as an artificial construct; as being fictional. With this approach Phelan (1989) considers all components to be present in every character depiction, and it is their relative relation which varies. As such, he suggests that "the mimetic and thematic components may be more or less developed, whereas the synthetic component, though always present, may be more or less foregrounded". With this, it is evident that Phelan still follows the previously described general distinction of mimetic and non-mimetic but builds upon it by suggesting a relative relation between them, rather than a separation.

Within SPICE, we are currently awarding a special focus to the collection and elicitation of citizen contributions of personal narratives of individuals (see: D2.2 – Narrative Identity). In this regard, the narratives are expected (even encouraged) to reflect personal perspectives, and considering the above distinction of character, we suggest that citizen curation activities in SPICE that employ narratives, would benefit from prioritizing the mimetic element of character. The thematic part, however, can be envisioned to be useful for contributions developed as the perspectives of a group rather than an individual.

Flat and round characters

A seemingly more simple, but useful nonetheless, model to distinguish characters, has been proposed by E.M. Forster, who introduced the terms *flat character* and *round character* depending on the amount and variety of mental features a character is ascribed (Margolin, 2010; Abbott, 2008; Oatley, 2011). The flat character is signified by a lack of depth, as they elicit predictable behaviour within a very limited span. They tend to be depicted by a single characteristic. Round characters, on the other hand, vary in both depth and complexity, meaning that they have multiple possible motivations and characteristics, which might even conflict with each other. As such round characters are argued to be a closer depiction of actual real-life persons (Oatley, 2011; Abbott, 2008).

In other words, "flat characters cannot surprise us while round ones can" (Margolin, 2010). Following a similar logic (and drawing explicit parallels to Forster's terms) Espen Aarseth (2012) has suggested how characters in interactive narratives can be classified as *bots*, *shallow characters* and *deep characters*. *Bots* are characters without any individual identity (e.g. like robots). This concept, although inspired specifically by video games, is also evident in other media. Especially within the visual media (e.g., TV and movies), this form of character can be seen in the background actors (or extras). We argue that these can be seen as bots, as they often have no individual personalities. In written media, this form of character can be seen in depictions of groups as complete entities, e.g., in fantasy novels and war novels, which especially describe larger armies and their movements as a whole, and often as a race or nationality.

Following the distinction of Phelan (1989), bots might be construed as being characters with an underdeveloped mimetic part, and an overdeveloped thematic and synthetic part.

As SPICE aims to elicit *rich* personal narratives as citizen contributions, with a special focus on promoting social cohesion through reflection of diverging perspectives, we suggest that narrative methods in SPICE should strive for the creation of citizen contributions which include round and deep characters, i.e. to include characters that can "surprise us".

Types

Following the distinction between flat and round characters, it has been argued that all characters in fictional stories contain some degree of flattening, as it is impossible for fictional characters to withhold all the complexities and transformability of real-life persons (Margolin, 2010). This likewise corresponds to the previous descriptions of characters always being incomplete, due to the restricted access to their traits through the discourse. This notion coincides well with the fact that in all cultures numerous character 'types' are utilized throughout the different narrative modalities; e.g. the hypocrite, the wimp, the nerd, the vixen, the stud. Though these types can be seen, as restricting a character to a certain kind of behaviour and traits, it is nonetheless, the same types we utilize, when we try to convey the everyday stories of our lives to other people (Abbott, 2008). We might describe a colleague or friend in terms like: "*He can definitely help you with your computer. He is a real nerd*". This puts our friend in a certain category, but it helps our audience to better visualize and grasp the characteristics of our friend. We might even use multiple types to give an even better understanding of the complexity of our friend by adding: "*But he's a real ladies man. Always eager to flaunt his hot girlfriend*". By this, the audience adapts their understanding of the person we are trying to describe. Although we are describing a real person, we are using narrative techniques to create a character in the mind of our audience.

> "[..] character derives from mental models we make of other people, and ourselves, and is a principal component of a literary simulation-dream" (Oatley, 2011).

By this, it can be argued that describing people or characters by types, will inevitably direct our mental models to apply specific characteristics and traits to the persons described. This in turn can be said to limit the possible actions, thoughts and emotions of the character to this type(s), thus denying the character the "capacity to surprise us with behaviour that exceeds the limits of the type" (Abbott, 2008). Given the previous descriptions of *flat* and *round* characters this would indicate that employing types in descriptions

of character, would result in flat characters unable to surprise. However, this restriction of character to the boundaries of their type(s), would indicate a fixed behavioural pattern, from which the character (and hence the author) would never be able to evolve. We argue against this, since considering the previous statements from the cognitive theories, characters do elicit behavior that can be said to emerge (or evolve) as information about their character is revealed gradually to the audience. As such, we do acknowledge that employing character types will present certain limitations to the perception of the characters, but not the absolute restrictions as proposed by Abbott. We further argue that these types are as much helpful, as they are a necessity for quickly depicting a character to the audience.

Considering these various perspectives and distinctions of *character*, in relation to SPICE, we suggest character to be an imperative element of narratives to promote social cohesion. If we regard social cohesion as being "based on the willingness of individuals to cooperate and work together at all levels of society to achieve collective goals" (Jeannotte, et al., 2002), and further consider empathy to be a subsidiary of this (see: D2.2 – Empathy), then we argue that character is an important aspect for any citizen contribution in narrative form, as "empathy is typically felt for individuals as individuals, not for groups or abstract classes of people" (Batson, et al., 1997). This follows how empathy can be understood as "other-oriented feelings congruent with the perceived welfare of another individual" (Batson, et al., 1995).

With this in mind we surmise, that characters with a more developed mimetic dimension, as opposed to a more developed thematic dimension or synthetic dimension, will have a greater effect on the development of empathy towards that character. Hence, we argue that citizen contributions of narrative form in SPICE, should be enriched by enhancing the mimetic aspect of characters.

4.2.6 Plot and Causality

Commonly understood, plot is regarded as the essence of a story, and the Oxford dictionary defines it as "[t]he main events of a play, novel, film, or similar work, devised and presented by the writer as an interrelated sequence" (Dictionary.com & Oxford University Press, Plot, n.d.). Within narrative theory, it is however, one of the most indefinable terms present, and its usage spans a wide variety of different phenomena (Dannenberg, 2010; Abbott, 2007). Through the 20th century, the models of plot have often related it to story (Abbott, 2008) - and some even made it synonymous to story - but following the previously described distinction between story and narrative discourse, there has since, been an increased recognition that plot is related to the telling, hence the discourse, and to the understanding of a narrative's story (Dannenberg, 2010). The differences in the theories regarding plot, are mostly found in how they see plot as being different from story. Aristotle's idea of mythos worked with plot as being the structuring of the bare-bone of a story into a beginning, middle and end. E.M. Forster (2002[1927]) on the other hand, found plot to be superior to story, and emphasized a close relation to causality (Dannenberg, 2010; Abbott, 2008). More specifically, Forster defined plot as being "the creation (and also the suspenseful suppression) of causal connections between the individual events that constitute the chronology of the story" (Dannenberg, 2010). He thus believed that chronological events can be seen as a story (much like the russian formalists), but once causality between the described events are introduced, plot is visible (Abbott, 2007). ""*The king died, and then the queen died*" is a story, but "*The king died, and then the queen died of grief*" is a plot" (Forster, 2002[1927]). This notion of plot being superior to story is shared by Paul Ricoeur (1980) who stated that "[a] story is made out of events to the extent that plot makes events into a story".

The focus on causality, however, has been argued to be inconsequential, as our minds are prone to always look for the cause of things (Abbott, 2008):

> "Chatman argues, the sequencing of narrative works on us so suggestively that we often don't need the explicit assignment of cause to be encouraged to think causally" (Abbott, 2008)

Utilizing the previous example, it can be argued that even "The king died, and then the queen died of grief", does not explicitly assign cause between these events, as we have no knowledge of whether the queen's grief is related to the death of the king. It is only due to our natural tendency to think causally, along with the assumption that the author adheres to the "cooperative principle" (Grice, 1957), that we relate the grief of the queen to the death of the king.

No matter the possible need for explicit assignment of cause or not, we argue, that if we bring back the proposition that narrative is constructed in (and by) our minds, and relate it to either of the above notions of causality, then the definition of plot as presented by Forster and Ricoeur is appropriate. This is further supported by the fact that some theorists see causal connections as a necessary condition for any narrative (Richardson, 2010).

4.2.7 Minimal Narrative

We propose that SPICE follows a minimal definition of narrative proposed by Michael Toolan (2006), by which a narrative is defined as:

> "[A] perceived sequence of nonrandomly connected events, i.e., of described states or conditions which undergo change (into some different states or conditions)" (Toolan, 2006)

By following this definition, we also expand upon a definition by H.P. Abbott (2008) of the "bare minimum" of narrative as "[..] the representation of an event or a series of events", to include, within the definition of narrative, a pointer to change. As a precursor for this, Gérard Genette (1988) has argued that an event itself, by definition, holds a change from one state to another since "as soon as there is an action or an event, even a single one, there is a story, because there is a transformation, a transition from an earlier state to a later and resultant state". However, we concur with the definition by Toolan, by which we restrict narrative to entail more than any singular event. I.e., a single event is not a narrative, but "just" an event, a statement. It is when multiple events are connected, that the narrative emerges. This definition also effectively (albeit implicitly), include the notion of plot, as it describes events that are "nonrandomly" connected. As such we believe this definition is beneficial as it is transmedial and includes multiple principal components of narrative.

A "minimal" definition of narrative like the above, is expected to support the system of SPICE in analyzing citizen contributions, as we regard such a definition as pertinent for determining if a citizen contribution adheres to the requirements of a narrative analysis. Hence, this definition, along with the principal components of narrative that we have examined, can inform the development of the ontology network in WP6 (see: D6.2 – Narrative Knowledge Area), and in turn, the semantic annotation service developed in WP3 (see: D3.2).

However, a definition of a "minimum narrative" as the above, effectively reduces narrative to a binary feature of "either or"; i.e., either a narrative is present or it is not. Marie-Laure Ryan (2006) has argued against such an approach, and instead suggests *narrativity* as "a scalar property rather than as a rigidly binary feature that divides mental representations into stories and nonstories".

The following section will therefore expand upon this notion of a "minimal narrative" by examining narrative properties as proposed by Ryan.

4.2.8 Levels of Narrativity

Whilst acknowledging the role of narrative in terms of our sense-making, meaning-making, organizing of experiences, and memory, Ryan (2006; 2007) proposes to distinguish 'a narrative' from something that 'possesses narrativity.' Thus, whereas 'a narrative' can be considered a semiotic object then, something

that possesses 'narrativity' should be focused on being able to encourage a narrative response, the latter thus referring to a cognitive-based definition (Abbott, 2009).

In this manner, narrativity relates to the quality of being narrative. With Ryan's scalar definition of narrativity, she thus focuses on the degree to which objects, artworks, artifacts and other forms of representation across media possess narrative properties (Ryan, 2006; Ryan, 2007; Prince, 2010).

In Ryan's model she envisions an "open series of concentric circles that spell increasingly narrow conditions and that presuppose previously stated items, as we move from the outer to the inner circles" (Ryan, 2006). Following this, she organizes eight steps of narrativity, divided across three semantic dimensions (spatial, temporal, and mental) and one formal and pragmatic dimension (Ryan, 2006; Ryan, 2007). With these dimensions, Ryan seeks to liberate the definition of narrative from any singular definition, as she proposes that the question of "what is a narrative?" can be answered on an individual level, as opposed to a generalized overarching singular definition of narrative. Thus, she argues how "some people will be satisfied with conditions 1 through 3 and will classify a text about evolution or the Big Bang as a story, while others will insist that narrative must be about human experience, and will consider (4) and (5) obligatory" (Ryan, 2007). An important thing to consider is that Ryan's model is a progressive model, in the sense that one cannot simply pick-and-choose the dimensions one finds most relevant to a definition of narrative, but instead any inclusion of later steps (or inner circles) per definition includes the previous steps (i.e., the outside circles, which includes the chosen circle). As a result of this function of the dimensions, each step provides a condition for elimination, meaning that the inclusion of a step, in turn means the exclusion (i.e., elimination) of 'texts', or more accurately, of representations, that does not adhere to the conditions of the included step.

Ryan's definition of narrativity as a scalar provides an elaborate concept for determining what might be regarded as levels of narrativity, through her articulation of these conditions for her four dimensions of narrativity. However, this articulation can also be considered to serve as a limitation of the concept, as each point of the scalar is restricted by normative descriptions, which can either be met or unmet. As such, although being developed as a progressive model, through the successive steps of the concept, these conditions for each point on the scalar, effectively reintroduces the binary function in the definition of narrative that Ryan argues against in the first place, albeit here on multiple levels.

For SPICE, the idea of narrativity as a quantity that varies, shows great potential. In SPICE, citizens are expected to engage in interpretation activities with *artifacts*, which within the sphere of culture, contain meaning in themselves, as artifacts can be considered to be "embodied by it and in it" (see: 4.1 above). In this sense, a focus on the narrative levels of these artifacts seems useful, as we hypothesize that artifacts with higher levels of narrativity will result in richer personal narratives being elicited. However, with the limitations of the model determined above, we propose to regard the levels of narrativity on a continuum (rather than a scalar), to form a relative relationship between two (or more) objects' levels of narrativity. I.e., when working with artifacts and other cultural objects, these might be placed on the continuum to illustrate the amount of narrativity for each object, and how they relate to each other in terms of their levels of narrativity. As such, we envision it would be possible to determine which forms of artifacts elicits the richest personal narratives, as well as which combinations of method best support this.

4.2.9 Interactive Storytelling

According to Jesper Juul (2001), the reception of narratives in games (i.e., interactive narratives) and narratives in more traditional media like novels and movies are two distinct experiences dependent upon the different ways in which the reader/player uses the medium. He argues how "[t]he relations between reader/story and player/game are completely different - the player inhabits a twilight zone where he/she is both an empirical subject outside the game and undertakes a role inside the game". In this, the act of playing a videogame, can in many cases be regarded as interacting with a narrative. Juul points to the example of Hamlet, where playing through the events depicted within Hamlet as a game, will be fundamentally different and incomparable to watching Hamlet performed as a play or depicted in film. I.e.,

Hamlet the game and Hamlet the play are not the same, even if the story is recognized as such (Juul, 2001). Based on this, we find it beneficial to explore what *interactivity* might then attribute to a narrative.

Marie-Laure Ryan (2015) has argued for the importance of interactivity in virtual reality, as "the sense of belonging to a world cannot be complete without the possibility of interacting with it". Although this description can be seen as related to virtual reality, we consider highly relevant for other media as well, as it proposes that interactivity can be an effective instrument to cultivate engagement. Thus, we propose that interactivity is a crucial element for citizen curation activities in SPICE, both in order to engage the citizens with artifacts, but also with the system of SPICE itself. As such, interactivity is not just about allowing the users to select which artifacts to explore, but to afford the users agency to develop and share their individual interpretation of the artifacts.

A substantial voice in the domain of interactive storytelling is the annual International Conference on Interactive Digital Storytelling (ICIDS), which has described how the advent of interactivity in narratives "[..] redefines the experience of narrative by allowing its audience to actively participate in the story" (Si, et al., 2011). On this, we regard the interactivity as an equally potential attribute of the audience as well as the narrative. In other words, player and narrative influences each other in a bi-directional manner. As such, the important factor is not which party is responding to the actions of the other, but rather that this is in fact an *interaction* between the parties, and both user and narrative can be seen as the *acting* part, as well as the *reacting* part. Following this, limit ourselves to a simple and broad definition of *interaction in narratives*, by which we describe interaction as: *an external input by the user that affects the output of the narrative*. Hence, a narrative can be considered interactive if the user is afforded agency to perform actions that affect the output of the narrative (either through changes to story or discourse).

A fictional, but illustrative, example of this can be found in the classic film adaptation of the novel "Never Ending Story", where initially the protagonist Bastian simply consumes the narrative, but in the end, is able to give outside input to the narrative, as he starts shouting in the "real world", and his voice is heard by the characters in the narrative. His actions in the "real world" thus affects elements in the virtual world of the narrative.

When working with interaction for narratives in SPICE, we consider interaction in narratives from two different perspectives in the form of interactive *narratives* and interactive *storytelling*. This distinction is also reflected somewhat by Ryan (2009) as she proposes how the "combination of narrativity and interactivity", can be divided into *the narrative game*, and *the playable story*. In the *narrative game* the "narrative meaning is subordinated to the player's actions", whilst in the *playable story* it is the "players actions [that] are subordinated to narrative meaning". These notions are proposed in relation to video games, or to interactive forms (as Ryan puts it) in which "the user manipulates one or more characters in the fictional world and affects this world from within". As such, in the *narrative game* the "story is meant to enhance gameplay", whilst in the *playable story* the "gameplay is meant to produce a story".

Following a similar logic, we regard the difference between *interactive narratives* and *interactive storytelling* to be the *intentions* of the interaction. As such, interactive narratives, can be regarded from the point of the 'audience', as a top-down approach, where the narratives are created, and interaction implemented with the intention of having the 'audience' apply changes to these pre-defined narratives through their actions. Interactive *storytelling* on the other hand, is regarded from the point of the 'author', where the intentions of the interaction is a bottom-up approach to the development or construction of a narrative through the actions of the user. At first sight, this distinction might seem tentative, as any external actions affecting a narrative, can be argued to in turn construct a new narrative. However, when considering interactive narratives and interactive storytelling as methods, as is the case for this examination of the concepts in relation to SPICE, we argue that the distinction serves a genuine purpose for two reasons. Firstly, as have been described in the previous sections on narratives in general, citizen contributions in narrative form, can be used to tell personal stories (both fictional and factional) of the citizens. In this form, when considering the inclusion of interaction, we propose that the primary focus should be the elicitation of these personal narratives, by which the intentions of the interaction would be

to engage the citizens in developing these narratives, and through the interaction to enrich the output. Such an activity would then fall under interactive *storytelling*. Secondly, the narratives that have been elicited (both through interactive storytelling as well as through more traditional narrative methods), might be grounds for activities, where the citizens are afforded the ability to alter the narratives of another citizen (either through changes to discourse or story).

As it might be obvious at this point, the distinction between interactive narratives and interactive storytelling is not a clear-cut line and determining the intentions of the interactivity is readily recognized as a task of subjective judgment. As such, the borders of each concept can be said to be blurred or partly open, creating a virtual "demilitarized zone" in which both concepts can exist in parallel.

Seeking to further elaborate on the differences of the two concepts, we can consider a formulation by Ryan (2009) of three features of interactive narratives that needs to be achieved to attain what she considers the epitome of interactive narratives: the life-identical narrative simulations created by the Holodeck in Star Trek (Murray, 1998). The three features considered are: (1) natural interface, (2) Integration of user action within the story, (3) Dynamic creation of the story.

