Decomposing Cartographic Artifacts - Concept, Design and Realization of a Numismatic Exhibition

Karel Kriz and Alexander Pucher
Department of Geography and Regional Research,
University of Vienna, Vienna, Austria
karel.kriz@univie.ac.at, alexander.pucher@univie.ac.at

ABSTRACT

From November 2012 till September 2013, the Kunsthistorisches Museum (Art History Museum) in Vienna, Austria together with the University of Vienna, Department of Geography and Regional Research is hosting within the framework of the Austrian National Research Network (NFN S98), a numismatic exhibition entitled "The Empire of the Huns in Central Asia and India". This exhibition focuses on the history of coins and covers the area of what was once known as Byzantium (Mediterranean area) across to the Empires of Central Asia and India. The focus of the exhibition is threefold and comprises the following aspects:

- the function of the exhibition as a show for the public
- the expectations of the visitor to navigate in exhibition space
- the task of maps and spatial representations as geo-communicators

High quality maps and cartographic representations in digital as well as printed form have been produced for the exhibition and act as visual base information with multiple purposes. The maps are therefore considered as the spatial backbone of the exhibition.

This contribution discusses the concept and design of the cartographic artefacts within the exhibition and broaches the topic on how maps of a mountainous environment can contribute to knowledge retrieval in a historical context. These artefacts include a walk-on 4 x 3.5 m floor map printed on 50 x 50 cm tiles that presents the visitor the main geographic overview of the exhibition area. Furthermore, for each of the 16 exhibition showcases, a regional map is provided to locate the numismatic and art-historical artefacts. These uniformly designed maps that are also linked to a user-orientated information portal serve as spatial connectors within the display. The variety of displayed cartographic artefacts showcases moreover also the appliance of mountain cartography in humanities.

Keywords

cartography in humanities – cartographic design – museum mapping – geo-communication

INTRODUCTION

"The Empire of the Huns in Central Asia and India - The Countenance of the Other" is an exhibition that deals with the coins of the Huns and Western Turks in Central Asia and India and presents a numismatic exposition that is currently accessible at the Kunsthistorisches Museum in Vienna, Austria. This show has a strong geographic-cartographic emphasis and is open to the public from November 2012 till September 2013. The major focus of the display lies in communicating the history of coins in the period from 200 CE to 900 CE. as well as presenting the civilizations of the Huns from a new perspective.

In the collective memory of western and eastern civilizations the Huns more than any other people symbolize the menace of migrating nomadic peoples from the steppes of Asia in late Antiquity. This exhibition looks closely at the Huns who are often misleadingly referred to as a number of different peoples referred to as savage "two-legged beasts". According to latest historical evidence this assumption is incorrect; on the contrary the civilizations of the Huns profoundly influenced the region's culture and history. This exhibition brings together a comprehensive survey of coins, offering a geographic-historical perspective and thus a new look at this little-known civilization, and presents the results of a six-year research project that was supported by the Austrian Science Fund (FWF); National Research Network (NFN), The Cultural History of the Western Himalaya from the 8th Century (S98).

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The geographic extent of the exhibition covers the historical empires in Central Asia and India, the Empire of the Sassanids concentrated in Central Persia as well as areas including the influence of the Byzantine and later Islamic Empires. As shown in Figure 1 the total geographic extent of the exhibition includes a vast section between the Mediterranean Sea all the way to central Asia extending for nearly 10,000 km. It was therefore necessary to subdivide the areas of representation in order to assure the consistency of thematic content for geo-communicational purposes.

