# A Family of Solutions for a Small Museum: The Case of the Archaeological Museum in Milan

## Donatella Caporusso, Civico Museo Archeologico di Milano, Italy; and Nicoletta Di Blas and Paola Franzosi, HOC-DEI, Politecnico di Milano, Italy

**Abstract**

Large applications, lasting a long time and requiring a sizable budget, play important roles in cultural heritage institutions for functions such as cataloguing objects, and presenting the institutions. They are less suitable for promoting things like events or temporary exhibitions: the information loses validity and interest in a short time. Another issue is the 'communication focus': large applications are like broadcast TV, speaking simultaneously to a lot of users (with different backgrounds, attitudes and interests), and therefore needing to be 'generic'. Small applications can instead focus on specific targets.

We came to the conclusion that small cultural institutions could use their (in general limited) budgets more effectively by developing small, focused, and well targeted applications, rather than large 'institutional' applications. In addition, they should make good use of the technology, making sure that content (images, audio, text, etc.) can be easily moved from one channel (device) to another with minimum effort.

This paper describes how the above principles have been applied to the Civic Archaeological Museum of Milan, a small but very important institution owned by the City of Milan, in Italy. An overall plan has been drafted and a number of needs have been identified; for each of the needs, a specific solution (and technological 'channel') has been identified. Though implementation of the plan is still underway, some low budget - good quality applications have already been developed. A very effective methodology (including a slender design methodology, a very precise workflow and some easy-to-use technological tools) makes the production process very quick and cost-effective. This paper describes the plan, the strategic choices and the initial set of developments.

**Keywords:** low-cost multimedia, fast development, user experience, storytelling, design

## 1. The Civic Archeological Museum in Milan

The Archaeological Museum of Milan has its roots in the 19th century. A very important Milanese cultural Institution, Accademia di Brera (now a famous fine arts museum) began to gather objects coming from private collections, recently-abolished ecclesiastic institutions, or

demolished historic buildings once in the Milanese historical centre. In 1862 the Ministry of Public Education founded the Museo Patrio di Archeologia (Archaeological Native Museum), whose task was to put together documents from all ages, starting from prehistory. From 1877, the Milanese Municipality established the Museo Artistico Municipale (Municipal Art Museum); the museum gathered collections donated to the civic government up until that time. These museum institutions were then merged into the Museo Artistico e Archeologico (Archaeological Artistic Museum), opened in the Ducal Court of the Milanese castle (called Sforza's Castle) in 1900. The archaeological collections grew thanks to many prestigious private collections.

After the Second World War, Sforza's Castle proved inadequate to house the large number of objects gathered until then. The Great Benedictine Monastery of Saint Maurice, in a nearby historical street (Corso Magenta), was chosen as new location for the Museum, which was inaugurated on 11th December 1965.

Today the museum still has two locations: the Prehistoric and Egyptian sections are housed in the Sforza's Castle, whereas the other sections are in the location of Corso Magenta, in the Benedictine Monastery of Saint Maurice.

Fig 1: The Sforza's castle in Milan, one of the two museum's locations

Fig 2: The Great Monastery of Saint Maurice, the other beautiful museum's location

This latter location (on which we shall focus our attention from now on) is very evocative: the monastery ruins and Roman remains are combined with the modern buildings. The objects lie upon visible strata of history… it is a museum within a museum. The monumental entrance leads to the first cloister of the ninth-century Benedictine monastery, which has now disappeared. There, Roman sarcophaguses and headstones with epigraphs are shown. From the hall of the museum you can enter the second cloister, where the remains of a first-century Roman *domus* (house) are preserved. In the little garden two towers rise up. The first is the circus tower has been subjected to several changes across the centuries, but still conserves a base and nucleus from Roman times. It was initially part of the fourth century Roman Circus; the horses set off from it and ran along the circus seven times before arriving at the finish line. In the eighth century, a monastery was built over the Roman Circus. The tower was integrated into the monastery as church bell tower. The other tower is the polygon one, tied to a line of walls that once surrounded the city. It was emperor Maximian who, at the end of the third century A.D., decided to enlarge the city walls into which the beautiful polygonal tower was incorporated. Frescoes dating back to the fifteenth century can still be seen in its inner walls, from the time when the tower was turned into a chapel inside the monastery.

