

PARTICIPATORY IMAGING MAPPING of CULTURAL HERITAGE ACROSS INTERNAL BORDERS STOLAC, BOSNIA AND HERZEGOVINA

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ABSTRACT:

During the war in Bosnia and Herzegovina (1992-1995) cultural heritage was explicitly targeted and the state of destruction was extensive to both sacral and secular monuments. Two decades after the end of hostilities the perception of the historic environment is still defined from the angles of national, religious or ethnic belonging. Enabling recognition, reconciliation, tolerance and respect within the community of Stolac, Bosnia & Herzegovina through a better understanding and sharing of cultural heritage was the focus of this project. Stolac is representative of the problems in the region and stands out for its particularly sharp divisions. Until recently there was segregation with local schools and their curriculum was divided with cultural heritage generally not addressed.

How can this small community engage with heritage and develop a dialogue that encourages tolerance, respect and as a base for development? How does one understand, then document areas significance to the community? Finally, how can technology assist? The focus of this paper is to relate the experiences and findings of a project that incorporated participatory imaging mapping and the use of technology to bridge between the internal borders of this small community. It will outline a methodology, experiences of the participants and results from their exercises in order to assist other communities facing similar issues.

1. INTRODUCTION

"With new information and communication technologies, cultural creativity has become detached from its territorial surrounding bringing new challenges for the culture of the future. New generations truly live and communicate in a completely new way that does not restrain them or define them by their origin or country but rather by their common interests and affinities for new knowledge and notions. Only then we shall understand that the culture of the young, digital culture and new technologies are currently the most concrete bridge between cultural heritage and the culture of the future."
UNESCO Regional Summit Forum: A Bridge between Cultural Heritage and the Culture of the Future (2005)

1.1 Stolac

Stolac is a small town lying at junction of two valleys in the mountains of southern Bosnia and Herzegovina. Mosques, Orthodox and Catholic places of worship were constructed within the valleys along with historic tower houses, cobbled streets, courtyards and hammams. In the middle of the valley lies a fast running river which is spanned by numerous masonry bridges, stamp mills and late 19th century industrial structures. Overlooking the valleys on a hill in the centre sits a medieval fortress with square towers, gates and walls that has recently undergone conservation. It is a peaceful, beautiful town where one can enjoy its cultural and natural heritage (UNESCO, 2007). Even many years after the war that tore this region apart there exist community divisions (Hadžimuhamedović, 2013). As part of a EuropeAid grant this project sought to address these divisions and bridge the gap between the communities with a focus on cultural heritage conservation, technology and documentation.

1.2 Team

A team from Cultural Heritage without Borders an NGO operating throughout South East Europe and Fundación Tecnalia a research institution from the Basque Country, worked with the Bosnia and Herzegovina Commission to Preserve National Monuments to create a project centred on the community of Stolac and their inherited cultural legacy. They involved the National Museum of Bosnia and Herzegovina, the Faculty of Architecture at the University of Sarajevo, a local NGO, Deblokada, and the Stari Grad Stolac Tourism Association. With funding from the European Union together they created a project to conduct educational courses on conservation and technology and collect up-to-date documentation on the monuments of Stolac. This project was designed to serve as platform for dialogue and capacity building.

1.3 Objectives

The overall objectives were to create a better vision of the future for the inhabitants of Stolac, help them understand their cultural heritage and improve inter-community communication. More specific objectives were to document the cultural heritage through a participatory mapping project and from this information develop an innovative multidimensional digital model as a platform for teaching, learning about conservation, technology and tourism. The model could then be used for interpretation of the cultural heritage of Stolac with technology as a bridge between communities, their troubled past and a brighter future. The model and the documentation could also be used to promote future cultural tourism.

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2. METHODOLOGY

2.1 Understanding Stolac

The first step in the methodology was to understand the context. Fortunately, many members of the team had extensive experience of many years of working in Stolac during prior unrelated projects. It was also by design that the team included nationally and locally based partners. Nevertheless, onsite meetings were convened to discuss the project, the political situation, what had changed in the region since the last projects and the progress of ongoing conservation. This step was augmented with a meeting by the key partner, the Bosnia and Herzegovina Commission to Preserve National Monuments. Meetings were held at their offices in Sarajevo and during the project with frequent briefings. They updated the team on the status of nationally significant monuments, their current documentation efforts and their goals for the project. They also made their central archives available for historic maps, drawings, past conservation projects and photographs.

