1001stories+
An effective and affordable multi-media, multi-format communication framework for cultural heritage institutions.

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Submitted to the
Faculty of Communication Sciences
Università della Svizzera italiana

For the degree of
Ph.D. in Communication Sciences

Abstract

Over the last decade, there has been an increasing number of technologies and devices (including smartphones, tablets and alike) able to provide new perspectives for the use of multimedia applications in the field of Cultural Heritage.

This work arises from the interest in providing better authoring/delivery possibilities to cultural heritage institutions (small and medium sized in particular). Indeed, often medium and small sized museums do not have the necessary resources to create high quality multimedia productions. Not only have they faced short time and low budget, but a shortage of dedicated staff.

Based on an interdisciplinary approach, this thesis focuses on the development of an effective and affordable multi-media, multi-format communication framework. The framework provides institutions with guidelines and methodologies and it is based on an innovative authoring tools (not developed in this thesis, but available).

Specific concerns of the framework are:

1. Developing multimedia content within a short time span
2. Developing multimedia content with a limited, low-budget
3. Adapting multimedia content to different technologies and to different user experiences
4. Making possible to "reuse multimedia content" (e.g. from websites, to audio guides, to multimedia guides, to YouTube or to paper brochures)

This research has been conducted throughout parallel and intertwined processes, requiring a take of perspective. One the one hand, a general investigation (about multimedia formats, technologies and methodologies for production) has been conducted. On the other hand, an empirical work on real-life multimedia productions has been undergone.

Indeed, the merging of theoretical knowledge and real fieldwork remains the main characteristic of this study's methodological approach and of its strength.

Its overall result is a fully developed framework (named *1001stories +*), providing:

- Multi-media: content information is presented throughout different media, including images, text, audio, and video

- Effective: the content can have the desired impact on the audience

- Affordable: content can be created in a short time, within low budget, and can be reused.

- Multi-technology: content is available on different channels (web, smart phones, tablets, You tube, etc…)

- Multi-format: content can be reorganized into various solutions, generating different formats for different user experiences.

A more conceptual contribution of this thesis is about consideration of what communication in the Cultural Heritage domain is about, what its purposes are, and what the most appropriate means to reach the potential audience may be.

Acknowledgements

Firstly, I would like to thank my advisor, Prof. Paolo Paolini. Not only for his guidance and support for this research, but in particular for his intuitions and suggestions all along the many projects developed during these years of collaboration.

Many are the people who participated with advice and inspiring discussion, contributing to the shape of this monograph. Thank you. However, one that I would dearly thank is Nicoletta Di Blas, who provided - since the very start – a valuable advice and support.

Final thanks goes to my beloved offsprings who, without having any knowledge of it, attempted to "sabotage" my work, but at the same time gave me the necessary strength to complete it.

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Could Be
As Popular As
Music"

I. Introduction

Media play a strategic role in communication in the field of Cultural heritage. This work arises from the interest in understanding the many options digital media offer, in particular for small and medium sized cultural heritage institutions, and attempts at providing an effective and affordable communication framework. This research is an incursion into the many possibilities opened up by the use of technologies for communication. Indeed, over the last decade, there has been an increasing number of technologies and devices (including smartphones, tablets and alike) able to provide new perspectives for the use of multimedia applications in the field of Cultural heritage, in particular in a moment of time in which small, fast and low-budget projects are often preferable. Benefitting of the availability of a great number of technologies, Cultural heritage institutions aim at delivering high quality products in a short time and within a low budget. Additionally, user experiences have evolved, corresponding to different user profiles, needs, situations and purposes, for the use of the applications.

For the above reasons, at its core, this is a study on the development of a framework for multimedia, multichannel communication for Cultural heritage institutions, attempting at providing one possible solution. This works takes into consideration the possibility that this framework may not be the only one possible solution for affordable and effective communication, but still represent an actual and original option, aiming at being able to quickly (and easily) create and deliver on several channel high quality multimedia content, in a short time and at a low cost.

Indeed, communication for Cultural heritage needs newer approaches.

This introductory chapter illustrates the issues that inspired this work and sets out the premises on which the study has been conceived and conducted.

1. Rationale

A time of doubts and new frontiers. In the last few years multimedia production has been going through some deep and intense modifications offering the metaphorical image of a map of a constantly moving territory. Lines forming this map keep moving overlapping other lines in numerous different directions. It is today an uncontrollable territory: technological changes have thrown us in a sort of abyss of creative possibilities. Fusions, hybridism, exchanges between multimedia environment and interactive media.

This progression on changes, blends and contaminations can be noticed among the images, images that should reveal something about what we experience; changes in social life, and the speed of interactions and symbolic exchanges typical of our days. All this affects communication strategies in the field of cultural heritage, in particular when applying multimedia technologies.

Hence, the need of plunging in multimedia for cultural heritage. This project stems from a global, interdisciplinary approach to media and communication in the field of cultural heritage, in particular looking at the role media plays in museums' policies and reflecting on the contemporary social and critical issues related to media and culture. Currently, a number of projects are been developed across more areas to move beyond traditional strategies and standards for communicating in the field of cultural heritage, including the development of new media as a museum-wide focus.

Since the 1960's media has entered the "world" of art and the "space" of museums and galleries, questioning every fundamental assumption in museum practice.

In the museum context, media play the double role of works of art, documented and archived, from idea to execution. Or could represent an innovative way to communicate art and artworks, aiming at reaching a wider audience.

However, media in the cultural heritage context still rely on subjective decisions, challenging the conventional notions of *original state* in an artwork and its standard presentation and documentation and providing additional information to those who

are attending or attended the event as well as providing access to those who could not attend in person.

Investigating a specific aspect in wider projects in the field of "Communication, Media and Culture", and offering an interdisciplinary focus on media technologies, this research extends beyond the technology and structure of artworks, excluding the artistic intent and execution and its re-enactment, but including the investigation of the role media play for a strategic communication in cultural heritage.

In particular, this study focuses on the development of an effective and affordable multi-media, multi-format communication framework for cultural heritage institutions.

- Effective: the content produced is striking
- Affordable: content can be created in a short time, within low budget constraints, and can be reused.
- Multi-media: content information is presented throughout different media, including images, text, audio, and video
- Multi-format: content is available on different channels (web, CD-rom, podcasts, cell phones, smart phones, tablets, etc…) allowing users could use multimedia with their preferred device

Indeed, technological improvements and easy access to media have influenced the art world and required changes in its communication.

(Multi)media technology represents a new chapter in what used to be a field for few, in particular in museum practice and the accessibility of new electronic and digital technologies questioned old traditions.

Cultural heritage is traditionally related to long term values and stable content. Until today, most museums' publications, such as catalogues, websites and multimedia applications, require a long term plan, effort and budget. On the contrary, media technologies evolve at a very fast pace, and are variable and unstable. In addition, today cultural heritage faces a shortage in budget and users' consumption has changed and asks for a change.

In different domains, but in particular in this field, the need for multi-format applications is growing: the variety of devices for "content consumption" develops rapidly, as well as the available technologies. In addition, user experiences keeps changing. Visitors require more than plain information about artefacts and objects, and have diversified, becoming more and more sophisticated. Simultaneously, user experiences have evolved, asking for different needs, situations, venues and contexts as well as different purposes for using the application. Users, in fact, no longer sit in front of a computer at home, but they access multimedia information at all time, circumstances and venues, choosing - among the many devices available - the most suitable ones.

While museums become a media laboratory, experimenting technology and its different uses, media acquire a strategic role for communication in cultural heritage, including social media, and more generally Web 2.0. Web sites, indeed, are becoming web applications as well as web visitors are becoming users and forming communities. Explore the concept that producing cultural experiences could be accomplished by performing an act of co-creation between organisation and participating audiences. Furthermore, the use of media must address the specifics of venue and audience to serve museum needs. They must be designed to support conceptual and aesthetic standards, and must work all the time, forcing on the producer a keen awareness of the audience and making the professional questions the relationship between audience and artefact, between museum and the outside world. In particular looking at the characteristics and behavior of museums' visitors (or visitors of other cultural institutions) and the characteristics and behavior of Internet and multimedia users, interested in cultural heritage content.

In fact, cultural institutions still appear to draw a sharp separating line between 'museums goers' and Internet 'users': those who visit museums and those who visit websites, YouTube, Facebook pages, download podcast, etc… Until today cultural institutions seem to be interested into physical visitors, whereas Internet users are often considered not really important, and therefore develop certain communication strategies and initiatives. Although some minor differences can still be detected,

they are essentially the same group of people, and therefore cultural institutions could approach them with similar content and similar services. This analysis takes as starting point a major shift in approaching the role played by visitors, merging the two categories into a single one: those interested in cultural content. Moreover, considering 'virtual and physical visitors' of the same relevance, this study has pursued the aim of creating a multimedia product that could 'speak' to them (by different means, of course) simultaneously and considering the different needs, scenarios and backgrounds.

This approach implies that communicating through a website and multimedia means shall become part of the mission of the cultural heritage institutions, and not an additional value.

2. Research context

In the beginning is the content. However, which is the best way to communicate it, in an engaging and interactive way? What are the best formats? And, once these complex multimedia elements are created, would we be able to use them again? What design factors could make multimedia content reusable and how?

Cultural heritage is traditionally associated to long lasting editorial content. Museums catalogues, publications, websites and multimedia applications, indeed, have always been created following a long-term effort and relevant financial resources. However, recent past has marked a significant change due to a new situation: budget is shrinking and technologies and devices are rapidly changing offering new space for experimenting new forms of communication and interaction. We live surrounded by Multimedia, wherever we are. This new situation raises questions - among others - on how the use of multimedia could transform the experience of visitors and the implications for museum practices when new technologies are implemented within the institution.

The digital age has had a profound effect on cultural heritage. Beside the vast potential on digitized objects to make them available and ready accessible and for a

more effective preservation and presentation, this new technologies offers to work with cultural heritage data in ways that were not even imagined just a few years ago. To explore and exploit these possibilities, an interdisciplinary approach is needed, bringing together experts from cultural heritage, the social sciences and humanities as well as information technology. The reasons for these changes are many, including the evolution of the media environment, changes in how people find and consume information, how search engines index and serve up results and the swift adoption of mobile devices and tablets by Users.

Communications therefore have - and must have- evolved, to create and host a variety of content elements.

More generally, designing multimedia ways to access information have all contributed to the redefinition of space and time as far as the transmission and management of knowledge concerned. Within this framework, this work proposes a series of considerations on the relationship between digital technology and its application in communication for Cultural Heritage.

Present situation shows that cultural heritage institutions in general face many challenges to create multimedia content at fast speed and with high quality.

The situation is that often medium and small museums do not have the necessary resources to create a complete array of content. Not only have they faced short time and low budget, but a shortage of dedicated staff. This work aims at creating and presenting a framework for multimedia multichannel communication that could diminish the digital divide between the few "big" institutions and all the many others, allowing each one of them to produce high quality multimedia content in a reasonable short time, with a low budget and resources. Moreover, a key aspect of this work is the possibility of moving flexibly in within this framework, creating content which suites the situation best, challenging: today's "blocking issues": costs and quality.

Furthermore, in recent years the possibilities of deploying Cultural Heritage content has been greatly enhanced and a large varieties of channels, for different purposes, is available.

However, it is often the case that deliveries on new channels or for new purposes becomes critical, rather than opportunities. Indeed, it is often the case that cultural institutions create new content rather than reusing (possibly after little adaptation) the existing one.

Several seem to be the reasons for such an apparently surprising behavior:

- Technical motivations: each device/technology may require different technical formatting, different interfaces, different interaction paradigms, etc…;
- Organization motivations: different channels/devices are often taken care of by different teams. Thus, it is often the case that the web, the multimedia guide, the podcasts, the audio guide, are all different;
- Communication motivations: changing device and technology often corresponds to different situations of usage. A visitor standing in front of an exhibit needs a different kind of communication with respect to a user sitting at home and looking at a web page;

The situation described may have unpleasant consequences for "multi-channel users", who may receive non-coordinated content (with minor or major differences among the various channels), without understandable motivations, if using at different times various channels.

Negative consequences surface also for the institutions: creating new content requires more efforts, lengthens the time for delivery, and increases costs. In particular, these who are penalized are small institutions that cannot afford to begin a new process every time that a new technology or a device is on the market.

This study has proceeded on the ground of the above considerations, aiming at participating in improving the present situation and presenting a framework for multimedia multichannel communication able to deliver high quality content over various channels and serving various purposes and various situations of usage, in a more consistent, less expensive and more effective way.

