

A TOOL FOR WORLD HERITAGE DOCUMENTATION, MANAGEMENT AND DECISION MAKING:

The silk roads cultural heritage resource information system (CHRIS).

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Abstract. This paper discusses the application of Information Management Systems (IMS) in cultural heritage management illustrated by the case study of the Silk Roads. The Silk Roads CHRIS deals with the development of an information management system supporting the Central Asian State Parties in their effort to prepare the Silk Road as a World Heritage serial transnational nomination. Serial World Heritage nominations are an innovative concept allowing the nomination of a series of sites linked by one Outstanding Universal Value fostering national and international collaboration. This complex procedure of nominating sites has brought new ways of rethinking heritage as well as new challenges when it comes to site management and monitoring. Serial nominations have to cope with much larger volumes of data and complex participatory processes due to a larger number of stakeholders involved, and require a more sophisticated approach towards information sharing and data integration compared to single properties. The Silk Roads CHRIS is based on the approach of “Preventive Conservation, Maintenance and Monitoring of Monuments and Sites” supported by the PRECOMOS UNESCO Chair. It allows to combine information useful for heritage management, tourism and regional development. Being supportive to the nomination process the Silk Roads CHRIS will also include monitoring aspects and thus be a valuable tool for heritage decision makers. Moreover, the system aims to support both, impact studies of various forms and functions of tourism on heritage as well as the development of site management strategies in a more sustainable manner. It provides an example of cultural cooperation networks, and demonstrates the potential of an improved heritage documentation system.

1. Introduction

Documentation is an important part of any World Heritage nomination process and later management and monitoring of the property. However, any documentation process faces certain challenges especially when considering serial World Heritage nominations. Serial World Heritage nominations are heritage sites linked by a concept supporting one Outstanding Universal Value and include sites that cannot stand by their own on the World Heritage List (Engels 2010). The challenges in documentation of serial nominations can be (i) a large volume of baseline information with varying quality, (ii) an overlap of data and lack of technical expertise, (iii) many stakeholders of different cultural and socio-economic backgrounds, and (iv) culture and language issues especially for transnational nominations.

To tackle these challenges, a number of tools can be used including Information Management Systems (IMS). IMS in cultural heritage can help with management, analysis and storage of data gathered for the nomination dossier and can be used to set up standards and methods to share information more

easily to support authorities when taking informed decisions about the future of the sites. Based on Prevention Conservation (PC), here especially the concept of “Conservation for Creativity”, IMS can be used to support serial transnational nominations and provide an opportunity for the local communities to be involved in the process of planned conservation.

One of these transnational initiatives is the Silk Roads with more than 35,000 km of major routes. In 2011 the ICOMOS Thematic Study on the Silk Roads identified three major routes located in Central Asia and China (Williams & Wordsworth 2010) to be nominated by 2013. In this context the Silk Roads Cultural Heritage Resource Information System (Silk Roads CHRIS) concept has been set up by a Belgian consortium headed by the Raymond Lemaire International Centre for Conservation (RLICC) at the KULeuven, and supported by the Belgian Science Policy Office (BELSPO) and the UNESCO World Heritage Centre to assist the five Central Asian State Parties, namely, the Republics of Kazakhstan, Uzbekistan, Tajikistan, the Kyrgyz Republic and Turkmenistan in the nomination.

2. Creativity in Preventive Conservation

As defined by AIC (1996), PC aims to “mitigate continuous deterioration and damage to cultural property through the formulation and implementation of policies and procedures”. Although PC is not a new concept, it has become an alternative approach used by the cultural heritage community as a method that can help us protect and preserve our heritage in a more sustainable way. The concept of PC involves regular maintenance and monitoring utilizing local know-how as an opportunity for participation and innovation. This means shifting from a problem-solving to a more holistic decision-making approach (Della Torre 2010a; Wu 2009).

PC is relevant to the long term protection of our heritage, when shifting from active conservation to preventive actions. It may also be considered as an insurance policy against loss of the integrity and authenticity of the sites and as a posterity record for future generations (de Guichen 1999). Moreover, PC could build a network among interdisciplinary institutions, e.g. the administrative institutions, cultural associations, research centers, entrepreneurs, or education centers.