2.2 Research & Evaluation

Work was conducted in both the archives and on-line for historic photographs, drawings and maps. The Commission to Preserve National Monuments (BiH, 2014 - www.kons.gov.ba) had posted many historic images and maps on line and this prior documentation was extremely useful in identifying important structures that had been lost before, during and after the war. It also help to identify conservation conducted since the end of the war and non-conforming, non-contributing structures. This information was useful during the project as many historic photographs were used to re-photograph the same locations to present the changes that occurred. In addition to images and maps, oral accounts were also helpful and these were mainly obtained from the local partners and workshop participants. In addition to these on-site meetings an evaluation of the project plan was conducted in order to ascertain if the project was well designed and if previous assumptions were correct. This resulted in adjustments to the schedule, the physical scope of the project and reshuffling of partner responsibilities.

2.3 Community Participation

An essential component of the project methodology was the involvement of the community. This was critical to the success of the project therefore multiple strata, segments and age groups were targeted to ensure there was at least a minimum level of involvement. This included school children, young adults and tourism operators and also regional participants. Another important component of the methodology was the development of incentives to participate. Fun, engaging access to numerous forms of technology served to function as an important enticement for involvement of all the target groups.



Figure 1 – Map showing the location of Stolac, BiH

3. PROJECT

The project was developed in three modules:

- 1) **Courses** were focused on a number of topics that included conservation, science and tourism. Courses were also held on technology, the creation of the cultural routes, smartphone apps and website creation.
- 2) **Information capture** was an essential part of these courses via participatory imaging mapping which also included collecting historic photographs, verbal accounts and written histories. 3D digital models of lost structures were also created.
- 3) **Dissemination via a smartphone application** that utilised GPS positioning and augmented reality was developed using the previously collected data.

Evaluation of this project approach and methodology as a model for use at other sites in South East Europe was conducted during and at the end of the project.

3.1 Courses

The team conducted eight interactive educational courses on cultural heritage with specific topics on conservation of cultural heritage and technology. Different strata of the community were engaged including children and young adults from the local school, university students from Sarajevo and young professionals from the region. The young professionals came from the fields of cultural heritage management, conservation, architecture and tourism. In addition there were practical workshops of between 3-4 days on conservation, a 2 day workshops for tourism professionals and 2 day workshops for school children and a 7 day long film creation workshop.



Figure 2 - Various groups of participants took part in the project including school children, young people, university students, professionals and experts.

These courses served as platforms to bring together the still-divided elements of the community to focus on the cultural heritage and its problems - not the differences between people or beliefs. It also provided access to international and regional experts on conservation, technology and participatory mapping. During the courses documentation was collected - stories on local monuments, oral histories, the context, surroundings of Stolac and digital images of the current monuments and their on-going conservation works. This helped the team understanding Stolac, its past and on-going issues (CHwB, 2014)

The workshops covered the following topics:

- Conservation with traditional materials and techniques
- Material investigation
- Building diagnosis (pathology study, thermal imaging, endoscope)
- Site analysis (aerial photography, site survey)
- Regional planning (remote sensing – GIS)
- Interpretation – story telling, historic routes
- Tourism
- Technology

The specific venue for these exercises was developed in coordination with on-going restoration/conservation works in Stolac. The primary focus was centered on the cultural heritage of Stolac - river objects, mills and bridges, as well as the Saric family house in Stolac, Branko Sotra Gallery and part of the complex of "Old Town Vidoski".

3.2 Information capture

During the courses many exercises were devoted to collection and mapping of the images. The capture technology that was used included the use of 14 GPS enabled Nikon Coolpix Aw30 cameras, tablet computers and smartphones to collect geo-referenced images of monuments, mills and bridges. The use of this technology allowed the community and team to build an inventory of places and monuments important to the community as well as update the official list of protected monuments. A defined protocol was taught during the courses and implemented for the capture of the images but with enough emphasis on flexibility to allow the participants to record what was important to them. This protocol included what time of day to capture the image, angle, general photography principles and note taking (Eppich, 2007). The images as well as being spatial located were also organized along with the name of the monument, date and other key information making possible the indexing and archiving of these records. The photogrammetric 3 x 3 rules were used to capture images of monuments that were in total or partial ruin in order to collect sufficient data to create 3D models (CIPA, 2013). This information was augmented with field measurements and the School of Architecture created these models using Photomodeler, Autocad and 3D Max. It was essential that the models were created with a low polygon count and reduced resolution textures as these had to be visible on smartphones. Numerous tests were conducted to ensure that these portable devices could process the 3D models.