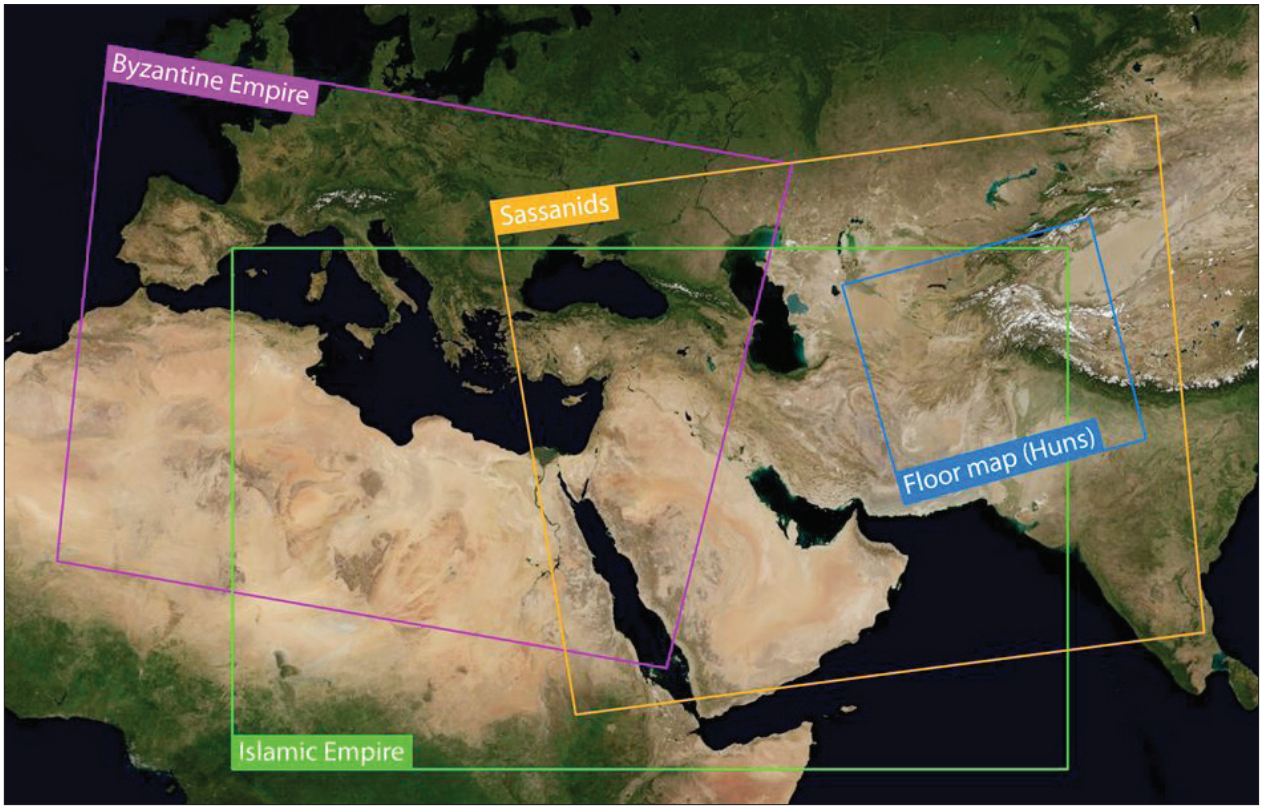

Figure 1. Geographic extent of the exhibition.

GEOGRAPHIC SPACE IN EXHIBITIONS

Cartography has numerous techniques and display methods to promote visual spatial representations within museums and exhibitions. Keeping a close focus on the visual cognitive approach, various sets of cartographic depiction methods related to museum and exhibition space can be deduced (Kinberger, Pucher 2012).

These expressions can be differentiated according to their relationship to spatial location. Apart from cases where no spatial-temporal context at all is given, three major areas of focus can be identified. The first type, representations that are used in museums but outside of the thematic scope of exhibitions, such as venue maps and orientation plans, are a very common form of cartographic expression within museums. These maps are used inside locations, however outside of the exhibition space, thus not including the contextual spatial-temporal component of the displayed exhibits. Plans are provided for orientation within the museum in order for the user to locate and navigate in real space.