3. Research question and objectives

In recent years, all the things museums were based and structured upon, were pretty much thrown open to question. Considering the influence media and technology play in Cultural heritage institutions, influencing the public's practice and consume, this work has led to the development of an effective and affordable framework for multimedia multichannel communication for Cultural heritage and institutions in general. Museums must be able to carve out a unique place for themselves in the hearts and minds of digital consumers and today their new problem is how to scale up to deliver these rich content-based experiences across a huge range of platforms and devices. How can cultural organizations deliver wonder and inspiration across everything from a smartphone to a high-definition Internet TV?

The answer might lie in a simple maxim - 'Create Once, Publish Everywhere' (COPE) - coined in a blog post by Daniel Jacobson, Director of Application Development for National Public Radio in the US.

The general frame of this work is the use of digital media for Cultural heritage communication, focusing on the many ways media are engaged in supporting communication in cultural institutions. Detailing this driving focus, four more specific concerns are investigated:

1. How can a multimedia-multichannel framework be adapted to the very many situations and organization?
2. How can a multimedia content be created within a short time?
3. How can a multimedia content be created within a limited budget?
4. How can the outcome (multimedia content) could be effectively re-used?

This work presents a fully developed framework, created and implemented for facing the various issues arisen and related to:
- delivering high quality content over various technologies and devices;
- serving numerous purposes and situations of usage;
- facing budget and time constraints;

- dealing with non- technical and sometime very limited (in number and resources) staff

Therefore,

1. The content created with this framework can be delivered over several channels and over all available (today) technologies. Content can be adapted: if different versions are needed, content could be reused, involving a little effort in terms of manpower and budget.

2.3 The workflow allows to create content in a short time, allowing a very simple data entry, resulting in less time to generate the multimedia application; moreover it allows a fast and light delivery, meeting the needs of todays "moving" communication. Final result is not only a saving on time, but also on budget

4. The need to deliver the "same" application over several devices and using several formats, forces the adoption of a strategy: small items of content are recombined to form different information architecture, allowing the same piece of information to be reused and recombined

Briefly, this framework, named *1001stories* +, consists of three general components:
1. An overall workflow, suggesting how to organize and manage the various steps for content production.
2. A methodology for adapting content to various needs and various devices.
3. An authoring/delivery environment that can be used, by non-technical content editors, to generate high quality content.

It focuses on content and it is able to deliver it to the various and heterogeneous audiences targeted. Despite content remains the core aspect and it is still prioritized, it considers all available technologies and delivery formats, in addition to its peculiar feature: its flexibility to adapt to further and future tools and devices. Last, but definitely not least, it is highly affordable: content can be created in a short time, within low budget constraints, and can be reused.

High quality multimedia content is created and delivered quickly (and easily) saving effort, time, resources and, consequently, costs.

My involvement to the development of this framework has been on multiple levels. I have participated on its conceptual and technological development aiming at outlining an overall workflow, in addition to a number of active discussion carried out with the technical team who has developed the tools I have used to create several multimedia production, a number of which are illustrates in this work, in Chapter 3, Section "*Case studies*".

4. Activities

This research has been conducted through parallel and intertwined processes, requiring a take of perspective. One the one hand, a study on existing multimedia production has been carried out. On the other hand, an empirical work on real multimedia productions has been undergone. An interdisciplinary approach - both theoretical and empirical - aims to uncover deep insights. Indeed, the merging of theoretical knowledge and real fieldwork remains the main characteristic of this study's methodological approach and of its strength: a blend of grounded theory methodology and participatory action research.

The work also includes ethnographical as well as historical, archival, and literature research.

Throughout a number of different case studies, it shows that the use of new communication technologies for the improvement of the cultural offer has emerged

as a source of great potential and has become a common field of practice, applying theoretical research on field projects.

The applied research project consist in an arrow of case studies, namely 6 multimedia production developed between 2010 and 2013: NIPPON-Multimedia; MANRAY-Multimedia; CONSONANZE-Multimedia, GIORGIOMORANDI-Multimedia, A WINDOW ON THE WORLD-Multimedia and KLEE MELOTTI-Multimedia.

Additionally, two multimedia production developed prior my active involvement are also included (ENIGMA HELVETIA, 2008 and LOOK AT ME, 2009). Brief descriptions are in Appendix 1.

Finally, two ongoing projects ("Sala delle Asse Castello", a communication project for the restauration of a room painted by Leonardo da Vinci in Milan and "Lugano Mobile", a collaboration for the making of a mobile guide for Museums in Lugano), developed with *1001stories+* framework are outlined in Chapter 5, Section "*Ongoing Projects*". Four user studies (see Appendix 2) compliment the research material.

The technology underlying the multimedia production is 1001story, an authoring-delivery environment created in 2005 by HOC- LAB (Politecnico di Milano). Along the past few years this tool has been further implemented and refined by TEC-LAB (USI), generating – overall - more than 40 professional applications, for various prestigious partners. 1001stories supports the creation and delivery of highly modular, multimedia interactive narratives.

Each multimedia production has been created within approximately a three month period of time, all of those providing more than 1000 images, and hours of audio-visual material, in English and Italian (and German, in few cases). The following is a standard outcome: a website, hosting video presentations, "interactive narratives" (accessible online and offline) and a "set of playlists" downloadable for MP3 and MP4 (iPod, smart-phone, and similar devices). Additional features, such as Virtual Tour or Exploratory portals appears in specific productions. Practical information, press material, and other data compliment the productions.

To sum up, the workflow - once the indications and guidelines for communication strategy have been decided – consists of few easy step:

- preliminary research on the topics of the exhibition
- interviews with the exhibitions' curators
- creation and editing of the content and iconographic research
- professional recording of the textual content and delivery of audio files
- creation of the website
- delivery of the multimedia- application

As far as the ongoing projects regards, more information are provided in Chapter 5, Section "*Ongoing projects*". Additionally, part of the study is carried on conversations with curators, museum directors, artists, new media professionals and experts, observing the contradiction between new media culture and museum culture and the participation of museums to the new media fray. An anthropological approach compliments the research, through participatory observation in museums, galleries and site-specific events.

Interaction with all the participants interested and actively involved in the field of multimedia, communication and cultural heritage have been developed, aiming to create a dialogue for data acquiring and sharing. Interviews with members of the participating organisations have been crucial to collect information, considering the shortage of existing documentation of the topic. Additional data are a result of my private participation, memory and response. I worked and researched in the field of exhibition practice and presentation of contemporary art. The timing has been crucial.

5. Research results

This works takes into consideration the possibility that this framework may not be the only one possible solution for affordable and effective multimedia communication, but still represent an actual and original option. Indeed, the

narratives created with *1001stories+* are currently delivered over several channels and all available technologies. Content can be adapted: if different versions are needed, content could be reused, involving a little effort in terms of manpower and budget. Furthermore, such procedure allows a fast and light delivery, meeting the needs of todays "moving" communication.

Thanks to the experiences in the field, this work had the opportunity to perfection the existing technologies and improve the quality of technology based communication, in particular in cultural heritage. Indeed, the development of new strategies for dealing with communication are high on the agenda of the international community in the broad field of cultural heritage, that, as many other application domains, suffers from a persistent scarcity of funding, but also needs to react to ever-changing requirements. However, theoretical reflection lags behind, and often do not consider what museums experience, with the support of multimedia content (in particular with mobile devices). Therefore, this experience aims to contribute to a reflection on this specific area of cultural heritage. Multimedia, indeed, must address the specifics of context and audience to serve museum needs. They must be designed to support conceptual and aesthetic standards, and must work all the time. Museum shall become, then, a media laboratory, not experimenting the limit of technology, but exploring the nature of learning. At present museums and cultural institutions in general experience a chronic shortage of funding, and therefore they need to react and explore new ways of communication. Short time for production and low-budget stimulate the expansion of multimedia interactive applications in cultural heritage, allowing targeted experiments, fast reaction to unforeseen needs and continuous improvements. In this context, this framework is a successful examples, created with the "Instant multimedia" approach: a high quality multi-channel application, created with a reduced time and effort, allowing present and future reuse.

6. Overview of remaining chapters

This work focuses on an original framework to create highly affordable multimedia, multi-channel communication for cultural heritage, thought in particular for small and medium sized institutions.

The structure of this monograph is shaped across four parts:

- Research context, background and related works
- My work/case studies: method and results
- Framework
- Critical overview and future works

Chapter II presents a review of the related work, highlighting the context in which this study has been driven.

Chapter III presents an arrow of case studies: six multimedia productions developed from 2010 to 2013.

Chapter IV illustrates the *1001stories+* framework.

Chapter V draws the conclusions and outlooks for future works.

II. Research Context, Background and Related Works

1. Synopsis

Technology-based communication represent a complex aspect of museums and cultural institutions core mission. Despite the current situation offers a wide space for experimenting, communicating to a large audience by multimedia means is not always considered of high relevance. Hence, preliminary to this work is the conviction that communicating should be one of the goals for any cultural institution.

The past decade has marked a significant change in the field of Cultural heritage led by the massive introduction of technologies. From digitalization to multimedia communications, museums and cultural institutions have witnessed significant modifications in a rather short time.

The two research fields closer to the approach presented in this work are Digital Storytelling and Adaptivity, in particular focusing on the Instant Multimedia approach. Digital Storytelling is a promising instructional strategy as well as a field of study and its potential extends far beyond the fields of communication and media. Adaptivity, for its own nature, does not belong to a given field. Both are crucial aspects of this work, as they represent the roots of the development of this framework. Digital Storytelling, indeed, is a characteristic of the framework. Adaptivity is a feature: each item of content shall be reusable. One of the aim of the framework is to offer a new approach to adaptivity, by "fine tuning" a multimedia and interactive application to specific communication need.

This chapter illustrates the research context and the two fields: Digital Storytelling and Adaptivity. Moreover, it presents the toolkit "1001stories", the technology behind the creation of the multimedia stories.

2. Multimedia for Cultural Heritage

Multimedia technologies have recently created the conditions for a true revolution in the Cultural Heritage area, broadening the lines of this field. Today, technologies have infiltrated into the cultural world, allowing the creation of new digital cultural experiences. New multimedia technologies are used to design new approaches to the comprehension and fruition of the artistic heritage, with the support of features like storytelling, gaming and learning. The development of new ICTs has altered the traditional manner of participation and access to cultural heritage, traditionally made through physical access. In recent years, indeed, new dimensions have appeared along the introduction of new technologies.

There is no doubt that today "new media" are the protagonists of a shift toward renewed communication patterns, aiming at increasing the cultural offer, in many respects and with quick and immediate tools and devices. Multimedia communication implies a language that tends to emphasize the aspects of our perception, including images that are intended to facilitate the understanding, presenting concepts in a more clear and concise way, and making information more explicit and actionable, creating new processes and models for communication, platforms for data generation, new technological devices for access to information. This paragraph focuses on a series of reflections on the current state of the relationship between new technologies and their applications in the communication of Cultural Heritage and it is limited to a few approaches similar to the framework developed and proposed.

The use of new media today has applications in areas very different between them and museums are increasing the use of digital applications. Many are the different options proposed, ranging from multitouch monitors as support along the visit, to 3D reconstructions, to audiovisual guides, all aiming at increasing the interest of the Visitor.

Web applications have benefitted from progressive technological development and thanks to the numerous possibilities for exploration, the visitor today profits from many pre-established narrative paths (video, audio, text , etc.). It is clear that what

benefits the user is a "finished" product for which many and varies techniques were used, problems addressed and "hard work" put into play. Some technical and procedural aspects, however, are a constituent for these applications. One among them is related to the need to establish the procedures for accessing the information: digital formats allows sorts of "multi- platform " enabling to access the many and various data. Aiming at increasing involvement and use of multimedia production on Cultural Heritage content related, both in Museums and on the web, developments occur in implementing the use and therefore the applications on mobile   technology.

Living a moment of time in which we are all "connected", the choice of "mobile technology" may appear as a trivial and costume oriented inclination. However, today, accessing "knowledge" through smartphone or portable devices in general, while visiting an exhibition or from other locations, appears to be an increasing tendency, as well as an attempt to reach the Visitor/User at any time, and any place.

3. **Digital Storytelling for Cultural Heritage**

Stories are, by nature, what we are most keen to listening to, like McKee said "Story is not only our most prolific art form but rivals all activities – work, play, eating, exercise – for our waking hours. We tell and take stories as much as we sleep – and even then we dream. Why? Why is so much of our life spent inside stories? Because, as Kenneth Burke tells us, stories are equipment for living."[1].

There are many definitions of what a digital story is, but they all coincide in pointing out that digital stories combine traditional means of telling a story with different types of digital multimedia: images, text, audio, and video to present information on a specific topic. As stated by Robin (2006) "the stories are typically just a few minutes long and have a variety of uses, including the telling of personal tales, the

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[1] McKee, R. (1997). Story: Style, Structure, Substance, and the Principles of Screenwriting, It Books; 1 edition

recounting of historical events, or as a means to inform or instruct on a particular topic"[2].