Fig 3: Reconstruction of the Roman circus (IV century A.D.). Details of the towers of the carceres, where the horse races started

Fig 4: The circus tower (IV century A.D.), in the museum's premises

The ground floor of the museum houses the Roman Section. Beside objects used in everyday life there are unique pieces, such as the Trivulzio 'Cage' Cup, which is considered one of the most

rare and beautiful Roman archaeological findings (only two such caps in the world have been preserved intact until today). Its manufacturing technique still remains a secret even from modern day glass manufacturers. Another precious object is the Patera of Parabiago, a big silver plate dedicated to the cult of the goddess Cybele. The plate shows goddess Cybele and her mortal lover Attis at the centre of a cosmogony map, with symbols of life, death and rebirth. This ritual object is especially valuable since it belongs to a time when pagan cults, like the ones dedicated to Cybele, coexisted with the rising Christian religion. There are also beautiful mosaic floors and statues, such as the torso of Hercules or the Head of Zeus.

Fig 5: The Trivulzio Cage Cup, a wonder of craftsmanship. Only two such cups in the world have remained intact until today

Fig 6: The Patera of Parabiago, a silver plate portraying religious myths

There is also the Medieval Section, in which Goth and Longobard objects, mainly jewellery and arms, are displayed.

In the underground is the Greek Section. A selection of important finds produced between the third and the first millennium B.C. in the Mediterranean area are revealed, together with a very rich collection of Greek and native vessels and votive potteries coming from the south of Italy. Since 2001, the rich nineteen-century collection La Gioia has been shown. More than 600 objects belong to it and are organized in a thematic path on life and death. There is also an Etruscan Section, where the objects are ordered according to specific aspects of Etruscan culture, such as trade, everyday life, the feminine figure, religion. The last section is quite unique in a civic archaeological museum: it is the section on the art of Gandhara, a region which encompasses today's North-West frontier of Pakistan and North-Eastern Afghanistan. Its importance is due to its strategic position, which made it a crossroads of peoples along the centuries. Indian, Iranian and classical Hellenistic elements characterize, together with local elements, the Buddhist art of the region. The art of Gandhara is documented mainly by reliefs and statues in stone and modeled material which decorated the typical Buddhist monument, the stupa. Since this art follows a religious language, every image answers a precise formal code, making every gesture and feature of the figures meaningful to the faithful.

Fig 7: Gandhara Art: Stele with the standing Buddha, detail

Fig 8: Gandhara Art: Relief of the 'distressed Brahman'

As can be seen, the collections of the Museum appear to be very rich and varied, and bear witness to artistic native production, but also contain rare and outstanding objects. Moreover, the Archaeological Museum distinguishes itself because of rich scientific activity and accurate publications.

# 2. Communication Strategy and Technology

The Museo Archeologico until 2005 did not have a well-defined strategy about how to use technology for improving its communications. At the same time it had an overall requirement: to develop focused communication for different segments of the potential audience, rather than developing a general (or generic) communication aimed, indifferently, at all potential users at the same time. In a very simplified manner the potential segments of users are the following:

- Foreign tourists, arriving in small groups or as families
- School groups, arriving mainly in the morning and with previous arrangements
- Italian tourists arriving as families or in small organized groups, and
- Local people (often not very young) coming back often to the museum

Lacking specific expertise on the sue of technology, the Museum, while it was redefining its own organization and its own communications, asked the HOC-LAB, of Politecnico di Milano to investigate what could be done with technology with a double goal in mind:

- To improve the effectiveness of public visits, and
- To widen the audience of people who were aware of the museum and its value; whether this larger audience would also increase the number of visitors was a different issue, not taken as an immediate goal for the time being. (While the museum has some items of international relevance, in a country like Italy, full of archaeological sites, it is not a top star.)

The first joint analysis of the users started also from the observation that, as far as familiarity with technology is concerned, age plays an important role, and middle-aged visitors (Italian ones in particular) are not very aware of modern technology. (According to a January 2007 investigation by a Masters student of TEC-CH (http://www.tec-ch.ch), the majority of Italian visitors, outside of school groups, are middle aged or more, and do not expect technology in the Museum, while foreign visitors are younger and do look for technological support while visiting the Museum. (Branbilla, 2007)). This consideration made it unlikely that the category of local museum repeat visitors would be the early adopters of museum technology.

