Introducing the Tripartite Digitization Model for Engaging with the Intangible Cultural Heritage of the City

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Abstract. In this paper we investigate the notion of intangible cultural heritage as a driver for smart city learning applications. To this end, we shortly explore the notion of intangible heritage before presenting the tripartite digitization model that was originally developed for indigenous cultural heritage but can equally be applied to the smart city context. We then discuss parts of the model making use of a specific case study aiming at re-creating places in the city.

1 Introduction

The paper departs from the new research direction of smart city learning that adds a new human-centered perspective to the so far functionalist vision of smart cities. The smart city learning approach does not address learning only as a way to train an adequate human capital but instead envisions learning as one of the driving forces of the smartness and well-being of a community. Unavoidably the underlying and ubiquitous techno-ecosystems - whose embedded intelligence, sensitivity and responsiveness surround the individuals - challenge the future of learning and call for a redefinition of spaces, contents, processes, skills and assessment approaches (e.g. [3,7]).

In this conceptual paper we focus on a specific aspect of the definition of the urban space as a room for practices that shape the meaning of these places. We call this the intangible cultural heritage of the city. This is meant in contrast to usually addressed cultural heritage in the form of buildings/architecture and artworks in the urban space. Instead, we focus on practices of everyday living and experiences that shape our meaning of urban places. This is in line with Dourish' distinction between space and place, where place denotes meaning making by everyday social practices in given spaces (e.g. [6]). According to Dourish modern ICT like ubiquitous WIFI connectivity and related technologies allow for "re-encountering" known spaces and thus allow for re-creating places.

In line with this idea, we first present the tripartite digitization model (TDM) for intangible cultural heritage (ICH), then we exemplify its potential and some of its aspects with a case study that allows for re-encountering urban spaces.

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2 Intangible Cultural Heritage

In contrast to tangible cultural heritage (buildings, sites etc.), intangible cultural heritage focuses on cultural practices. The intangible cultural heritage of the city can thus be seen as something constituted by the inhabitants of the city in their daily living routines, giving meaning to places found in the city. This "meaning making" is subject to constant changes, some subtle, some more drastic (e.g. structural changes when a city loses its industrial traditions). For this special session we invite contributions that focus on how this intangible heritage of the city (and thus its inhabitants) can be captured, represented, and disseminated in order to learn about (historical or modern) practices in relation to the actual urban scape.

Usually, the notion of intangible cultural heritage is tightly connected to indigenous cultures and the preservation and archiving of their practices (see [14]) as laid out in the UNESCO Convention for the safeguarding of the intangible cultural heritage [18]. Tailored to indigenous cultures, the convention distinguishes five domains of intangible cultural heritage:

A. Oral traditions and expressions, including language as a vehicle of the intangible cultural heritage
B. Performing arts
C. Social practices, rituals and festive events
D. Knowledge and practices concerning nature and the universe
E. Traditional craftsmanship

Without belittling the importance of safeguarding indigenous cultural practices, intangible cultural heritage is also relevant in changing urban landscapes, where especially the domains C and D are interesting avenues for exploration of the concept. The scope of this domains would necessarily be less broad when applied to the urban space, e.g. D would be rephrased to "Knowledge and practices concerning the city and its surroundings". Figure 1 represents in a stylized way the change that happened in the city in our case study, that was (as many European cities) subject to a radical structural change from industrial town

Fig. 1. The changing spaces of Aalborg over time affect the places created by interaction with the residents.

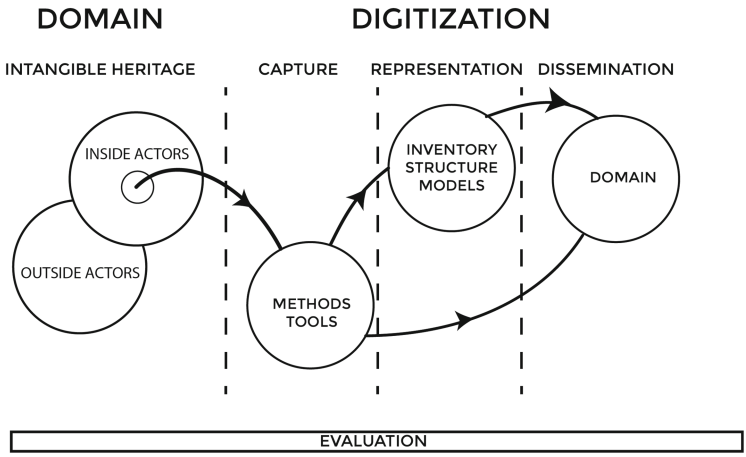

Fig. 2. The tripartite digitization model (TDM).

(harbour, petro-chemical industry) to a town of knowledge (university, colleges, etc.). In relation to the topic of smart city learning, it is our conviction that the urban space itself can become the playground for experiencing such changing social practices.

