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Title

HOMM_ICT supporting hands-on & multi-media laboratories in museums

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Promoting Institutions

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Short description

Museums, places of informal education *par excellence*, have great potential in assisting the education activities in schools and fostering lifelong learning. Through information and communication technologies, HOMM allows visitors to a museum (students, teachers, public) to process (before, during and after the visit) knowledge of the heritage of the museum, to make use of its multimedia content as well as to enhance the hands-on experience and contribute to increase the resources of the museum. In general, HOMM is a tool of information crowd sourcing: it allows the accumulation and sharing of relevant knowledge on local dimensions, very often non available through the scientific and academic literature.

Homm is a tool supporting the effectiveness of museums in developing inclusive and collaborative educational practices, contrasting learning difficulties and creating connections between people. It is now available a beta version of the prototype software "homm_sw" developed by Officina Emilia (University of Modena and Reggio Emilia, Italy) in collaboration with the Crafts Museum (New Delhi, India).

The demo available online (www.homm-museums-software.org) shows the application of the "network-of-stories" and seek to create a non-linear and open multimedia narration (with video, text, images).

The network of stories entitled "A lathe at school" (from the Italian partner) runs along eight areas: The history of Monarch lathe, Education and Training, Inventions and mechanical technology, the socio-cultural context, Work and Economics, History, Officina Emilia, Officina Emilia Workshops. A network of stories has been created by using homm, both in the Italian and in the English version (with subtitles). It consists of 43 clips, including 33 video (about 2-4 minutes, for a total of 300 minutes), 6 photo albums and 4 clips with only text and images.

Another network of stories entitled "Putchu Pots" (from the Indian partner) is in progress. Others are under review.

At present, there are two browsing environments of the networks of stories. One helps in building a personal sequence in exploring and playing the videos, albums of photos, and reading the texts of the story according the sequence spurred by the personal curiosity and interest of the user. In the other one, the clips are ordered according the main thematic area in which are classified. The latter consultation of text, images of individual clips can be easily printed and video played.

Goals

By proposing Homm to museums and education institutions, we intend: (a) to use ICT to support interactive workshops in museums; (b) to improve the use of the museum by academic and education institutions, training centers and programs of adult education; (c) to promote social inclusion, strengthening the identity of museums as places of learning and support relationships

between individuals, groups and institutions; (d) to encourage the sharing of HOMM-sw networks of museums and research centers interested in developing and using HOMM.

Methodologies

HOMM uses ICT in five ways: (a) to enhance a large amount of multimedia materials already available for museums' visitors (on site, in the museums, and on the web); (b) to suggest associations and "mental maps" that connect information through a semantic navigation and a non-linear narrative; (c) to enhance the personal memories of themes and experiences acquired by interacting with the museums' heritage; (d) to support a collaborative environment for communities of practice involved in the processes of teaching- learning and processes of social inclusion and cohesion: the museums' operators, teachers, literacy centers for migrants, local educators, social workers and social rehabilitation, facilitators in communities of elders, (e) to create a storage of multimedia content produced through the activities and interactions in communities of practice (technical experts, researchers, ...); (f) to produce and disseminate original materials for educational use in any educational institution, on the salient features of the area (the cultural, historical, institutional, social, economic, technological and environmental).

To meet these aims, the software architecture adopted in the development of HOMM-sw is based on four pillars: (1) a web system for creating and managing community of users, authors, administrators of the sw platform and contents; (2) ICT information points in the museum that integrate multimedia activities with the hands-on activities; (3) a website with a personal workspace that allows you to 'continue the visit after the visit, (4) a working group for the production and content management, and collaboration tools that are used to expand the storage of content.