The Charter of Athens (International Congress of Architects and Technicians of Historic Monuments 1931) followed by the Venice Charter (ICOMOS 1964, art.4) already highlighted the need of a systematic maintenance for the conservation of monuments, an idea that has been later supported by other initiatives and practices e.g. the PRECOMOS network, Monumentenwacht (MW), and Maintain our Heritage in the UK. Following the Venice Charter, monitoring and maintenance will be the right strategies to both, preserve the integrity of the cultural heritage causing minimum damage to its significance, and slowing down the process of deterioration. However, most of the successful examples are applications in museum collections, e.g. in the Canadian Museum of Nature in Ottawa. Therefore, supporting this so-called proactive protection of cultural heritage in monuments and sites, the PRECOMOS network and the UNESCO Chair for PC, Maintenance and Monitoring have been established at the Raymond Lemaire International Centre for Conservation (RLICC), University of Leuven in Belgium (RLICC 2011).

The PRECOMOS initiative in collaboration with non-governmental organizations such as MW (Stulens & Meul 2009) aim to look at the processes of conservation giving them the same level of importance as the result itself, and PC as a method to protect the

cultural heritage against all types of natural and human threats. The PC approach engages everybody involved with heritage by organizing daily activities, and shifts the responsibility of the conservation activities from a single person to a whole community (de Guichen 1999). PC is seen as a process where the community feels included in the preservation of heritage monuments and sites and gets benefits out of it. For instance, the MW experience in Flanders has shown that the number of owners and citizens interested in PC has increased. Buildings listed as heritage need regular assessment of their state of conservation. In this context, MW provides inspections at a considerably lower cost, which proves a financial incentive to the owners (Stulens & Meul 2009).

Here, PC opens the space for creativity and innovation fostering local technical expertise. This creativity is associated with innovation and as stated by Della Torre (2010a, p.115) could be “the opportunity to widen horizons, generating occasions for meeting, exchange, hybridizing”, instead of looking at gentrification but at mixed communities and cities. In short, preservation activities can be understood as drivers for development, the more local and small scale they are, the more they contribute to local and regional development. Moreover, appropriate conservation and management decisions in cultural heritage cannot be taken without an accurate understanding of the state of conservation and threats to the sites and monuments. If decision makers are well informed, this process will lead to more sustainable management strategies and development of conservation policies supporting the protection of the values of the cultural heritage. At the end, these decisions will be able to overcome different hierarchical governmental levels and allow local actors that care about the heritage sometimes for the first time to actively participate. PC should not be seen as an obstacle to access and transform the fabric but as an opportunity for innovation, development, and changing attitudes. Moreover, in the scarcity of resources switching to prevention is exactly the change needed (Della Torre 2010b).

In this context, the application of PC brings the concept of Conservation for Creativity supported by the Districts of Creativity (DC). The DC are an instrument of development for communities in recovering their own identity giving them economic revenue through cultural heritage. The dimension of DC in Conservation of monuments and sites could aim to provide technical assistance for improvement of production and quality of techniques involving small entrepreneurs and craftsmen for long periods. Moreover, it recognizes their participation in the conservation activities as

a competitive advantage in the knowledge of local conditions and continuity of relationships with the owners and locations (DC Network 2011).

PC creates opportunities at a local and regional scale not just with tourism activities but using the available local skills. For example, at a small intervention scale, such as maintenance, there is more chance to involve local small enterprises for a long period also contributing to strengthening the link between local people and heritage. Another two examples are the inclusion of arts and crafts in the preservation activities, or as shown by the best practice in Florence, the use of laser technology for the restoration diagnosis and works of cultural heritage. The latter example was a successful initiative supported by the Italian local institutions, clustering diverse activities as research, tourism and preservation of the heritage materials (Lazzeretti et al. 2010).

Moreover, parallel to these actions mentioned above, the PC approach changes attitudes and habits when (1) its concept is understood by the general public, (2) it is accepted as a continuous preventive care strategy and prevention of future damages rather than periodic and curative interventions and (3) it becomes an integral part of institutions' consciousness by adopting it as a routine (Stulens & Meul 2009; Levin 1992).