The second type can be summarized as maps that are used as supporting information within exhibitions. Written descriptions give spatial information in textual form and possess no graphic depiction to pinpoint a location. In this case the "written map" can be seen as a narrative. Traditional visual maps resemble the most common type and display a specific issue of an object or event. The map offers different possible purposes, object of interest or narrator of a spatial story. The overview map is a map of global, continental or national scale, used to give a rough orientation. These maps use the fact that most people are familiar with the shapes of continents or countries rather than those of smaller areas. Sometimes overview maps are also part of detailed maps for the reasons mentioned above. So called map-related expressions are very common and enhance the potential of traditional planimetric maps through the use of 2D or 3D depictions, such as aerial pictures, panoramas, reliefs, globes, etc. Multimedia as well as virtual and augmented reality are further digital

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graphic facets exploiting interactive cartographic representations using multimedia sources, such as virtual space, sound, videos etc.

Thirdly and finally, maps can act as thematic content in exhibitions by representing artifacts of historical or contemporary context. Maps and other cartographic representations thereby become pieces of art themselves.

GEO-COMMUNICATION IN MUSEUMS

Communicating space and time in combination with displayed exhibits is an important issue for museums, however, is unfortunately not always implemented appropriately from a geographic perspective. In this context, various aspects must be consequently considered in order to fulfill the goals, such as the service component of a museum, the educational purpose and the communication process of both virtual and real artifacts. According to Alexander (2008) the following tasks can be seen as being indispensable within a museum environment: collection; conservation; research; and communication. The question from a geographical viewpoint therefore arises: how can these assignments be effectively linked to artifacts utilizing geo-communication? The implementation of all these tasks depends therefore primarily on the precise spatial, temporal and thematic characteristics of the entity.

Looking more closely at numismatic objects the major query that stands up from a geographical perspective is very composite and is linked to the so-called "Numismatic Where's and When's". In comparison to normal art-historical items they are highly elaborate and manifold due to the fact that they include various facets of space and time that play an important role for information transfer and retrieval. Hence the following interrogations in combination with the artefact must be answered or at least marked out in such a way that location and time can be delineated:

- Where and when was the numismatic artefact struck?
- Where and when was the numismatic artefact distributed?
- Where and when was the numismatic artefact found?

The answers, however, to these questions from a geographical point of view can be very diverse and are often vague, at times even non-existent. Furthermore scale plays also a decisive role on how location is depicted. Therefore in many cases approximation and interpolation is required.

Generally speaking the spatial-temporal object foundations are very often unsatisfactory from a cartographic perspective because exact coordinates or timestamps are not available. Uncertainty is therefore in this context an omnipresent issue that has to be addressed. Keeping this in mind, mapping ambiguity becomes a delicate issue that influences the process of communicating historical artefacts. In order to map insecure information effectively, spatial location and distribution as well as temporal description and clarification must be outlined in such a way that the cognitive process of perceiving, interpreting, evaluating und understanding is guaranteed.

Possible ways of doing so, besides obtaining reliable coordinative data, is the use of graphic design to emphasize potential areas of certainty opposed to uncertainty. In many cases these areas are allocated to regions of so-called hotspots on the map. There are many methods to depict uncertainty in maps, however the majority of cartographic examples use the graphical variable colour in combination with areal features to demonstrate the deployment, such as area-highlighting with colour excluding exact boundary delineation (compare Figure 2), central-peripheral emphasis utilizing colour to focus on hot-spots, or the use of progressive colouring. Within the exhibition some of these methods were showcased in maps to demonstrate this approach.