In the project the simple on-line collaborative tool Google Map was used to plan the courses, work schedules, identify monuments, review images and verify results. This free on-line tool made it possible to conduct meetings in real-time between Stolac, Sarajevo and Bilbao. As participants uploaded the images, descriptions and measurements during the courses they were visible to invited participants and partners. Understandably, the course participants produced many more images, data files and documentation than could be used in the final smartphone application therefore editing by the team was necessary. Nevertheless it gave the project team and participants an understanding what was important to the community and what to include in the final application and assist in planning the eventual visitor cultural routes.

This highlights that many tools do not have to be difficult to use, expensive or sophisticated in order to be effective. All the tools were left with the school and tourism association in Stolac. An example is available at: www.connectingstolac.ba.

3.3 Dissemination via smartphone

The culmination of the project was the development of a smartphone application that would display the images on a map along with descriptions in three languages captured by the participants. This is freely available on the Android or Apple iOS for the community of Stolac as well as for visitors. The application used the GPS functionality of the smartphones to display in real time the description of the existing but also lost monuments for visitors. The camera features of the smartphone or tablet can recognize the direction and location and inform the user of the structure, its history and state of conservation. The application also displays historic photographs next to current photographs and historic maps. The 3D digital models were inserted into the application for augmented reality so the community and visitors could see structures that were lost and rotate and zoom on the models. All of this information was also made available on the webpage of the project.

Three routes were planned for visitors: a short level route for older people, a route for children that passed the major monuments but crossed few streets and an adventurous route that was longer and led to the hill top fortress. With this application the visitor, students or conservators are able to view historic maps, photographs and other information while on site. This is useful for ongoing conservation projects, education and tourism.



Figure 3 Testing the digital smartphone / tablet computer guides on site in Stolac. A web version is also available as well as on a large table computer installed in the school

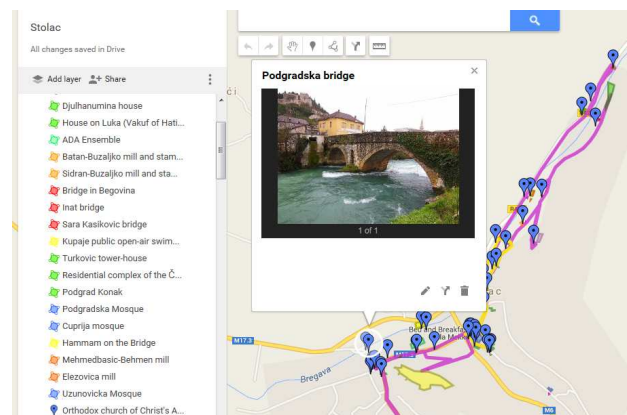


Figure 4 A resultant map created in real time during the course using participatory imaging mapping with names, categories and descriptions (Bridges to the Future, 2014)

4. PARTICIPATORY MAPPING

Cultural mapping involves the representation of landscapes in two or three dimensions from the perspectives of indigenous and local peoples. It is potentially an important tool for UNESCO in its efforts to help Member States and civil society create platforms for intercultural dialogue, and increase awareness of cultural diversity as a resource for peace building, good governance, fighting poverty, adaptation to climate change and maintaining sustainable management and use of natural resources. (Crawhall, 2008)

Participatory mapping was an important part of this project and therefore was used extensively as a means of interactively collecting information from the community that drew upon local people's knowledge and enabled them to create visual and non-visual data to explore issues, opportunities and questions. Participants worked together to create visual representation of Stolac using the GPS cameras.



Figure 5 Participants in Stolac using GPS cameras and prints of historic photos to understand the past and document the present.

The GPS enabled cameras and on-line collaborative mapping tools with tablet computers and smart phones were also used. While collecting information the participants deliberated over how to best represent Stolac and shared their observations and related personal stories. This led to a rich collection of images and many times surprising results.

One of the strengths of participatory mapping is that it allowed an understanding of different features of a particular place and the interplay between them to be explored. The residents' personal and collective experiences and their attitudes and perspectives on their historic and natural environment were explored. The approach explicitly recognized the citizens as collaborators in the project and fostered empowerment (UNESCO, 2009). It helped participants define and represent places and relationships that are important to them. Participatory mapping was more than a technical research exercise as it allows the collection and extraction of data as well as an opportunity for social encounter between participants (Degraf, 2012).