Digital strorytelling is quite a huge field, spanning various domains, from sociology (eg memories preservation) to education. Lately, it is witnessing a growing interest in the field of Cultural heritage, where storytelling is being acknowledged as "the" way of engaging audiences [Proctor and Cherry, 2013][3]. Digital storytelling is being introduced by museums as another means to contextualize objects or to include in exhibitions personal stories related with historical events. To goal is to "de-musealize" objects and make them closer and more relevant for visitors. The interest towards digitals storytelling in cultural institutions is not new: from 2003 to 2005, the National Gallery of Art in Washington D.C. held a series of classes to integrate arts education curriculum with digital storytelling [Springer et alii, 2004][4]. The power of digital storytelling for turning visitors from passive viewers to active interpreters was already underpinned in 2002 by [Mulholland et alii 2002][5] ,who arguments that new technology, through storytelling, should support active interpretation as well as learning and creativity in the cultural domain.

Today, there are several ways to tell a story: videos, interviews, fiction, slideshows, etc., and Digital storytelling has recently been recognized as a powerful mean to engage visitors, "with two main interpretations: first, it is conceived as a better-channeled form of "user-generated content" (which was extremely popular 6-7 years ago). Visitors, instead of being asked to generally express their opinion or

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[2] Robin, B. R. 2006 *The Educational Uses of Digital Storytelling*.
http://www.coe.uh.edu/digitalstorytelling/evaluation.htm

[3] Proctor, N. & Cherry, R. (Eds.). Museums and the Web 2013: Proceedings. Portland, Oregon: Archives & Museum Informatics, 2013

[4] Springer, J., Kajder, S., Borst Brazas, J. (2004). Digital Storytelling at the National Gallery of Art. In Museums and the Web 2004: Proceedings.
http://www.archimuse.com/mw2004/papers/springer/springer.html#ixzz3C93qOe2r

[5] Mulholland, P., Collins, T. (2002). Using Digital Narratives to Support the Collaborative Learning and Exploration of Cultural Heritage, Proceedings of the 13th International Workshop on Database and Expert Systems Applications, p. 527-531, September 02-06, 2002

comments, are asked to tell a story about something (e.g. an object of their own or an object on display in the museum); the second interpretation sees curators and experts "telling stories" about cultural topics in a web 2.0 way (i.e. in a somehow "improvised", relaxed style). Let us see some examples of both.

"Object stories" was launched in March 2010 by the Portland Art Museum. Object Stories invites visitors to record their own narratives about personal objects—whether a piece of clothing, a cherished record album, or a family heirloom. The stated goal is "to demystify the Museum, making it more accessible, welcoming, and meaningful to a greater diversity of communities – while continuing to highlight the inherent relationship between people and things". Nearly one thousand people from throughout Portland have participated as storytellers in this project.

"100toys" is a story-collecting project by the Children's Museum of Indianapolis. The Children's Museum searched its collection and chose 100 of the most iconic objects of American childhood in the last century. After over 24,000 votes, the online visitors chose a list of "Top 20 toys" that define childhood. In the fall and winter of 2012-13, these 20 toys were featured in a special display at the museum, alongside selected stories from the over 600 submissions received [www.childrensmuseum.org/100toys].

One of the largest project on digital storytelling and cultural heritage is "Culture Shock!" in the North-east of England (www.cultureshock.org.uk). This project uses museum and gallery collections to inspire people to create their own digital stories, which are also being added to the relevant museum collections. In this project people participate in one-day workshops in which they create their own digital stories. All the stories are inspired in some way by museums and galleries or by heritage and things that are important to people. The finished stories are permanently added to museum collections, broadcast online and at special events. Culture Shock! is a partnership project led by Tyne & Wear Archives & Museums and includes Beamish - The Living Museum of the North, The Bowes Museum, Hartlepool Museums & Heritage Service and Culture:Unlimited. The project aim to engage people with the extensive and varied collections held by the partner museums to

explore the diverse heritage of individuals, groups and communities living in the North East of England.

Another large-scale project is the Digital Storytelling program of the Australian Centre for the Moving Image (www.acmi.net.au). The ACMI runs regular workshops to guide people through the telling of a personal story using multimedia tools. Participants combine the audiovisual resources of their personal archives (photographs, video footage, text, music and sound) to produce a 3-4 minute personal story which they then narrate. Target groups include individuals, community groups as well as corporate groups. A number of powerful stories that examine all elements of being human - love, loss, recovery, isolation and celebration – have been produced. Participants have created tributes to important people in their lives, told stories of experiencing or recovery from illness and explored the place where they live.

A number of research project aiming at engaging users in the co-creation of digital narratives with cultural heritage artifacts are being run. For example, [Bellucci et alii, 2014][6] experiment a workshop environment in which people first explore physical affordances and attributes of the artifacts with sense perception (e.g., touch) and then create stories around the objects. The stories are then "superimposed" on a transparent screen enabling social, multiple interaction "in situ" with the content generated by other users. Stories can be edited, shared, remixed. The two key points are: (1) physical embodiment, by having people directly interact with the physical objects to augment and (2) situated social interactions.

The European project "CHESS" (Cultural Heritage Experiences through Socio-personal interactions and Storytelling - http://www.chessexperience.eu/) aims to leverage interactive digital storytelling to enhance and improve the visitors' experience in museum visits. It uses personalized information about cultural

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6 Bellucci, A., Diaz, P., Aedo, I. (2014). Digitally augmented narratives for physical artifacts. In Proceedings of the 2014 International Working Conference on Advanced Visual Interfaces (AVI '14). ACM, New York, NY, USA, 229-232. DOI=10.1145/2598153.2598192 http://doi.acm.org/10.1145/2598153.2598192

artefacts to create customized stories that guide individuals or groups through a museum, aspiring to inject a sense of discovery and wonder in the visitor's experience. The CHESS system employs mixed reality and pervasive games techniques, ranging from narrations to augmented reality on smart phones. Targeting to replace the traditional set of exhibit-centric descriptions by story-centric cohesive narrations with carefully-designed references to the exhibits, CHESS follows a plot-based approach, where story authors (curators, museum staff, script writers) write stories around pre-selected museum themes. Two museums participate in the effort, namely the Acropolis Museum, in Athens, Greece, and the Cité de l'Espace in Toulouse, France.

ArtBabble, the cloud-based, international art video partnership, is an example of professional storytelling. It was initiated and administered by the Indianapolis Museum of Art. It hosts hundreds of videos and additional materials about art in a wide sense. At the time of writing, it brings together 54 international partners and has evolved towards a model that can accommodate even further growth. The partners can manage their own content, and add external video by embedding video from other sources [Painter, Fauconnier, 2013][7].

Storyscope is another example of professional storytelling. Storyscope is a web-based environment for the construction of museum narratives, which links a final narrative to the underlying story and plot, thus allowing end-users the ability to see the thought-processes of the curator and to develop their own personalised narratives. Storyscope supports a narrative author in story building by proposing additional events, and relations between events, for developing a plot of the story [Wolff, Mulholland, Collins, 2013a; Wolff, Mulholland, Collins, 2013b]."[8]

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[7] Painter, E. L., & Fauconnier, S. (2013). Strength in numbers: Complementary approaches to 246 content on collaborative Museum websites. In Proceedings of Museums and the Web 2013, 247 Portland, Oregon, USA

[8] Wolff, A., Mulholland, P. & Collins, T. (2013a). Modeling the meaning of museum stories. In 249 Proceedings of Museums and the Web 2013, Portland, Oregon, USA. 250
Wolff, A., Mulholland, P. & Collins, T. (2013b). Storyscope: Using Theme and Setting to Guide 251 Story Enrichment from External Data Sources, Hypertext and Social Media

4. Adaptativity

In different domains, but in particular in the field of Cultural heritage, the need for multi-format applications is growing: the variety of devices for "content consumption" grows at fast pace, as well as the technologies available and the diversification of technological devices.

In addition, the user experiences keeps changing. Visitors require more than plain information about artefacts and objects, and have diversified, becoming more and more sophisticated. Simultaneously, user experiences have evolved, asking for different needs, situations, venues and contexts as well as different purposes for using the application, presenting a variety of context.

This new user experience and contexts trigger the discussion on how content and interaction can be mapped according to these factors and within this frame, Multimedia communication shall improve quality to better meet users' expectations. Users in fact can choose the device(s) that suit them the most and the situation they prefer.

Considering the diversification of technological devices and the variety of contexts of use, many attempts have been done to integrate technological potential, adapting content and interaction to a specific device.

At present, the discussion has moved a step ahead, questioning the content. [1, 2, 3].[9]

Many interactive multimedia systems today suffer from an inability to satisfy the heterogeneous needs of the many users using the same application on different devices and different contexts of use. Many attempts have been done to integrate technological potential and the context of usage, but adapting the content and

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1. Brusilovsky P. Maybury M. T. (guest eds.), The Adaptive Web. Special Issue of the Communications of the ACM , 45, 5, May 2002, ACM Press.
2. Brusilovsky, P., Stock, O., and Strapparava, C., Eds. Adaptive hypermedia and adaptive Web-based systems, AH2000. *Lecture Notes in Computer Science, 1892*, Springer-Verlag, Berlin, 2000.
3. De Bra, P., Brusilovsky, P., and Houben, G.J. Adaptive hypermedia: From systems to framework. *ACM Computing Surveys 31*, 4 (1999).

interaction to a specific device according with the model of user behavior and preferences.

Currently the discussion is on how to design for "situated interaction", in which context is not simply the location but also the activity. For example, Museums often provide the same multimedia content on their websites and onsite mobile guides, providing the same "guided tour" to visitors with very different interests [1, 2][10].

Indeed, the same selection of items cannot satisfy the needs, interests and preferences of the many visitors. The traditional "one-size-fits-all" approach becomes obsolete and instead an adaptive system shall be preferred.

A remedy for its negative effects could be to develop flexible but structured systems able to adapt to the features of single and groups of users. This issue is addresses by a wide research area known as Adaptive Software Systems, which has been specialized into a number of subareas such as Adaptive Hypermedia, Adaptive Web, Context-Dependent Computing [1, 2][11].

A distinctive feature of an adaptive system is an explicit model that represents the user profile (his/her knowledge, goals, interests) and/or the situation of use (in its physical, temporal, environmental, or technological characterization). The model is used to provide an adaptation effect.

Oftentimes a distinction is made between adaptation (system-driven tayloring) and adaptability (user-driven tayloring). An adaptive system automatically updates the

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1. Proctor, N. (2005), "Off Base or On Target? Pros and Cons of Wireless and Location-Aware Applications in the Museum" Proceedings of the Tate Handheld Conference Sept 5, 2008 downloadable at: http://tatehandheldconference.pbwiki.com/Resources
2. Katz, Shahar; Kahanov, Yaacov; Kashtan, Nadav; Kuflik, Tsvi; Graziola, Ilenia; Rocchi, Cesare; Stock, Oliviero; Zancanaro, Massimo. Preparing Personalized Multimedia Presentations for a Mobile Museum Visitors' Guide – a Methodological Approach, Museums on the Web, Albuquerque, New Mexico, March 22-25, 2006; http://www.archimuse.com/mw2006/papers/katz/katz.html

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1. Brusilovsky P. Maybury M. T. (guest eds.), The Adaptive Web. Special Issue of the Communications of the ACM , 45, 5, May 2002, ACM Press.
2. Brusilovsky, P., Stock, O., and Strapparava, C., Eds. Adaptive hypermedia and adaptive Web-based systems, AH2000. *Lecture Notes in Computer Science, 1892*, Springer-Verlag, Berlin, 2000.

representation of the user profile and situation of use and consequently customizes its behavior. An adaptable system requires the user to specify what the model is and how the system should be different.[12]

5. Instant multimedia

Instant multimedia could become a pervasive phenomenon for Cultural heritage: innumerous small, good quality, applications made available for different channels and supporting different user experiences. Users, today, are more likely to pay attention to small applications, possibly available on their mobile devices, rather than "to consume" large, expensive applications.

The instant multimedia approach regards a number of aspects, such as design, workflow, content, technology. As to be affective, it needs to be organized in a structure, a sort of "ready to use" package: a standardized structure allowing fast production at high quality.

More in depth, it should comprehend:

- "An "**instant design pattern**": (Folmer et alii, 2006; Paolini et alii, 1999; van Duyne et alii, 2002; Welie & Traetteberg, 2000) an appropriate pattern (i.e. predefined solution) that can be completed (reliably and quickly) by a simple "adaptation" to the specific needs of the production currently under way.

- An "**instant workflow pattern**": a pre-defined plan of activities adaptable to the specific aims of different productions .

- An "**instant content production method**": content should be created within a defined method, allowing small adaptations.