A further analysis of the Museum's assets made it evident that just 'listing' the objects belonging to the museum, with corresponding descriptions, would not convey the message. First of all the museum (the branch located in Corso Magenta) is organized in different sections, and each section has a different focus and different potential interest. The main sections are the Roman Section, the Greek Section, the Etruscan Section, the Medieval Section and the Gandhara Art section.

Secondly, the location of the museum is in itself a major reason to raise interest and curiosity, as noted earlier. The Museum is located in the spot where the Roman Circus (built in the IV century A.D.) was located, and the fact that Milan had a Circus is not known by most visitors (and most citizens of Milan as well). Even more interesting, in the courtyard of the Museum there is one of the towers of the entrance gate of the circus, and there is a large remnant of the walls built by emperor Maximiam (III century A.D.). Later all the area became a monastery, and later still (in

the 19th century) it assumed today's organization, with the building where the Museum is sited, and the wonderful St. Maurizio church.

A consequence of this historical development is that the museum staff is very knowledgeable about the city's urban development, from a pre-Roman city, to a provincial Roman city (i.e. up to the III century A.D.), to an imperial city (from the 4th century Milan, was one of the capitals of the Western Emperor), up to the 19th century.

The *analysis of the requirements* was conducted using C-AWARE (Bolchini et al., 2007), a variant of a generalized analysis method, AWARE (Bolchini & Paolini, 2004). The most relevant stakeholders were the Director of the museum (Donatella Caporusso, a co-author of this paper), and the curators of the different sections. The conclusions of the analysis, as far as using technology for communication is concerned, can be summarized as follows:

- Subjects of interest are the different sections of the museum, the history of the building on its own (from pre-Roman time to today) and the urban development of ancient Milan in general.
- Technology to be used included the Web, CD-ROMs (for merchandising at the counter or for promotional distribution), pod-casting (both for remote users and actual visitors) and mobile devices (not yet identified with a specific technology) for visitors.
- The styles of communication had to be varied, in order to reach different audiences:

**Type A**: Introductive-narrative: for users (not necessarily visitors) with a generic interest, in order to raise curiosity and to pinpoint the most interesting aspects.

**Type B**: Detailed narrative: for visitors actually touring the museum.

**Type C:** Promotional-Brand: to convey (both to remote users and actual visitors) the general message about the museum and its relevance.

**Type D:** Information providing: to provide detailed selected information about the most relevant aspects of the museum

**Type E:** Catalogue-like information providing: providing (most likely to students or scholars) a reference description for each specific item hosted by the museum.

Two aspects were also considered of specific interest: reusability of content, that could be moved among the different applications, and the possibility of getting intermediate results that could be deployed one by one.

Another important decision was to start experimenting with the new approach that Politecnico was defining: instant multimedia, i.e. developing small, relatively inexpensive applications, based on standard 'engines', rather than embarking on a large, all-inclusive project.

On the basis of the above, the following major steps were designed:

- **STEP 1**: Developing a number of Type A applications for creation of "narratives" describing the main sections of the museum. Different channels (Web, podcast and CD-ROMs) had to be supported.
- **STEP 2**: Developing corresponding informative sections, of Type B, for providing more traditional information.
- **STEP 3:** Reusing narratives of STEP 1, integrating them in such a way that a rich and varied visitor interactive experience (Bolchini & Paolini, 2006) could be provided.
- **STEP 4**: Creating a global communication (over the WEB) to convey the museum *brand* and typical practical information.
- **STEP 5**: Creating detailed information (over the Web) for each relevant item of the museum - the most cumbersome task. In the following paragraph we describe how we designed and implemented the "step 1" activities.