As the three features are considered in an attempt to achieve full life-like interaction forms, the first feature of *natural interface* is certainly an important feature, but for considering the use of interaction in narrative methods of SPICE, less so. However, the other two features can be viewed as closely related to the notions of *interactive narratives* and *interactive storytelling*. Hence, the feature of *integration of user action within the story*, relates to our characterization of *interactive narratives*, while the feature of *dynamic creation of the story*, evidently relates to *interactive storytelling*.

Ryan (2009) sees the integration of user action within the story, as dependent on the types of actions made possible for the user, together with the systems capability to process and properly respond to these actions. Although Ryan considers this from the perspective of video games, where she argues that the current implementations are inadequate, we consider the basis of the feature as relevant to SPICE as well. By this, an implementation of interaction with narratives in SPICE, need to consider the capabilities of the system to both afford the user the needed possible actions, as well as properly process the result of the interaction. E.g., if an activity involves the development of a personal narrative based on the user's active selection and ordering of different artworks, the interface must support these possible actions of selecting and ordering (see: D5.1), all the while being able to process the output in the form of personal narratives to be used by the system (see: D3.1, D3.2 and D6.2). This example would be a case of *interactive storytelling* since the intentions of the interaction is the development of a narrative through these actions of the user.

An example of an *interactive narrative* in SPICE, could be an activity where the user is presented with various snippets of a curated story connected to an artwork, visualized as nodes connected to different parts of the artwork. The activity could then be for the user to explore these different snippets of the story of the artwork as a journey, by independently choosing the order in which these nodes are explored. With this approach, it would be considered an interactive narrative, as the journey of the user would present the nodes in an individual manner, hence changing the original discourse. In this example the interface would need to afford the possible actions of selecting and de-selecting the nodes to the user, while the system should be able to react to these actions by displaying the selected content of the selected nodes.

Employing these distinctions of interactive narratives and interactive storytelling in the methods of SPICE, holds grounds for further experimentation and discussion, since the distinction is not clear-cut (as previously) described. However, the considerations proposed for each is still argued to be fruitful even if regarded collectively for articulating activities involving interaction and narratives within SPICE.

4.2.10 Narrative Methods

Building on the previously described theories, this paragraph will explore how narratives can be used as a methodology in its own right, or as additional tools for investigating the self, as "[n]arrative methods are particularly well situated to examine meaning-making processes that concern the self" (Adler, et al., 2017).

When narratives are employed in a research method (e.g., as applied in some of the disciplines named in the introduction), it is most often used as part of an approach to a specific research problem, rather than as a stand-alone methodology. Thus, the perspective on 'narrative' as a method, also shifts depending on the discipline, scientific approach, and the subject of investigation. For instance, within the domain of psychology, narratives of personal experience can be seen as tools for obtaining information about the motivations, traits and values of a person, which in turn might determine the personality of this individual (Maddi, 1996). However, they can also be regarded as a way through which one constructs one's individual and collective identity (McAdams, 2011; Somers, 1994; Adler, et al., 2017).

When pursuing the use of narrative methods for engaging the users of SPICE as participants in citizen curation activities, it is important to consider which narrative tools might be relevant to involve in this process. With a specific focus on social cohesion and participation through citizen curation, the tools and activities should therefore nudge or guide the users towards these normative goals of SPICE.

From the narrative theories examined previously, it can be argued that the users of SPICE inhabit two narrative roles, as 'readers' (or 'consumers') and 'writers' (or 'authors') of narratives.

When the citizens interpret artifacts in an exhibition (which by itself most often contains a narrative related to the origin or attributes of the artifact or the artist/designer), we regard them as 'readers' as they construct a narrative around the artifact, as they (more or less consciously) ask – and try to imagine the answer of – questions like: What is the function of this artifact? What is happening in this painting? Was the artist experiencing an inner turmoil when he created this sculpture?
This coincides with an analysis of the phenomenon of 'collecting' (see: 4.3 below) presented by Thomas Tanselle (1998), where he argues that "[o]bjects not only stimulate us to discover how they came to exist and what their original function was; they also tease us into probing their subsequent status and adventures".

Citizens can be regarded as 'writers' when they share an interpretation of an artifact or more generally when they share their own narratives. Narratives in SPICE, however, can also be argued to not only serve as a tool for interpretation, but also for reflection (as previously described), and thus has a somewhat bidirectional relationship to the interpretation/reflection loop (see: 3.0 above).

From this understanding of the two narrative roles of the citizens in SPICE, we examine various narrative methods through an eclectic approach.

Directed Storytelling

Derived from the theories of narrative inquiry, a useful tool is directed storytelling. Directed storytelling seeks to ensure rich narratives of participants by guiding them to tell "compelling stories". This guidance continues throughout the session in order to "[..] keep the storyteller comfortable in flowing narrative" (Martin & Hanington, 2012). Directed storytelling is often used to extract specific information about the participants' lived experience, in relation to a specific design question. The guiding questions are therefore often pre-defined and structured. Directed storytelling can thus be considered a partially closed approach, as the guiding questions stem from a specific question to which the designer (or researcher) seeks an explanation (Martin & Hanington, 2012). As such, it shows many similarities to the method of semi-structured interviews.

Considering the intentions of SPICE, which seeks to develop a system, in which personal interpretations and potentially "unsafe ideas" of artifacts are to be shared widely among users and aid the system in suggesting artifacts and stories of interest to each user, this facilitation of storytelling by the users, can be considered to ultimately needing to be handled by the system. Eliciting rich and compelling stories from the users, is not an easy task, as "users do not tend to engage themselves in lengthy interaction while visiting CH sites" (Bruni, et al., 2020). Furthermore, people tend to be reluctant to share personal narratives (and even to recognize the value of one's own stories). As remarked by a participant in a study by Chloé Rose and Colette Granger (2013), when the participants were asked to "[..] tell something about their life story, [..]

everybody said … we don't have any stories". Even though they later experienced that everyone did have stories to tell. Hence, a structured approach like directed storytelling could potentially work very well for a system that needs to guide the users in the generation of rich narratives, and that utilizes systematic ontology networks in order to structure and analyse the output data of the users (see: D3.2, D4.1 and D6.2).

A limitation to this approach to narrative inquiry, though, is its focus on a specific object of interest. As such, it relies on this specificity in its practice, which in turn applies restrictions to the potential content of the narrative elicited by the citizen. However, at the 2nd Mini-conference of SPICE, conducted at the 23rd of March 2021, it was remarked by a representative of IMMA, that the mediators of that museum often found, that open-ended questions hits a dead-end with a user, as the open-ended questions seldom elicited rich responses from the users. Considering this, an approach like directed storytelling might serve to aid in eliciting richer contributions, albeit with a somewhat confined topic of interest.

Story Circle

The story circle is a form of narrative inquiry, that is especially adept at creating a safe space for sharing of personal stories. This specific ability makes the story circle an especially compelling interpretation activity for SPICE, which seeks "to assist citizens in articulating their own points of view (perspective-making), as well as understanding the views of others (perspective-taking), turning the museum into a safe space for unsafe ideas" (Bruni, et al., 2020).

When describing their experience from employing the story circle at the Center for Digital Storytelling (now *StoryCenter*), Joe Lambert (2013) remarks how "what we know is that when you gather people in a room, and listen, deeply listen, to what they are saying, and also, by example, encourage others to listen, magic happens". It has further been suggested, that "the story circle offers a way to honour and witness the stories they [the participants] share in a community context, while at the same time offering encouragement and support in the process of the story's further development" (Rose & Granger, 2013).

The method, as developed by StoryCenter, is a principal part of a workshop for creating personal narratives through digital storytelling'. The story circle is an activity that borrows from "therapeutic engagement and community organizing" (Lambert, 2013), and is structured much like a session of group therapy, including only the facilitator(s) and the participants. Although the story circle as a concept focuses more on therapeutic practices in the story circle process, Lambert also shows that it can be combined with guidance on applying various storytelling techniques from the facilitators. Hence, a similar approach could be taken, and similarly we argue that the participants could be counselled on the use of narrative theories to tell their stories. By only including the participants in the feedback each other, the story circle promotes a quality of safety, as "everyone is in this together". In its conception the story circle is intended as a safe place to receive feedback and discussion on ideas of each participant for sharing a particular personal story through the digital storytelling workshop.

Lambert (2013) describes seven distinct considerations the facilitator(s) of the story circle must keep in mind to ensure depth and effectiveness in the process:

1. *Clarity of Ground Rules:*
   It is important to establish the general rules of the story circle at initiation. The general rules follow fairly standard rules for any group process: "confidentiality, do not interrupt each other, keep feedback positive and constructive, stay on topic, couch feedback in the conditional not the declarative, or use questions rather than statements, and be aware of one's tendency to dominate or conversely shy from group dialogue"
2. *Protecting the Storyteller*
   From the point of the facilitator, this consideration involves managing the discussion around the vulnerability of the storyteller. As such, it involves observations of the storyteller's level of comfort when presenting the story, as well as recognizing how ready they are for receiving feedback. The facilitator needs to continually be aware of whether a line of questioning is acceptable to the

storyteller, for instance by checking in with the storyteller. The key is that the storyteller should always feel like they are in control and should as much as possible run their own feedback session. This means both regarding how much time they wish to spend on telling their story versus how much time they wish to allot to questions and discussions, but also as to what questions the storyteller wishes the other participants to address concerning their story. For SPICE, this could be imagined as an activity where the participants share personal artifacts and their personal stories related to them. In such a setting, the questions to be initially addressed, might be regarding the original utility of the artifact, which the museum professionals (as well as the other participants) might be able to propose answers to. Finally, protecting the storyteller means that at any point a participant is free to take time-out and to reconsider their participation.

3. *Focusing Discussion of the Story*
   The facilitator needs to carefully administer the discussion, so it does not get side-tracked, since "allowing respondents to use the time of the storyteller to explore their own story can become a distraction". As such, any feedback and discussion should be for the currently presented story and storyteller, within the frame of the workshop or citizen curation activity.
4. *Time Management*
   All participants should have allotted an equal amount of time for presenting and receiving feedback. It is important for the facilitator to keep track of this, as there is a probable risk of fatigue, but the story circle should preferably be completed in one sitting, since "the group never listens as deeply as it does on this first sitting".
5. *Shaping Process of Feedback*
   The feedback should not be confined to the professional facilitator. Instead, there must be a focus including the entire group in the process, by listening to everyone. However, always with a focus on supporting the storyteller. Additionally, the facilitator is responsible for keeping order and reminding of the ground rules, when necessary.
6. *Identification of Broadly Applicable Lessons*
   The facilitator should also be able to recount more general rules, which might be extracted from a single example. As such, for SPICE, it could be knowledge that connects different artifacts, or even connecting similarities between stories across participants. This would naturally have to be done with respect to consideration #2.
7. *Closing Summation and Encouragement*
   The facilitator is responsible for ensuring a proper exit from the story circle. As personal (and often emotional) narratives were shared, the facilitator should be able to lend support for the individuals (even if this in the form of proposing external support – i.e., from the staff or peers, or to another museum professional, who might be able to divulge more information regarding the artifact examined).

These seven steps aid the facilitator in establishing and maintaining the safe space that is critical for the process of sharing personal narratives in the story circle, as "the circle additionally issues an invitation – a validation of personal narrative that hearing others' stories offers – which opens up a space to tell stories that might otherwise have remained untold" (Rose & Granger, 2013)

The story circle described by Lambert have been developed with the purpose of providing a form of group review process for sharing and discussing ideas of draft scripts at a digital storytelling workshop. However, we regard its value as reaching far beyond this purpose. As the workshops is concerned with personal stories, the great emphasis the story circle puts on support, acceptance, and active listening. This emphasis is finely expressed in an observation by Daniel Weinshenker captured by Lambert:

> "Sometimes, or maybe even all the time, all we need to do is observe, sometimes all that's needed is to be listened to, to be known, to witnesses someone telling a story and letting them hear the echo and then letting them become a participant in it for the very first time" (Lambert, 2013)

The safe space created in the story circle is, however, not self-evident, but rather is developed in each session. Thus, it has been observed how "[t]he dynamics of how stories come to be told in the story circle are marked by a reluctance that, curiously, is ameliorated by other, similarly reluctant participants" (Rose & Granger, 2013). Following this, it has also been observed how "hearing others' narratives reminds participants of forgotten events, or gives them courage to speak what they have previously kept silent about" (Rose & Granger, 2013). Hence, through the process of sharing your own story, and listening to the stories of others, the story circle oscillates between interpretation and reflection, as the sharing and receiving of the stories prompts community, and a safe space that promotes further sharing and empathy.

> "While the act of telling the story expands, enriches and complicates the answer to the question "Who am I?", the telling and listening that occur in the story circle connect the selves and stories of ... [the storytellers] with the shared culture they create together." (Rose & Granger, 2013)

In other words, by listening to the stories of others, while sharing one's own story, the story circle appears to promote *social cohesion* as it instils a "sense of trust, hope and reciprocity" (Jeannotte, 2003). One might even go as far as to argue that the story circle seemingly adheres to the definition of social cohesion presented earlier (see: D2.2 – Social Cohesion), as it can be considered to be an "ongoing process of developing a community of shared values, shared challenges and equal opportunity [..], based on a sense of trust, hope and reciprocity [..]" (Jeannotte, 2003).

Social Tagging / Folksonomy

Tagging refers to the markup of objects. Originally used within the world of graffiti painters to describe writings of a person's name or special mark on walls or other objects, the term has transferred to other areas as well, and importantly it has been adopted in the realm of digital information, as marking of such information with particular keywords, or similar, to effectively categorize the information as being, for instance, a particular item, form or type. Such tagging, which can be regarded as meta-data, can be used to filter the data, or to infer connections to other data.

The idea of *social tagging* can refer to an activity by which "'tags' or keywords are supplied and shared on-line by the general public" (Trant, Wyman, & others, 2006). Within the cultural heritage domain, such *tags* have been considered "user-supplied access points for works of art, or other information resources" (Trant & steve.museum, 2006). Social tagging thus involves the perspective of the public to potentially enhance the traditional institutional perspective, as "tagging represents a dialog between the viewer and the work, and the viewer and the museum" (Trant & steve.museum, 2006). Hence, social tagging can be argued to result in a "socially constructed classification" system, or a folksonomy, of the tagged items or data (Trant, Wyman, & others, 2006; Trant & steve.museum, 2006).

When utilized as a narrative method, social tagging can be regarded as an interpretation activity, as "tagging offers a way for people to connect directly with works of art, to own them by labeling or naming them – one of the aspects of sensemaking (Golder and Huberman 2006)" (Trant & steve.museum, 2006). Hence, it involves interpreting an artifact in a condensed manner, by essentially applying tags (e.g., emojis or other symbols, and keywords), that the citizen relate, and find relevant, to the artifact in question. This way, social tagging can be used to ascribe a plethora of *access points* for the artifacts, for instance, personal emotions elicited by the artifact, descriptions of characters or actions depicted in an artwork, values represented in an artwork, or the geographic locations in which an artifact might have been utilized, and more. The possibilities for the meta-data supplied through social tagging, is in effect theoretically limitless.

As such, as a narrative method, social tagging can be argued to rely on our narrative perception, as Abbott (2008) describes how our "human tendency to insert narrative time into static, immobile scenes, seems almost automatic, like a reflex action". Given this, "our narrative perception stands ready to be activated in order to give us a frame or context for even the most static and uneventful scenes" (Abbott, 2008), and whichever tags is applied to the artifact will reflect a personal interpretation act by which the artifact is

placed in a narrative setting. Likewise, for interpreting the tags of others, dependent on the presentation or visualization of the tags, it can be argued, that narrative will be sought implemented in the "reading" of the tags, as "[..] our minds inveterately seek structure, and [..] will provide it if necessary" (Chatman, 1978).

In other words, even seemingly scattered keywords related to an artifact can constitute a representation of a narrative.

> "Social tagging and folksonomy offer a less formal, more participatory, and highly distributed way to augment museums' institutional documentation with content that reflects the perspectives and interests of their communities" (Trant & steve.museum, 2006)

For SPICE, social tagging can be considered an interesting approach to citizen curation, as it has been argued that through social tagging the "visitor adds value for themselves, for the museum, and other visitors by revealing different perspectives and contexts" (Trant & steve.museum, 2006). Additionally, proofs of concept have shown how "tagging is both engaging in itself as it is satisfying to do, and productive as it increases the number of access points to art museum collections" (Trant & steve.museum, 2006). However, as the concept involves the very broadly defined activity of "collective assignment of keywords to resources" (Trant & steve.museum, 2006), we argue that any activity in SPICE utilizing *social tagging*, should consider the specific objective of the social tagging activity. I.e., what categories of tags the citizens should be asked to add. For instance, should the citizens supply tags concerning the emotions elicited or portrayed, or should they add their interpretation of the narrative depicted in a painting or a sculpture?

Hence, a social tagging activity could be based on the concepts from narrative theory presented earlier in this section, and such predefined categories of emotions or narratives can likewise follow the ontologies developed in WP6 (see: D6.2).

Additionally, as *social tagging* involves the users *actively* applying tags to an artifact, and directly engaging in a "dialog" with an artifact, social tagging is inherently *interactive*. Hence, it is important to consider what user-actions must be afforded by the system in order to allow for social tagging (see: 4.2.9 above). This in turn, relies on the intended citizen curation activity utilizing social tagging, but at a bare minimum could be considered to at least afford the possibility of providing input to a specific artifact (see: D5.1).

4.2.11 Relevance to SPICE

With narratives regarded as a fundamental cognitive mode, we also see narratives as an inherent property in the Interpretation-Reflection Loop (see: 3.0 above). When we make interpretations, we seek to provide structure and order to our perceptions. We try to put the perceived into some form of context, and thus it has been suggested that "[n]arrative is so much a part of the way we apprehend the world in time that it is virtually built in to the way we see" (Abbott, 2008). Furthermore, people use narratives for identity forming and as a sense making device, when trying to convey to themselves and others, who they are, and more importantly, how they came to be the person they are (see: D2.2 – Narrative Identity). By this, "[n]arrative methods are particularly well situated to examine meaning-making processes that concern the self" (Adler, et al., 2017).

Hence, we regard narratives as unavoidable, and particularly desirable, considered from an ontological point of view, by which "we organize our experience and our memory of human happenings mainly in the form of narrative-stories" (Bruner, 1991).