- An "**instant multimedia technology**": accessible to a non professional staff, an engine that would support the data entry and generate the

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[12] Di Blas, N. et al., '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 1, 2007. http://www.archimuse.com/mw2007/papers/diBlas/diBlas.html

application, and capable of publishing the final content over a number of channels (possibly with no human intervention)".[13]

Close to the (so called) CMS's (Content Management System), a computer program that allows publishing, editing and modifying content as well as maintenance from a central interface, avoiding the need for massive hand coding, providing procedures to manage workflow, Instant Multimedia improve and enhance two aspects: speed and low cost. Whereas CMS allows a more flexible design, and therefore needing more time to configure and set in place, as well as a more complex data entry system, Instant Multimedia has a less flexible design, allowing a little control over the interface, but allows a very simple data entry, resulting in less time to generate the multimedia application, and save on budget. The toolkit used to develop the work presented in this publication, "1001stories" has been developed focusing on the Instant Multimedia approach. Furthermore, throughout this work, several improvements and enhancements have been done, developing newer versions to support the growth of technologies occurred in this past years and the Cultural heritage institutions emerging needs. The definition "Instant Multimedia" [Di Blas et alii, 2007; Campione et alii, 2011][14] was coined to stress the similarity with the instant books phenomenon and the distance between this new kind of production with respect to traditional, long term productions like catalogues and standard

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[13] Di Blas, N. et al., '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 1, 2007. http://www.archimuse.com/mw2007/papers/diBlas/diBlas.html

[14]
Di Blas, N. et al., '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 1, 2007. http://www.archimuse.com/mw2007/papers/diBlas/diBlas.html

Campione, P., et al., *A "Smart" Authoring and Delivery tool for Multichannel Communication*. In J. Trant and D. Bearman (eds). Museums and the Web 2011: Proceedings. Toronto: Archives & Museum Informatics. Published March 31, 2011. http://conference.archimuse.com/mw2011/papers/smart_authoring_delivery_tool_multichannel

websites. At the core of the Instant Multimedia approach stands a tool "1001stories", described in the next paragraph.

6. "1001stories"

"1001stories" is a toolkit for digital storytelling and was first developed at the HOC-LAB, Politecnico di Milano, in 2005, with the aim of producing multimedia (audio, images, texts), multichannel (web, CD-rom, podcasts, cell phones…) "narrative" applications.

Developed for delivering multimedia narratives, 1001stories allows a set of desirable features:

- Multi-timing: users could use multimedia at any given time and situation
- Multi-format: users could use multimedia with their preferred device
- Multi-context: the same content could be used and re-used in different narratives or as part of a "larger container"
- Multi- audiences: users could range from naïf to experts to scholars
- Content oriented: the (cultural) message is the core
- Fast and low cost production

In the past few years, and thanks to this tool, a considerable number of cultural heritage related multimedia applications have been developed for different partners and different institutions, guaranteeing a standard feature across the different productions, Several user experiences and several technologies (web, smart-phones, tablets, audio devices, interactive installations, audio guides, etc…) are dealt with the same content (possibly after small adaptations), synthesizing the approach behind the design: 'one production = several deliveries'. Experiences cover traditional websites, multimedia guides, audio guides, podcasts, interactive support within exhibitions, virtual exhibitions, just to mention a few. Content is also

delivered via YouTube and Facebook. Essentially, one multimedia application takes into consideration and combines several different factors: low budget, short time for delivering the production, different types of users and situations of usage, etc…

Still today, 1001stories is an ongoing development, aiming to expand the number of formats, and improve its use within new technologies, such as multi-touch tablets and tables, for example.

The name 1001stories is inspired by "The book of One Thousand and One Nights", the legendary collection of Middle Eastern and South Asian stories and folk tales compiled in Arabic around the 9th century. The work as we have it today, was collected over many centuries by various authors, translators and scholars and the tales themselves trace their roots back to ancient and medieval Arabic, Persian, Indian, Turkish, Egyptian and Mesopotamian folklore and literature. What is common throughout all the editions of the Nights is the initial frame story, and the framing device incorporated throughout the tales themselves. The stories proceed from this original tale, offering different layers of the stories. The same idea lies behind the development of the "1001stories" engine.

Developed within the frame of the Policultura project (www.policultura.it), "1001stories has been created to enable people to easily shape an interactive multimedia artifact as a "hypermedia story" (a non linear narrative that exploits a variety of media: text, audio, images, videos, animations (Joyce, 1997; Mallowy & Marshall, 1996) and to deliver it on different channels so that people can enjoy the hyperstory in different physical settings and situations, both on-line and off-line: through the web (e.g., at home, in the office, in the computer rooms at school or in a museum), through a CD-ROM (e.g., on a museum kiosk or in the classroom), and through a mobile device like the iPod (for mobile use "on the go", walking, in the metro, on the bus, or in the park)".[15]

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[15] Bolchini, D., Di Blas, N., Garzotto, F., Paolini, P., & Torrebruno, A. (2007). Simple, Fast, Cheap: Success Factors for Interactive Multimedia Tools. *PsychNology Journal, 5*(3), 253 – 269. www.psychnology.org.

The core idea behind the development of 1001stories is that budget, and time are crucial aspects for content creators.

Today, we could refer to "1001stories" as an "instant multimedia package". Indeed, it is an authoring, generation and delivery tool that supports the production of multimedia, multi-channel stories. Since its appearance, "1001stories", in different versions and at different levels, has been used for several applications, in different domains and situations and for a number of clients. Among many others, "1001stories" has been applied in projects developed in collaboration with Ministries (Syrian Tourism, Mediterranean Sea, Italian Ministry for Cultural heritage), museums (Archeological Museum, Milan; Museo d'Arte, Museo Cantonale, Museo delle Culture, Lugano; Herman Hesse Museum, Montagnola) and cultural institutions.

Moreover, the toolkit serves didactic purposes. With PoliCultura, an initiative promoted by HOC-LAB, since 2006 nearly 25.000 students (from age 5 to 18) and over 1500 teachers have been involved, participating to a national competition.

Finally, at USI (Università della Svizzera italiana, Lugano, CH), and at Accademia di Arte Santa Giulia (Brescia, IT) the tool has been used by students as a basis for content authoring exercise.

The toolkit though - conceived as a tool for non multimedia professionals - is composed by two main ingredients: "(a) a hyperstory development tool, allowing for an efficient content data entry and the fast generation of the multimedia interactive application; (b) a methodological guidance, which supports an organized development process and provides a "proposed workflow", i.e., a structured collection of activities and content production guidelines to build a hyperstory in an efficient way."[16]

A peculiar aspect of "1001stories" is its target: users with basic technical know-how and high standard goals to achieve, despite the scarcity of budget and time

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[16] Bolchini, D., Di Blas, N., Garzotto, F., Paolini, P., & Torrebruno, A. (2007). Simple, Fast, Cheap: Success Factors for Interactive Multimedia Tools. *PsychNology Journal, 5*(3), 253 – 269. www.psychnology.org.

constraint, such as often happens in (small) Cultural heritage insitutions. Furthermore, providing a predefined - but flexible – structure, it allows to shape stories by focusing on the design of the message and the narrative, rather than technology, allowing a content-centered approach.

The tool, with his most recent improvements, has been proved fast and easy to learn and use, and very affordable, in terms of budget and time consuming.

"1001stories" has three main components:

1. An authoring environment (at first stage written in PHP and Java Script and later rewritten entirely using Python and web2py) where content (in its various pieces) is authored;

2. A generation engine generating the proper information architecture (described via a number of JSON files) organizing the content items in a structure suitable for the final delivery

3. A delivery engine, implementing the various interactive formats over various platforms (audio guide, multimedia, web version, mobile, etc..)

A dualistic aspect characterizes the tool: the complexity of the technical environment, opposing the simplicity of the authoring environment that is very simple to use. Stories are composed by texts, images and audio and the final delivery can be done over a number of channels and devices, both online and off line.

"From a technological point of view, 1001stories is a web-enabled application framework (Ceri, Florian, Matera & Facca, 2007; Fayad, 2000; Garzotto & Megale, 2005; Mori, Paterno', & Santoro, 2004; Schwabe, Rossi, Emeraldo, & Lyardet, 1999) (www.webratio.com) for multi-channel hypermedia storytelling"[17].

However, a substantial shift is made from traditional tools for programmers: 1001stories is thought and conceived for non-technological users, and therefore it takes into great account the end-user development, making the stories created with

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[17] Bolchini, D., Di Blas, N., Garzotto, F., Paolini, P., & Torrebruno, A. (2007). Simple, Fast, Cheap: Success Factors for Interactive Multimedia Tools. *PsychNology Journal, 5*(3), 253 – 269. www.psychnology.org.

1001stories easy to build and publish. The production process is streamlined and effective. The authoring environment's process requires only basic technological skills: creating text, audio files (MP3), pictures (jpeg), and uploading files: activities manageable also by a non-technical staff and authors.

The toolkit "1001stories" presents 3 key components:

    a) design pattern

    b) workflow

    c) content production

    a. The design pattern has been developed accordingly to five major requirements, providing the following output

REQUIREMENT	OUTPUT
The info-architecture had to support engagement and to raise interest	The style is "narrative", based on visualization and audio (rather than on text);
The pattern had to be content-independent	The format is versatile;
The pattern had to be suitable for different technological channels and improved accordingly to the available technologies	The data entry process is separated from the application generation, supporting versions from each different device and format;
The pattern had to support different "user experiences" and scenarios	Different deliveries are provided, according to each ones need: short versions; long versions; loop mode; play-list mode, selection mode, etc;
The information architecture had to be simple for the author and *capable of supporting different user experiences*	The information architecture is strikingly simple: content is made by a number of "items", each one paired with an audio narrative and still images, video and/or animations;

Table 1.1001stories toolkit's design pattern: requirement and output

b. The Workflow comprises ten phases, which lead to the creation of a "1001stories" application:

1. *Gathering Of The "Raw" Material And A General Idea*
   Gather material on the subject, converse with the "expert", proceed with iconographic research, and consult the available text (if any exists). Once this phase is completed, a generic idea of the "narrative" is shaped.

2. *Editorial Plan*
   The project staff, together with the "expert", transforms the general idea into a precise plan, flexible for further revision and adaptation, but within an envisioned outcome.

3. *Writing The Narratives*
   For each "item" a piece of text is produced.

4. *Visual Communication*
   Iconographic research completion, including the different "visuals" gathered and selected (in the various possible formats, including photographs, flash animations, videos, slideshows, etc.)

5. *From Text To Audio*
   Texts are recorded. For this preliminary recording, an in-house production is used.

6. *First Version: Putting The Pieces Together*
   The main ingredients ready, they have to be organized and merged together:
   • texts (including the titles for the users of each element)
   • images (including captions)
   • audio files
   Partial or global previews allows an easy check of the partial work

7. *Quality Check*
   The first version allows both an overall impact of the result as well as a complete check.

   The checking activity involves several levels of intervention:
   - trivial mistakes (e.g. wrong picture, fault in the text, etc.)
   - content (high) quality
   - completeness

8. *Text And Audio Revision*
   If changes have been made, a new session of audio recording and editing may be necessary.

9. *Revising Visual Revision*
   The critical evaluation of the pictures may imply shifting them around and/or, most important of all, selecting other pictures to reinforce the visual communication.

10. *Final Version*
    The revised audio files, texts and pictures (with captions) can be inserted and - following a final check - the generation can be accomplished: different versions, for different formats can be generated, in one step and with a single effort.

c. Content production must be fast and reliable to be successful. This are the two key features of an Instant Multimedia package, in particular when flexibility, short time, limited budget but high quality results are constraining aspects. Three are the "ingredients" of "1001stories" for content making:

1. *Interviews:* in depth conversations and interviews with experts of the fields, professionals, etc…allows to gather the data and information that later will become the narrative texts (and audio). Several are the advantages of oral texts as starting point:
   - Collection of extended material in a rather short time;
   - Direct interaction with the experts allows - when properly interviewed- more engaging contributions;
   - A conversation provide terms and the tone most suitable for oral narrative;

2. *Evocative Images*: images add an emotional aspect to the narrative – which remains the driving force - rather than providing strictly rational information, allowing several advantages:
   - The attention stays focused on the text/audio

- Any subject and concepts (tangible and intangible) can be conveyed practically and emotionally with images
- Images can be substituted, changes, moved, without requiring further intervention on text and audio
- Strict synchronization (between images and audio comment) is not necessary.

3. *Professional speakers*: a professionally recorded audio text, with a professional speaker, provides a greater quality than a professionally recorded one with an "author speaker", in terms of costs and comprehensions, despite the loss of "emotional touch".

Within the Instant Multimedia approach, many are the advantages of an application engine.

Technology and implementation do not play a major role, leaving plenty of space to content production, which remains the core aspect.