# 3. Step 1 Activities: Telling 'Stories' About History And Art

In spring 2006, we started building 2 applications about two of the museum's sections: the Roman section and the Gandhara Art section. We decided to address two of the most relevant segments of users: the Italian tourists and the foreign tourists (the applications are in Italian and English), with specific attention to 'hungry minds' rather than to '(systematic) information seekers'. Our aim was in fact to raise cultural curiosity and highlight the museum's value rather than to provide an organized set of information. In order to achieve this goal, we selected the narrative style most apt to engage the reader. As far as technology is concerned, the application had to be multi-channel, so as to assist further segments of (potential) users and support different scenarios of use, ranging from consultation from home via the Web, *before* the visit, to fruition via iPod (while in some way or another 'moving'; for example, during a train trip), to consultation from home again, but *after* the visit (CD-Rom). An audio guide version, to be used while on the museum's premises, is currently under way.

## 3.1 The 'OneThousandandOneStory' Technique

In order to develop the 'narrative' applications about the different museum's sections, we decided to adopt an Instant Multimedia methodology for producing multimedia, multi-channel applications: the 'OneThousandandOneStory' technique.

By **Instant Multimedia** we mean all those techniques that allow quick, effective, low cost (why not) production of good quality applications; examples of these technique are Pachyderm (LaMar et al., 2005; Samis, 2005) and MEDINA (for informative applications; see Garzotto, 2006).

In the case of the museum's sections, we selected a particular Instant Multimedia technique, called OneThousandandOneStory (see Di Blas et al. 2007), especially apt for building *narrative* applications. The OneThousandandOneStory technique (already used by HOC lab for 11 applications) helps generate multimedia (with videos, images, audio files and textual content), multi-channel applications; it is characterized by a set of simple and 'pleasurable' interactions for the users (ranging from automatic navigation to manual navigation) and by a strong role of visual and audio communications with respect to texts (that can be seen on demand, but are not

immediately offered to the users). Users can thus sit and relax, enjoying the slideshow of images and listening to the narratives, letting the application lead them into a pleasant journey through the content.

Fig 9: The Roman Section application on an iPod

The OneThousandandOneStory technique consists of a design pattern, a production workflow, a content production method, and finally an engine, that will hence be shortly described (a detailed description can be found in Di Blas et al. 2007).

## The Design Pattern

The design pattern consists of a set of 'topics', revolving around a theme, each developed in a set of sub-topics. Topics are selected so as to create an overall interesting, fascinating story around the theme and are NOT meant to be informative/exhaustive.

Fig 10: The Home Page of the Roman Section application: the 'Roman Section' is the application's theme; the list of the topics can be seen on the left

Fig 11: Roman Section application: the topic 'Epigraphs' and its list of sub-topics - on the left

## Production Workflow

The workflow is strictly fixed and it is organized roughly into 4 main parts:

1. gathering and refining the content (images and texts followed by registration of audio files),
2. implementing the first version,
3. doing a quality check, followed by
4. producing the final version.

When exploited 'at full speed', the workflow can lead to a final middle-sized application in a week's time (our lab's record!).

## Content Production Method

One of the innovative aspects of this technique (it has successfully been used in the case of the Archeological Museum) is the way content is gathered. The best method is to *interview an expert* on the theme: the interview's transcript is refined and organized into small chunks (of approximately 100 words), according to the set of topics and sub-topics (the 'editorial plan'). Possible gaps (for example, missing data) are filled in afterwards. A 2-hour interview can provide the final content for a middle-sized application!

**The Engine**

OneThousandandOneStory goes with a very easy-to-use engine (bearing the same name). Its main components are **Data Entry**, **Preview** and **Generation**. Data entry allows editing the editorial plan (i.e. the set of topics and sub-topics) and entering all the content: images (or videos or animations), texts (and also short texts like captions), and audio files. The preview function allows checking the work in progress, to see 'how it feels'; eventually, generation leads to the final version of the application for the different channels (Web, iPod files and CD-Rom). The generation of the applications (for the different channels) takes virtually no time.

# 3.2 Tales about the Roman Section

The Roman section of the Archeological Museum hosts real masterpieces, along with interesting findings and remains; moreover, as mentioned, the museum's location is in itself related to the Roman history of Milan. The editorial plan of the application (fig. 12) reflects the above considerations: one topic is dedicated to the Museum itself (Roman remains in the Museum Space), stressing the peculiarity of the museum's location ("the museum is literally built upon strata of history…"). The following two topics are about two amazing masterpieces: the Patera of Parabiago, a big plate dedicated to the cult of the goddess Cybele (fig. 6), and the Trivulzio Cage Cup, a glass cup considered one the rarest archeological findings from Roman time, of exquisite making, very likely an imperial gift (fig. 5). The following topics introduce groups of findings (epigraphs, statues and mosaics), dealing with interesting examples.