For SPICE, this view on narratives extends to the other methods of citizen curation as it permeates our approach to these. For instance, 'Visualization techniques' (see: 4.4 below) can be regarded as visual representations of data or collections to which a narrative might be applied (or sought to be constructed from), and the importance of narratives for 'Collecting' (see: 4.3 below) and in turn for identity, has also been argued for by Roger Cardinal (1994), as he argues that "[i]n its sequential evolution, the collection

encodes an intimate narrative, [..] the continuous thread through which selfhood is sewn into the unfolding fabric of a lifetime's experience". Similarly, artifact analysis can also be regarded through the lens of narrative (see: 4.1 above). Following the idea of *levels of narrativity*, it is evident that these methods all differ in terms of their *narrativity*, but all can be argued to hold the potential for narratives.

As discussed for the *story circle*, storytelling can be a powerful method for promoting social cohesion. Following the statement by Paul Ricoeur (1991) that "life can be understood only through the stories that we tell about it", it does not seem farfetched to suggest that the life of others can only be understood by *listening* to the stories of others. Ryan (2009) further argues that "[n]arrative has a unique power to generate emotions directed toward others", which she elaborates by stating that "it is by mentally simulating the situation of others, by pretending to be them and imagining their desires as our own, that we feel joy, pity, or sadness for them". As Batson (1995) remarks how empathy can be understood as "other-oriented feelings congruent with the perceived welfare of another individual" (see: D2.2 – Empathy), we argue it is reasonable to infer that by listening to the stories of others and sharing our own, we are able to develop empathy towards the 'others'.

> "Unconsciously, I am sure I tell stories that I hope would endear me to you; or at least create an emotional connection between us. An intimacy." (Lambert, 2013, p. 7)

Aside from this connection to the normative goals of SPICE, the relevance of narrative theories to SPICE occurs at multiple levels.

The structure, principles, and practices of narratology can serve to inform, structure, and enrich citizen curation activities involved with storytelling (see: D5.1), as well as inform the technical systems supporting these activities (see: D3.1, D3.2 and D6.2) by techniques and theories from traditional narrative theory. All the while connecting these activities and citizen contributions of SPICE to our fundamental understanding of human experience as a narrative. Additionally, as this understanding filter through every aspect of our approach to narratives, we regard narratives as a way by which we reflect upon our experience (see: D2.2 – Narrative Identity).

The relevance of the traditional narrative theories to the citizen contributions of SPICE, can be considered as evident when we consider how the project deals with artifacts of cultural heritage through a wide range of media. The project further deals with narratives created by museum professionals for the articulation of a specific artifact or exhibition, as well as narrative contributions created by citizens. This reflects the interplay within the iterative process of the Interpretation-Reflection Loop, as the citizen contributions derived from citizen curation activities build upon the methods for interpretation, can also be used, through the SPICE platform, as a foundation for generating new types of activities for new contributions (see: 3.0 above).

Hence, considerations about *what* the *story* is, and *how* that might be best represented through the *discourse* in a given media, holds the possibility of maximising actualization of the narrative potential of the story, when the transferred between media.

To conclude, we regard narratives as a general foundation for citizen contributions, which can be built upon by various methods for both interpretation and reflection. Through such personal narratives in combination with the development of user- and community models, we see potential for elucidation of a complex dynamics of meaning-making and negotiation within a cultural semiotic space (Lotman, 1990) (see: D2.2 – Cultural Semiotics), which in turn relates to the individual and cultural identities of the citizens (McAdams, 2011) (see: D2.2 – Narrative Identity).

4.2.12 Practical Examples

The following section provides practical examples of Interactive Storytelling and Narrative methods in use within the domain of cultural heritage and interactive and mediated experiences. The examples presented

serves as inspiration for both activities within SPICE, as well as more technical aspects of the implementations.

PLUGGY (Pluggable Social Platform for Heritage Awareness and Participation)

PLUGGY was a European research and innovation action oriented towards the creation of interactive technologies to support crowdsourced curatorial processes related to cultural heritage (Lim, Frangakis, Tanco, & Picinali, 2018). The rationale behind the project was that existing applications and repositories for heritage curation and dissemination do not really create long-lasting heritage communities. Generic social platforms (Facebook, Instagram, etc.) certainly offer potential to build networks, but they have not been exploited yet with regards to cultural heritage promotion and integration in people's everyday life. PLUGGY aimed to bridge this gap by providing the necessary ICT tools to allow end-users to share their stories and local knowledge about cultural heritage, thus contributing to a more collaborative curatorial process. Through the PLUGGY software platform, end-users can create their own digital and interactive stories combing a variety of formats and technologies: augmented reality, 3D sound technologies, geolocation and gamification mechanisms (Lim, Frangakis, Tanco, & Picinali, 2018; PLUGGY, 2019).

The insight we might garner from the example of PLUGGY, is inspiration for the extent of the curatorial processes envisioned in SPICE. As such, SPICE could take into consideration broad manifestations of cultural heritage. In PLUGGY, the citizens created digital and interactive exhibitions ranging from Peloponnesian silk wedding dresses, up to industrial chimneys in Malaga, all the way up to old coins from Slovakia. Additionally, the wide range of formats and technologies made available for citizens to create their digital and interactive story, serves as reference to the importance of considering the transmediality of stories as previously touched upon in the narrative methods. As such, PLUGGY reinforces how how the curatorial processes envisioned in SPICE should consider transmediality as a key feature of the system. I.e., the system of SPICE and the activities envisioned in SPICE, should afford the citizens the possibility to create and tell stories that mix different media formats.

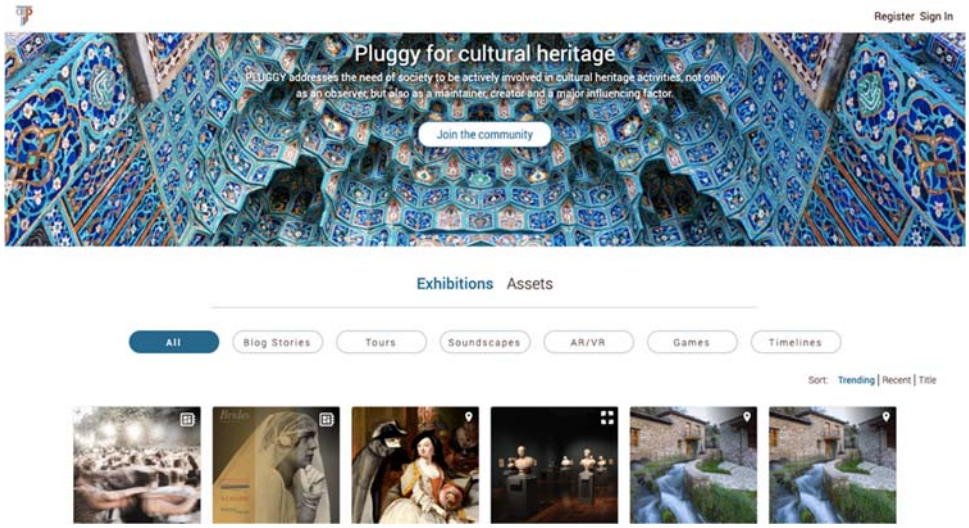


Fig. 7: Screenshot of the PLUGGY platform

Curarium

Curarium is a browser-based software application for exploring, analysing, and making arguments about the works of art in art collections (metaLAB(at)harvard, 2016). With the intentions of utilizing the power of crowdsourcing, it allows users to annotate these works of art, tell stories about each work, and curate collections in a collaborative way. Digital archives, also based on different data models, can be imported

into Curarium, and then searched and browsed through a visually enhanced user interface and annotated by the users in collaborative modes.

Allowing for repository-wide visualization tools to create dynamic data visualizations of collections, Curarium seeks to bring objects and their respective communities together in dialogues. Rather than being an online exhibition platform, it is described as “an environment for pursuing and sharing collections-based research nimbly, intuitively, and iteratively” (metaLAB(at)harvard, 2016).

The intention of Curarium is to construct media-rich stories based on the collections that are augmented with arguments about the items and curated by the citizens. Curarium is of interest to SPICE as it serves as a working example of enabling multiple voices in the curatorial space, through its tools for collaboration on the annotations of the works and collections. Additionally, the wide range of visualization tools within Curarium to augment the stories, together with the wide range of intended users and communities for Curarium relates to the work being developed through SPICE. The possibilities of interaction that is implemented into Curarium, with especially the annotation features, serves as inspiration for SPICE.

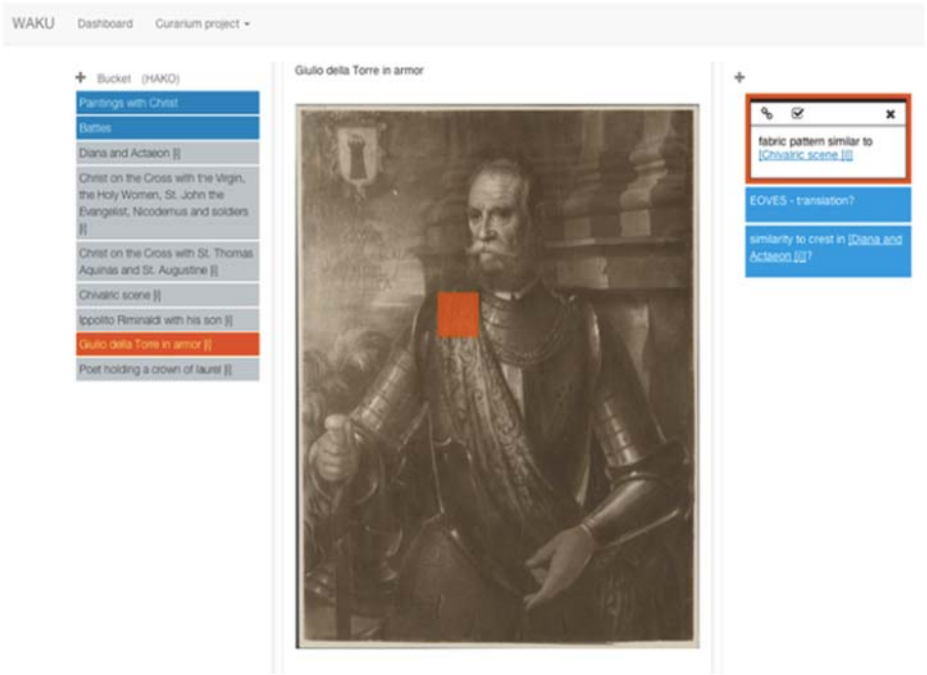


Fig. 8: Screenshot showing annotation functionality related to Curarium.
Users can add their notes to digital artifacts (e.g., the picture of a painting) or to specific parts of it (e.g., as in the screenshot above where users can leave a note relating to where the orange square is positioned)

Acropolis

The Acropolis system is a “social computing platform that allows citizens to build and share their own narratives about long-running news stories of political nature" (Schneider & De Souza, 2015). Acropolis is built around a set of design goals, which concerns three different areas of the design: (1) content creation, (2) UX design, (3) social curation.

For content creation Acropolis supports user-curated narratives and allows users to socially engage in different perspectives and plots in a story.

On the part of UX design, the interface is designed for ease of use, and with a gentle learning curve. Types of interactions conforms to simple drag-and-drop operations, and story creation and visualizations are based on a timeline format. For curating content to a story, the perspective of the user is added by a simple

title and description and can curate a post as an *answer* to another post, by simple drag-and-drop operation.

Social curation was built around the idea of recommending content from other stories, to potentially include in the user's own story. E.g., "[w]hen curating content for a story, items that have been curated by others in the storyline appear as suggested content for the new curator" (Schneider & De Souza, 2015).

In Acropolis the users can re-use and re-interpret content in three ways. Firstly, the user is recommended content from other users (hereunder also public figures) that can then be re-curated. Secondly, the user can manually curate a news story or video, by entering an URL for the specific content. Lastly, the user is afforded the ability to search for content (news, videos and posts on social networks), from which they can browse the results and select content to curate.

The feedback gathered in the testing of Acropolis provides useful guidelines for SPICE. As such, Schneider and De Souza (2015) describes how specific insight was provided on the following aspects:

- *Timeline based templates:* Basing the story templates on representation of a timeline, integrated with content recommendations, were effective in story creation, and editing occurred in an incremental fashion.
- *Separated story and character representation:* Creating a function for identifying and describing the entities which take part in stories (namely, public figures) was the logical antecedent of the monitoring of public figures in the access to stories.
- *Direct manipulation not easy:* "drag and drop curatorial operations were neither heavily used nor intuitive to all users, providing evidence for the proposition that interfaces aimed ahead of the adoption curve may not attract much use on social and crowd computing platforms"
- *Follow stories not people:* In sharing stories, the focus of the activities in the social network of story creators were the narrative contents, not the contacts. "Based on these findings, we recommend designing for following only (updates of) stories and plots, not people. As an illustration, our approach allows the user to follow a particular perspective of a story, a narrative curated by some user, or even the answers of a particular question posed in the context of a story".

From this feedback we can extrapolate multiple considerations for SPICE. For instance, although the stories are latent in the domain of Acropolis (political news stories), the overall approach to story creation – which involves the selection of items to be included in the story in a timeline representation – can potentially be partly transferred to SPICE. Additionally, the reflection on the useful separation of story and character representations in Acropolis, can suggest that historical or fictional characters (having symbolic or religious meaning for instance) could be explicitly represented and accessible in SPICE in the interpretation and reflection phases. The insight provided on the focus of the activities being the stories and not the people, confirms that in SPICE the object of reflection should be the interpretations (i.e., the citizen contributions) and not the other users, and calls for effective tools for exploration of, and exposition to, the contributions.

Asides from the considerations above, Acropolis is interesting for SPICE, as a key feature it integrates is "the ability to aggregate the perspectives posed by the set of users who curated the same content in a single object displayed in the public narrative" (Schneider & De Souza, 2015). By this, Acropolis touches upon a crucial element for SPICE, in the form of community building around the shared news stories. Albeit, in what can be considered a somewhat simple manner, as it creates communities based on similarities in collecting habits, it serves as a working example of accumulating perspectives from multiple people on the same subject of interest. Further, it implements a recommender system which presents content from other users that have also curated the content currently being curated. Albeit, the focus of SPICE is on the presentation of diverging perspectives, as opposed to similar perspectives, both the community building as well as the recommender approaches in Acropolis might serve as inspiration for operationalizing the dynamics of the Interpretation-Reflection Loop through the recommender system developed in WP3.

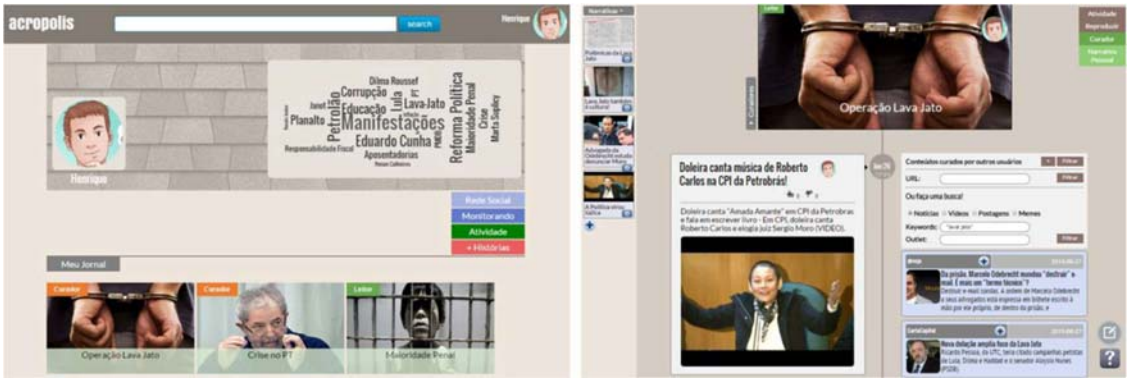


Fig. 9: Screenshots of two interfaces of Acropolis.
Left: The 'my stories' interface. Right: interface for reading and curating a story.
(Schneider & De Souza, 2015)

ArsMeteo°: Artworks and TagsFloating over the Planet Art

ArsMeteo° is a Web 2.0 portal for collecting and sharing artworks (videos, pictures, poems and music) (Associazione Culturale ArsMeteo, 2009). The contents are enriched with a variety of meanings by the tagging activity of all users of the community, both authors and visitors. The aims of the project are to create a new space for a community of artists and art lovers and create a background for the growing of a new artistic culture by using new technologies (Acotto, et al., 2009).

The platform combines social tagging and tag-based browsing technology with functionalities for collecting, accessing and presenting works of art together with their meanings. Users can rate the relevance of tag-artifact relations, by clicking on the plus and minus symbols next to the tag. Such rating activity allows the system to associate a weight to a tag related to a given artifact, which will affect the ranking of search results. The tagging activity of the community provides a basis for browsing the works of arts and finding new, unexpected relations among artists and artworks.

The integration of folksonomy in ArsMeteo° might serve as inspiration for SPICE and the underlying system of the platform. The extensive use of social tagging in ArsMeteo, which extends to keywords relating to e.g., semantic references, mental associations, descriptive attributes, emotions, and insights, is therefore relevant for SPICE, which likewise applies the use of keywords in the semantic intelligence of the system (see: D3.2 and D6.2). As described in the narrative methods, the application of social tagging as a storytelling technique is also of great interest to SPICE.

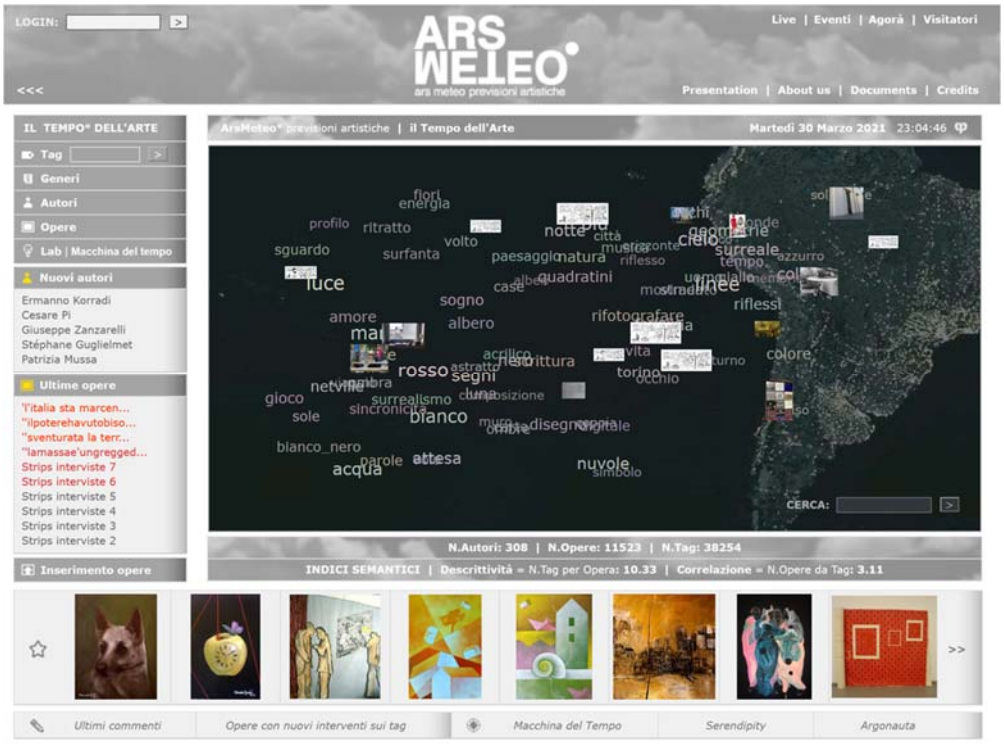


Fig. 10: Frontpage of the ArsMeteo platform (Associazione Culturale ArsMeteo, 2009)

4.2.13 Recommendations for SPICE

With the previous argumentation of how empathy (and in its wake, social cohesion) might be enhanced by storytelling, and how empathy is felt towards an *individual*, overall, we argue, that the activities in SPICE should seek to encourage the elicitation of *personal* perspectives through narratives.