Therefore, resources, in terms of staff, time and budget, can be applied to content revision, evaluation, testing and quality assurance and not on implementation. Technological decisions (software architecture, databases, programming language) and interventions are not needed, allowing the production staff to be concern, mainly, on cultural heritage, communication, content, semiotics, domain-knowledge, rather than technology.

The lack of synchronization between the images and the audio could be intended as a limit of the tool, whereas in this case it is a requirement. Indeed, images are meant to be evocative (rather than identifying or descriptive) of the topic. This lack of strict synchronization allows a great freedom for the author, and allows a great reduction in terms of time and budget. However, precise synchronization can be "simulated" by carefully placing images along the audio line.

"1001stories" approach to digital storytelling is driven both by cultural and practical requirements. From a cultural point of view, it had to support:
- pleasurable and light-weight approach to cultural topics
- quick reaction to needs (e.g. an exhibition, a special event)

- focus on niche target and content (e.g. "children", "foreign visitors")
- easy update of new content
- easy elimination of obsolete content

From a practical point of view, it had to allow:

- efficient use of a limited budget
- scalable use of budget (low budget –> few productions; high budget -> more production)
- fine-tuning with new trends and technologies

To simplify, the multimedia, multi-channel narratives created with "1001 stories" are stories composed by a number of topics, and each topic represents a single "item" of the whole story. The various topics are accessible in a number of ways: sequentially, randomly, or through automatic loop, accordingly to the User's preference and convenience.

Three are its the main features: a Data Entry, a Preview and a Generator.

1. The Data Entry is a simple authoring environment enabling the user to edit the editorial plan of the story and to enter content for each element.

2. The Preview allows to visualize at any moment of the process the content inserted, as it will appear to the final user.

3. The Generator produces and publishes the final applications (for the different delivery channels).

A methodological support compliment the engine, including a workflow and content production guidelines, underlying 10 key editorial activities, such as:

- Collecting the preliminary content material
- Defining and structuring the editorial plan
- Setting the Visual Communication; collecting the iconographic material

- Writing the narratives
- Creating the audio (from text)
- Complete the preliminary version
- Performing quality check
- Revising text, audio
- Producing the final version

Since its creation, the toolkit has been improved and has benefitted of several enhancements. In particular, it has been improved to serve the so-called "Instant Multimedia" approach, namely the production of multimedia interactive applications characterized by a combination of speed and low-budget as well as quality and effectiveness.

The environment "1001stories" supports the "Instant multimedia" approach: a novel architecture, based on XML and XSLT transformations, allows an engineered and streamlined production process. A key feature is to adapt, in order to tune applications for the different devices and formats. Indeed, the need to deliver one application over several devices through a variety of formats requires the use of a particular content building strategy, in which single items of content are recombined forming different information architecture, allowing the same item to be reused, forming new text. This process requires a nearly neutral content writing style and keeps the authoring cost-effective.

Today Cultural heritage has the need of producing multimedia application within a short period of time and with a limited budget, but guaranteeing a very high quality and seeking at several technological channels and 1001stories serves this purposes. The need to deliver the "same" application over several devices and using several formats, forces the adoption of an apparently simple "building blocks" strategy: small items of content are recombined to form different information architecture. In order to keep the authoring cost-effective, an almost neutral style has to be adopted. This way, the same piece of information can be reused and recombined with new blocks, forming new text.

Indeed, the applications produced with 1001stories can be delivered over the web, mobile devices (smart phones, iPhone, iPad), off-line (CD-rom, USB key, mp3 players, iPod) or on-line, over standard cell-phones (audio only), through social spaces, etc., needing basically one authoring effort (including some "adaptive adjustments") and one technological effort.

1001stories keeps expanding its family of devices and formats, in order to improve quality and to better meet users' expectations.

In conclusion, "1001stories" displays a higher degree of flexibility, as explained above, in terms of formats, user experiences etc; furthermore, it allows a certain elasticity on the final product, allowing a number of levels of "perfection, depending on actual possibility for improvements (depending on the available resources).

III. My Work/Case Studies: Method and Results

1. Introduction

Since the beginning of the 20th century, decades before the coming of the multimedia era, the whole idea of the sensorial association and combination of sounds and visions sprang from the nascent avant-gardes, and the first half of the 20th century offered the public an incredible production of technical machinery able to merge and swirl the senses of hearing and looking. Since then, the growth of media has been wild and the continued development of technologies has expanded the possibilities and forms to an uncontrolled extent. Moreover, in the past decade the role of the online/web environment has grown exponentially, offering a space free of control and restrictions, where working, creating, and experimenting has been possible – and still is - challenging not the physical boundaries, but the limits of this technological and virtual environment.

The accessibility of new electronic and digital technologies represents today a benefit for the exhibition's audience and museums have found a venue for fresh improvement and new opportunities, in particular engaging multimedia technologies.

Since 2008, throughout a number of different collaborations among TEC-Lab and the museums of the city of Lugano, there has been a substantial use of new communication technologies aiming at improving the cultural offer. In this perspective, in the past few years my work has contributed to the creation of a considerable number of cultural heritage related multimedia applications, developed for different partners and different institutions, guaranteeing a standard feature across the different productions.

The core object of inquiry (a universal framework for multimedia multichannel communication in Cultural Heritage) has moved the first steps from that moment and the multimedia productions developed at that time have set the ground for the investigation leading to the outcome of this research.

Previous multimedia narratives, made on the occasion of the exhibitions "Enigma Helvetia. Arti, riti e miti della Svizzera moderna" (2008) and "Guardami. Il volto e lo sguardo nell'arte 1969-2009" (2009), have provided further analysis on the available tools and technologies among the audience's need and expectation, and have led to the latest improvements: the aim of developing adaptable contents able to move from one experience to the next, with very small efforts. Within this frame, the past production have focused on the development of a number of different multimedia narratives that could be used, adapted and merged.

All this productions are part of a multifaceted framework for communication in the field of Cultural heritage. Each one has been conceived for a particular exhibition and with different aims and requirements. However, each peculiar aspect can be combined and used at once to satisfy particular needs and situations.

This communication framework aims to raise awareness and communicate art related content, allowing people who are already familiar with the subject to find more organized material and reaching people who are not yet accustomed by it, but share potential interest. It also aims to reach and interest a target of people that is currently not deeply fascinated by the field of art. "Going digital" in the field of art is still difficult, and could be perceived as a risk, in an established environment. Innovative communication experiences, however, have also a great potential: they can generate "excitement" and non-traditional benefits.

Moreover, it allows a 360° communication for the museum.

2. Rationale

This chapter illustrates the work undertaken and its approach, developed thanks to a number of real cases. It shows a different number of adapted solutions and one of its most important features: its adaptativity to evolving technologies, scenarios and situations.

It is a tool that allows further experimentation and implementation, developed with an innovative approach that leave infinite options for future improvement and evolution.

Moreover, the flexibility of such framework implies that different design solutions can evolve in time, according to different requirements, aims and needs.

Case studies of this research are an arrow of multimedia application developed between October 2010 and June 2013, namely NIPPON–Multimedia, MANRAY-Multimedia, CONSONANZE-Multimedia, GIORGIOMORANDI-Multimedia, TONY CRAGG-Virtual Tour, WINDOW ON THE WORLD-Multimedia and KLEE MELOTTI-Multimedia.

Moreover, at the time of the writing, two important projects are being developed, namely "Sala delle Asse Castello", the multimedia communication project for Leonardo's Sala delle Asse restauration in Milan; "Lugano Mobile" a collaboration for the making of a mobile guide for two Museums in Lugano (Museo Cantonale d'Arte and Museo d'Arte).

These Multimedia productions have been developed with a conceptual framework and the technology "1001stories", initially developed by HOC-LAB, at Politecnico, Milan and lately implemented with the collaboration of TEC-LAB, USI, Lugano.

The content created has been "adapted" to the different devices, and the technical formats have been optimized for the different technologies used (web, podcast, iPhone-applications, Smartphone, iPad, tablets in general …) at each occasion. An innovative authoring environment has been developed to coordinate all the different productions and a novel "adaption" strategy has also been experimented.

In general, this multimedia multi-channel applications have been created following few recurrent steps:

- preliminary research on the topics of the exhibition
- interviews with the exhibitions' curators
- preliminary organization of the multimedia sections (eg: themes, highlights, biographies, etc…)
- creation and editing of the content and iconographic research

- professional recording of the textual content and delivery of audio files
- creation of the website
- delivery of the multimedia- application

Processes are of various length, accordingly to the initial material provided. An estimation of two/three months to complete the one exhibition is an appropriate average, but the production could be much faster when images and data are available from the start of the project.

Few issues determines the workflow, such as copyrights, as well as curators' presence for interviews or video making. As far as copyright concerns, it is a topic very high in the agenda, but not relevant for the purpose of this research.

The following paragraphs describe an approach to this gigantic field and are not a how-to guide to create multimedia communication but a collection of real case studies and perspectives on an emerging framework (or set of frameworks) by the people who developed it, and written by one of these.

3. Glossary

Multimedia narrative is a story not primarily text-based, created with audio and video. The term 'narrative' is obviously extremely broad and, in this context, is meant to refer to works that explicitly represent an unfolding story. The term also indicated a story that have a narrative structure and multimedia elements [i.e., that combine still and/or moving image, text and/or audio].

Interactive narrative is an interactive story made of several "fragments" arranged into different patterns, both in a linear and a non-linear way. Interactive narratives allow Users to select (in different ways, and accordingly to the delivery format) the fragments of interest. Fragments can be accessed in sequence; however, each fragment must be self-contained and independent from sequencing.

Thematic narrative is a multimedia narrative providing information on central and general topics. In the specific case of the exhibitions, it is a narrative about the main themes of the exhibition, the artist(s) involved, the artistic movement, the historical context, etc... In particular, with thematic narratives, Users can access the content randomly, sequentially or selecting what interests the most. Furthermore, thematic narratives often act as introductions, to be used before the visit (at home, while driving to the exhibition, on a train, etc.) or after the visit, to enhance recollection.

Catalogue/Highlights are multimedia narratives on a selected list of items, systematically arranged and often including descriptive material, arranged according to any of various systems. The Catalogue/ Highlights can be accessed sequentially or by selection. In the specific case of the exhibitions, it often includes a selection of masterpieces. Possible scenarios of use include preparation *before the visit* (preview of the best exhibits), recollection *after the visit* (search for specific exhibits). If accessed via mobile device (either online or as a downloaded podcast), they can be used during the visit as audio-guides or interactive guides.

Panoramic photography is a technique of photography, using specialized equipment (or software) that captures images with a wide format, making an image a panorama (from Greek πᾶν "all" + ὅραμα "sight"): a wide-angle view or representation of a physical space. Panoramic photography soon became a substitute to painting for creating wide views. Approximately 150 years after the introduction of the Daguerreotype (in 1839), when photographers began assembling multiple images of a view into a single wide image, Digital photography greatly simplified this assembly process, and such stitched images are used to create extremely high resolution panoramic images.

Virtual Tour is a recreation of an existing location, by a sequence images. It may also use other multimedia elements such as sound effects, music, narration, and text. Virtual tours are made up of a number of shots taken from a single vantage point and allow the User to move freely in the recreated space.

4. Case studies

The following paragraphs illustrates a selection Multimedia production developed from 2010 to 2013 which have led to the improved version – today available – of *1001stories+* framework

4.1. Case study NIPPON-Multimedia

4.1.1 Rationale

NIPPON-multimedia (www.nipponLugano.ch) is a multimedia application developed at the occasion of the exhibition project "NIPPON. Between Myth and Reality: Art and Culture from the Land of the Rising Sun". The project includes events and four exhibitions taking place in Lugano (Switzerland) from October 2010 to February 2011.

The four exhibitions are dedicated to: (1) the world-renown photographer Nobuyoshi Araki ("Araki. Love and Death"); (2) albumen photography ("Ineffable Perfection"); (3) erotic prints from the XVII-XIX century ("Shunga"); (4) the Gutai artistic movement ("Gutai. Painting with Time and Space").

At the time of this project, the City of Lugano was rethinking itself and its cultural offer. Indeed, the territory of the City and its museums were turning to a new approach to cultural offer and events, and "NIPPON" represented the starting point of a process of renovation.

The initiatives of this event are not isolated, or competing against one another. On the contrary, they were especially conceived as part of a program consisting of integrated activities, according to the spirit of a modern, pervasive culture, capable of leaving its mark in the city.

The same spirit of unity lied under the making of multimedia content. NIPPON-Multimedia represents a real challenge: the creation – within a three month period of time - of a multimedia content suitable for four different exhibitions, presented in five locations (one outdoor).

The following are the outcomes of NIPPON-multimedia:

- 4 (+ 4) "interactive narratives" (for the Web, offline and Information Point). The web version can be accessed via web; the offline version has been used for CD-ROM or e-Key delivery.

- A "set of playlists" downloadable for MP3 and MP4 (iPod, smart-phone, and similar devices).