Fig 12: The editorial plan of the Roman Section application

The editorial plan highlights the narrative style of the application: the theme (the Roman section) is dealt with in a non-systematic way: the most beautiful or peculiar things are put in the foreground (i.e. the fact that the museum itself hosts Roman remains and the two masterpieces); anecdotes, whenever possible, are told.

## Example of anecdotal text: sub-topic 2.3, "The Cult of Cybele"

In Greek mythology, Cybele, the mother of the gods, was in love with Attis, a shepherd. When Attis betrayed her with a shepherdess, Cybele was driven mad by jealousy. When he was asleep, she either castrated him or, according to a different version, drove him mad and he castrated himself. At this point she realized what she had done and, repentant, asked Zeus to bring him back to life; her request was granted. The cult of the goddess Cybele was thus dedicated to the idea of rebirth and life after death. It was very diffused in the IV century pagan world, at the same time as the pagan cult of Mitra, but also as the Christian religion.

Where the main topic does not address a single item (for example, in the case of the topic 'epigraphs'), the list of sub-topics provides a general introduction, but then immediately focus on specific instances.

## Example of instance – related text: sub-topic 4.3, "The Sarcophagus of a Lawyer"

Within the collection of the museum there is the sarcophagus of a young lawyer. It goes back to the third century A.C. and was found intact inside the church of Saint Dionigi, founded at the time of Ambrose, in the second half of the IV century. The decoration of the sarcophagus was dedicated to the young man by his father, who expresses his regret at his son's death at an early age. The lawyer is depicted immersed in his activity, near a basket full of rolled papyrus and while speaking in public. On one side of the sarcophagus the lawyer is depicted immersed in studying a book, and on the other in court, pleading. This is an example of how an epigraph tells the story of a life as it was lived in Ancient Milan.

Fig 13: The Roman sarcophagus of a lawyer

The narrations (derived from a compelling interview with Donatella Caporusso) literally give life to the findings and overall create a fascinating frame for the section.

## 3.3 Tales about the Gandhara Art

The application about the Gandhara Art Section stem from an interview with the section's curator, Anna Provenzali. The Gandhara Art needed a special treatment: while for the Roman section it was possible to count upon some background knowledge from the visitors (especially Italian visitors), the Gandhara Art is definitely less renown, therefore "cultural bridges" with the common ground of the visitors as well as an introduction (from an historical and cultural points of view) were needed.

Fig 14: The editorial plan of the Gandhara Section application

## Example of introductory text: sub-topic 1.2, "Cultural Syncretism"

The peculiarity of the region of Gandhara is its composite cultural base. Alexander the Great (356-323 BC) reached the borders of Gandhara. The region was then lost by his successors, but a Hellenistic kingdom - the Bactrian Kingdom - developed and persisted in the contiguous region (ancient Bactria, between modern Afghanistan, Uzbekistan, and Tagikistan). This kingdom remained autonomous for about 70 years after the death of Alexander the Great. The Greeks from the Bactria moved to Gandhara at the end of the 2nd century BC and were then replaced by the Iranian populations Saka and Parthians from the 1st century BC. Hellenistic, Indian and Iranian iconographic elements and traditions were thus put together and re-developed in a totally original way, in service of an artistic expression of the Buddhist faith.

As it can be seen in the editorial plan (fig. 14), the main links with western culture were identified in Alexander the Great (who actually determined the birth of this kind of art, when he reached those far-away regions bringing Hellenistic culture) and classical Greek art. The whole application is built on the 'dialogue' between 2 cultures, the Western and the Eastern ones.

## Example: Hellenistic influence on the Gandhara Art: sub-topic 3.4, "A Classical Figure"

A fragment from a relief, preserved in the museum and portraying a female figure, is an example of how the classical element is present in the art of the region of Gandhara. In this feminine figure, we can notice that the dress and the hairstyle are of classical style, though modified according to local fashion. It is possible that the inspiration was due to relations with the Roman world, but we can also think of a persistence of classical Hellenistic iconographies, circulating in the region after Alexander the Great's expedition.