Engaging the citizens in storytelling activities can also be useful for engagement. Even though, when asked directly and 'on the spot', it can be difficult for people to recognize the value of their own life stories for others, it has been argued that "[s]torytelling [through social media] has become a common and daily practice, a way to bring closer those who are far away and to open the private world to the public" (Bruschi, 2018). This follows, that the activity of storytelling is such an in-grown part in each and every one of us, that the creative task of telling a story, holds a great potential for engagement.

As such, when garnering input from the users, be that through closed-question questionnaires, through explicit writing of narratives, or 'emerging' narratives built from the interactions of the citizens with the artifacts and each other (through exposition to the contributions of others), we propose to maintain a focus from the perspective of narratives. In other words, any activity should be built around the potential for developing a narrative of the user.

Due to the previously stated issue with collecting intimate personal narratives, we suggest that the narrative activities be developed with a more implicit approach to narratives by promoting fictional narratives, through for instance minor roleplaying. E.g., like was done in the first workshop in the 1st Mini-conference of SPICE (see: 5.1 below), the citizens could be asked to make up a small story, in which they were to assume the role of themselves as a child and telling a close loved one – like a grandmother – of their experience of the presented artifact. Although the story involves an explicit personal element in the form of the role of oneself as a child, the narrative asked for is a fictional narrative. As such, the participants might not be stifled by their own inability to remember a specific episode. Instead, they rely on an overall mental image constituted by several, more or less salient, memories, into a general feeling or

some values that was important to them at that time of their life. Hence, this would bring them into a framing of themselves that can help in facilitating the creation of the narrative.

With a reference back to the presented narrative theory, such personal narratives, can benefit from the inclusion of round and deep characters. This in turn is something that the activity, the questions, the task, and the system should aid them in including.

The principal components of narrative, as described in the previous sections, can be used for such structuring, and guiding of the users' input, as to enhance the possibility of the citizens providing 'rich' input. For instance, the distinction between story and discourse can be regarded as useful, if an exhibition is developed to visually represent a set of curated citizen contributions of written narratives, it is important to consider the differences in the original and the new mediums abilities to represent the original story, and as such in their abilities to actualize the narrative potential of the contributions.

The two principal components *events* and *character* can be useful as well, as they might be used to determine if a citizen contribution can be regarded as a narrative, which in turn can prove useful for the semantic annotator service developed in WP3 (see: D3.2). Although we prefer the notion of *levels of narrativity*, over a minimal definition, the minimal definition presented can still be useful as an initial classification of contributions, in order to filter by this at a later stage. Considering the notion of levels of narrativity, we find this concept especially relevant to SPICE, and we recommend that further research in this area, as it might provide insight on which forms of artifacts naturally possess more narrativity over others, and as such potentially elicits 'richer' personal narratives by citizens.

The division of *events* into *actions* and *moves*, which is dependent on *character* and regarded as *intentional,* can be envisioned to be used together with the reflection processes in the Interpretation-Reflection Loop (see: D2.2), to determine the intentions, and through this the *motivations*, of the characters. This might in turn provide key insight into the *motives* of the author (McClelland, 1951), as fantasy have been argued to be the "raw material in which to search for motives" (Maddi, 1996). Thus, this might aid in the building of the user- and community-models, currently being developed in WP3 (see: D3.1).

Additionally, ideas from interactive storytelling are relevant to SPICE, as the activities based on the Interpretation-Reflection Loop, axiomatically can be regarded as interactive in their basic sense of citizens engaging with the artifacts through the process of interpretation and reflection (i.e., the citizens submit an interpretation, and receives the interpretation of another to promote reflection). Depending on the activities, these two separate processes of interpretation and reflection can include various amounts and types of possible interactions. Hence, in SPICE, both for the activities developed and for the system handling the interactions, the capabilities of the system to afford the user the needed possible actions (see: D5.1), as well as properly process the result of the interaction (see: D3.2), needs to be considered.

An activity we might consider as *interactive narrative*, could be to present the story of an artifact or an exhibition in parts, each with restricted form user access, by a puzzle the user needs to solve before the next part is revealed. Ryan describes this form of interactivity as simple, but widely used, e.g., in adventure games (Ryan, 2009). Following the fundamental causes of engagement proposed by Henrik Schønau-Fog and Thomas Bjørner (2012), such an activity engages the user on multiple basic levels, as we argue it engages the user through *intellectual engagement* in terms of the puzzle solving, as well as through a combination of *physical* and *narrative engagement*, due to the suspense created by withholding the next part of the narrative from the user.

For any activity where the user is prompted for a narrative response, the concept of *directed storytelling* could be considered. Experimenting with this method in an automated setup, where the system guides the user through the narrative response, could hold great potential for SPICE, as it might provide insight on both engagement and how to enhance the citizen contributions. With a focus on the method in an automated setting, it could also be useful for both on-site and off-site activities in SPICE.

The story circle (see: 4.2.10 above) could be envisioned for a scenario like the case study of Design Museum Helsinki, where local citizens bring personal artifacts to a workshop held at a local venue, where museum

experts are available for consultation (see: D7.3). In a scenario like this, a variation of the story circle could be of interest, to prompt personal stories regarding the brought artifacts of the participants, which by themselves are personal in nature because they are brought from the ultimate personal space, in the form of the participants' own homes. The museum experts would here take on the role of facilitators, and as such, should adhere to the seven considerations of the story circle described previously. However, with their added knowledge as museum experts, they could also enhance the stories by the participants, by providing knowledge on the specific artifact or the era from which it is from. The intentions by this naturally not being to take anything away from the personal narratives presented, but to add to them. By this, the facilitators would be regarded as more active participants or co-creators of the narrative. As such, the role of the museum experts would be a delicate balance between adding additional knowledge to the presented narratives, for enhancing the presented story, all the while "pushing a storyteller at precisely the right moment with the right suggestion [that] can yield a transformative breakthrough for the story, and the storyteller" (Lambert, 2013).

As with the original concept of the story circle, by which the story circle is a single activity with a specific purpose towards a goal of a workshop, in SPICE the story circle could be combined with other methods dependent on the specific goal. The important thing to keep in mind, is the purpose of the story circle, which is to create a safe space for the participants to tell their stories and as such aid the participants "to go deeper, farther, be more complexly nuanced than they may have before in their creative process" (Lambert, 2013).

As was done in the first workshop at the 1st Mini-conference of SPICE (see: 5.1 below), where we combined artifact analysis, storytelling and narrative inquiry (story circle), with the intentions of later analyse the stories for markers of the narrative identity of the participants, we argue that SPICE should always consider any method in combination with others. Especially, for the narrative methods we see a beneficial relationship with other methods as well (see: 4.2.11 above). More importantly, by the edicts of the Interpretation-Reflection Loop (see: 3.0 above) as well as the normative goals of *social cohesion*, *participation*, and *inclusion*, all methods must not be considered in isolation, but should be envisioned with a role within the loop.

4.3 Collecting

Collecting can be described to include following activities: (1) recognizing relevant material (objects), (2) creating physical or immaterial ownership of them, (3) organizing, taking care and adding new objects to collection, and (4) sharing it with others in different ways. Collecting is a human activity and a social phenomenon which contributes to the attribution of values and meanings to objects and is related to identity formation.

In SPICE collecting is regarded as a method for interpretation when affording the citizens the possibility to form or "curate" a personal selection (collection) of meaningful objects/materials - for example making their "own collection" based on museum's online collection database or when selecting favourite objects from exhibition and sharing them in private Instagram account. Here the personal selection represents an individualized collection and is an interpretation of the initial material.

Collecting has been described as "the selecting, gathering, and keeping of objects of subjective value" (Muensterberger, 1994). Representing something not vital for bodily survival, collecting however represents values that are required for "establishing a sense of human identity and defining one's place in the world" (Tanselle, 1998). It can be regarded as driven by a need for mastery, or a need of control and order of the "outside world". The process can be analysed into several components: creation of order, fascination with chance, curiosity about the past, and desire for understanding. Collecting can be said to involve a "thrill of the chase". Finding that one rare item, or just finding the "right" item for the collection. It is a form of self-expression including creative aspects in narratives about objects and making of the collection and presenting it verbally and visually (Tanselle, 1998). However, uncontrollable collecting has

also been recognized as a pathologic condition and it has been connected to trauma and fetish. In contemporary brain research, it is linked to brain disfunctions (Anderson, Damasio, & Damasio, 2005).

Collecting and gathering is a human activity and as such, also a social phenomenon. Susan M. Pearce (1995) writes: "[Collecting] represents one of the fundamental ways in which people use material culture to construct their identities and their social roles". Collecting (or a collection) is not only defined by material "results", the objects. "...ideas like non-utilitarian gathering, an internal or intrinsic relationship between the things gathered—whether objectively 'classified' or not—and the subjective view of the owner are all significant attributes of a collection, together with the notion that a collection is more than the sum of its parts" (Pearce, Thinking About Things, 1994). Collecting implies intentional selection, acquisition and disposal and giving a specific value to the group of items by its collector or possessor. The process of self-identity is connected to this recognition of value.

Collecting is in the core of museum activities and it is embedded in the very definition of the museum. According to the current ICOM (International Council of Museums) definition a museum "acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage" (ICOM, 2007). A museum cares for (or conserves) a collection of artifacts and other objects. Historically, the model for contemporary museums originates from private collections. Collecting is also in many ways connected to development of research activities, expertise (connoisseurship) and knowledge building in all areas of cultural heritage with roots in empirical study of objects and specimens. Today, private collecting is especially close to art museums and art market and today, individual collectors and their stories are often equally important in the exhibition narrative as the artworks collected.

Collecting is a significant aspect of consumer culture. Consumer research literature has focused on individual collector's activities and motivations – the social and psychological significations of collecting. In the classic account *Collecting in a consumer society* Russel W. Belk (1995) outlines the history of individual and museum collecting and examines the relationship between the development of consumer society and the rise of collecting by individuals and institutions. Belk states that collecting is an acceptable form of consuming and it is widely considered to contribute something to society rather than just being self-indulgent shopping.

Contemporary research within heritage sector has pointed to "mutual constitutiveness of objects and people", the symbiotic and reciprocal relation that materializes in collecting. Material culture - objects and collections – is embedded in social relationships and collecting contributes to the attribution of values and meanings to objects. Attention is paid also to collectives and communities that share collecting activities - like collectors' clubs (Dudley, Barnes, Binnie, Petrov, & Walklate, 2012).

4.3.1 Relevance to SPICE

As a social activity collecting is not defined only by material objects - the collectables or the collection - but is essentially linked to identity formation and self-expression and it is often practiced in communities.

Personal collections receive new meanings when connected to others. Related to identity, memory and personal life stories, collections can be used to ignite discussion. People can be brought together to present their personal collections, maybe joining people who are interested in similar kinds of collectibles in "collectors' club" activity. Platforming private collecting activities of non-professional people in the museum context supports inclusion and diversity. Collections can be used to trigger personal stories about life experience and these stories can be shared with other people, enhancing empathy.

The possibility to create an individualized collection of museum content enhances participation to cultural heritage. Also citizens' personal collections and collecting activity is relevant for SPICE, for example the design objects that a design enthusiast has acquired and is reposited in her own "home collection".

In SPICE collecting activity can be divided to 1. selecting by preference ("my collection") and 2. selecting based on a specific end-goal ("treasure hunt").

Potential user-actions for Citizen Curation that could be envisioned and used as a basis in interfaces are for example:

- Collecting in digital systems: tagging, using "make your collection" tools
- Managing: add, edit, delete
- Interpreting and presenting: through multimedia – text, voice, audio and pictures/movies
- Sharing: museum website, Social Media
- Viewing: museum website, Social Media
- Commenting: museum website, Social Media

4.3.2 Practical examples

These examples present collecting activities linked to museums' online collections. Here, collecting refers to selecting (or curating) a personalized collection online. For the online visitor, the collecting activities include searching and finding objects and information, tagging, annotating and interpreting the selected material and sharing the results online. A museum professional could also use the online collecting activity in a similar way for example when curating an exhibition or making a publication of the museum collection. The third example presents a special digital tool used to engage the visitors with the collection onsite and share information about the visit both for the visitor and the museum. All examples highlight the effort that museums take to curate an engaging experience with the collection.

Art UK

Art UK (Art UK, Homepage, 2016) is a cultural education charity which digitises artworks from the UK's public art collections, tells stories behind the art, and creates opportunities for public interaction with art on their website (Art UK, FAQ, 2016). Art UK enables users to select a number of artworks from their digitised collection, and then organise and view their selection in different ways; write about their selection and record their interpretation of the individual works in their own words; receive recommendations of related artworks based on their selected images; publish or share their selection with other users of Art UK. The activities of curating an individual collection, recording personal interpretations and sharing them with other users are most relevant to SPICE project.

Art UK enables users to collect images by clicking a heart icon via "Favourites", then allows citizens through "My Curations" to select a themed group of collected artworks, write an introduction for the overall selection (750 characters maximum), and then giving context or interpretation to their selected works by adding text to each image (again 750 characters maximum) to tell the story they want to share. Users can explore others' stories and discover artworks to select by artist, subject, venue or tag. They need to create a user account and sign in to start curating. Users can manage their curations with the editor in "My Curations" – a feature available once a user has signed into Art UK. Users can arrange the artworks within "My Curation" and choose how to view them: as Album, Storyline, or Showcase. Users can give context or interpretation to their choices by adding text to tell the story or interpretation they want to share. Once the user has completed their curated selection, they can choose to publish their "Curation" to share with others on the Art UK site. Other artworks from Art UK's collection are recommended based on the artists included in each user's "My Curation" selection.

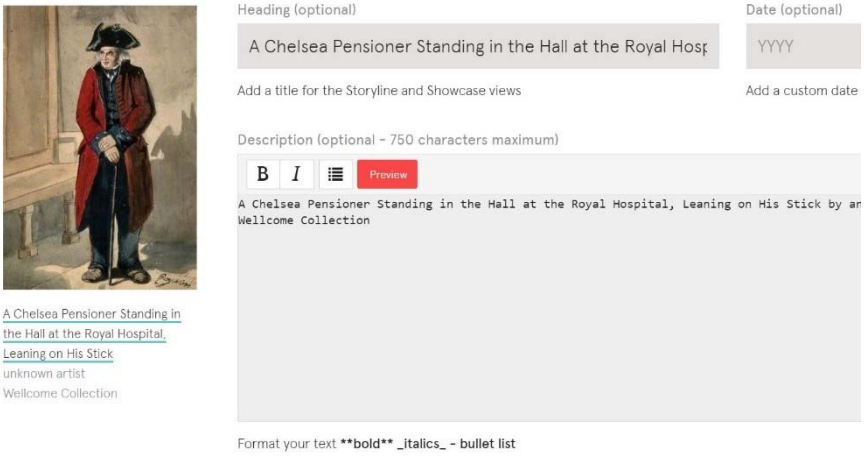


Fig. 11: My Curations on Art UK, Edit, User's commentary and description of artworks in selection.

Städel Museum's Digital Collection

The Digital Collection of Städel Museum (Städel Museum, Homepage, 2012) in Frankfurt am Main, Germany aims at generating "inspired finding" by providing associative search results that appeal to visual memory. The online collection of approximately 50.000 artworks has a comprehensive, semantic search function. The searchable, tagged areas include, for example, pictorial motifs, technical summary, material data, artist but also other categories (filters) like "iconclass" (including: nature, society, abstract, history, religion) and "association" (including for example: dog, Easter, text). Visitor can make searches also with emotive terms as "joyful", "curiousintriguing", "eerie", or "longing". The aim is to inspire the further unravelling of our holdings (Städel Museum, About the Digital Collection, 2012). The relevant activities to SPICE are especially the tagging option, the wide variety of filters and the use of emotive words to inspire search.

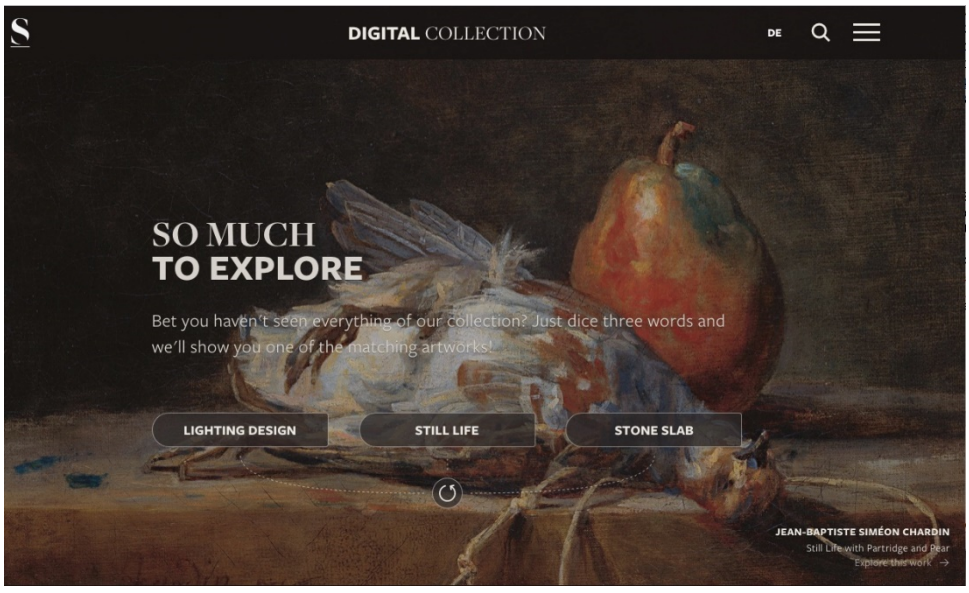


Fig. 12: The frontpage of the Städel Museum's Digital Collection

The Pen

The Pen, a custom-made electronic and digital tool at Cooper Hewitt Smithsonian Design Museum in New York (Cooper Hewitt, n.d.) encourages visitors to engage with the works on view in the museum exhibition and to create a personalized collection during the visit. With The Pen, the onsite visitors can learn about design and the collection objects and also design themselves. A sensor in the end of The Pen reads the

information on NFC tags in the object labels. This information is stored in the Pen's onboard memory and can be read at the interactive tables in the museum exhibition. At the interactive tables the visitors may explore and manipulate the objects they have collected, discover related objects in Cooper Hewitt's collection, retrieve contextual information, learn more about designers, design processes and materials, watch and share videos and even sketch their own designs.