- An "interactive map". This is a version suitable for information points or for web consumption. An interface of images is shown: when an image is selected, the corresponding item of the narrative is played.

All this in the frame of a website, hosting video presentations by the curators of the exhibitions and coordinator of "*NIPPON*", trailers promoting the exhibitions, as well as practical information. More than 1000 images, and hours of audio-visual material, in English and Italian.

4.1.2   NIPPON-multimedia

NIPPON-multimedia is the result of a 3 months production, from the preliminary discussions with the Museums and the many stakeholders involved, to its delivery and online publication.

Once the indications and guidelines for communication strategy – coordinating the many parties involved - have been decided, next steps have been the gathering of the content (both textual as well as iconographic), the making of the videos, the narratives, the hosting website. The multimedia introduction to the exhibition themes and the selection of the artworks have been developed using the technology 1001stories. In addition, a new multimedia application "Nippon at a glance" has been developed, allowing users to "play" with the 4 exhibition's contents. Given the curatorial concept of "*NIPPON*", this multimedia multi-channel application has been created following few easy step:

- preliminary research on the topics of the exhibition
- interviews with the exhibitions' curators

- creation and editing of the content and iconographic research
- professional recording of the textual content and delivery of audio files
- creation of the website
- delivery of the multimedia- application

NIPPON-Multimedia is a family of multimedia applications, available in various formats over several devices/channels: web (also from mobile devices, like iPhone, iPad, smartphones etc.), podcast, CD-rom, social spaces etc. (figures 1 and 2).
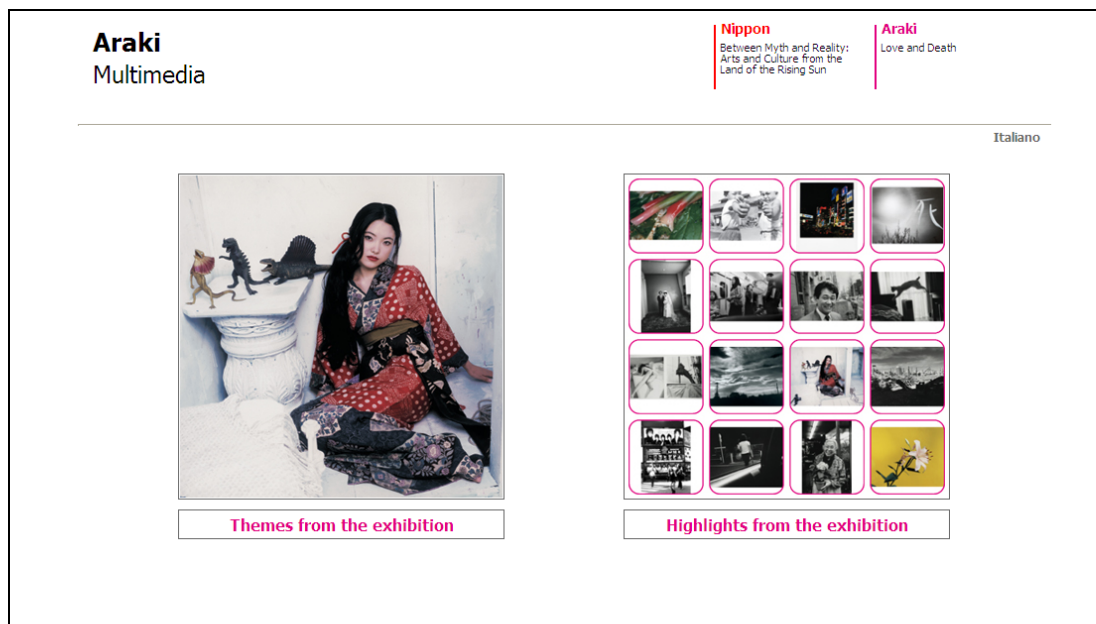
Figure 1. Nippon Multimedia: the (web) home page of the section of the exhibition:
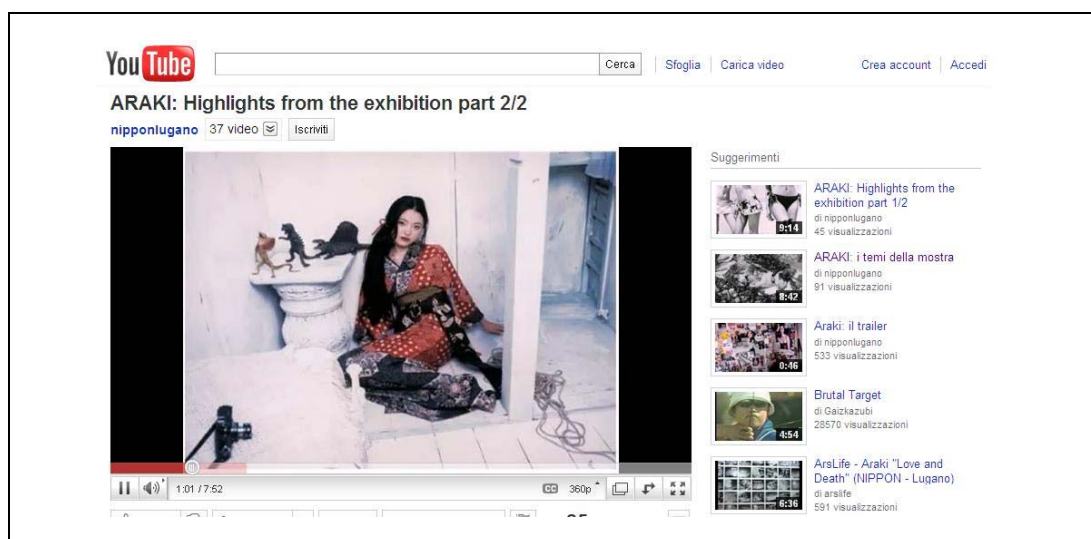*"Araki. Love and Death"*

Figure 2. Nippon Multimedia, "Araki. Love and Death" exhibition on Youtube

More in detail, as far as the content concerns, for each exhibition there is a multimedia introduction, explaining the cultural context, the themes and the approach of the exhibition itself; "Highlights", instead, are multimedia presentations to a selected group of works, a sort of introduction of a selection of the most relevant exhibits. The Highlights are either linked to the multimedia introduction to the exhibition's themes, to provide insights when relevant, or they can be accessed on their own, as a small multimedia catalogue. An additional feature is "Nippon at a glance": a highly innovative "interactive map" (a mosaic) where users can select an image and get content, taken either from the multimedia introductions or from the highlights. "Nippon at a glance", merges all the different multimedia items, creating an emotional and exploratory space that can be driven by selecting an image, or a specific word (used in the audio) or a specific artist. The map is relaxing and educational all at once: it can be accessed via PC, iPad or iPhone. Podcasts can be used to download all the content and could serve as mobile guide in the exhibitions' space. The applications produced with 1001stories can be delivered over the web, mobile devices (smart phones, iPhone, iPad), off-line (CD-rom, USB key, mp3 players, iPod) or on-line, over standard cell-phones (audio only), through social

spaces, etc., needing basically one authoring effort (including some "adaptive adjustments") and one technological effort.

To effectively support a number of different user experiences, four different communication formats were developed, exploiting an innovative approach to adaptivity.

a. Thematic narratives

For each exhibition, a "thematic" multimedia narrative was developed, providing information about the exhibition's main themes, the artist(s) involved, the artistic movement, the historical context etc... Each thematic narrative is organized as a sequence of pieces of content, each about a specific subject (figure 3).

EXHIBITION: "ARAKI, LOVE AND DEATH"

| 1. WELCOME | 2. BIOGRAPHY | 3. THE NUDE | 4. THE PHOTOGRAPHY | 5. THE DEATH | 6. ARTISTIC EXPRESSION | 7. THE EXHIBITION | 8. INVITATION |

Sequence of topics in the "thematic narrative"
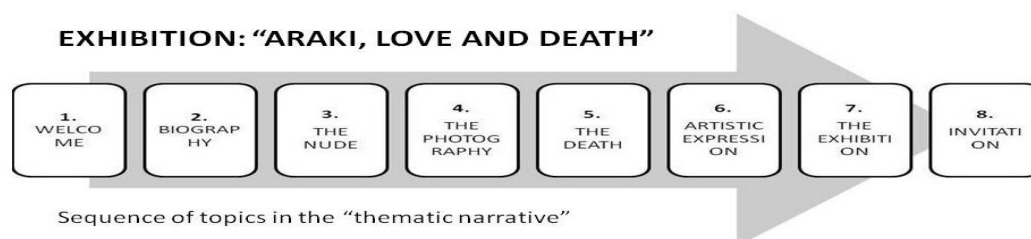
Figure 3. The sequence of topics of the thematic narrative for the exhibition "Araki. Love and Death"

Each piece of content consists of an audio, lasting one minute approximately, plus a slideshow of images (5 to 6) with their captions (fig. 4). Thus, in 8-10 minutes, the user can get a complete overview of the exhibition's themes.

The user can either listen to the entire sequence automatically or select what she is interested in. Some "highlights" from the exhibition are offered as additional links (figure 5). The thematic narratives act as introductions, to be used before the visit (at home, while driving to the exhibition, on a train, etc.) or after the visit, to enhance recollection.
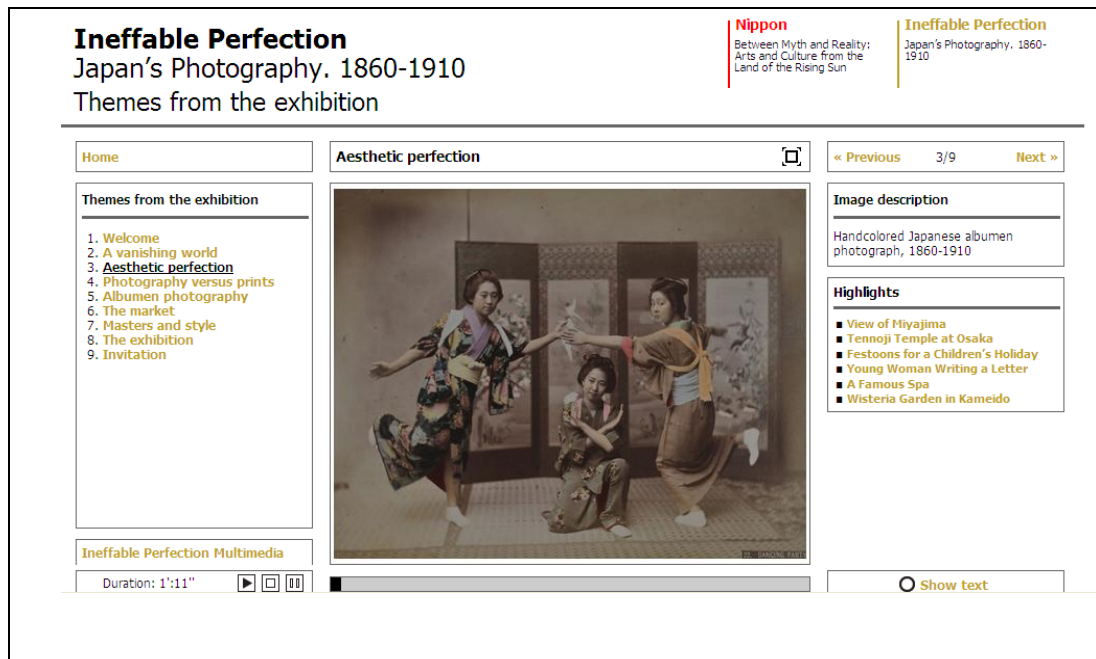
Figure 4. A screenshot from the thematic narrative of the exhibition "Ineffable Perfection", about albumen photography. On the left, the list of the narrative's pieces of content; in the middle, the slideshow of images; on the right, the captions and the links to the relevant highlights
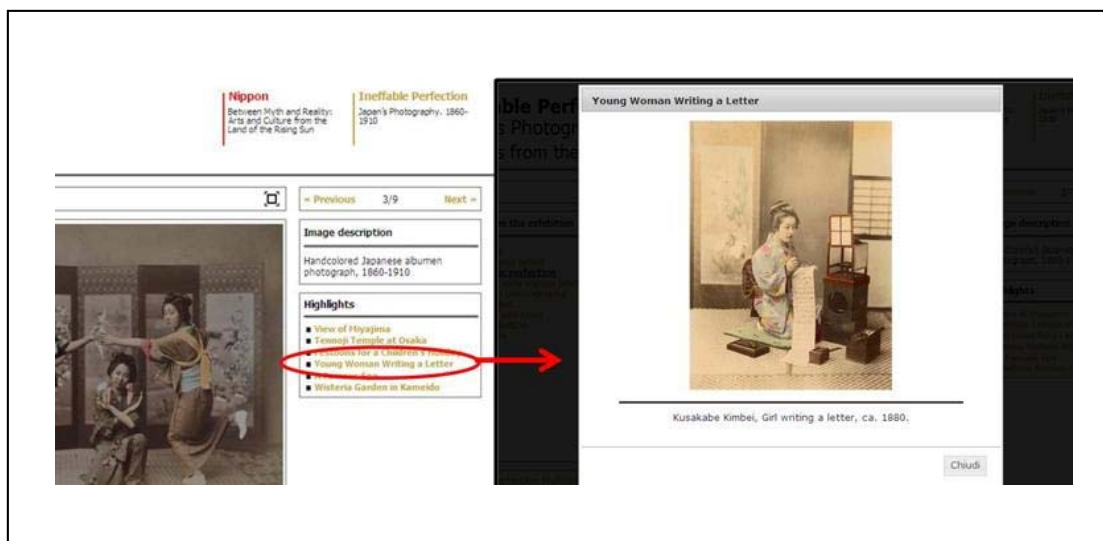
Figure 5. The user can access a highlight while consuming a thematic narrative. Once the short description of the highlight is over, the user is brought back to the thematic narrative

b. Catalogue (of highlights)

For each exhibition, a number of "highlights" (20 circa per each) were selected for a "closer view" (figure 5, on the right). Each highlight goes with some images and a comment. The highlights can be consumed either "sequentially" or by selection. Possible scenarios of use include preparation before the visit (preview of the best exhibits), recollection after the visit (search for specific exhibits). If accessed via mobile device (either online or as downloaded podcast), they can be used during the visit as audio-guides or interactive guides (see below).

c. Interactive guides

The pieces of content developed for the thematic narratives and the multimedia catalogue can be re-purposed to work as interactive guides (over mobile devices). The highlights comment on the exhibits; the pieces of content of the thematic narratives introduce the background.