An excerpt of the text of showcase 7 illustrates the problem of uncertainty and the cartographic implementation (URL-1):

> *"Showcase 7 ALKHAN: King Khingila and the consolidation of Hunnic power in Northwest India: […] At a certain point in time, which cannot be exactly pinpointed, the Alkhan took over the ongoing production of a Kidarite mint in Gandhara, as is shown by the unchanging reverse and uninterrupted style. […] Historical sources and archaeological finds reveal that at this time the Alkhan had expanded far eastward across the Indus and had reached at least Taxila."*

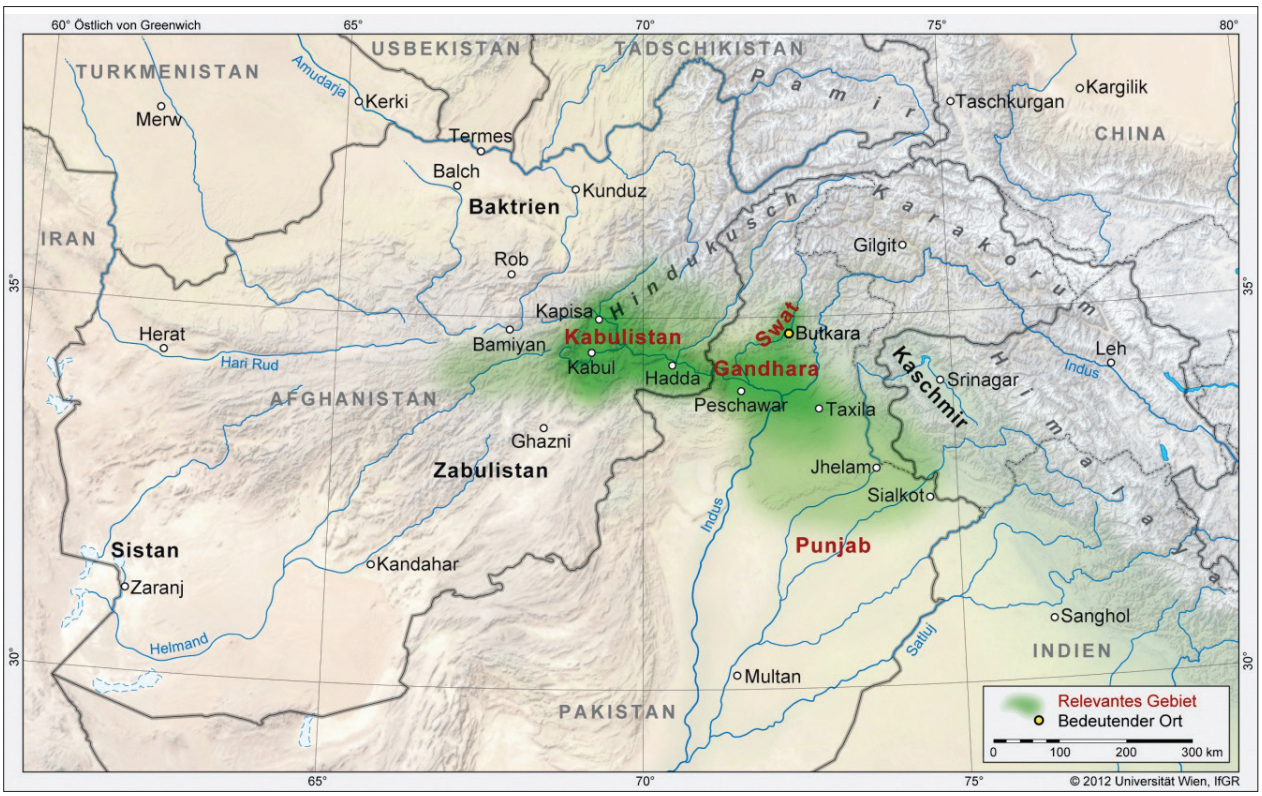

Figure 2. Overview map showcase 7.

FOCUS OF THE EXHIBITION

The integration of new presentation and communication aspects into museums and exhibitions possess many challenges for curators and exhibition managers, which leaves room for further research in various scientific areas. Non-profit organizations such as museum3.org (URL-2) offer an active platform for the exchange of knowledge on the future of museums. However, no group is yet devoted to cartography and geographic information and its context within exhibitions. This clearly shows the lack of awareness of these fields for exhibition design.

The focus of the exhibition therefore addresses these issues and draws attention to a display for the public, navigation in exhibition space and the utilization of maps as a powerful tool to communicate space and time connected to numismatic artefacts.