Furthermore, following Waller's (1995) approach of risk management to PC, with a comprehensive identification of the risks and their magnitude, risk management can be applied in PC not just for decision making on the conservation issues and mitigation strategies of risks but to evaluate the cost and benefits, as well as availability of resources associated with each strategy. This method proposes a mechanism based on planning and anticipation of potential risks. However, with the increase of risks and number of sites and monuments listed on the UNESCO World Heritage List there is a need to create tools that enable easier exchange and update of information, and data integration among a larger number of stakeholders.

However, the application of PC has its drawbacks. By minimal intervention it restricts the improvement of aesthetic appearance, affecting a comprehensible interpretation for the public; and requires regular maintenance and systematic monitoring of the build heritage. Most of the time the 'soft' activities taken in a long-term such as inventorying, information management, monitoring, inspections, or research, are seen mostly as unproductive by non-specialists but at are well received regarding the long-term preservation of the site (Della Torre 2010). Moreover, choosing PC as a strategy on top of active conservation will imply changes in the timing of the conservation activities and the management of the heritage site.

This approach requires an initial investment to set up the plan and other soft activities that are not been applied on the monument or site itself. PC is a process that at first hand is only measurable at a long term sometimes appearing of little benefit to the owners. Additionally, some challenges that this approach is facing at a governmental level are the rotation of administrative personnel responsible for the decision of what management practice to follow and the lack of interest in the political context.

3. IMS as a tool in World Heritage

Following the World Heritage Convention, to foster international cooperation for the protection of heritage sites, UNESCO and ICOMOS (International Council of Monuments and Sites) are promoting the nomination of heritage sites linked by a concept supporting one Outstanding Universal Value e.g. serial, serial transnational properties and cultural routes (Engels 2010). These nominations present an opportunity to both, include sites that cannot stand by their own on the World Heritage List such as the sites along the Silk Roads, and encourage collaboration and exchange between State Parties. However, this initiative and even more the transnational nominations have complex challenges particularly in the systematization and management of information.

On the one hand, transnational nominations are an opportunity to both, protect the properties and their component parts, and create awareness within an international framework such as the World Heritage Convention. Moreover, they also bring an exchange of models and management strategies for the conservation of the sites. Here, following the main aim of the World Heritage Convention of preserving our World Heritage for future generations, the concept of Conservation for Creativity could be applied for a long-term preservation of the sites including the local community. It will not only link cultures, regions and communities but will also be an instrument for the promotion of sustainable development and tourism at different scales (IUCN et al. 2009).

On the other hand, some of the challenges of these large scale nominations entail significantly higher efforts than a single nomination and are more complex when it comes to documentation, management and legal issues. The preparation of a nomination dossier for a series of cultural heritage sites requires active coordination among stakeholders, guidance and precise recording and documentation of the baseline information. However, the challenge does not stop here; after the properties are nominated there is a need to establish appropriate sustainable monitoring and reporting systems.

This is where IMS play a relevant role. IMS are digital repositories originally used to manage business and organizations efficiently and effectively. Today, IMS are also applied to the protection of cultural heritage (Box 1999). They aim to allow for an easier comparison and storage of information, avoid duplication and overlap of data, set up standards and methods to easily share the information especially at an international level and support the authorities at the time of taking informed decisions about the future of the sites. Therefore, IMS are innovative technologies working as a tool for PC and cultural enhancement. They make “the whole business of heritage listed places much more accessible and interactive” (Rappoport 2009, p.294). However, to fulfill its objectives, the use of IMS also requires well trained staff and regular update of information. The use of IMS in cultural heritage is illustrated below by the case study of the Silk Roads.

4. Silk Roads CHRIS

4.1 THE COLLABORATIVE PLATFORM

The Silk Roads Cultural Heritage Resource Information System (Silk Roads CHRIS) is a web-based IMS collaborative platform in development based on the needs of the Silk Roads serial transnational World Heritage Nomination. It is in accordance with

the Operational Guidelines on the World Heritage Convention (UNESCO 2008) and follows the UNESCO Chair in PC, Maintenance and Monitoring of the Monuments and Sites (PRECOMOS) approach.