The personalized collection curated by the visitor with The Pen is saved anonymously on a personal account which can be retrieved through code in the museum ticket. The personal account provides also statistics about the visit with data for example about the countries where the selected objects originated or about their color and also highlighting the individual " collecting habits": at which point during the visit the selections were made. For the museum, The Pen gives information about visitors' movements inside the museum and about preferred objects and activities. This reflective activity is especially interesting for SPICE: collecting information about the user's activities and mirroring it back to the user in form of a fascinating visitor statistic. Similar kind of "neutral" statistical reflection could be used to parallel different users' activities, learning about other experiences.

Fig. 13: Statistics collected by The Pen are presented in visitor's personal online account. (Image from https://labs.cooperhewitt.org/2016/the-visit-statistics-page/)

4.3.3 Recommendations for SPICE

The collections form media infrastructures for museums and provide also a platform for Citizen Curation activities. There is a wide variety of good examples for SPICE how citizens can be inspired to form personal online collections, make interpretations and share them and comment other people's curations.

Collecting as a popular hobby and social activity offer special possibilities for museums to enhance dialogue between professionals and visitors and within different kinds of communities.

4.4 Visualisation Techniques

Living in the era of information technology driving "information overload", many of us encounter several complexities that is crucial to decision making. The manner in which this information is presented drives perception in the human brain. Visualization is a technique for creating visual imagery such as images, diagrams, animations, or films and more in order to communicate a message. The Oxford dictionary defines visualization as "the formation of a mental image of something". Through the process of forming a mental image or model, the human brain has the ability to break down complex information and facilitate decision making. This can be described as a form of interpretation.

As mentioned earlier, there are several techniques for creating and enhancing visualization. This section is oriented around the genre of *information visualization* and delves into dynamic mechanisms for exploring it for the purposes of museums and cultural heritage. In order to do so, it is crucial to examine how information visualization has been defined.

In his chapter *Information Visualization: Perception for Design*, Ware (2004) explains how visualization functions as a cognitive tool for the human brain. In an attempt to define visualization, Ware (2004) states that, "(u)ntil recently, the term visualization meant constructing a visual image in the mind (Shorter Oxford English Dictionary, 1972). It has now come to mean something more like a graphical representation of data or concepts. Thus, from being an internal construct of the mind, a visualization has become an external artifact supporting decision making". The latter statement highlights the power of visualization beyond a mere aesthetic value, but rather a process to support interpretation and ultimately decision making, which is more powerful. However, what does it mean to "represent"? This has been categorically articulated by Spence (2001) in his acclaimed book *Information Visualization: An introduction*, wherein he elaborates on the dictionary definition of represent "to present clearly in the mind" to identify three principal concerns for 'raw data', namely:

- The type of data present in the content
- The dimension of data based on its attributes
- The user who ultimately **interprets** the data (Spence, 2001)

In his work, although Spence (2001) does not explicitly define 'raw data' for which the principal concerns arise, in this study, raw data refers to non-visualized unprocessed data collected from a source such as an archive of a museum's collection of artefacts. These three principal concerns are clear anchors for designing any information visualization. It is also important to note that the development of tools for creating information visualization are advancing exponentially and Graphical User Interfaces (GUI) for these tools make it easier and faster. Based on this advent, Card, Mackinlay & Shneiderman (1999) define information visualization as "the use of computer-supported, interactive, visual representations of abstract data in order to amplify cognition". Card (2008) also identifies a key problem which is in "finding an effective mapping between abstract entities and a spatial representation", which was partially presented in the previous paragraph.

In another article, Card (2008) frames visualization within the broader category of perceptualization, which includes a multi-modal combination of senses such as audition and tactile senses. This aspect is important to SPICE in order to adhere to accessibility and inclusion. One way of attempting to address it is by exploring visualization through interactive media. From the standpoint of visualization in virtual reality (VR), Forte (2007) emphasizes that "[t]he user-navigator acts within the scene, choosing the behaviors, driving the action, perceiving the information and the informative echo surrounding him/her. The interaction is immersive at the interface and at the visualization level". Here, the user is the perceiver (interpretor) guided by spatial representation and choosing the type and dimensions of data in a limited framework of the "scene". In earlier studies, various researchers in the fields of VR have defined "immersion" and "presence" in different ways and sometimes used the terms synonymously. For example, what Forte refers to as "immersive" is similar to the notion of "presence" defined by Slater (1997; 2009) wherein he explains it as a sense of being in a particular space and time despite knowing that one is actually "not there". Therefore, a unique challenge that can be addressed in SPICE is whether it is possible to create accessible

dynamic VR and non-VR information-based visualizations in the realm of cultural heritage that is capable of instilling presence in order to foster engagement for SPICE users such as visitors, end-user communities, curators, mediators, designers, researchers, and more.

In order to understand why information visualization is essential, Ware (2004) examines the role played by it in our cognitive systems. Ware states that "[t]he 20 billion or so neurons of the brain devoted to analysing visual information provide a pattern-finding mechanism that is a fundamental component in much of our cognitive activity" . This leads to several advantages outlined, namely:

- Cognitive ability in humans to comprehend massive data.
- Gaining new insights that were not anticipated earlier.
- Revealing problems within the data in case it was not apparent.
- Enabling pattern recognition thereby forming conclusions and facilitating decision making (Ware, 2004).

The author (2004) also emphasises that "[t]he pattern finding stage of visual processing is extremely flexible, influenced both by the massive amounts of data available and by the top-down action of attention driven by visual queries". Therefore, this potential provides a glimpse into the advantages of information visualization towards the development of SPICE systems as well as implementation within the case studies.

The cognitive ability to gain insights in order to reveal problems and enable pattern recognition can be satisfied through representation, i.e., to present clearly to the mind. As considered by Spence (2001), the need for representation not only arises from the cognitive processing of raw data in order to gain insight but notes that it "originates in a form unsuited to that purpose". In his book, Spence (2001) also provides a few techniques for representation and the relevant ones to SPICE to instil interpretation may include:

- Scatterplots
- Patterns
- Magnification
- Iconic Representations

An example of each of the techniques is shown below.

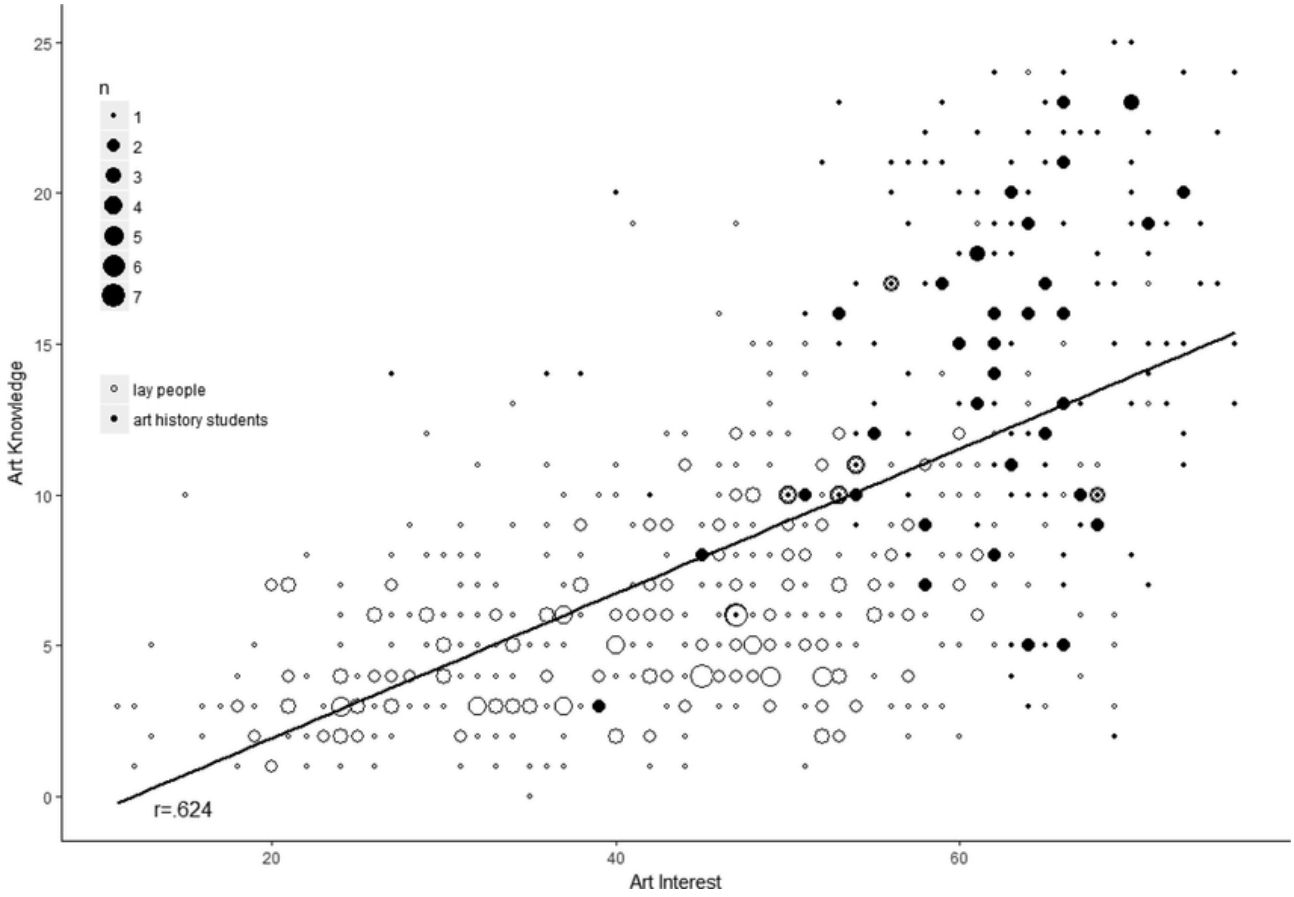


Fig. 14: An example of a scatterplot examining relationship between art knowledge and art interest. (Specker, et al., 2020)

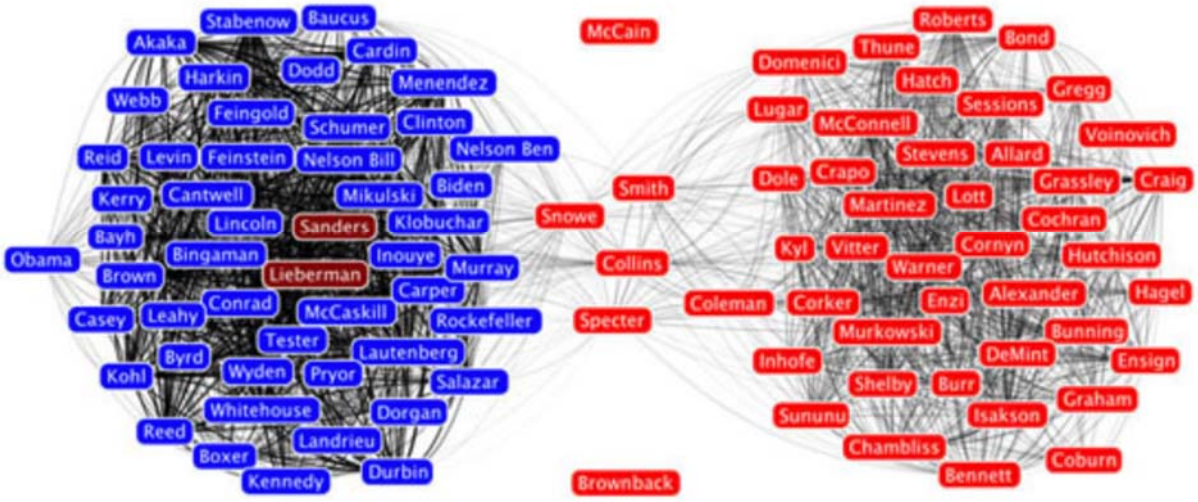


Fig. 15: The Senate Social Network visualized by slate.com
Indicates voting patterns of US senators wherein the middle represents a form of bi-partisanship.
(https://slate.com/news-and-politics/2009/04/the-senate-social-network.html)

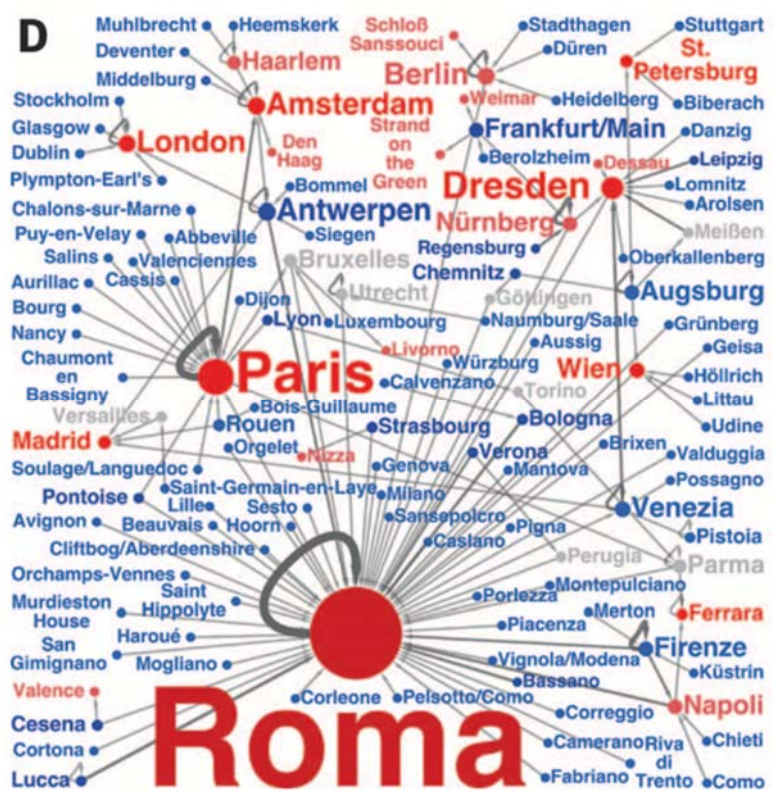


Fig. 16: An example using network-based patterns provided by Schich and colleagues (2014). It illustrates the birth-death flow of prominent artists in Europe during the 18th century, wherein the blue indicated places as birth sources while the red represents death attractors and gray is neither.

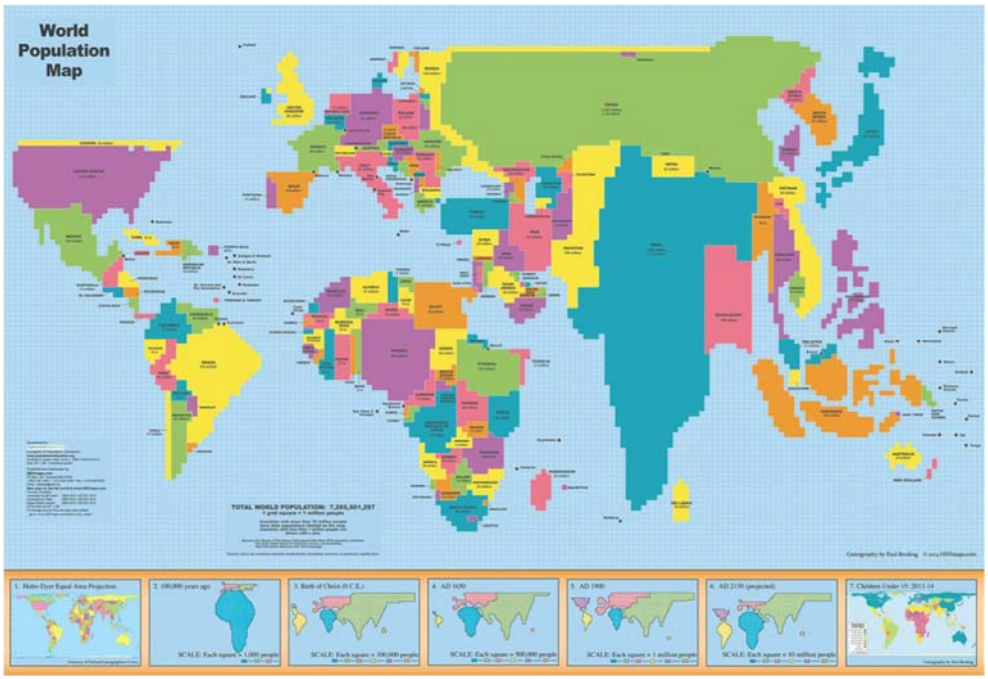


Fig. 17: The State of the World Atlas 8th Edition (2008). Uses magnification encoding to disproportionally represent country sizes based on their population densities (Smith, 2008)

Fig. 18: Examples of icons to represent textual contents in museums. Relying on its interpretations these could be used repeatedly.

The above set of examples provide some techniques for information visualization that are of essence as static or dynamic forms. In the domain of interactivity and graphical user interfaces (GUI) for navigating through these visualizations, it would be beneficial to understand some of the fundamentals.

During early stages of evolution and development of advanced graphical user interfaces, Shneiderman (2003) delved into the essentials of dynamic information visualizations, namely:

Overview: Gain an overview of the entire collection.

Zoom: Zoom in on items of interest

Filter: filter out uninteresting items.

Details-on-demand: Select an item or group and get details when needed.

Relate: View relationships among items.

History: Keep a history of actions to support undo, replay, and progressive refinement.

Extract: Allow extraction of sub-collections and of the query parameters

These methods are used extensively to this day. Shneiderman's (2003) view also highlights the strengths of dynamic information visualizations as opposed to static ones wherein a user is able to examine different perspectives of the same data.

The early research works of Card (2008) and Forte (2007) envisioned key concepts in the digital and new media realm that connect various visualization techniques with interactivity. While Card analyses digital interfaces in softwares and tools that visualize information, Forte delves into heritage within virtual worlds and how immersion has an effect on cognition as well as the ability to provide information. In relation to interactivity, Forte points out that it is immersive at the interface and visualization level. As seen in these early works that have shaped as well as envisioned some of the present trends within digital spaces and new media, interactivity is paramount for visualization.