The display of the exhibition as a show for the public focuses on the goals of geo-communication in museums utilizing cartographic methods. The service component of a museum as well as the educational purpose within the communication process of numismatic artifacts is supported by maps and map-related representations that stimulate the user to submerge into the individual topics of the exhibition through a spatial component.

The expectations of the visitor to navigate in exhibition space are assisted through various maps and cartographic artefacts in order to direct knowledge transfer. Every showcase has an overview map that is linked on the one side to the exhibits and on the other side to the large walk-on topographic overview map that interconnects the exhibition space. Furthermore, direct links via QR-Codes that are present at all showcase access points navigate the user to further in-depth information that is hosted on the exhibition portal.

Several showcases also possess maps as hubs for information retrieval and thus encourage the user to interact with the spatial component of the exhibition. Links to neighbouring showcases stimulate this way awareness and interconnectivity. The task of maps and spatial representations as geo-communicators is further underpinned through detailed cartographic enlargements that can be accessed via QR-Codes that link to the exhibition portal.

EXHIBITION SPACE

Exhibition space is defined as a location in a museum where coherent exhibits connected through a topic as well as space and/or time are displayed and offers the visitor the opportunity to retrieve information in manifold ways. The currently described numismatic exhibition at the Art History Museum in Vienna unveils a

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very traditional venue in a rectangular setting with a number of units, both to inform the visitor as well as to attract attention and to stimulate interaction with the exhibits. As shown in Figure 3, it consists of an eye-catcher (The Hun Skull at the entrance), showcases, a walk-on floor map and an animated visual (screen) unit.

The eye-catcher that is situated at the entrance of the exhibition forces the visitor to interact visually with this unique exhibit. It is a replica of a Hun skull that draws attention to the custom of artificial cranial deformation which spread into Central Europe during the Great Migration, especially with the Huns in the 5th century CE.

A series of 16 wooden, glass-covered showcases are positioned chronologically alongside the interior wall and each is dedicated to a certain period in history affected by a special event, an ethnic group or a kingship in a certain geographic area. Furthermore every showcase is installed with a spatial and temporal entity. The main artifacts consist of important examples of coins from each area and period, accompanied by additional information about archeology, their cultural and social history.

The walk-on floor map is a 4 x 3.5 m topographic overview map of the regions Bactria, Gandhara and adjacent areas in the 2nd half of the 1st millennium CE and represents the cartographic centerpiece of the exhibition. It shows basic topographic information for the purpose of orientation accentuating hill shading techniques and associative natural coloring to emphasize the morphological and climatological features of the region. Important historical places as well as major areas of that time are depicted and show how these regions and vicinities were once linked with each other. Additionally a selection of recorded historical trade routes are displayed that document the crossroads and passages pe ople had to overcome of altitudes above 3,000 m on their travels through the area.

The animated visual unit consists of a large format video screen where seven movies dealing with various numismatic as well as geographic topics are presented. These short movies also known as 'filmlets' display narratives in the sense of geographic storytelling (Cartwright, 2004) by making extensive use of cartographic visualizations along with thematic content.

CARTOGRAPHIC LEITMOTIF

In order to transport spatial as well as temporal information effectively in an exhibition, a cartographic leitmotif is essential. Therefore a conceptual framework was setup consisting of four areas of focus. The first focal point is the display of high quality maps and cartographic visualizations in digital and printed form. These maps act as visual connectors utilizing locational features to link thematic information as well as aesthetical issues to attract attention. The second area deals with the depiction of geographic space and dependencies in exhibition space. This is important due to the fact that mapping the real world into the exhibition space binds the artifacts with their position on earth and thereby emphasizes the spatial context. Thirdly multimedia implementations represent a new and innovative form of geographic visualization. Such