The multi-lingual Web-GIS system, now in English and Russian, is tailored made from previous experiences in IMS for cultural heritage, Calakmul 4D GIS in Mexico and the HERITECH IMS in Croatia developed by GIM (van Ruymbeke, Tigny, De Badts, Garcia-Moreno, et al. 2008). It is accessible through standard internet web browser allowing the implementation of a large number of actions and tools. The Silk Roads CHRIS uses the geographical location of features of interest as common denominator for all the information stored in the system. Users can navigate through the system, and select on the maps or via query a heritage feature that contains linked information such as description and historical texts, photographs, 3D models or videos documenting each site. Moreover, customized maps can be generated by overlaying a selection of available layers and then be exported to common formats to illustrate the nomination dossier.

As all the information added to the system comes together with metadata compliant with international standards and can be managed within the system as well. The system works with ISO standards, specifically the Dublin Core Culture for cultural heritage, as well

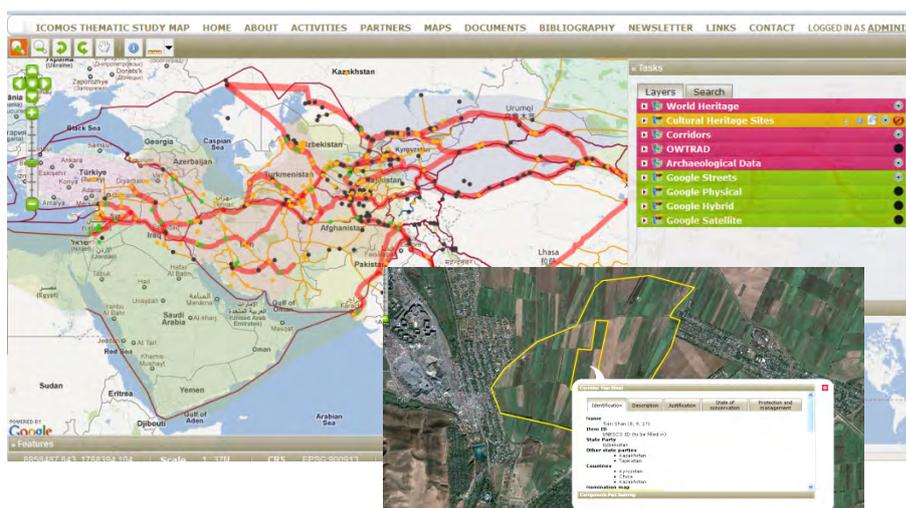


Figure 1. Silk Roads CHRIS Information Management System. Powered by GIM. <http://www.silkroad-infosystem.org> [Copyright: Silk Roads CHRIS Project]

as the Core Data Index to Historic Buildings and Monuments of the Architectural Heritage and the ICOM-CIDOC for archaeological sites (Council of Europe 2009). In addition, all information is secured by group-specific access rights to allow access to each group to a set of information such as maps, tools and the information about the nomination dossier. Finally, the temporal dimension is also integrated providing an additional tool for monitoring and analysis capabilities such as linking the factors affecting the property with mitigation and management strategies. The information structure will be based on the current inventory system of the Central Asian monument passport, the variety of typologies identified in the region and the World Heritage nomination dossier form. Figure 1 illustrates the Silk Roads CHRIS platform.

4.2. DOCUMENTATION AND MONITORING TOOL

The PRECOMOS concept based on PC (ICOMOS 2003) and risk management approach is applied to the Silk Roads CHRIS. There are the four phases of the PC process supporting the preparation of the World Heritage nomination and the future management and monitoring of the sites. Each one of the steps corresponds respectively to: (1) Analysis, (2) Diagnosis, (3) Therapy and (4) Control. Currently the first step (1) is already applied in the system and explained below. The other three stages are part of a monitoring and risk analysis of the property and its component parts.