Participatory mapping has been possible for many decades and takes many forms including paper maps, sketching and 3D physical scale models (Lovell, Eric 2012). However the technique is now undergoing a revolution with GPS enabled cameras connected in real time via WiFi or 3G networks to create interactive maps on the Internet for a full collaborative effort. When combined with other forms of technology and documentation procedures it has become a very powerful tool for understanding what is important to the community.

5. CONCLUSIONS

5.1 Challenges

Working with children proved to be one of the most challenging issues during the project. However, there were a variety of questions that were used to help children understand these issues, including: How can we tell the story of a monument? How do you see a craftsman/craftswoman mixing traditional paint and mortar? Why are they doing this? Why were these historical buildings destroyed? The methodology of the workshops entailed practical activities developed on site. Experienced educators came from the National Museum in Sarajevo to facilitate these workshops. Tangible outcomes, such as drawings, stories, and photos from the activities were used for the further development of the augmented reality model. There is only one secondary school in Stolac. Engaging young people in conservation of their cultural heritage with technology served as inspiration for their future undertakings in life. Technology that is applied to conservation and its interpretation often fascinates and enthralls young people. It provides them with a bridge to imagine their own future.

This was difficult because young school children from the Primary School "Stolac" and Primary School "Crnici". At the beginning of the project the Primary School "Stolac" divided its pupils according to nationality, where Croatian and Bosnian children entered the same school from different entrances. On April 28, 2012 the court in Mostar made a legal decision stating that such a division is a violation of the law on discrimination. The school was ordered to change this practice starting from September 1, 2012. In light of this recent development, the workshops helped further the process of desegregation by engaging children regardless of nationality. This was stressed that children needed to grow and develop in cultural harmony as a foundation for the democratic development of a society.

5.2 Results

Enabling recognition, reconciliation, tolerance and respect within the community of Stolac, Bosnia & Herzegovina through a better understanding and sharing of cultural heritage was the focus of this project.

The global objectives were to create a better vision of the future for the community of Stolac. To help them understand their own rich history and cultural resources, and to improve inter-community dialogue. While these objectives were very ambitious this project did succeed in letting the community know of their rich heritage; first, from the viewpoint of the young people photographing and documenting their own monuments, cultural heritage and nature. Secondly, from the experts, both regionally and internationally coming to this small mountain town to study and record their unique natural and cultural heritage. The process allowed the community to see through the eyes of others their valuable resources. While the rifts within the community are deep and were long in the making, this project did build bridges between segments of the community and with young people.

The specific objectives of documenting the cultural heritage through a participatory image mapping project were fully met. Thousands of images were captured and mapped by over 140 participants from many segments of the community. Descriptions of monuments were written and other information gathered that would not have otherwise been available. The other specific objective of creating a multidimensional

smartphone application was also met and the participants and partners that worked to create it are proud of the final result. It remains to be seen if this work and application will assist or improve tourism. While there is anecdotal evidence of an increase in visitors, it is not necessarily a result of this project.

To return to the questions posed earlier in the introduction:

How can the community engage with their heritage and develop a dialogue? How does one understand then document areas significance to the community? How do outside experts, eager to assist, understand what is important and engage?

These questions were addressed through the conservation courses and with participatory imaging mapping. The participatory mapping is more than just a product but a process. This process engaged the community and helped them focus on their own cultural heritage. Their actions in active participation and resultant images demonstrated what was important and significant to the community. It also allowed outsiders to understand the significance to the community of their heritage.

The final question: how can technology assist?

This was an easy question to answer. Young people (and many others) were fascinated with technology and eager to learn more. Therefore it was easy to cross barriers when presented with digital tools such as GPS cameras, table and tablet computers and smartphones. More importantly they are engaged with the tools to make the tools – software to create 3D models, smartphone apps and concepts such as augmented and virtual reality. Many see technology as a way to improve their future and this project provided educational forums and access to that technology. Finally the project provided a clear and understandable goal to the process – to collect and make a smartphone application. Technology was not used for its own sake but to focus on cultural heritage and document it and make this documentation available for others.

5.3 Final question

A final question remains: What was recorded during the participatory imaging mapping?

The usual monumental architecture including mosques, churches, mills, bridges and hammams, as they were suggested and necessary for the project during the courses. This was not surprising as participants were asked to do this and these monuments are obvious elements to photograph.

But what was a surprise was the many participants image mapped the streetscapes, the river itself, images of ducks in the river, other wildlife, trees, small drinking fountains, machines for the control of water, materials, doors and details of doors. Another surprise that was not anticipated was the number of images including people - conservation workers especially, instructors in the courses and the participants themselves.