2.1 The Tripartite Digitization Model

Although originally proposed for the digitization of indigenous intangible culture heritage [14], the tripartite digitization model (TDM) is equally relevant for other types of intangible (and tangible) cultural heritage. Figure 2 highlights the main components of the TDM. Starting point and one of the crucial aspects of the model is its embedding in a co-creation line of thought, i.e. especially in relation to intangible heritage, the community members/knowledge holders have to become pivotal in all digitization endeavors if meaningful application should emerge. This is deeply rooted in the Scandinavian HCI tradition of participatory design of information systems (e.g. [15]). The TDM is a structuring tool as well as a tool to guide work in the area of heritage and learning and focuses on the three aspects of capturing, representing, and disseminating information. Each part of the model is associated to specific questions that have to be answered for each ICH project and can be used as a descriptive tool to identify the underlying features of each project. Here we present some of the challenging questions that will also structure the presentation of the two case studies in later sections:

– Capture:
  C1 Where does this data come from (archives, user-generated,...)?
  C2 How subjective should/could this data be?
  C3 Should it be captured in situ (and by whom: experts vs laymen)?

– Representation:
  R1 How can data about social practices be represented?
  R2 How can ontologies be useful for representing the data?
  R3 What is the relation between the data and the learning goal (dissemination)?
– Dissemination:
  D1 Which kind of technologies can be exploited?
  D2 What is the relation between place, content, and technology?
  D3 How can success be measured in such a setting?

Additionally, the model asks more theoretical questions that are related to the whole field of digitizing ICH, e.g. C: Which kind of data is relevant for capturing social practices related to urban places?; R: What could be standards for representing ICH data?; D: Which types of dissemination exist (and to what purpose)? How is the relation between C, R, and D?

What is apparent from a recent review of 10 years of research in the field of intangible cultural heritage [14] is a lack of methodological rigor in regard to these questions and an obvious lack of work on representation of data, which makes it nearly impossible to use the collected data in other forms than archival.

3 School Boys' Rebellion: Learning About Intangible Cultural Heritage

In 1941, a group of teenage school boys formed one of the first resistance groups against the German occupation. They sabotaged the German forces and were captured at last, but remained active even from out of the arrest. One of them became a journalist after the war and wrote several books about the time of the "school boys rebellion". This can be seen as a classical eyewitness account of specific of a dramatic intangible cultural heritage of Aalborg municipality. It served us as the data source from which to construct a smart city learning application that encourages the user to seek out pivotal locations of the historic events and listen to the first hand accounts of this eyewitness in place.[1] Thus, the target group for this application is quite broad, including tourists visiting the city as well as residents that would like to know more about the city they are living in.

From a theoretical point of view the general idea behind the application is based on experiential learning [9]. Earlier, we have shown how this paradigm can be utilized in a virtual learning environment for increasing knowledge and skills about culture-specific gestures [13]. In a city environment instead, place and space become the most important features (first and foremost due to travel times for the experience). Again from a theoretical point of view, the application exploits the spatial situation model and the induced spatial presence [21] to capture this effect.

[1] Download "Skoledrengenes Oprør" on Google Play (only in Danish).

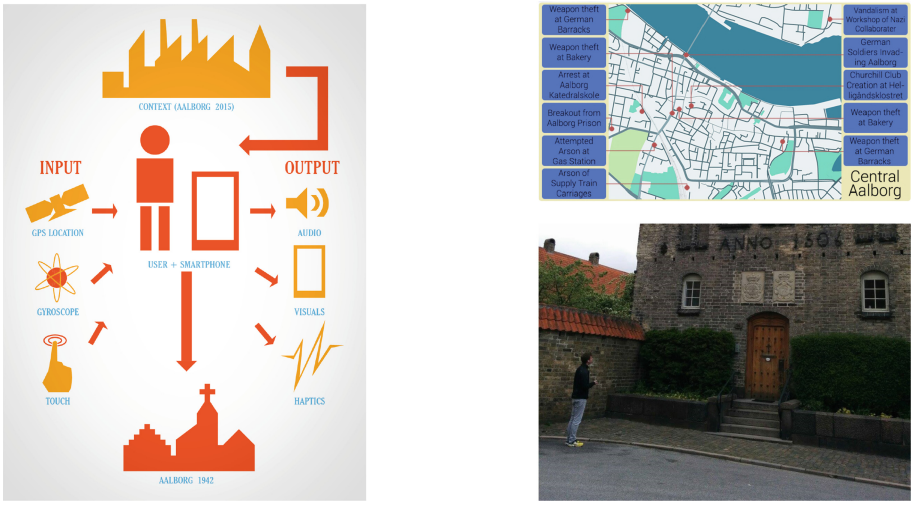

Fig. 3. Map showing where in Aalborg stories about the Churchill-Club can be found.