The software architecture is built around the needs of the end users of the activities of the museum. Before the visit to the museum, the enrollment of individuals and the group to which they belong (eg. as school classes accompanied by teachers) will set the conditions to create a personal workspace and a group's workspace. A self-assessment test prior can be implemented (customizable by the teacher, in the case of classes of students), related to the aspects that are specifically explored in the activities of the museum. During the visit, the users will be identified by a proximity card. The time for interaction with ICT tools will be limited, during the visit, since the museum is a unique place to make the real visit and the hands-on activities. The personal workspace will be enriched by various information and may be extended through many channels (tablets, mobile phones with custom applications). After visiting the museum, each user will be able to navigate freely through the HOMM-sw application indefinitely. The personal web space may be adapted to the specific needs (for example, the level of knowledge effective) and to user's preferences.

The most original parts of the architecture of HOMM-sw are the tools for both work groups of students (coordinated by teachers), or the groups that will be created for the sharing of digital resources, to validate that the work of each group publication of the results of their work. These documents, produced by the original processing of knowledge emerged from the interaction with the heritage of the museum, its artifacts and the stimuli received hands-on activities, may be shared through the web in the wider community.

To date, three types of applications have been designed.

The first relates to the user in the context of the visit. A selection of digitized information, such as text, photos, video and voice comments made during the visit can be stored. All this information can be retrieved and used in subsequent activities to be shared by classmates and others selected

from the registered groups. The accompanying teachers can re-elaborate texts, build narrative and explore storytelling, sharing activities and collaboration with peers, and more.

A second type of application concerns the potential of personalization of information for the individual user. Each object (media clip) is included in a network of content and applications at different levels (for specific users and different needs). In the network of stories, some of the objects will be connected according to the narrative logic proposed by the person who created the navigation between those contents. Links or other items can be added by users. This application constitutes an important tool for teachers that can build original tracks of multimedia documents in support of the proposed activities to their students, taking into account the needs of their specific educational programming, as well as skills in starting and learning goals that characterize each class. It is then possible to produce, with little effort, different documents and stories, customized to suit the needs of students who have special educational needs.

A third type of application is the modularity of the objects and the software architecture adopted in designing HOMM-sw. This feature will allow the administrator to create a customized web connection, to be shared with a selected group of users (eg a team of students in the class working on a specific subject). The web structure and the contents implemented with the approval of the administrator of the activity undertaken with HOMM can be shared with others or remain heritage of individual communities or individuals.

This application creates, in schools, platforms to share information and specific contents between colleagues in the same level of class, or who teach disciplines in the same area or the same discipline. Given the strong acceleration of scholarly publishing to the creation of on-line tools, let us imagine a production of tools effectively, efficiently (also monitored by relationships with the universities) which can exploit the potential of creating documents by multiple professionals in the field of education and also by the teachers. HOMM is an excellent example of a platform that allows you to build pathways of multidisciplinary materials, scientifically validated and monitored by professionals working in museums, in order to support learning processes and cross-linked with the active knowledge of the local context.

The opening of the tool we have designed is high and allows immediately to "manipulate" materials so far poorly disseminated, poorly known, printed in a few copies, too specialized or older and outdated, but still appropriate to their educational usage. The manipulation of texts, the use of agile images and videos, the ability to create free connections and to implement the filing of documents are exactly what a new generation of teachers and educational staff expect to find in a toolbox to support them in the common work at school and in museums.

Target

Students, teachers, tutors, educators territorial, social workers visiting a museum (and visitors to the museum in general).

Officina Emilia and Crafts Museums wish to explore the use of the prototype HOMM-sw and its full development through a network of museum experiences that promote learning through workshops on technology, culture, art and society, such as the network European Virtual Museum Transnational Network (V-MUST, <http://v-must.net>) and the Asia-Europe Museum Network (ASEMUS, <http://asemus.museum>), one of which both CM and OE are associated members, and the network created by the Inclusive Museum Community (<http://onmuseums.com/about-the-community>), the Italian network of ecomuseums (<http://www.ecomusei.net>) and the international network of museums of industrial heritage (TICCICH , www.ticcih.org).

Context of the experience and motivation of the project

Currently, the promoters are: The Crafts Museum (CM) in New Delhi, India, and Officina Emilia - Museolaboratorio (OE) of the University of Modena and Reggio Emilia, Italy.