- 1) Analysis is the identification of the site or monument – It compiles the significant values and baseline

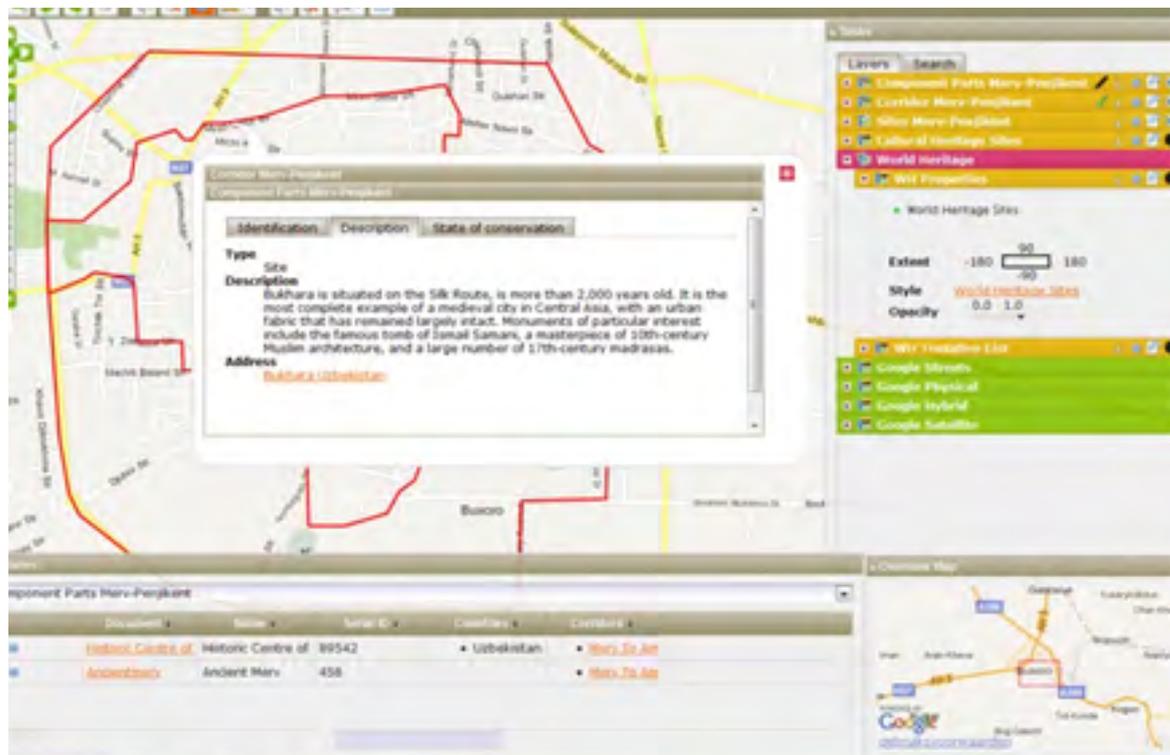


Figure 2. Example of component part as demonstrator. Silk Roads CHRIS. Powered by GIM. <http://www.silkroad-infosystem.org> [Copyright: Silk Roads CHRIS Project]

information for the nomination dossier. This comprises documentation of the sites to be nominated by e.g. maps, through the delineation of buffer and core zones entered directly into the system with GPS coordinates, or using Google maps backgrounds; texts supporting the nomination such as description, justification, Statement of Conservation; and other graphical information supporting the overall OUV.

After having populated the system with the information required for the nomination dossier, the State Parties can interact, e.g. they can define and adapt the buffer zone or core zone, and add or delete proposed component parts together with the associated information. Ideally, all this information is visualized on top of background satellite images or orthophotos at a large scale together with processed images in GIS as geographical baseline documentation.

Data input at this stage is the information at different detailed and spatial scales.

First, for the elaboration of the nomination dossier, the baseline information can be obtained at a reconnaissance scale for heritage documentation (Letellier 2007). This scale is a rapid assessment of the heritage place and its setting, providing an overview and understanding of the characteristics of the property and its component parts and identifying its significant elements, factors affecting the property and management issues. However, in order to effectively monitor and manage the property more detailed levels of documentation for each component part should be provided.

Second, the system will focus on three spatial scales for the geospatial information: the (1) Silk Roads (scale 1:400.000/ 1:600.000), the (2) corridors/properties (scale 1:100.000/1:200.000) and the (3) component parts (scale 1:10.000/1:20.000) while offering unlimited in and out zooming capabilities.