Figure 3 left shows the features and context of the application. The different location around the city that have been selected as content are depicted in Fig. 3 right (above). And the start location (the school boys old dormitory) is shown in Fig. 3 right (below).

In order to support the user in creating a story-based SSM and to contribute to the resulting spatial presence, the visual cues as well as the audio cues have been designed with the historical context in mind. Additionally, to allow the user to experience the urban space more fully, it was decided to discard navigation between story location by maps and instead use a combination of sound beacons and directional sound [20] relying on the GPS and gyroscope information in the smart-phone. This means that when the user points his smart-phone in the direction of a story segment, a sound beacon becomes audible that is related to the location (e.g. church bells for a cloister). In other direction, only static can be heard. Thus, the user searches story segments by scanning in a 360° radius around him and when he finds another segment, he can decide to start walking towards it. Once the user reaches the location, the story becomes available for listening.

Results concerning the user test can be found in [4]. In general, results show that users were eager to explore the city to find the different story elements and they were highly immersed in the narratives on location. They were also able to successfully use the sonic navigation method introduced with the application and could easily find the points of interest.

In the following, we analyze the application in relation to the TDM and the questions we raised in the previous section.

3.1 Capture

C1. Where Does the Data Come From? The primary source is the eye witness accounts of one of the members of the resistance group that have been published after the war and that have been collected in one volume [12]. Additionally, other sources in relation to the specific time in general and the Churchill club in particular have been integrated [1,10].

C2. How Subjective is this Data? Most of the data used in this application are eyewitness accounts from members of the Churchill club. Moreover, other eyewitness accounts from the same time (occupation of Denmark during World War II) have been consulted for cross checks. It would of course be preferable to integrate other sources as well like news reports from the time. Additionally, the format of the app would allow for experiencing subjective experiences of these historic events. It could for instance be very interesting to integrate stories from other groups, e.g. German soldiers or laymen of the Churchill club members.

C3. Was it Captured In-Situ (and by Whom)? In this case the data was not captured by the research team. Instead, the sources have been analyzed in regard to three distinct features that would benefit the dissemination:

1. stories had to be evenly distributed around the city;
2. locations had to be "there" (at least in some way, i.e. not completely destroyed) to create more spatial presence;
3. a coherent (and "interesting") story should emerge across different locations in the city.

3.2 Representation

R1. How is the Data Represented? Similar to other projects in the ICH domain, the representation of the data is the least thought through part of this project. The main data are the stories that have been created based on the original eyewitness accounts. For the dissemination part those have been represented in archival form, i.e. as a data base of audio recordings, which have been tagged with GPS coordinates.

R2. Could Ontologies Be Useful for Representing the Data? Several papers have suggested the use of ontologies for cultural data [2] or for data related to social practices around intangible cultural heritage (e.g. [16,17]). In case of the Churchill club, ontologies for representing stories and narratives could be helpful (e.g. [5,11]) but have not been explored so far. In combination with ontologies for location-based interactions (e.g. [8]) this could be a useful way to ensure coherence of story fragments that can be distributed across the city.

R3. What is the Relation Between the Data and the Learning Goal (dissemination)? For this project there is a one to one relation between location and story data that is used for dissemination purposes.

3.3 Dissemination

D1. Which Kind of Technologies Have Been Exploited? The project makes use of standard smart-phones with active location sensors (GPS, WIFI access points, UMTS access points). Additionally, sound-based navigation has been developed.

D2. What is the Relation Between Place, Content, and Technology? The story content is directly linked to the locations that are encountered in the city. Moreover, in order to facilitate active exploration of the city, no map navigation was realized. Instead the aforementioned sound-based navigation is used to ensure exploration possibilities of the urban space and avoid fixation to a map.

D3. How is Success Defined and Measured? In our case, measurements included interviews as well as a measurement of spatial presence in relation to the SSM [21]. A standard spatial presence questionnaire was used [19].

4 Conclusion

The paper presented the tripartite digitization model for intangible cultural heritage and used it as an analytical tool for an example project that focuses on the dissemination of a specific type intangible heritage, namely eye witness accounts that have been turned into a coherent distributed storyline, which can be discovered by exploring the urban scape.

This work is situated at the intersection of research in the preservation and dissemination of intangible cultural heritage (e.g. [14]) and research on smart city learning (e.g. [7]). We have presented the TDM as a viable analytical tool for research in these areas. Further development of the model is currently focused on establishing best practice guidelines for the different challenges encountered in the digitization of intangible cultural heritage. We have already shown that the representation of data in this domain is the weakest link in projects related to intangible cultural heritage. The presented example application in this paper is no exception in this respect. In order to further applications relating to the awareness and dissemination of intangible cultural heritage, this is one of key areas that needs to be addressed.

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