This demonstrates that the process and product of participatory image mapping reveals many very interesting unexpected results. The conclusions that can be drawn from this are that while asked to photograph tangible cultural heritage many participants photographed people and the natural environment. This signifies that they do not often see these as inseparable or divided into individual categories as the experts do. It signifies that what is most important to them is the integrated space of their home and the people that inhabit it and are working to protect and conserve it.



Figure 6 Interesting details such as doors were also captured

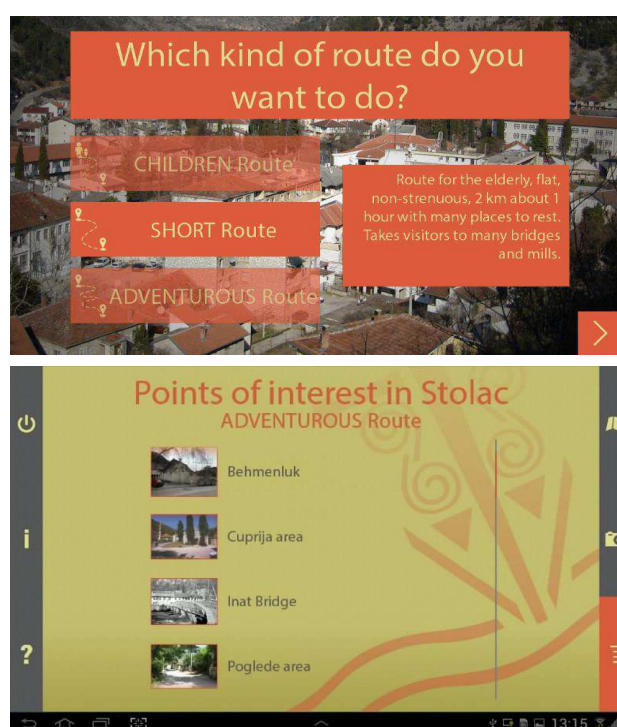


Figure 7 a screen capture images of the smartphone application

5.4 Closing Remarks

Participatory imaging mapping was used as a tool for dialogue with technology as the medium. This project focused on the tangible cultural heritage but at multiple levels of society with school children, young people, professionals and experts. Participatory imaging mapping proved to be a valuable tool – but it is the process that is more important than the final outcome. Mapping is a communication bridge and does not guarantee successful dialogue but creates a platform and opportunity for communication. It uses mapping to create relationships (Rambaldi, 2002). During this entire process the participants and wider community learned about their heritage, and conservation. The team created the courses to provide participants with solid knowledge of conservation theory, active field work, and personal interaction. The project established an atmosphere that stimulated dialogue and reconciliation and intercultural understanding; necessary prerequisites of democracy and peace, with full respect for human rights. Additional similar participatory mapping projects are underway in South East Europe including an upcoming project in Kosovo.

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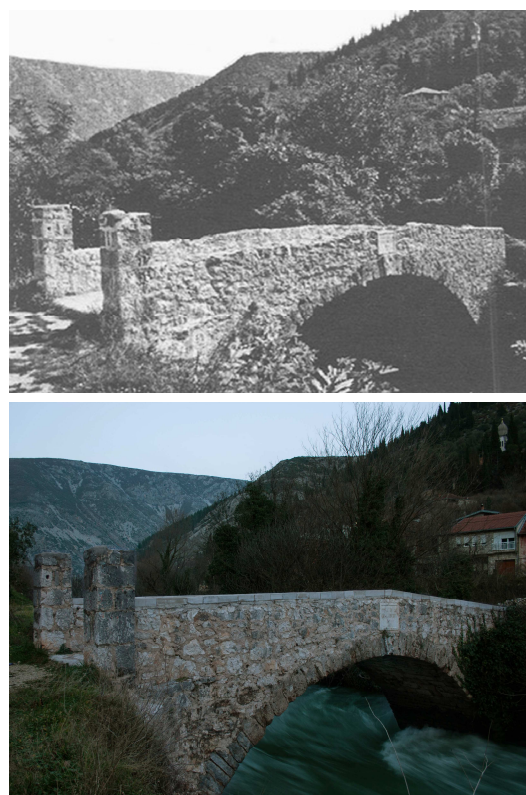


Figure 8 Čuprija Sare Kašiković - časopis Most Bridge in Stolac at the beginning of the 20th century and the bridge photographed by participants during the project