Furthermore, the three other steps of the Silk Roads CHRIS will support the risk assessment and management strategies including systematic monitoring and maintenance to assist the conservation planning. In this case, (2) the diagnosis phase will link the current State of Conservation and risk analysis based on threats affecting the property, and (3) the therapy will provide the risk mitigation strategies. This process will be supported by a main method of (4) control by a back-loop that not only will monitor efficiency of the actions or mitigations proposed, but will also assist in Periodic Reporting after the property is nominated.

4.3. CONSERVATION FOR CREATIVITY

In the last 20 years, Central Asia has been going

through a process transformations affecting the state of conservation of its cultural heritage and including changes in the management. For example, cities that were important nodes of exchange along the Silk Roads are now growing rapidly threatened by new developments that sometimes do not comply with the legal obligations or by the use inappropriate material and techniques in the over-restoration projects have the risk to lose the integrity and authenticity of their monuments and sites e.g. Bibi Khanum Mosque in Samarkand and the Aisha Bibi Mausoleum in Kazakhstan (Fodde 2010).

To improve the management and conservation of the sites, various UNESCO projects have been taken place in the Central Asian region. For instance, two best practices are the UNESCO Norwegian Funds-in-Trust for the Management, Conservation and Presentation of the Tamgaly Petroglyph World Heritage Property since 2004 and the UNESCO Japanese Funds-in-Trust project for the preservation and restoration of the Ancient City of Otrar, both projects developed in Kazakhstan. Although these are successful examples a relevant issue in Central Asia is still the lack of continuity in the conservation of the monuments and sites (Peshkov 2007). For example, a large number of the archaeological sites along the Silk Roads are earthen constructions that are especially vulnerable to climatic changes and require regularly maintenance and care to minimize the risks of deterioration. However, these recommendations are not all the time a priority for the authorities responsible for the conservation of the sites, or most of the time they are not correctly applied or just ignored (Hurd & Fodde 2004; Peshkov 2007).

Within this framework, PC as a type of conservation strategy in the nomination process of the Central Asian Silk Roads has a potential to integrate culture based development in the regional co-operation. It could also be an alternative for those remote areas where tourism is probably not the main source of economic income. The application of the "Conservation for Creativity" concept is proposed, based on the experience developed in the collaboration between the research group of Prof. Stefano Della Torre at the Politecnico di Milano and the Lombardy region, as a way to contribute to the sustainable socio-economic development of World Heritage properties at a regional level. However, this development will not only be influenced by the implementation of PC strategies but also by tourism or handicrafts.

The use of an IMS for the monitoring and documentation of World Heritage properties will allow the inclusion of all stakeholders and their active participation. For example, with the use of a monitoring tool, IMS could

aid to easily detect and quantify the deterioration rate, which without access to a detailed risk assessment is not easy to determine. This process will need regular control and will lead to planned conservation as a strategy that merges a large scale reduction of risks and a careful organization of daily activities on the sites (Della Torre 2010b). Moreover, it could involve stakeholders in the update of the condition assessment of the heritage site with the use of digital technology, improving preservation practices towards sustainability.

The IMS collaborative environment could also bring people together from different disciplines by creating a space to discuss ideas based on a good understanding

historians, architects, public administrators and contractors.

5. Conclusion

The PC approach applied to the use of IMS in cultural heritage opens the possibility to better manage and monitor cultural heritage, especially when the values of more than one site need to be protected. The case study, the Silk Roads CHRIS showed the capabilities of a system that can assist the State Parties with the preparation of the nomination dossier by guiding them to complete the baseline information and following international documentation standards. Moreover, it introduces an ad-hoc monitoring system for the