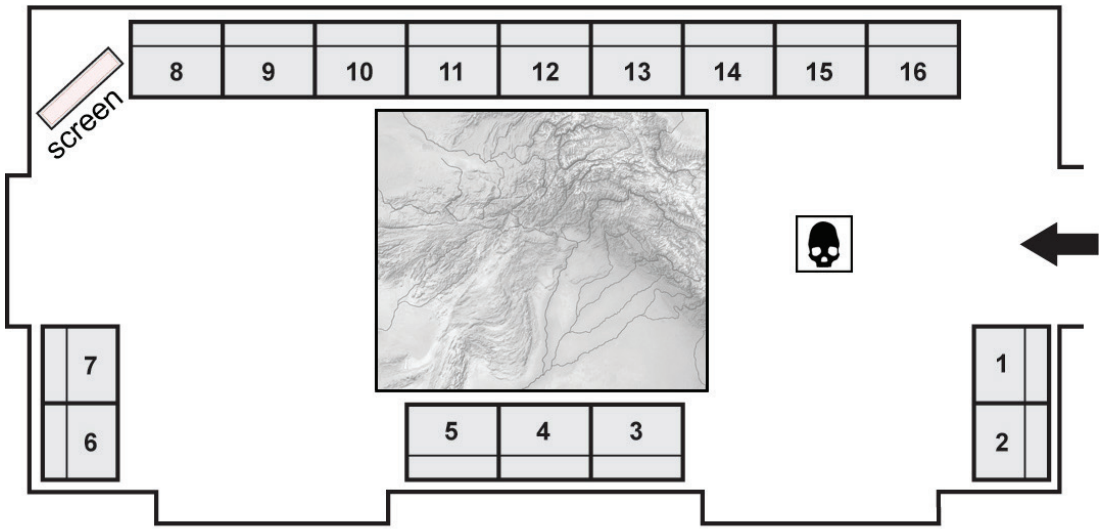

Figure 3. Layout of the exhibition.

installations attract and engage the observer depending on thematic and technical constraints and allow new ways of information retrieval. Finally the sustainability of exhibition content through online information availability is a necessity to effectively emphasize content documentation in order to achieve profound long-term impact.

The display of high quality maps and cartographic visualizations in digital and printed form is a key issue within the exhibition. Maps play an important role and great importance is attached to them. Besides having a geo-spatial assignment they also act as eye-catchers to stimulate the observer to interact with the exhibits. In the exhibition two types of map representations are manifested. The first type is a small scaled overview map that is available in each showcase - as displayed in Figure 2 - presenting general topographic features for orientation in a subtle fashion including hill shading, a slightly under saturated natural earth colouring, hydrology, current administrative boundaries and labelling as well as major mountain ranges and points of interest of that time. The thematic content is depicted in contrast to the topographic information in a very garish manner. The idea is to focus the user on spatial and thematic issues that can be identified within the showcase as well as to connect to the oversized walk-on map that is located on the floor in front of the showcases. The second type of cartographic representation is the so-called "Special Map" that is prominently setup. There are three such maps within the exhibitions. These maps have a direct thematic linkage to the overall topic of the showcase and can be seen as an exhibit on their own. The map is designed in such a way that the viewer should at first be attracted and then dwell upon the content in order to extract insight. The topographic and thematic information is much denser and visually more intense in comparison to the overview map. It utilizes selective cognition principles such as focused colouring and de-saturation methods that guide the observer to the focal points of the representation and gently conduct the viewer to concentrate on dedicated issues (compare Figure 4).

The depiction of geographic space and dependencies in exhibition space is accomplished through an oversized topographic walk-on overview map of the size of 4 x 3.5 m. This huge map is printed on a stain proof, durable foil that is laminated on interlocking 50 x 50 cm PVC tiles. This fixed, yet removable carpet is situated in the center of the exhibition space and provides a physical walk-on of the real geographic space. Since the map is viewed while standing on it, the scale, layout and design takes this greater visual distance into consideration. This by all means noticeable cartographic product presents the visitor the main geographic over-

Figure 4. "Special Map" Sasanian Empire about 270 CE (reduced scale) (URL-3).