Figure 6. A visitor using the catalogue on iPhone as interactive guide at the Araki exhibition

d. Mash-up narrative

The content developed for the thematic and catalogue applications was repurposed to fit another format, a "mash-up narrative", that we called "Nippon at a glance". Each element (e.g. a topic from a thematic narrative, a highlight…) is represented

by a thumbnail, in an attractive mosaic of scattered pieces (figure 7). The user selects the elements that draw her attention. This format fits very well devices like smartphones, iPahones (fig. 6), iPod, iPads, tablet PCs, multi-touch tables and similar. It is particularly suitable in the case of users who feel like having a serendipitous experience. The mosaic can also be explored using a word cloud and a tag cloud.
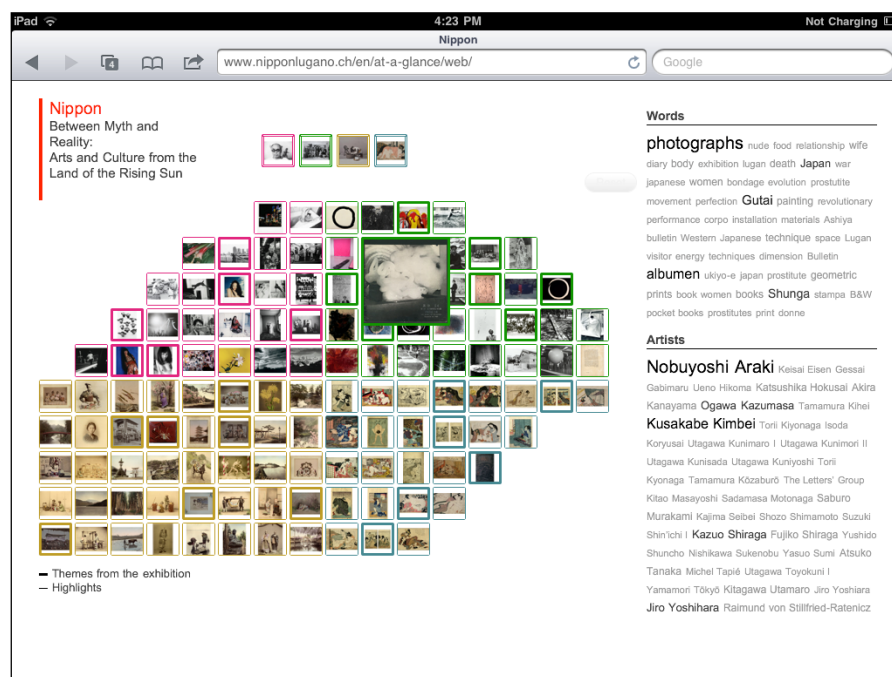
Figure 7. The "mosaic" of "Nippon at a glance" over iPad

All these different formats were developed thanks to an innovative approach to adaptivity, described in what follows. Basically, one single effort is required, in terms of content authoring and technology, to get the four different versions.

4.1.3   Critical discussion

NIPPON-multimedia represents one of the best results of a solid and long term collaboration among the Faculty of Communication Sciences and the City of Lugano

that - since 2008 and throughout a number of different collaborations, - have involved the use of new communication technologies for the improvement of the cultural offer, becoming an effective example of multichannel communication in Lugano, and showing openly the role multimedia and technology play in tighten the relationship between culture and territory.

The new attitude expressed with this exhibition project linked the whole city and its several exhibition venues, and tightened the collaboration between the two parties, in the geographical space of the City, the surrounding territory and in the virtual space of the web as well. Within this frame, NIPPON-multimedia became an extraordinary project tightening together two of the main culture providers of the area. Furthermore, it has been an extraordinary technological support to the diffusion and understanding of the exhibitions. Developed as support to the diffusion and understanding of the four exhibitions, the communication strategy aimed at providing multimedia content on the artists, on the main themes as well as on a selection of masterpieces of the four exhibitions; to provide a "leisure" explorative experience as well as additional material on the exhibitions and the complimentary events.

Moreover, NIPPON-multimedia describes a successful case of "Instant multimedia" for generating multimedia "narratives". Its content has been "adapted" to the different devices, and the technical formats have been optimized for the different technologies used (web, podcast, iPhone-applications, Smartphone, iPad, etc.). Thanks to the power and flexibility of the authoring environment or by proper cut-&-paste, we could coordinate different productions:

a) slightly different applications were generated for different devices (PC, iPad, iPhone, podcast). These versions differ (mildly) for information architectures, relative weight of the media (audio vs. text or visualization) and interaction capability.

b) The two "narratives" (thematic and highlights) generated for each exhibition aimed at reaching several goals simultaneously:

I.   *User profiles*: users well acquainted with the subject would not need the thematic narratives, meant instead as introduction for less experienced users;

II.   *User experience*: the "highlight" narratives were intended for a double use:

    i.   audio-guides or interactive guides to be used at the exhibition premises;

    ii.   Complimentary material to support the understanding of the exhibition, to be used via PC, via examples, thematic narratives (and to this end, the two applications were interlinked).

c)   In "Nippon at a glance" all the content items were mashed-up together, with a visual interface combining images with word and tag clouds, in view of two different user experiences:

I.   After a visit, for a leisurely recollection of images, keywords and artists.

II.   Independently from any visit, as a leisure browsing.

Since content items from the 4 exhibitions were combined, a problem of content adaptation surfaced: users could not know the content item's context. Thus, a small trailer, lasting a few seconds, explaining which exhibition the content came from and what it was about was added to each content item. Thus users accessing the same content item via the exhibition narratives or via the visual interface got (slightly) different versions.

4.2. Case study: MAN RAY-Multimedia

4.2.1   Rationale

Man Ray-multimedia is a multimedia application developed on the occasion of "Man Ray", held at Museo d'Arte, Lugano, in March – June, 2011, an exhibition on one of the most influential and prolific artists of the twentieth century. Photographer, painter, experimental filmmaker, for this exhibition the artist is presented through some four hundred works that document his creative path, and cast light on the leitmotifs underlying his oeuvre. The iconography is further

enriched by the works of some other leading twentieth-century artists — Jean Arp, Marcel Duchamp, Francis Picabia, and Pablo Picasso, to name just a few — providing insights into the context in which Man Ray's works were created. According to the curators' vision, the presentation of the works to the visitor is entrusted to the artist himself: Man Ray wrote a brilliant autobiography in which he narrates the circumstances in which some of his most famous works were created and recalls the reasons and the models – mostly female ones – which inspired him.

MAN RAY-multimedia has been developed to support the diffusion and understanding of the exhibition through multimedia narratives, providing multimedia content on the main themes of the artist career, along which the exhibition has been conceived, as well as well as on a selection of fragments from the artist "Self Portrait"[1], the autobiography he published in 1963.

The multimedia narrative "Self Portrait" allows users and visitors to better understand the exhibits through excerpts from the artist's fascinating memoir.

Furthermore, this exhibition has been the occasion to launch, in addition to a multimedia support, the first social game with a cultural aim: a competition for "creative writing", aiming at involving young audiences through web 2.0.

The following are the outcomes of MAN RAY-multimedia:

- 2 (+ 2) "interactive narratives" (for the Web, offline and Information Point). The web version can be accessed via web; the offline version has been used for CD-ROM or e-Key delivery.

- A "set of playlists" downloadable for MP3 and MP4 (iPod, smart-phone, and similar devices).

- An "audio companion" for visitors of the exhibition. Along the exhibition, this "audio companion" allows visitors to better understand the context of Man Ray's artistic career, through excerpts from "Self Portrait", the autobiography by the artist.

- The official audioguide, available at the exhibition premises.

- A Virtual Tour of the exhibition

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[1] Man Ray's life excerpts are from "Self Portrait. Man Ray" A Bulfinch Press Book

All the multimedia content and the "audio companion" can be accessed and free downloaded via web, from PC or iPhone, iPad, or any web-enhanced device.

All this takes place in the frame of a website, hosting video presentations by the Director of the Museum and the co-curator of the exhibition as well as practical information, and a photo gallery. (Figure 8)
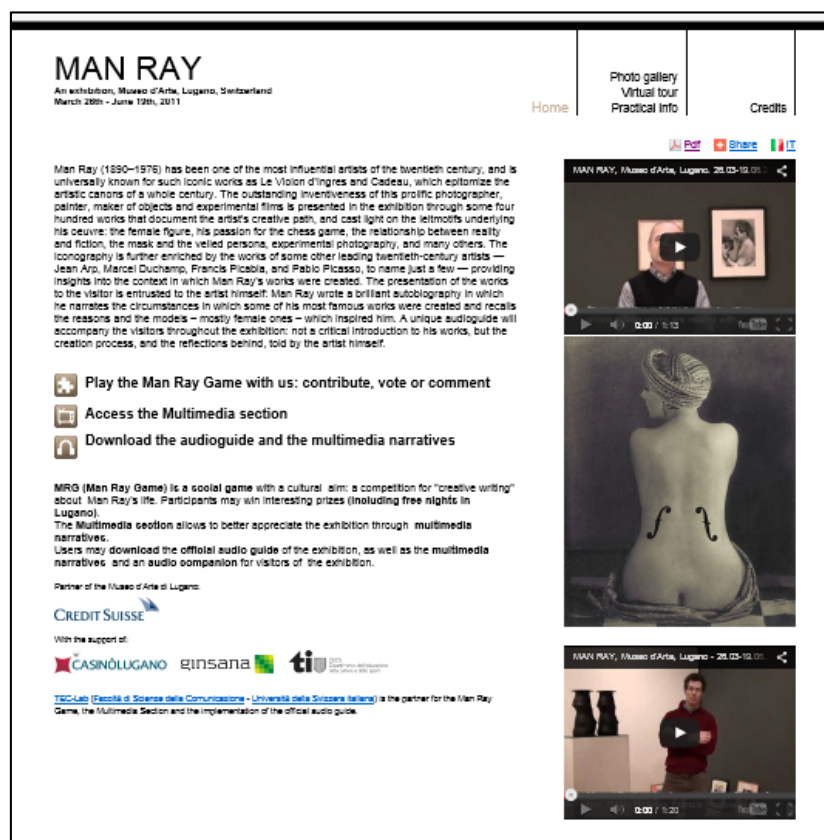

Figure 8. Man Ray- Multimedia: the (web) home page

4.2.2   MAN RAY-multimedia

MAN RAY-multimedia is the result of a 2 months production, from the preliminary discussions with the Museums and the many stakeholders involved, to its delivery and online publication.

While the communication strategy has been agreed straightforwardly among the many parties involved, the content making process have faced some issues, regarding the use of images and excerpts from the artist memoir, posing some interesting challenges. Due to copyright limitations, not as many images as needed for the visual communication – in particular regarding the MRG - were available; they were later acquired directly from the Man Ray Trust, which was supporting both the cultural game and the multimedia application project.

Once the iconographic issue has been solved, next steps have been the gathering of the content (both textual as well as iconographic), the making of the videos, the narratives, the hosting website.

At the same time, we have been working on the creation of the social game.