In the field of cybernetics, Forte (2007) correctly highlights one of its most basic principles, as stated by Korzybski (1933), that "[t]he map is not the territory". Moving to the context of a virtual realm, Forte states that "the map represents the cyber-geography, the alphabet, the cartography of learning, whether in the perceptive act or in the information metabolism (memory) and "all information is interconnected in a 3D space. An ontology of the connectivity involves a mutual causality – actor and environment modify each other, creating new information" (Forte, 2007). These might be of importance if we envision a large-scale transition of knowledge and information in the digital domain. It begs the question for SPICE regarding the role of museums in maps. Forte (2007) answers this by stating that a museum "exhibits didactic criteria of visual communication, a place in itself, because it tries to construct newer contexts" and "it extrapolates objects/items from their original communicative context (or "signification") for representing them in a decontextualized frame, out of their informative medium". In conclusion, he declares that the museum could either be a map or a territory and that "the museum can be defined as a metaterritory (territory of a territory), because it deterritorializes cultural information from its original

contexts/content/communication systems, in order to recreate (when it can) new meta-alphabets able to generate partial information codes".

4.4.1 Relevance to SPICE

As stated earlier, the human brain is able to recognize patterns as well as absorb various types of emotions. Hence, presenting information in a visual format has the ability to make use of pattern recognition as well as emotional absorption and a visualization carried out through design, aesthetics and storytelling is ultimately capable of fostering deeper engagement. It would be beneficial for us at SPICE to examine the types of unprocessed museum data that would be of interest to the end-user communities and how these can be visualized to foster participation and engagement. Some techniques and key concerns related to data visualization such as the type, dimension, and the user were explained in the previous two sections and these have to be considered.

Dynamic visualization is a form of communication that when carefully used can enable museum audiences to gain a clear grasp of content that include artefacts and narrative. This is enhanced through embedded aspects of interactivity that delegates degrees of agency to the user. One is able to interpret and examine different perspectives of the same data while simplifying complex content and delegating design wherein the end-users are able to modify inputs as well as choose spectrums of visualization allows them to choose and explore it themselves. When applied to workshops conducted with end-user communities prioritizing user-experience (UX), it could definitely assist with citizen curation.

Within the research carried out at SPICE, information visualization is helpful in aiding comparative analysis and with several other methods as well, and this fact cannot be ignored. A clear example is the dynamic sociotechnical system that maps the interconnectivity between the SPICE systems to the museums and their end-user communities. Other SPICE systems such as the recommender system, linked data hub, scripting and interfaces require a form of visualization in order to map and filter the essential data.

4.4.2 Practical examples

Windhager, et al. (2018) provide a comprehensive survey of visualizations of cultural heritage data. Their aim was to classify, categorize and review recent developments of interfaces that leverage methods of information visualization to enhance access to cultural collections. They categorize the works according to three main axes that are often used in information visualization: *data*, *users* and *tasks*. When looking at *data*, two classes of data are referred to: the data constituting the digital cultural object, and the accompanying metadata. The latter is where most approaches to visualizations in CH focus. However, many works also integrate a visual representation of the content itself in the form of: image, audio, video, text, and 3D object. For the design of CH visualizations, the intended *users* is a critical factor: Users' prior knowledge, experiences, and interests will influence their expectations and interactions with a visual interface. Target users are diverse and can be distinguished according to their expertise (experts or casual users). Finally, looking at *tasks,* many of the systems are designed for the promotion of learning or education. Others are designed for creating an engaging and pleasurable experience, while another category are visualization systems designed for curating and scholarly inquiry. Tasks can also be classified according to the granularity of the task: elementary tasks, involving individual elements of the reference sets, and synoptic tasks, involving the entire reference set or its subsets. Finally, Windhager, et al. (2018) survey visualization methods for CH according to the various display methods dividing methods into temporal (i.e., timeline, time-axis, animation) and non-temporal (i.e., lists, grids, plot, map, network, treemap, wordcloud, and bar charts) methods.

Codex Atlanticus by The Visual Agency

An example of a dynamic information visualization of the evolution of Leonardo Da Vinci's thoughts is *Codex Atlanticus* by The Visual Agency (2019). These thoughts are put together through an interactive digital library containing the famed artist's journals and notebooks. The collection is known for being the largest digital set of his original drawings and writings.

Fig. 19: An overview of Codex Atlanticus by The Visual Agency.

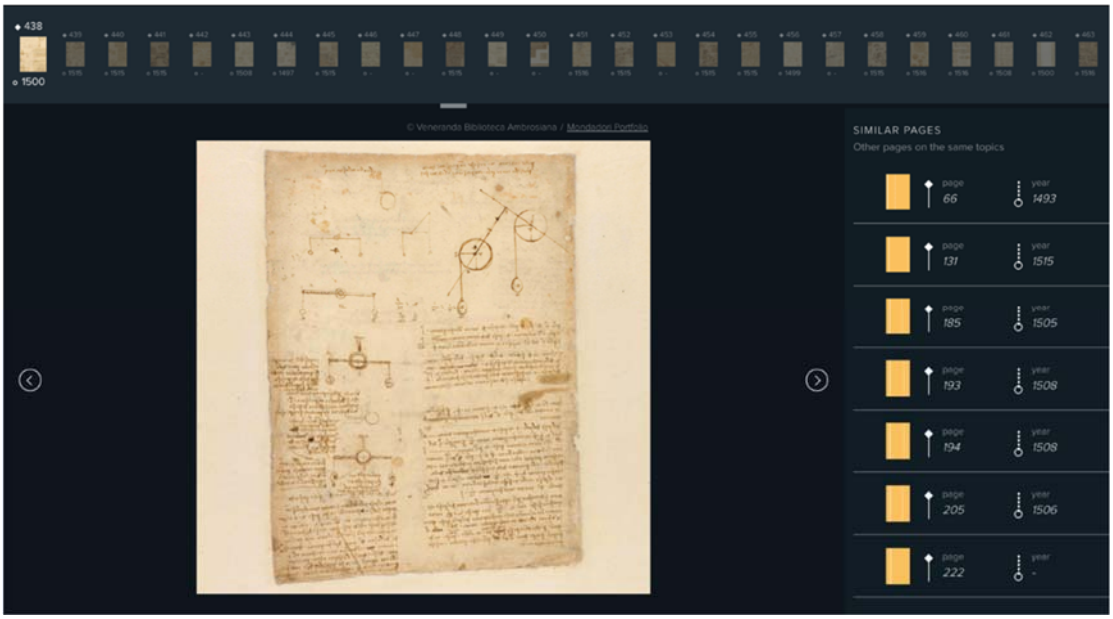


Fig. 20: Zooming in on an item of interest in Codex Atlanticus

EMDDialog

EMDDialog (Hinrichs, Schmidt, & Carpendale, 2008) is an interactive information presentation that was placed in the Glenbow museum in Calgary as part of an exhibition. Its goal was to inform and provoke discussion regarding the exhibition. It did this by providing two access points to the exhibition information. One along the temporal dimension, while the other providing other contextual dimensions. In their work, they describe the challenges that information visualization displays have when situated within the museum. First, they emphasize that the display should have a high visual appeal. Because it is placed in the

museum, people should be motivated to engage and "play" with the display and this will happen only if the display has a high aesthetic appeal. Second, the display's data and the mode of interaction should be integrated and related to the museum exhibitions. Third, visual representations designed for museums face the likelihood that visitors will only spend a short period of time with an exhibit and rarely visit it more than once. Thus, the authors (2008) emphasize that visualizations should be seamless, intuitive, engaging and effective in its use of metaphors and themes. Finally, interaction design should also be considered so the visitor can easily explore the information space. In their work they aimed to address these challenges. Another important aspect is that the visualization was aimed to support both individuals and groups within the museum.

When considering groups, a key challenge is in the diversity of the audiences varying in backgrounds, ages, professions, perspectives and more. The authors (2008) recognize the appeal of 'casual' visualizations in museums, galleries, and other public spaces wherein these types of visualizations attempt to address these challenges. In their own study, the authors noticed that children were intrinsically motivated to use the interactive displays and not being afraid of making mistakes. On the other hand, adults were quite hesitant, shy, and cautious; particularly elderly folks required more instructions for use. These challenges are very relevant to the context of SPICE wherein the idea of inclusivity and engagement is being applied. The EMDDialog study was carried out in 2008 and their observations of group may be different in the present context. Therefore, SPICE case studies need to carry out tests in order to observe and understand how particular end-user communities interact with dynamic visualizations.

Focusing on representation and interaction design of dynamic visualizations, Hinrichs, Schmidt, & Carpendale (2008) mentions a couple of principles, namely "walk-up-and-use" that emphasizes on the intuitiveness without the requirement of tutorials or instructions and "trial and error" highlighting the ability to explore without fear of mistakes. These principles were applied for the exhibit on the biography of Emily Carr – a famed artist, environmentalist, and feminist. Their aim was to provide information in a "thought provoking manner rather than a didactic one" and ultimately initiate discussions on topics of her life and work. This is perhaps a promising example of how techniques of visualization could assist in empathy, sharing, engaging, interpreting, holding dialogues, all in line with the goals of SPICE.

Another relevant aspect is the authors' (2008) choice of 'context-based' tree visualization containing a cut section of the tree as shown in Fig. 21 below and node-links representing branches. This is a dynamic way of using metaphors and the interplay between the life of Emily Carr and the cut section showing the life of a tree. The content in them is accessed by simple touches to the display, touching the nodes for example expand further branches containing links. In the end, the authors state that "[e]ach visualization can be seen as an implicit navigation tool for the other visualization" . A major takeaway is to explore how the forms of visualization can act as metaphors and interplay with the content rather than being distinct from it.

Although the authors (2008) admit that "the interpretive character of the visualized information could have been reflected stronger", they provide a set of guidelines based on their observations from the study:

- "Rewarding short-term and long-term exploration".
- "Supporting collaborative information exploration".
- "Making information visualization appealing".
- "Supporting various exploration styles".

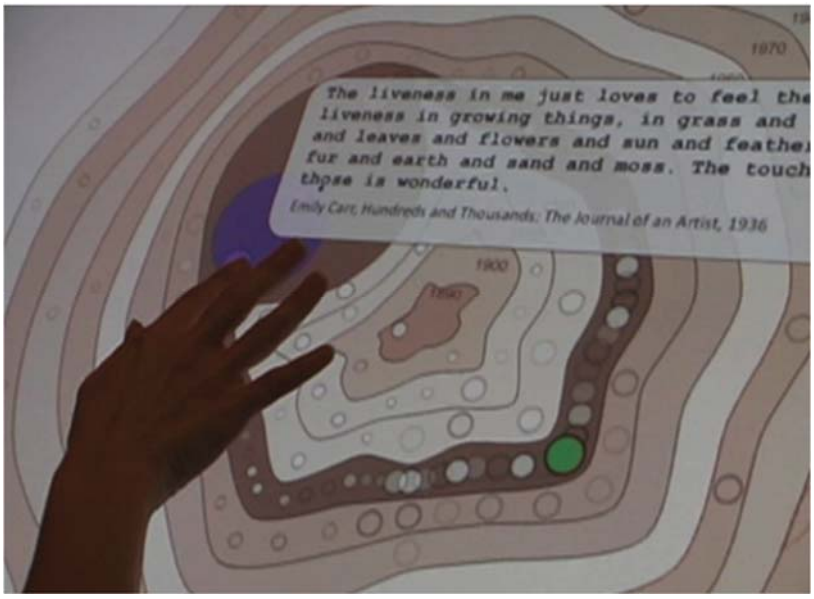


Fig. 21: Interacting with the EMDDialog interface
(Hinrichs, Schmidt, & Carpendale, 2008)

The Bohemian bookshelf

The Bohemian bookshelf (Thudt, Hinrichs, & Carpendale, 2012) supports serendipitous discoveries in the context of digital book collections. It consists of five interlinked visualizations that offer a unique way to browse and look through the collections, encouraging serendipity by offering multiple visual access points, highlighting connections between books and enabling visual pathways between items.

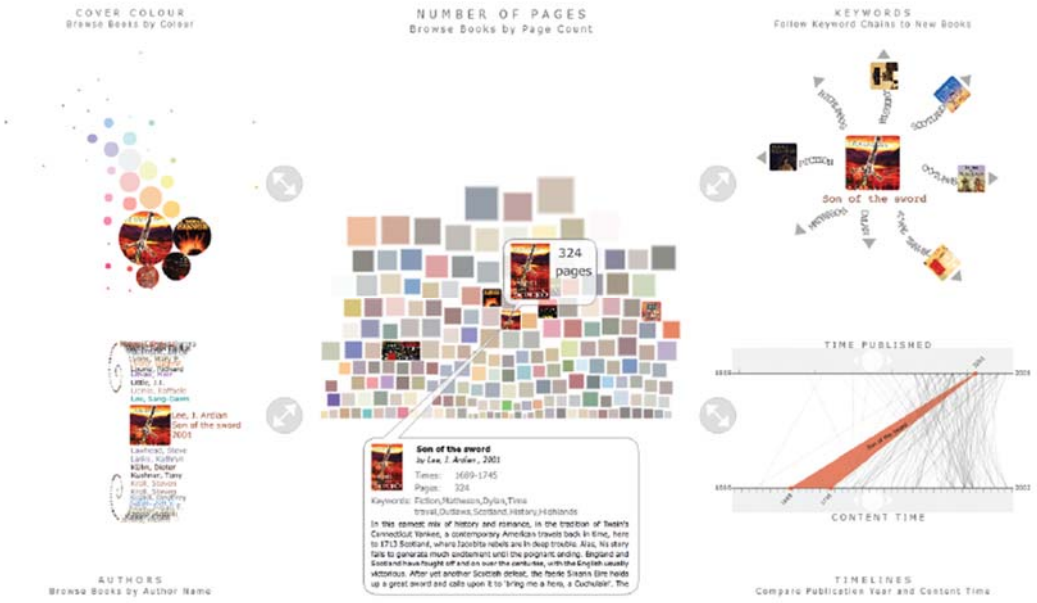


Fig. 22: Bohemian bookshelf.
(Thudt, Hinrichs, & Carpendale, 2012)

The Aksum Project

In 2003, *The Aksum Project* (Bonfigli, Forte, Guidazzoli, Pescarin, & Zane, 2004) attempted to reconstruct the archaeological landscape of Aksum, Ethiopia using a series of spatial data from various sources as well as GIS and remote sensing platforms. The multiplatform approach used by the creators enabled users to

seamlessly navigate the virtual environment without requiring any specialized knowledge in VR. An interesting aspect of this project is the design of the user interface geared to be semi-immersive through the combination of VR as well as a Graphical User Interface (GUI) that allowed users to select objects such as the buildings and other artefacts in the environment. This was an early pioneering work in visualization of archaeological landscapes in VR using spatial maps and could be of value to certain Case Studies such as HECHT.

Fig. 23: The Vision Station in The Aksum Project.

Interactive Diorama: A VR reconstruction of The Anatomy Lesson of Doctor Nicolaes Tulp by Rembrandt, 1632

There are several other VR experiences that reinterpret and visualize works of well-known artists within a virtual environment. An example of this work is *Interactive Diorama: A VR reconstruction of The Anatomy Lesson of Doctor Nicolaes Tulp by Rembrandt, 1632* that uses this approach to reinterpret Rembrandt's painting of the same name and allows visitors to exert agency in order to navigate within the simulated environment of the diorama and interact with the scene (Díaz-Kommonen, 2017). In this experience, Diaz-Kommonen (2017) introduces her own point of view of the artwork through the use of 3D modelled characters from the painting, audio design through ambience and music, and metaphors such as deliberately omitting the body from the surgeon's table. This poetic omission provides room for interpretation to embodied users by acting as a powerful signifier. The author (2017) concludes that "the 'place' created in the painting is more than the painting itself, since that which is illustrated in the artwork has slowly come into being as layer upon layer of artistic, historical, and scientific discourse is aggregated" (Díaz-Kommonen, 2017).

Fig. 24: Interactive Diorama.
A VR reconstruction of The Anatomy Lesson of Doctor Nicolaes Tulp by Rembrandt, 1632
(Díaz-Kommonen, 2017)

VR experiences of these types that aid interpretation through metaphorical play are of importance to Case Studies such as for DMH's *Pop-Up Museum* presenting collections through portable VR headsets for its end-user communities. They could also be useful to GAM and IMMA to reinterpret modern art and allow citizens' own interpretations using immersive media.

4.4.3 Recommendations for SPICE

Here are some concrete recommendations for using visualization techniques in SPICE:

- In all the sectors of SPICE, careful consideration needs to be made regarding the form of visualization that suits an activity/product/system. The visualization need not necessarily be static or dynamic information visualization. For example, the pop-up museum requires VR visualization of Design Museum Helsinki's collections and is embedded with interactivity in immersive media, thereby extending it be far more experiential and it may not present a large quantity of data. The decision made regarding the visualization should be grounded with clear references or ideally extend to simple prototypes developed rapidly and tested out with relevant audiences to collect insights through feedback.
- Visualization for citizens or end-user communities in the museums should not be limited to the realm of the aesthetics or usability that geared towards compressing and fulfilling relevant information having filtered it out. Rather, the focus of visualization should extend towards the goals of SPICE. How does the visualization instill empathy or foster social cohesion, inclusion, accessibility and engagement? This should play a prominent role during the design of dynamic visualizations. Although not necessarily explicitly, some of the questions asked before and during the design of visualizations should include:
    1. How could the information provided improve the user's life?
    2. Is the visualization accessible to a broader audience in relation to the initial access point and usability for interactions? For example, the Tate Sensorium (Pursey & Lomas, 2018) attempts to explore prominent paintings Francis Bacon's Figure in a Landscape (1945) beyond the perceiver's vision and incorporates other senses such as aural, taste, touch, and smell. In this section, we have investigated different types of visualizations, however, it is also worthwhile to consider accessibility to end-user communities and examine beyond the framework provided.
    3. Does the visualization build a framework for dialogue and engagement when used in varying contexts?

- As a part of the social and technical systems, the work packages and case studies in SPICE must consider how the development of the process and development of their work is visualized so that the communication is clear and insights can be derived from the data collected.

5.0 Workshops

(Disclaimer: This section also appears in D2.2)

As the restrictions and uncertainties presented by the COVID-19 pandemic have limited us from the possibilities of organizing workshops directly with the stakeholders, we have instead been organizing workshop-pilots internally within SPICE. We will continue with this strategy until the situation allows for in-situ workshops, however, as a contingency solution, we are designing the next workshop for real stakeholders in an online modality with the 5 case-studies.