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view of the investigation area. The map shows significant historical settlements and regions that played an important role at that time. Furthermore a selection of trade routes illustrates the inter-connectivity and historical significance of the region. Current as well as disputed administrative boundaries are displayed in order for the observer to connect to the presence. In addition, major cities, hydrological network, graticule, hill shading as well as mountain ranges, peaks and passes serve as orientation points for the observer. The challenge lay in the combination of past and present features to achieve a balanced and appealing visual depiction for effective information retrieval (compare Figure 5).

Figure 5. Portion of the topographic walk-on overview map (reduced scale) (URL-4).

Multimedia implementations in museums have manifold roles attached to them and can be utilized very effectively by cartography to transport spatial information in combination with thematic issues. Cartographic artefacts in multimedia implementations are very powerful tools for information retrieval. On the one side they attract attention due to the fact that in most cases their installations are very salient. On the other side they allow in-depth knowledge acquisition. Within the exhibition short movies, so-called filmlets for geographic storytelling were installed to portray seven topics that are linked directly to the exhibition:

- The Hun Skull and the story of cranial deformation: This movie examines the background of the deformed Hun skull including its development and meaning.
- The Countenance of the Other and the Special Maps: This movie provides information on the localization of the special maps shown in the exhibition. Based on a world map with a Natural Earth overlay, the map section is displayed in two zoom levels. In addition, there are also short flyovers for each map.
- Topographic overview of the Empire of the Huns in Central Asia and India: The goal of this movie is to explain the composition and structure of the walk-on topographic overview map displayed in the exhibition. Building upon a topographic base map, the essential map components for each defined layer are presented. The accompanying displayed photographs support the conception, giving deeper insight into the character of the landscape.
- Historical regions - a journey through Central Asia and India: Besides localizing single regions, significant trading routes are highlighted to emphasize the inter-connectivity of the area. Furthermore, two images which illustrate distinctive landscapes are shown for each region.

- What do we see on coins? The movie highlights the different elements which constitute a coin design and explains their meaning.
- How are coins turned into history? The movie explains how coins reflect the historical processes of a period, and how political history can be reconstructed with the help of coins in the absence of other sources.
- The dynamics of Hunnic territories from the 4th century CE until the arrival of the Western Turks around 550 CE: By means of an animated map, the movie demonstrates at an accelerated pace how, during a period of about 200 years, different spheres of control arose and how they interacted with each other.

The sustainability of exhibition content through online information availability is a key issue for effective and enduring dissemination. Therefore an online exhibition catalogue portal for PC, tablet and smartphone access for on- and off-site information retrieval was designed and realized.

The overall concept of the bilingual (German/English) online portal is to inform the user about the exhibition as well as to allow the user to navigate through the online version of the exhibition without causing any disruptions or ambiguity. The implementation is achieved through a flexible scalable scheme that is installed in the application to provide access through assorted digital media. This structure can be retrieved likewise through mobile smartphone devices and tablets as well as immobile large screen computers keeping the look and feel at all times consistent. The top level entrance to the portal as displayed in Figure 6 hosts a header and footer area that embrace varying thematic information. The header holds, besides the exhibition banner a slim and coherent navigational area consisting of a language switch, search zone as well as a home icon that is accompanied by the four thematic cornerstones of the exhibition: the showcases, the coins, the maps and the movies. The footer in contrast accommodates general administrative issues linked to the exhibition including legal notices, press and exhibition information, bibliography and copyright matters. This embracing control area is available on all subsequent levels of the application. It is supported by its graphical design and is responsible for high recognition and secure navigation within the application. All following sublevels of the portal are embedded within this structure to keep recall present. In addition to the general header structure, so-called bread crumbs are also installed in all lower levels to assist navigational awareness.