Fig 15: Gandhara Art, a classical figure, in which the influence of Hellenistic elements is evident

The application literally acts as a gateway to the East, leading the visitor step by step on Alexander the Great's path to Gandhara, and the discovery of this cultural 'melting pot'.

# 4. Conclusions And Future Work

The work of the Archaeological Museum is still underway, but an initial set of applications has been developed with little effort and a small budget. This initial result has been made possible by the combination of two factors: the willingness of the Museum to experiment with innovative approaches, and the desire of a technological University (Politecnico di Milano) to use technology in a new way, different from the usual track.

As far as the future is concerned, a number of new developments are envisioned:

- Developing the narrative versions for the remaining sections of the Museum.

- Starting an effective pod-casting strategy, using the material already developed, in order to make the museum more 'visible' world-wide.

- Developing more traditional 'informative Web sites' for each of the sections. This will be based upon the (Instant Multimedia) engine Medina (Garzotto, 2006), developed by the HOC-LAB of Politecnico di Milano.

- Transforming the current 'narrative files' into interactive video-guides for visitors, based on MP3-MPEG4 technology. Visitors will be able to upload the guides to their devices (MP3 players, iPods, …), either as they enter the museum, or from the Web site. Politecnico is modifying the OneThousandandOneStory engine for this purpose.

- Creating a new set of interactive audio-visual guides using the same engine, aiming at specific niches of visitors and based upon an innovative experience design approach.

- Creating an 'umbrella' Web site holding the different pieces together.

# Acknowledgments

# References

Brambilla, G. (2007) Cultural Impact on Museums Visitors - A case study and a methodology, Master Thesis, Master of Science in Communication, Major in Technology-Enhanced Communication for Cultural Heritage, University of Lugano.

LaMar, Michelle, et al. Architecting the Elephant: Software Architecture and User Interface Design for Pachyderm 2.0, in J. Trant and D. Bearman (eds.). *Museums and the Web 2005: Proceedings*, Toronto: Archives & Museum Informatics, published March 31, 2005 at http://www.archimuse.com/mw2005/papers/laMar/laMar.html

Bolchini, D., F. Garzotto, P. Paolini (2007). "Branding and Communication Requirements for Content-intensive applications". IEEE International Conference on Requirements Engineering, 2007 (submitted paper).

Bolchini, D., P. Paolini (2004). "Goal-Driven Requirements Analysis for Hypermedia-intensive Web Applications". *Requirements Engineering Journal*, Springer, RE03 Special Issue (9) 2004: 85-103.

Bolchini, D. and P. Paolini (2006). "Interactive Dialogue Model: a Design Technique for Multi-Channel Applications". *IEEE Transactions on Multimedia*, Vol. 8, No. 3, June 2006.

Di Blas, N., D. Bolchini, and P. Paolini (2007). "Instant Multimedia: A New Challenge For Cultural Heritage". in J. Trant and D. Bearman (eds.). Museums and the Web 2007: Proceedings, Toronto: Archives & Museum Informatics, published March 31, 2007 at http://www.archimuse.com/mw2007/papers/diBlas/diBlas.html

Di Blas, N., P. Paolini and C. Poggi (2005). A Virtual Museum where Students can Learn. In L. Tan Wee Hin & R. Subramaniam (eds*.) E-learning and Virtual Science Centers*. Idea Group Inc., U.S.A. 308-326.

Garzotto, F. (2006). "MEDINA three years later: Towards 'Enterprise Frameworks' for Cultural Tourism Web Applications". In D. Bearman & J. Trant (Eds.) *Museums and the Web: Selected Papers from an International Conference.* Toronto: Archives & Museum Informatics, pp 173-184. Also available at http://www.archimuse.com/mw2006/papers/garzotto/garzotto.html

Samis, P. (2005). "Just Add Elephants: Breeding and Browsing Rich Media Educational Resources at the San Francisco Museum of Modern Art". *Studies in Communication Sciences,* Vol. 5, Number 1, Summer 2005.