Ethical considerations

The normal procedure for workshops or experiments conducted by AAU is to inform the participants through a "Participant Information Sheet" that AAU will not collect any data that can potentially reveal the identity of the participants, such as name, address, ID, e-mail or telephone number (see: D9.6). Such procedure will be standard for workshops or experimentation conducted by WP2 on stakeholders and citizens.

However, in the internal workshops conducted by WP2 during this first year of SPICE, this procedure was not formally followed, as these workshops were conducted internally within the SPICE consortium, with the partners directly affiliated with the development of the project. The participants were therefore well acquainted with the kind of anonymity policies followed by SPICE, and their input was voluntary under these assumptions. As such, the data collected in these two internal workshops are regarded as classified within the SPICE consortium and is not intended for external use or publication outside of SPICE. Measures were taken though in the formulation of questions and the structure of questionnaires and activities, to avoid any direct references to each participant.

5.1 Workshop #1 (at mini-conference #1)

An internal mini-conference was held on the 29th of October 2020 (see: D7.3). During this mini-conference WP2 conducted a workshop in which a permutation of interpretation and reflection methods was tested.

Combining *artifact analysis*, *narrative inquiry* and *narrative identity,* it was an exemplary combination of methods that could be implemented in the interpretation-reflection loop (see: 3.0 above). This approach was tested with all the five case studies in SPICE in an attempt to identify both cultural and individual markers for narrative identity analysis from the participants' stories.

By examining the participants' perception of themselves and how they 'came to be the person they are' (see: D2.2 – Narrative Identity), it was expected that the differences (as well as similarities) between the participants could be illuminated. The desired output was to obtain a better understanding of the participants' narrative identity, which in turn could be used to inform the categorization and recommendations of the SPICE users and the content. Thus, we were interested in exploring a format through which the participants would be motivated to share individual (and potentially personal) stories.

Structure of workshop

The structure of the workshop was as follows (see: appendix A below):

- Part 0: Intro and Demographics questionnaire (Simple)
- Part 1: Artifact analysis

- Part 2: Storytelling
    a. Storifying childhood
    b. Storifying adolescence

A. Part 3: Narrative inquiry
    c. Story-circle

Workshop tasks

Firstly, all participants were provided with an identic questionnaire (albeit the artifacts presented varied), with questions specifically derived from artifact analysis (e.g. materials, age / time-period, condition, functionality, emotions elicited). The idea was to allow the citizens full freedom in the interpretation of the artifact, whilst aiding their cognitive process by asking questions that could promote the interpretive activity specific to their artifact. The questions were based on our previous description of artifact analysis from the viewpoint of Martin & Hanington (2012).

> "Communication research has long recognized storytelling as important in the construction of identities, relationships and communities (Polkinghorne, 1988, McEwan & Egan, 1995, Hull, 2006)" (Jamissen & Skou, 2010)

After this task, the participants engaged in a storytelling task. The participants were asked to make up a short story about their experience with their presented artifact. However, in that story, they were to assume the role of themselves as a child (the specific age was left open for the participants to freely choose). They were then asked to prepare telling that story to a close loved one (e.g., grandmother). It was highlighted to the participants that their story should reflect an account that they believed would have been elicited by the artifact at that specific time of their life (childhood). It was also clarified that it could be both, a fantasy, or a description based on real events.
During the second iteration of the activity, the participants were provided with more information on the artifact. This information included textual descriptions of the artifact, which was provided by the museum curators. After having received this additional information, the participants were asked to create yet another story. Again, taking on the role of themselves, but this time as being in their late adolescence, i.e., the last part of their teenage years. This time, the participants were asked to create this short story (as being a teenager) to flirt, impress or make friendly conversation with a someone they really like. The idea with iterating these two different life points (childhood and adolescence) was to obtain information that could somehow represent a developmental trajectory in the narrative identity of the storyteller, at two different moments of hindsight.

After creating these two stories, the participants were gathered in a "story-circle" (see: 4.2 above) and asked to select and share one of their stories. It was thought that by doing this, we could potentially be able to say something about the person based on the chosen story, but also on the disregarded story.

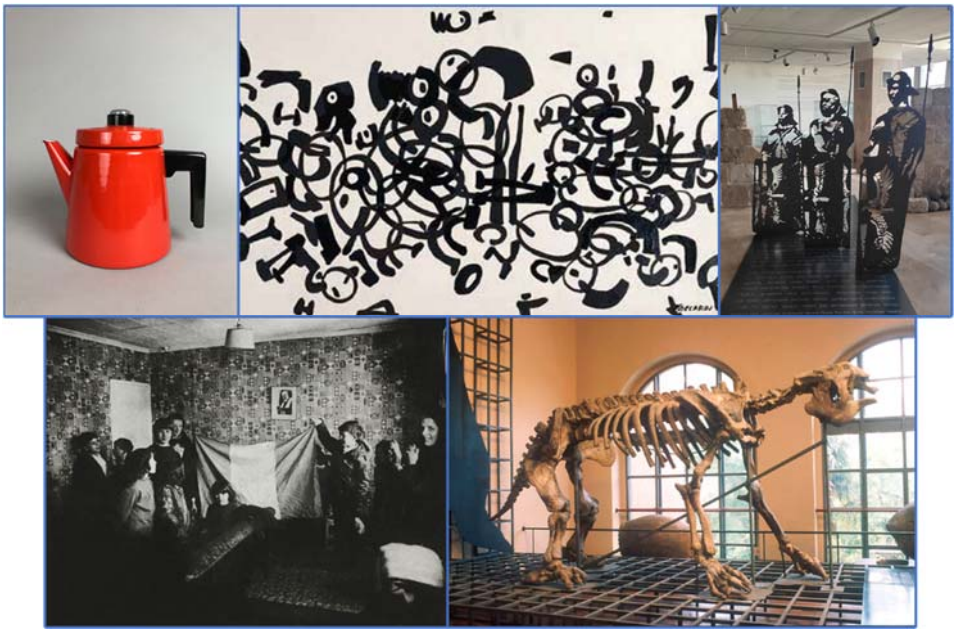


Fig. 25: Artifacts presented to participants in workshop testing of permutation 01. Each artifact was individually assigned for each group in the workshop. From the top left: Antti Nurmesniemi: Coffeepot Pehtoori, Carla Accardi: Arciere su bianco (Painting), Roman Legion (Sculpture), Les Levine: Deery Family of 13 (Catholic) (Photograph), Megatherium Americanum (Fossil).

5.1.1 Results / Discussion

The reason for exploring a narrative from the focal point of the participant as a child and as an adolescence respectively was based on that "[s]hared family narratives take on an increasingly important meaning in adolescence, when a primary developmental concern becomes the exploration of identity (Erikson, 1968) through narrative meaning-making" (Fivush & Merrill, 2016).

By making the participants fashion a story with themselves as the main character – and specifically a past version of themselves – with the addressee being a person close to them, it was expected that the participants would engage in personal hindsight prior to, and possibly during, their creation of the story. As the activity was a creative one, as opposed to purely factual, the intention was to create an open and "safe" space in which the participants would feel free to tell the story of their choosing. We did not insist them to share in detail a specific and personal memory, but rather allowed the participants *full freedom* to decide if their fashioned story would reflect a personal recollection or if they wanted to share it in the form of a fantasy. Allowing for such freedom, was not expected to necessarily mitigate the relevance of the output in relation to narrative identity, since "[..] narrative identity is not memory; it is the story told about memory" (McAdams, 2018). Even if said memory is not described specifically in the story procured, we argue that since the participants were asked to create a story that they could have elicited at that time of their life, they would naturally implement their perception in the present of their memory of this past, i.e., their "reconstructed past" (McAdams & McLean, 2013). Departing from the concept of narrative identity, this approach was believed to reveal pertinent information about potential markers of the participants' assumed identity. Additionally, it was noted from the collected stories that a number of the participants' stories actually included details that suggested a more personal rather than fictional approach to the task.

Narrative identity is considered to be a complete story of a person. As McAdams (2018) has described, it is "[..] a special kind of story—a story about how I came to be the person I am becoming". Similarly, "[t]hrough narrative identity, people convey to themselves and to others who they are now, how they came to be, and where they think their lives may be going in the future" (McAdams & McLean, 2013). Following this understanding of narrative identity, it has been argued, that narrative identity is empirically a difficult construct, and that "[..] a person's narrative identity will never be exhaustively expressed by any

single story (Lucius-Hoene & Deppermann, 2000). The question thus arises, how might we expect to gain insight into the totality of a person's narrative identity based on a single, or even a few, stories, as is done in the current approach?

Additionally, it has been argued that narrative identity might not be construed as a single entity within a person, "[s]ince every story is inevitably characterized by selectivity, situational pragmatic objectives of the teller, audience-design, etc. [..]" (Lucius-Hoene & Deppermann, 2000). This follows the description of McAdams (2011), who regards narrative identity as a "selective reconstruction of the autobiographical past". Hence, it seems natural that this selection differs in time, as our recollection of the past is always influenced by our knowledge in the present (Kvernbekk, 2013; Landa, 2000), but it seems likewise plausible to conclude that this selection is socially and culturally informed, as people construct different stories about who they are, and how they came to be, dependent on the given time, situation, social context and audience (Lucius-Hoene & Deppermann, 2000).

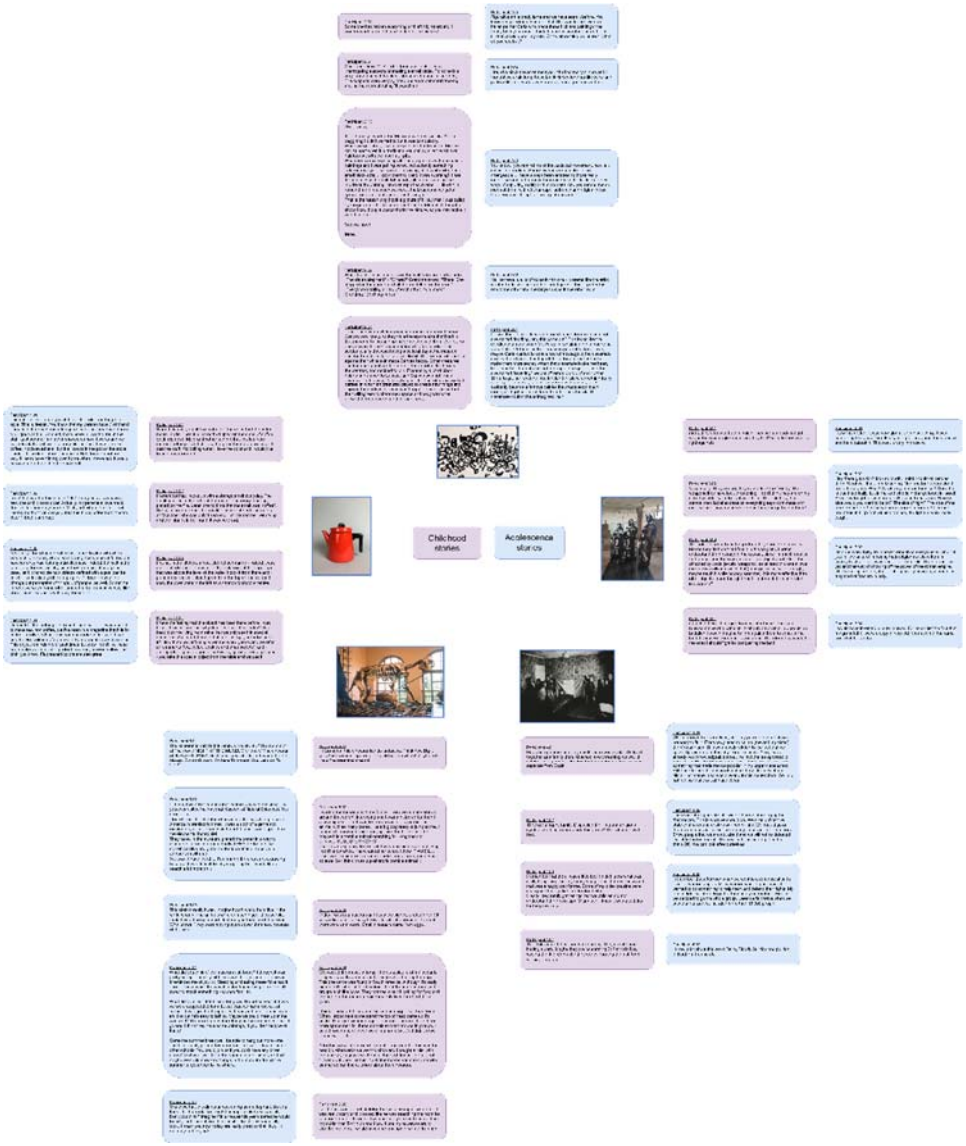


Fig. 26: Mindmap of the stories elicited at Workshop #1

If we consider narrative identity as an integrative concept however, like McAdams himself along with Ricoeur and others (McAdams, 2011; McAdams & McLean, 2013; Adler & Clark, 2019; Ezzy, 1998; Ricoeur, 1984), we argue that even a single snapshot reflection of a person's identity, as is the case in this approach,

is still a piece in the on-going process of constructing ones narrative identity as a whole, and consequently a partly reflection of the whole.

5.1.2 Further Analysis

The data from the workshop, in the form of the participants' stories, is currently being analysed by WP2 and WP3. In the ongoing analysis, WP2 is using a qualitative narrative identity analysis approach involving *affective themes*, as presented by Jonathan Adler & colleagues (2016; 2017) (see: D2.2 – Narrative Identity). WP3 is using the data from the workshop as prototypic data for the semantic annotator service currently under development. For this, the data is used to test the ability of the service to semantically enrich user-generated textual contents through sentiment analysis and emotion detection (see: D3.2).

In WP2, incorporating the aforementioned affective themes for narrative identity analysis, we have initially looked at the data using narrative measures of "Contamination/Redemption". This type of analysis helps us establish the emotional shift in the tone of the participants' narratives, moving either from positive to negative, or on the contrary, from negative to positive.

User_1.1_child.xls	rdfs:label	@id	@type
User_1.1_child.xls			
User_1.1_child.xls	love	ex:anno_4_emotion_282-286_love	emotion:Love
User_1.1_child.xls	like	ex:anno_5_emotion_309-313_like	emotion:Like
User_1.1_child.xls	red	ex:anno_6_emotion_331-334_anger	emotion:Anger
User_1.1_child.xls	told	ex:anno_7_emotion_156-160_trust	emotion:Trust
User_1.1_child.xls	smell	ex:anno_8_emotion_109-114_anger	emotion:Anger
User_1.1_child.xls	smell	ex:anno_9_emotion_109-114_disgust	emotion:Disgust
User_1.1_child.xls	afraid	ex:anno_10_emotion_28-34_fear	emotion:Fear
User_1.1_child.xls	like	marl:Positive	
User_1.1_child.xls	love	marl:Positive	
User_1.1_child.xls	red	marl:Negative	
User_1.1_child.xls	told	marl:Positive	
User_1.1_child.xls	smell	marl:Negative	
User_1.1_child.xls	smoothed	marl:Positive	
User_1.1_child.xls	very small	marl:Negative	
User_1.1_child.xls	afraid	marl:Negative	
User_1.1_child.xls	coffee maker	dbr:Coffeemaker	
User_1.1_child.xls	coffee	dbr:Coffee	
User_1.1_child.xls	coffee	dbr:Coffee	
User_1.1_child.xls	coffee pot	dbr:Coffeemaker	

Fig. 27: Semantic Annotator Data Example.
Example of the data extracted from the stories by the semantic annotator

The initial narrative analysis of the data using affective themes has so far demonstrated that not all collected narratives contain, what could be classified as an emotional shift, or indicating to either contamination or redemption. However, it does occur frequently enough to suggest further exploration of this approach.
Moreover, using the semantic annotator system for affective story analysis would still require further investigation. This would entail looking further into whether the connotations suggested by the semantic annotator reflect the "mood" of the story. I.e., the accuracy of the prediction of the system.

		Is it a narrative?			Keywords		Story transition?	General mood
		More than one event	*Are there change*	*At least one character*	*Explicit*	*Implicit*		
Participant X								
- Story 1	When I was very small I was afraid of the noice that the coffee maker made. Then it all smoothed up when the smell of coffee got in my nose. My grandmother told me that this is a very modern coffee pot and she used to grind the coffee beans and cast the stuff into boiling water. I love the color and I would like to paint my room red.	TRUE	TRUE	TRUE	small, grandmother, afraid, love, modern,	home, family	negative -> positive	positive
- Story 2	This coffe maker is really cool. I love the color and the plain style. This is design. You know that my parents have 3 of them? They collect fancy Finnish design objects and they have others too - glass and all. As child, I was never allowed to touch the stuff. Last summer my father showed us how it works and we even drank the coffee. it is funny old fashioned way to make coffee. Not brewed at all but it all cooks in the pot on the stove. Think of how elementary it has been! But I love the pot and would like to have it in my own home when I move out. It would be awsome to have it in the bookshelf!	TRUE	TRUE	TRUE	cool, love, Finnish design, design, plain-fancy, father, parents, funny, old fashioned, bookshelf, home	restrictions vs. allowance, family, living on your own,	no	positive

Fig. 28: Example of manual processing of narrative.
Exploring the redemption/contamination measures of Adler & colleagues (2016)

The next step would be to also apply the motivational themes in the narrative analysis. Utilizing the motivational themes could potentially give insight into the values of the authors of the stories, based on the motivations depicted in the narratives. Thereafter, we could further continue with the analysis of these values by using tools from cultural semiotics (see: D2.2 – Cultural Semiotics).

5.2 Workshop #2 (at Mini-conference #2)

As part of the internal Mini-Conference 2 that took place on the 23rd of March 2021, WP2 held a joint workshop together with WP5 and WP7. The aim of the second workshop was for each case study to share mock-ups of their desired interfaces to subsequently explore how their designed mock-up interfaces could be improved using the interpretation and reflection methods, and the Interpretation-Reflection Loop. The participants included at least one representative from each case study partner, SPICE consortium members, as well as members from all work packages.

Prior to the workshop, each case study was asked to submit their pre-workshop “homework” tasks. The homework tasks were put together by WP2 and WP5. The tasks involved the case studies having to use theoretical approaches to interpretation and reflection methods to design their own mock-up interfaces. We will thereby firstly introduce the pre-workshop materials, together with the homework task, and thereafter the workshop itself, the outcomes and the emerged discussions.