In between the control area the thematic content is situated. This is structured in a top-level banner area and below by the four thematic cornerstones of the exhibition. The showcase level contains the core topics of the exhibition and allows the user to immerse directly into specific thematic areas that can be accessed through this layer. Every showcase has an extensive textual explanation accompanied by a map, timeline

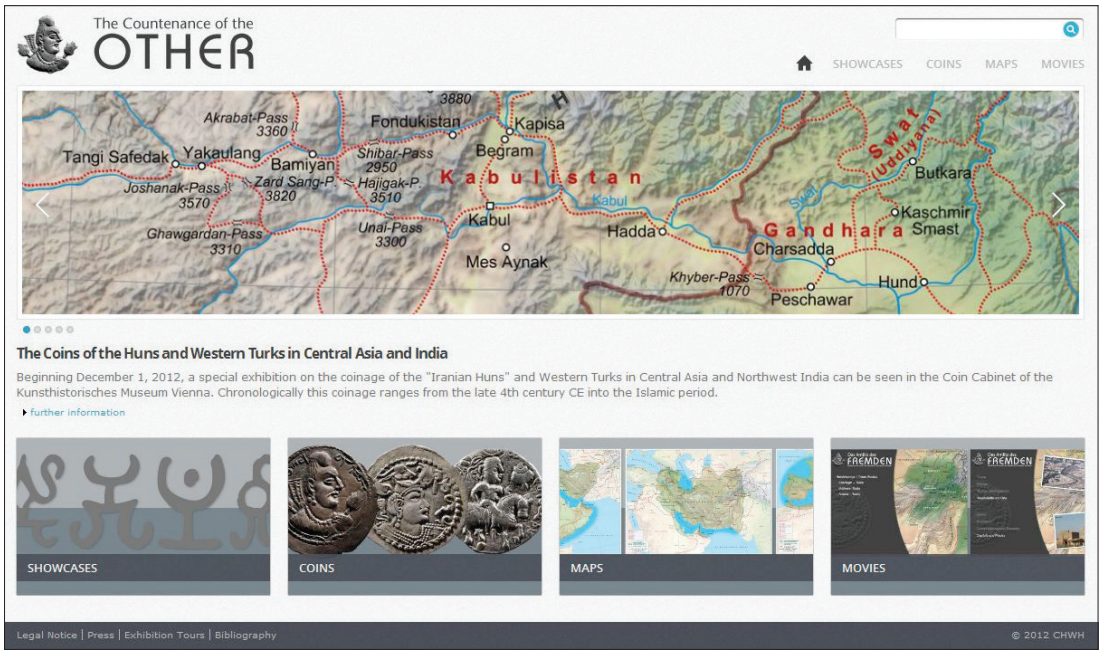

Figure 6. Exhibition homepage "The Countenance of the Other" (URL-5)

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and one or more object description. The coin level is the numismatic focal point as well as the turntable of the exhibition. The thematic approach can be steered by a detailed selection procedure that allows the user to extract individual information with regards to specific content requirements to find one or more coins of the requested choice. Selection criteria are subdivided in three global areas concerning object information: minting authority, region and timespan. Once the coin is selected, further information as well as an enlargement of the object is displayed. The map level can be seen as a container for spatial information of the exhibition. All displayed maps including the topographic walk-on overview map can be examined in full detail utilizing panning and enlargement functionalities. The movie level - the last of the four cornerstones - is structurally similar to the map level and holds the multimedia implementations of the exhibition. Various short movies can be viewed individually within this area.

CONCLUSION

Enhancing methods of spatial information by means of cartographic communication is essential for exhibitions that embrace location. It is therefore important to foster know-how transfer and collaboration with neighbouring disciplines that address spatial issues. As presented and carried out in the described numismatic exhibition, cartography and geo-communication have more in common with humanities then normally assumed. Collaborations in these fields unearth new perspectives and views that enhance scientific profundity as well as public awareness. It is clearly a fact that today's museums and exhibitions are transforming from static presentation forums to interactive scientific platforms that are becoming more and more places of interaction with objects that are linked to time and space.

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