The CM has undertaken a major restructuring to enhance the extensive collection of artifacts and great talent that lies in the traditional Indian craftsmanship. CM hosts monthly fifty artisans who come from all over India.

OE is an action-research project at the University of Modena and Reggio Emilia. Since 2009, it opened a museolaboratorio that offers hands-on workshops on science, technology, history and society to improve the understanding of the students (and their teachers and their families) of the social context in which they live. It is a “meeting place” between schools and businesses to encourage understanding of the processes of production and innovation, placing the actual production and local social transformation processes on a global scale.

Strengths experience

ICT applied in the project HOMM can enhance learning, both informal learning, that is typical of traditional museums, and non-formal learning (increasingly important in museums through hands-on activities aimed at creating practical skills and know-how). HOMM can improve the usability of museums to enrich the knowledge acquired in formal education and support dissemination of learning processes associated with the knowledge of the local context and its relations with the rest of the world.

HOMM may help to enhance the historical, cultural, social, landscape, architecture of a territory, strengthening museums as agents that promote, through the creation of knowledge and the creation of opportunities for interaction, social inclusion, community cohesion and sustainable development.

Weaknesses

It is currently available only the prototype of the software with only a part of the applications.

Results of the evaluation

The functionality of the prototype HOMM-sw (beta version) was evaluated by two groups of users (in Italy and India): this has allowed us to refine the back office tools and features to highlight what further developments could be useful both in the administration that during the consultation phase of the content.

Why it can be considered an innovative tool?

We believe that there are some important aspects not yet explored in the use of ICT in museums. In particular, we propose to connect HOMM with activities normally kept separate: individual paths of users' interaction before, during and after the visit to the museum, evaluation of the effectiveness of individual activities and hands-on programs, sharing of resources. In a network perspective, we focus on the modularity and replicability in the use of ICT on different scales. There is also the need to encourage the involvement of communities in hands-on laboratory in museum and outside the museum.

The use of ICT to accompany hands-on activities in the museum opens a space for innovation in lifelong learning practices. This would make it possible to provide appropriate solutions to the needs of a large group of people ("from the cradle to adulthood"), while maintaining a high accuracy and scientific rigor.

Finally, the creation of tools for dissemination and collaboration between communities, may support and develop the possibility that school teachers take advantage of educational materials related to the local area and contribute in strengthening awareness about the connections between the local and the global level. The slow replacement of traditional teaching materials with online and multimedia teaching materials is an irreversible process, though not without uncertainties and dangers of non-effective use of resources, an area that we consider with great attention.

What training needs revealed

To deepen and broaden the knowledge acquired in museum visits need appropriate content, various media, from a comparative perspective, and a collaborative spirit in which individual contributions can be valued.

ICT can facilitate the connections between the visit to the museum and the different learning contexts. In this perspective, it is important, in the case of activities with schools, which prepare the visit with teachers, to choose the appropriate activities for the group of pupils or students and teachers by providing practical tools to monitor the process, which includes the learning-visit in the museum. It is important to consider that this learning process does not necessarily develop, before and after the visit, in a linear and a priori defined way. The visit to the museum and hands-on activities, that take place there, must foster care, creativity, interaction and critical knowledge, but always require mediation, reinforcement and monitoring the ongoing processes and ex-post evaluation.

The quality of the narrative produced in the application of network-of-stories requires a design that needs multidisciplinary skills.

In addition, collaboration between museums and universities, might ensure the necessary specific skills useful for multimedia production, not available in schools, but more and more accessible to young people, and rarely aggregated around publishing projects.

Where to find the documentation to learn more

Complete documentation of HOMM and homm_sw is available online www.homm-museums.org. The demo HOMM-sw with the network of stories, "A lathe at school" is available online www.homm-museums-software.org.

For information on Officina Emilia: see the website www.officinaemilia.unimore.it

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