In order to help the participants better prepare for the workshop, WP2, WP5, WP7 put together a collection of pre-workshop materials (a digital workshop package) and designed a preparatory homework task.
The digital workshop package consisted of two parts; a methodological part (prepared by WP2), and an applied part (prepared by WP5). The methodological part provided an overview of the different methods for interpretation and reflection, and a short introduction and visualization of the Interpretation-Reflection Loop. The applied part consisted of mock-up examples of citizen curation activities, together with information on how to develop one's citizen curation activities. The preparatory homework task was to try to use the methodological part together with the applied part to develop theoretically grounded citizen curation activities relevant to their case-study.
The digital pre-workshop package was sent 2 weeks prior the workshop, and the participants were asked to submit their tasks latest one day before.

Methodological part (WP2)

The methodological package included:

1. *Seven (7) Method Cards* The seven (7) SPICE method cards described in more detail the four (4) interpretation and three (3) reflection methods. Each method card included: an introduction of the method consisting of condensed key points derived from the theoretical framework, a section linking the method to the mock-ups, and finally, hyperlinks directing to examples of the method being used in the domain of cultural heritage, art or experiences (see: Fig. 29).
2. *One (1) empty "My card"* which were used to select which methods each case study found particular interesting for incorporating in their interface mock-ups (see: Fig. 29).
3. *A brief description and visualisation of the "Interpretation-Reflection Loop"* (see: Fig. 2).

Applied part (WP5)

The applied package included:

- *A document describing the Citizen Curation mock-ups*, meant to be used as a starting point for making one's own mock-ups.
- *Instructions for making one's own mock-ups*. This includes how to download the Balsamiq software that was used to make the citizen curation mock-ups.
- *Two Balasmiq files containing interfaces from the mock-ups documents* that one can reuse in your mock-ups (see: Fig. 30).

Fig. 29: Seven method cards and "My Card"

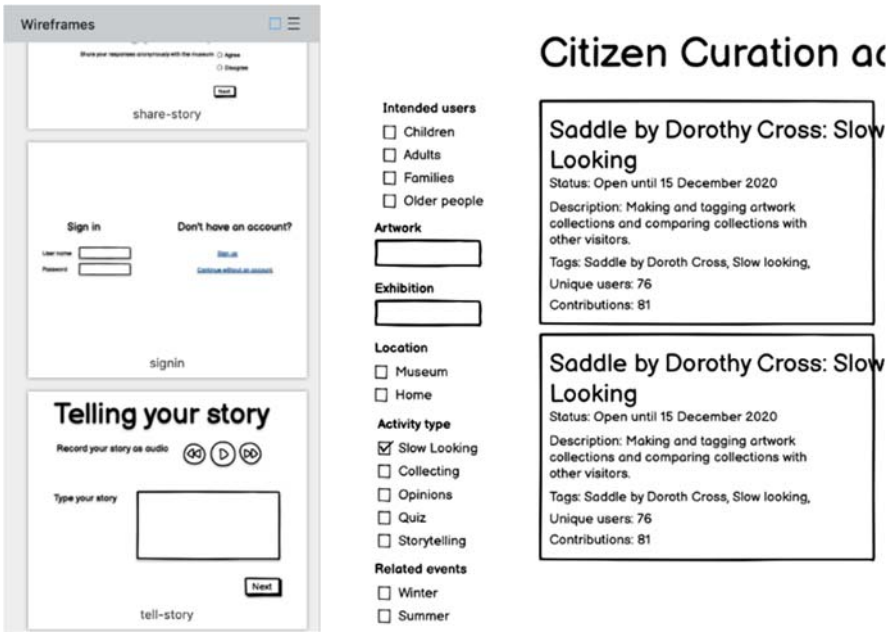


Fig. 30: Screenshot from the example interfaces in Balsamiq®

Mini-Conference 2, 23.03

The mini-conference 2 took place on Tuesday the 23rd of March from 9.00-13.00 on Zoom. During the conference, each case study and work package was represented at least by one representative. Before the conference, all 5 case studies had submitted their 'My Card' and their interface mock-up designs.
In order to give a better overview of the emerging themes and discussions, the conference will be described in two parts.

Participants

The participants of the mini-conference included at least one representative of each case study partner, SPICE consortium members and members from all work packages. For an overview of the case studies institutions (and their acronyms) see Table 1. Additionally, Table 2 summarizes the main characteristics of each case.

Short name	Institution name	Country
DMH	DESIGNMUSEON SAATIO - STIFTELSEN FOR DESIGNMUSEET SR	Finland
GAM	GALLERIA D'ARTE MODERNA	Italy
HECHT	HECHT MUSEUM	Israel
IMMA	IRISH MUSEUM OF MODERN ART COMPANY	Ireland
MNCN	MUSEO NACIONAL DE CIENCIAS NATURALES	Spain

Table 1: Case studies
(from D7.1 – Evaluation Protocols)

5.2.1 1st part - Case Study Presentations

At the start of the conference, each case study was asked to do a short 10-minute presentation of their mock-ups and present their selected methods using the 'My Card' method card. Each case study presentation was followed by a 5-minute discussion.

It was gathered from the presentations and submissions that each case study approached the methods and the mock-up tasks differently depending on their primary target-group and underlying case study objectives. As many interesting approaches and considerations emerged from these presentations, some of these will be highlighted below (see: Table 2).

Case Study	Bonding capital	Bridging capital
DMH	Enable senior citizens and families living far from the museum to engage with culture and share among themselves or with their communities regarding how their personal artefacts and interpretations connect to Finnish culture and design heritage.	Make their artefacts and interpretations available in virtual and touring galleries to provoke understanding and contributions across generations and geographical communities.
GAM	Enable Deaf people and other visitors to actively participate in cultural interpretation and storytelling and connect and share their interpretations through social media functions.	Enable the contributions of Deaf people to be digitally accessible to others in the museum and online. Interconnect contributions using story features such as characters and emotions.
HECHT	Enable members of religious and secular communities, in particular minority populations, to express and share their viewpoints and appreciate the variety of opinions even within a community.	Provide support in the museum for accessing and exploring opinions across different communities in order to find similarities and also respect and understand differences.
IMMA	Support groups who are less able to visit the museum physically, such as asylum seekers and children with serious illnesses, to access collections and share their own perspectives.	Make their perspectives available online and in the museum. Encourage visitors to think about universal, personal themes such as family to make interconnections across groups.
MNCN	Actively engage children, including those from lower socio-economic groups who may not consider science interesting or a career option, through activities such as games and puzzles.	Make anonymised contributions available across groups to explore differences of opinion on biodiversity and what individuals can and should do to protect the environment.

Table 2: Bonding and bridging capital of the case studies (from D7.3 - Case Studies Progress and Plan)

Interpretation and reflection methods

It was noted that while some case studies were more decided on which methods and activities, they were interested in incorporating, then others were still open for exploring different approaches. For instance, one of the case studies (MNCN) that had only marked one interpretation method (narrative methods), and no reflection methods, was interested in further enriching their methods based on the feedback to their mock-ups. It was suggested to the case study by other participants that by using their collected stories, they could incorporate methods for reflection from duoethnography, as this could help elicit conversations about important topics (e.g climate change) relating to their case study objectives. Furthermore, while one other case study (HECHT) had also not marked any reflection methods, they were nevertheless interested in incorporating visitors' values, pointing to potential methods from cultural semiotics.

In relation to combining and utilizing the various interpretation and reflection methods, one of the case studies (DMH) highlighted the eminent relationship between artifact analysis and narrative methods, as for them, the two were considered inseparable. Moreover, it was pointed out that visualization techniques could additionally be used outside of just data visualization, also for promoting usability and accessibility

for the users, or used as a foundation for storytelling activities and gamification.

Who is the "user"?

All the case studies demonstrated different approaches when presenting who the 'main' users of the system were. While some case studies were more focused on the visitor perspective, then others presented their mock-ups more from the curator, or museum mediator perspective. During the conference, this allowed discussing and addressing the different considerations for the platform from various viewpoints. For example, when one of the case studies (IMMA) was in the first stages of development more interested in using the 'outputs' from the 'groups analysis' primarily for the museum curator, then another case study (HECHT) was leaning more towards the 'outputs' to be facilitated by the system and more directly with the individual visitors.

Moreover, an important consideration that was pointed out was concerning primary target groups and communities surrounding these target groups. During one of the case study presentations (GAM), it was pointed out that although it was important for them to keep their focus on their target group, they simultaneously wanted to focus on cultivating the broader community around their target group. They then demonstrated this by giving an example of a visitor 'outside' of their primary target group using the system. This highlighted an essential consideration for all the participating case studies.

New ideas

Interesting ideas surfaced in relation to new activities. After one the case study (IMMA) presentations, one of the ideas involved the visitors using existing artworks, paintings and objects in the system to create their own collages, promoting a more gamified approach. Moreover, it was also noted that the case studies were clearly inspired by each other's presentations. This was particularly apparent during the 2nd half of the conference where all the 5 cases could discuss the possible changes to their mock-ups, and their chosen methods.

5.2.2 2nd part - Interpretation-Reflection Loop

During the second half of the conference, WP2 held a presentation elaborating on the interpretation-reflection loop with a focus on reflection processes -- how to stimulate the input from the participants towards social cohesion. Although all cases had prior to the workshop been sent a document describing the interpretation-reflection loop and the related processes, the presentations held by WP2 and WP6 aimed to further establish the connection between the methods and the foundational underpinnings of SPICE (social cohesion, inclusion, empathy, and others.).

Reflecting on the IRL

At the end of the presentation WP2 suggested five guiding questions to help the case studies improve and enhance their reflection methods and activities, converging towards the interpretation-reflection loop. Thereafter, the participants were placed in breakout rooms to discuss the aforementioned questions relating to their case study. After 10 minutes, all participants returned to the main room to elaborate on their answers.

The 5 guiding questions:

- How do the activities in your mock-ups enable citizen curation in relation to your exhibition?
- What kind of reflections do you expect your mock-up activities to elicit on the participants?
- What type of reflection "outputs" could help you best elicit important conversations in your community?
- What do you think you could do to direct these mock-up activities, to make your audiences reflect in a direction that promotes social cohesion? (use your intuitive understanding of social cohesion)

- What changes to your original mock-up design would you consider based on this?

The post-task discussions were fruitful in terms of the case studies reflecting on their approach and possible changes to their mock-ups.

See Table 3 for the full list of answers by each case study.

Case study	**1. How do the activities in your mock-ups enable citizen curation in relation to your exhibition?**	**2. What kind of reflections do you expect your mock-up activities to elicit on the participants?**	**3. What type of reflection "outputs" could help you best elicit important conversations in your community?**	**4. What do you think you could do to direct these mock-up activities, to make your audiences reflect in a direction that promotes social cohesion?**	**5. What changes to your original mock-up design would you consider based on this?**
HECHT	Our scenario has less to do with citizen curation and focuses on social cohesion and inclusion.	We expect participants to have a stronger awareness of other people's opinions and motivations. We hope they reflect on the values that drive their opinions and can emphasize with others values.	Reflections that talk about values and are provocative enough to elicit responses (but they should not be too provocative to shut down the conversation)	We should break up the question to lead them to examine their opinions on a deeper level. We can also use indirect approaches that would help them express opinions. Finally, we can show them other people's opinions according to our understanding of their social/personal/community model. Possibly, it is better to first show one person's opinion, and only then, show the entire span of opinions.	Breaking up the questions to sub-questions. applying a conversation-style interface. We hope we can apply techniques of conversation elicitation.
MNCN	Our intention is to provide teachers with the possibility to create their own treasure hunts, choosing the objects from the museum's collection, the narrative and the questions that are most appropriate to the interests of their students. We also envision the possibility for teachers to share	Our aim is to get participants to reflect on the long-term implications that some of their actions in everyday life may have. We also want them to reflect on the implications that climate change can have on their lives and to be aware of the small but important role	We believe that individual stories about the personal understanding of climate change, its effects and how we act to prevent it, can be used to confront different views on this issue. The stories can be collected during the activity at the museum, or they can be taken to	Perhaps cohesion can be promoted if through the reflection activities a common awareness of the problem is built, through the stories of other children who may be more aware of the importance of taking action on climate change. It may be easier for a child to hear the	The mock-up design is still valid, but we need to think better about the activities that will take place after the museum visit. It is also necessary to think about the possible uses that the museum itself can make of the interpretations and reflections collected during the visits.

	their treasure hunts with other teachers, thus creating a community of teachers who can be both creators and consumers of content.	that we as individuals can play.	school where, with more time, the teacher can invite the children to reflect on the issues raised during the museum visit.	voice of another child than that of an adult.	
IMMA	The current mock up enables citizens to select and interpret artworks in different ways, and crucially to share those personal selections and interpretations with friends and family (via email), the general public (via social media) or the museum itself. We see the linking and sharing of these individual acts of selection and interpretation as central to the concept of citizen curation.	We expect responses to vary from the descriptive and factual, e.g. 'What is going on in this image?' or 'What is this sculpture made of?' to the personal and creative, elicited by more open-ended questions, e.g. 'If you were given the chance of making a sculpture by mixing two or more everyday objects, would you want to do so? Why/Why not?' etc.	Reflections that capture novel perspectives on artworks and objects, or which come from users from underrepresented or underserved communities. Personal reflections that elicit empathy from different user groups and that problematise perceptions of homogeneity within communities, with the ultimate aim of fostering social cohesion.	To start with, the deliberate and conscious selecting of artworks with which to elicit reflections will be important, i.e., encouraging visitors to think about universal, personal themes such as family to make interconnections across groups.	Based on our discussions of the above during mini-conference 2, the suggestion was made to build in modular reflection activities so the user can have a number of alternatives 'ways in' to thinking about and reflecting on an artwork or object. A modular rather than linear approach to reflection activities would also increase accessibility and inclusion.
DMH	The activities programmed such as sharing collections and design stories are geared to promote dialogue. Citizens would be involved and will be able to participate in design heritage (creation) through these activities.	Satisfaction, joy, through sharing experiences as well as inspiration and curiosity related to the ability of sharing the contents/learnings to friends and relatives.	There are several end-user communities in DMH. It would be important to understand who they are, where do they come from (social and cultural backgrounds), and the content of the museum. Personal outputs tied to their own narratives through auto and duoethnographic interactions are envisioned.	Due to a variety of end-user communities from diverse backgrounds sharing and exchanging narratives and knowledge promotes understanding amongst these diverse groups. It fosters curiosity/interest about each other has the ability to break biases/stereotypes and is likely to aid social cohesion. If we are aiming to measure social cohesion qualitatively, a basis/framework is very much needed throughout SPICE.	We would work on the Pop-Up Design Museum mock-up and outline a detailed set of activities in it. Mockups being used by curators, educators, and end-user communities will direct the iteration of existing mockups.

GAM	We ask visitors to directly interpreter their favorite artworks giving the museum their emotional response to what they see. Their contribution will be side by side with the "official" museum voice and available to reuse for other visitors as well. In this way knowledge about the collection will be grow including visitors' voices.	We expect them to have a more natural approach to the collection and we wish they will feel free to express their reaction to the artworks. We hope that validating the audience response will be a way to involve them more and to create a feeling of ownership and pride regarding the collection.	Voices and interpretations that diverge from the curatorial one may help everyone step up and share their reaction toward a collection which is owned by the city. This will also help the museums to better understand what is relevant to a broader community.	For sure, in our scenario we will elicit all the audience to engage with interpretation activities and only then reveal that the scenario was tailored on a very specific audience, deaf teenagers. Enjoying a tool which would have normally been considered an aid, hopefully will contribute in helping generate a deeper awareness on inclusive design.	The mock-up scenario is still valid, but we feel we should give more freedom in digitally manipulating the artwork. So instead of giving only the possibility to comment the artworks in different way, we are evaluating the feasibility to let users also merge different artworks with a "collage" tool.

Table 3: Case study responses to the five guiding questions at Workshop #2

5.2.3 Conclusions

The mini-conference 2, through its various stages and contributions, undoubtedly served as an important scaffold for the case studies to advance in developing their ideas, chosen methods and related activities. Moreover, the case studies presenting and reflecting on each other's ideas in an open discussion format, also illuminated important considerations for all the work packages.

It was observed during the first half of the conference that the reflection methods and related activities were approached with much more ambiguity than the interpretation methods. However, it was also clear that after WP2's presentation on the interpretation-reflection loop and WP6's presentation on visualization of citizen curation, the case studies began to better grasp the intrinsic connection between interpretation and reflection in SPICE. And finally, even more new ideas and approaches emerged from the 2nd half of the conference, such as: finding new different ways for eliciting visitors' interpretations and providing alternative modalities for different tasks (IMMA), as well as introducing new roles for users through that encouraging peer learning and dissemination of knowledge (MNCN).

Furthermore, this workshop provided WP2 with many fruitful ideas and directions to be considered in the second year for the development of the IRL model.

6.0 Conclusions and Future Work

In this report we investigated different methods for interpretation. More specifically, we examined and evaluated *artefact analysis*, *interactive storytelling and narrative methods*, *collecting*, and *visualization techniques*. For each method the relevance to SPICE was outlined, and key-concepts were presented together with relevant examples of applications of the methods in different domains of cultural heritage and/or interactive media experiences. Additionally, we elaborated on the specific recommendations for the SPICE framework and highlighted the interpretation processes within the development of our framework for the Interpretation-Reflection Loop. As the notion of citizen curation is central to the project, we also included in this report our current understanding and definition of this concept.

Through two internal workshops some of the methods for interpretation were explored together with their related activities and evaluated with the case study partners through a participatory codesign approach. The workshops not only helped to further examine and establish the methods' relevance to each case study, but also highlighted important considerations for all the work packages and gave rise to new ideas for the next iteration.

The next steps for WP2 that spring from this report include:

1. Further developing the Interpretation-Reflection Loop model (IRL model). Integrating and combining the various interpretation methods (and related activities) in a way that could subsequently align with the proposed reflection methods (and related activities). Research, derive and test concrete scriptable activities that enrich the opportunities for citizens to contribute content that is rich enough to be amenable to the kind of dynamic analysis aimed by the IRL, in order to converge to the different dimensions of social cohesion.

2. In this direction, prospect and explore how to best combine interpretation and reflection methods, related activities, and mock-ups into "user-journey loops" that circles back and forth between citizens' produced interpretations of cultural objects and reflections on these contributions, as well as the contributions of others.

3. Focus specifically on SPICE specific validation through additional workshops with the case studies, particularly with the museums' end-user communities and mediators.

4. Ideate possibilities for online workshops with real stakeholders in the five case studies, shall the COVID-19 situation persist, and if possible, progress with the original plan of organizing in situ workshops for these purposes.

5. Coordinate, iterate and implement the ideas of this report with WP3, WP4, WP5, WP6 and WP7.

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8.0 Annexes

A. Permutation 01 – Workshop Flow Diagram