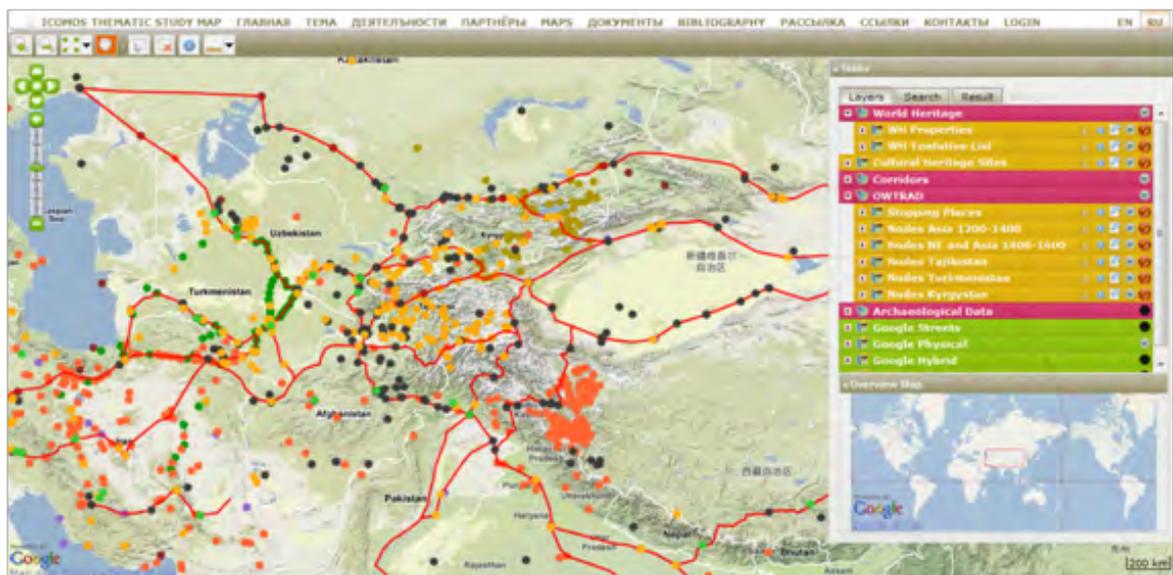


Figure 3. Example of data integration. Silk Roads CHRIS. Powered by GIM. <http://www.silkroad-infosystem.org> [Copyright: Silk Roads CHRIS Project]

of the fabric and values of the heritage sites. It will make a difference in a fast changing world in education and research, innovation and creativity. For example, as depicted in Figure 3, the Silk Roads CHRIS allows the addition of other databases and studies e.g. the ICOMOS Thematic Study on the Silk Roads (Williams & Wordsworth 2010), giving a scientific base for the discussion of the comparative study for the World Heritage nomination and access to a large bibliography, for now in English, about the Silk Roads. Another example could be the creation of the book records of the monuments and sites or educational activities offered to the public. Here, the Silk Roads CHRIS offers one platform to work and exchange of ideas of various stakeholders from diverse disciplines, such as

management of World Heritage properties improving the ability to share documentation and foster international collaboration. However, when it comes to transnational World Heritage nominations, there are still a number of challenges to overcome such as the application of an IMS with different legal systems within the framework of its own culture and levels of technical expertise in documentation and recording techniques in each of the State Parties.

The idea of creativity and innovation using Creative Conservation as an alternative to the traditional conservation approach is promising. It is a dynamic concept that gives the local communities the possibility

to take part in decision making and be included in the protection of the values, maintenance and monitoring of the sites while receiving some benefit. However, building a vision of the future is sometimes a very slow and elaborated work in local communities. Therefore, the application of PC in monitoring and management processes could be a first step towards a change in conservation strategies.

IMS aid in the activities related to the nomination and management of the World Heritage properties and provide an effective measuring tool to better detect the threats and their causes, and propose methods of control. However, the use of IMS also requires qualified staff, regular and consistent update of information, and consent of the different stakeholders on the methods for documentation and recording. IMS is a tool to find a common working language but it does not aim to unify cultural and policy differences. The Silk Roads CHRIS provides an example of a cultural cooperation network, and demonstrates the potential of an improved heritage documentation system.

Acknowledgements

The authors would like to acknowledge the support of the UNESCO World Heritage Centre, BELSPO (Belgian Federal Science Policy Office), the Belgian consortium and the local stakeholders in Central Asia participating in the Silk Roads Cultural Heritage Resource Information System (CHRIS) project. Moreover, we would like to acknowledge the support and advice of Prof. Tim Williams from the Institute of Archaeology, University College London (UCL), Prof. Stefano Della Torre, Head of Department BEST and the Research Group of Planned Conservation at the Politecnico di Milano and Yuri Peshkov Programme Specialist Culture Sector at the UNESCO Almaty Cluster Office.

References

AIC, 1996. AIC Definitions of Conservation Terminology. WAAC Newsletter. CoOL: Conservation OnLine, 18(2). Available at: <http://www.conservation-us.org/index.cfm?fuseaction=page.viewPage&PageID=620&E:\ColdFusion9\verity\Data\dummy.txt>.

Box, P., 1999. GIS and Cultural Resource Management, Bangkok: UNESCO.

Della Torre, S., 2010a. Conservazione programmata: i risvolti economici di un cambio di paradigma. Il capitale culturale, (1), pp.47-55.

Della Torre, S., 2009. Il patrimonio architettonico e i processi di sviluppo locale. In Learning Districts: patrimonio culturale, conoscenza e sviluppo locale. Milano: Maggioli Editore.

Della Torre, S., 2010b. Learning and Unlearning in Heritage Enhancement Processes. In Culture and the Making of Worlds. Milan. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1692099.

Engels, B., 2010. Serial Natural Heritage Sites: A Model to Enhance Diversity of World Heritage? In World Heritage and Cultural Diversity. World Heritage Studies. Cottbus: German Commission for UNESCO, pp. 79-84.

Fodde, E., 2010. Conservation and conflict in the Central Asian Silk Roads. Journal of architectural conservation, 16(1), p.75.

de Guichen, G., 1999. Preventive conservation: a mere fad or far-reaching change? Museum International, 51(1), pp.4-6.

Hurd, J. & Fodde, E., 2004. "Preservation and Restoration of The Ancient City of Otrar", Kazakhstan Conservation Of Earth Sites in The Central Asian Silk Roads Manual for the Testing and Assessment Of Historic and New Earthen Materials and for Their Application Within an Ethical Conservation Process, Paris: UNESCO.

ICOMOS, 1964. Venice Charter. Available at: http://www.icomos.org/venice_charter.html [Accessed August 30, 2010].

International Congress of Architects and Technicians of Historic Monuments, 1931. The Athens Charter for the Restoration of Historic Monuments,

IUCN et al., 2009. Serial natural World Heritage properties. An initial analysis of the serial natural properties on the World Heritage List IUCN. Available at: http://www.iucn.org/about/work/programmes/wcpa_worldheritage/wheritage_pub/wcpa_whstudies/ [Accessed November 8, 2010].

Lazzeretti, L., Capone, F. & Cinti, T., 2010. Technological innovation in creative clusters. The case of laser in conservation of artworks in Florence. IERMB Working Paper in Economics, (10.02).

Levin, J., 1992. Preventive Conservation. Getty Newsletter 7.1, (Winter).

DC Network, 2011. Districts of Creativity. Available at: www.districtsofcreativity.org [Accessed October 30, 2011].

Peshkov, Y., 2007. Current Situation of Heritage in Central Asia - Observations and Prioritizations through the Activities of the UNESCO Office. In Expert Meeting on Cultural Heritage in Asia and the Pacific Strategy Development and Needs Assessment. Japan.

Rappoport, P., 2009. Legislative frameworks, policies and means to encourage planned conservation. In A. Canziani, ed. Planned Conservation of XX Century Architectural Heritage. Milano, pp. 292-301.

RLICC, 2011. Precomos - Preventive Conservation, Maintenance and Monitoring of Monuments and Sites. Available at: <http://precomos.org> [Accessed June 7, 2011].

Stulens, A. & Meul, V., 2009. Monumentenwacht, a Monitoring and Maintenance System for Cultural (Built) Heritage in the Flemish Region (Belgium). In Berne.

Waller, R., 1995. Risk management applied to preventive conservation. C. L. Rose, C. A. Hawks, & H. H. Genoways, eds.

Storage of natural history collections: A preventive conservation approach, pp.21-28.

Williams, T. & Wordsworth, P., 2010. Silk Roads Thematic Study. Interim Report.

Wu, M., 2009. Understanding Preventive conservation in different cultural contexts. In pp. 134-140.