The multimedia introduction to the exhibition themes, the excerpts from Man Ray's "Self Portrait" and the audio companion have been developed using the technology 1001stories. In addition, a new multimedia feature, the Virtual Tour, has been developed, allowing visitors to "visit" or "re-visit" the exhibition at a distance.

MAN RAY-multimedia, as to simplify, has been created following few easy step:

- preliminary research on the topics of the exhibition
- interviews with the exhibitions' curators
- creation and editing of the content and iconographic research
- professional recording of the textual content and delivery of audio files
- creation of the website
- delivery of the multimedia- application

The final product allows a delivery over various formats on several devices/channels: web (also from mobile devices, like iPhone, iPad, smartphones etc.), podcast, CD-rom, social spaces etc.

More in detail, as far as the content concerns, there is a multimedia section dedicated to the themes, introducing the major and more recurring themes of the artist works and the approach of the exhibition itself; and a section dedicated to the excerpts of his "Self Portrait", a multimedia presentations to a selected group of works told with the artists words. They are either linked to the multimedia themes, to provide

insights when relevant, or they can be accessed on their own, as a small multimedia catalogue. An additional feature is the "audio companion". Podcasts can be used to download all the content and could serve as mobile guide in the exhibitions' space. In addition to the "more classical" multimedia narrative, MAN RAY-multimedia presents two innovative features: the Virtual Tour and the social game.

The Virtual Tour allows the visitor to a new exploration: used as a guide in the museum, or from home, the multimedia visitor can explores the exhibition at any time, in any place.

The Social Game is an example of multimedia edutainment (have fun and learn). Indeed, this occasion represented a great occasion for experimentation.

To effectively support a number of different user experiences, three different communication formats were developed, exploiting an innovative approach to adaptivity.

a. Thematic narratives

The "thematic" multimedia narrative provides information about the exhibition's main themes and it is organized as a sequence of pieces of content, each about a specific subject. This content can be accessed either "sequentially" or by selection. If accessed via mobile device (either online or as downloaded podcast), it can be used during the visit as audio-guides or interactive guides (see below).

b. Excerpts from "Self Portrait":

A number of excerpts from Man Ray's autobiography were selected for a "closer view" (figure 2, on the right). Each excerpts has some images to compliment the artist's words and providing the User a visual completeness of what is told. This content can be accessed either "sequentially" or by selection. If accessed via mobile device (either online or as downloaded podcast), they can be used during the visit as audio-guides or interactive guides (see below).
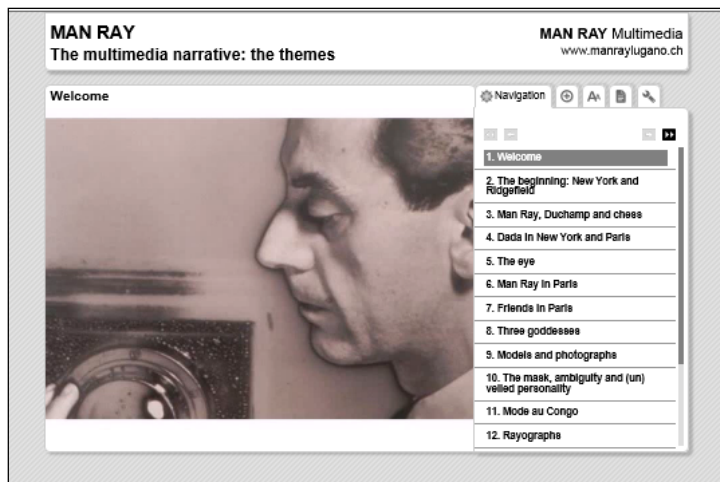
Figure 9. A screenshot from the thematic narrative of the exhibition. On the left, the list of the narrative's pieces of content; on the right, the slideshow of images

c. Audio guide and Audio companion

An audio guide has been produced, with pieces of the two multimedia narrative and including some more multimedia content especially made for this purpose.

The pieces of content developed for the two multimedia can be re-purposed to work as audio companion (over mobile devices) along the exhibition. The excerpts comment on the exhibits; the pieces of content of the thematic narratives introduce the background.

d. Virtual Tour

A Virtual Tour of the exhibition rooms have been created, allowing the visitor to explore the exhibition at any time, in any place (Figure 10).
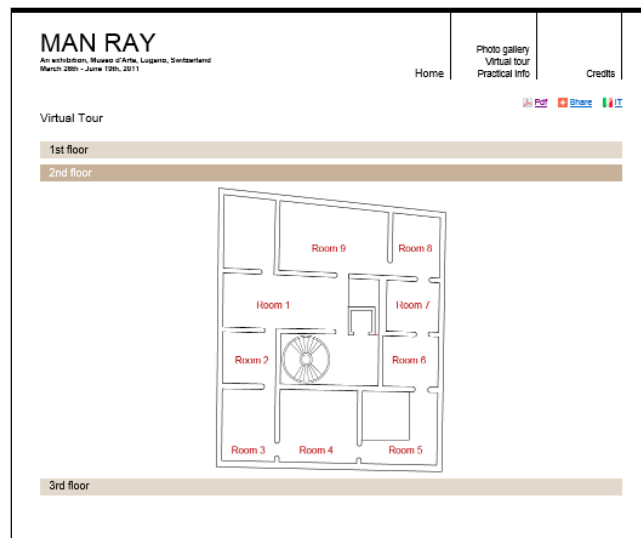
Figure 10. A screenshot from the Virtual Tour.
On the top, the floor plans; on the bottom, a view of one room

4.2.3 The MRG (Man Ray Game)

Aiming to stimulate creativity and inventiveness, MRG (Man Ray Game) is the first social game offering an extraordinary technological support to the diffusion, promotion and better understanding of the life and the artistic production of one of the most influential artists of the last century. The MRG is a project tightening

together two of the main culture providers of the area, aiming at trying an innovative way to involve a new audience, of young people mainly, in the art sphere building upon the success of social spaces (Figure 11).
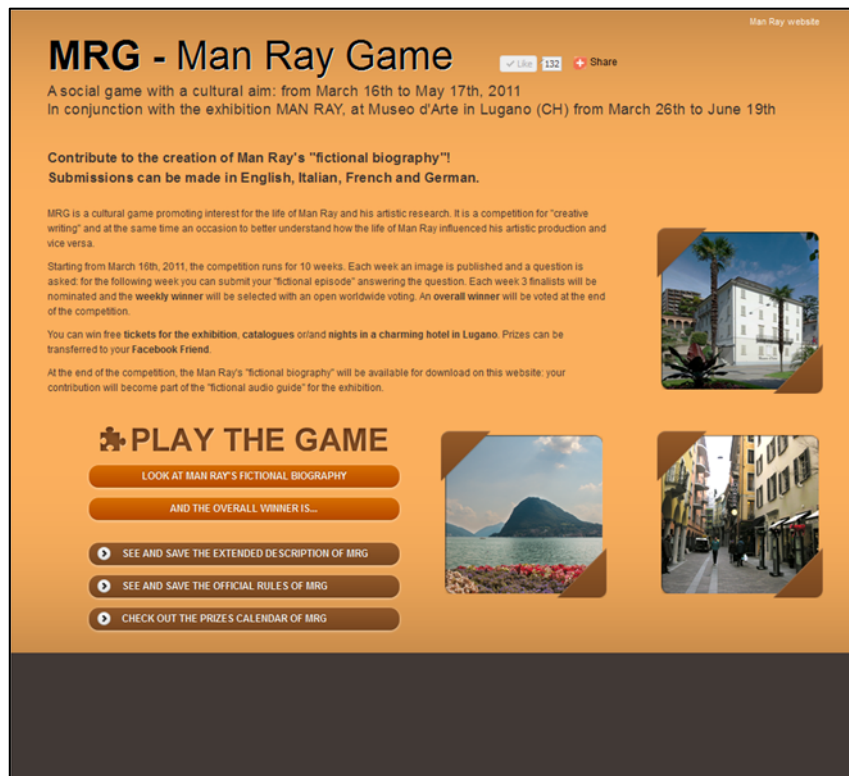
Figure 11. The Man Ray Game home page

Each week, on a given day (each Wednesday in this specific case), on www.manrayLugano.ch/game an image is published and a question is asked: for the following week participants are invited to submit a "fictional episode" answering the question. Participation is free: only a registration on Facebook is required. Submissions can be made in English, Italian, French and German, in order to involve a wider audience worldwide. The competition runs for 10 weeks, and participants can win free tickets for the exhibition, catalogues or/and nights in a charming hotel in Lugano. At the end of the competition, the Man Ray's "fictional biography" is created thanks to the players contributions.

Everyone, worldwide, can play. Participation is free, however a profile on Facebook is required for submitting an entry- or comments. No registration on any site is needed for voting. Each week, when an image and a question are published, participants are called to contribute by submitting a text of maximum 800 characters, describing a "fictional" episode of Man Ray's life inspired by that image and the associated question published in the game (Figure 12). In order to participate, the player needs to enter the weekly contest (Figure 13).

The following week, three finalists are selected by the editorial staff (the "Judge(s)"). All three finalists' entries are published to be voted. The main selection criteria are creativity and cultural innovativeness, not "biographical truth". The MRG is not looking for Wikipedia surfers, but for smart and resourceful "free thinkers"! The following week the weekly winner is declared. The winner is the entry that received the greatest number of valid votes from the public and who satisfies all the rules. The Judge(s) will tabulate the Votes and announce the winner. All decisions of the Judge(s) are final and binding. The winning entry is published, along with the true episode, from the autobiography of Man Ray. Audience (Worldwide) may comment (on line) the entries and they may vote for the comment they like best. At the end of the competition, a "fictional biography" created with the winning submissions will be made available for download on this website.
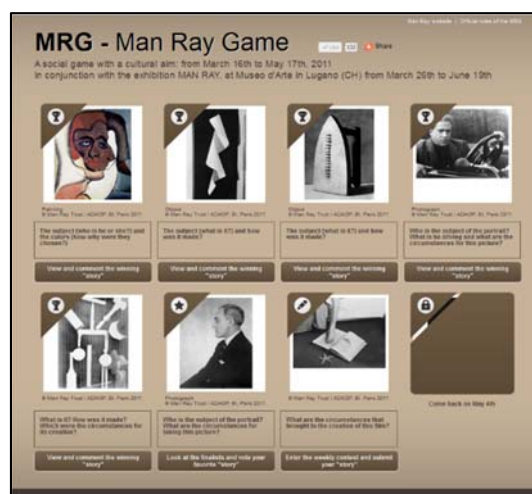
Figure 12. The Man Ray Game weekly submissions
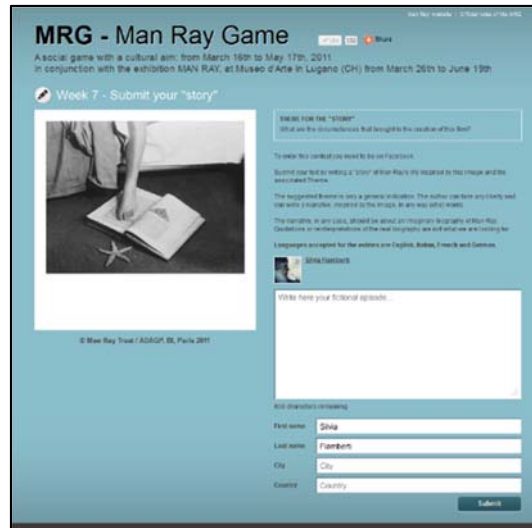
Figure 13. The Man Ray Game format to submit weekly contributions

The MRG has been created following few easy steps. The first decision was to provide a strong integration of the game with Facebook. Thanks to the APIs provided by the social network, it is possible to track the user session through the website without the need of a custom approach. This technique has been used for stories and comments submission.

Different benefits come from this solution:

- Since Facebook is so widespread today, it is highly probable that the user already has an account. He doesn't need to register on the website.

- No sensible data has been managed. All the privacy and security issues connected with private data are handled by Facebook. At the same time the identification of the user and the mechanisms to contact him are straightforward.

- The game is promoted among the friends of those who have played thanks to the publication on the Facebook wall.

4.2.3.1 Results, number and participation to the MRG:

The MRG has taken place from March 16th to May 17th, 2011. During this period of time, there have been:

- o 132 "like" on Facebook
- o 62 submissions to the weekly contest
- o 25% of the expected result (30 submission per week, 8 weeks)
- o 21 comments
- o 1029 votes for the submissions

From Google analytics:

- o 3863 people visited the site (unique visitors)
- o From 57 countries (mostly from Italy and Switzerland)

4.2.4 Critical discussion

Man RAY-multimedia represents an example of technological support to the diffusion and understanding of the exhibition, shaped in collaboration with the Museum Director and curators of the exhibition, as far as the content concerns. Being part of a wider collaboration with the City of Lugano and its museums and cultural partners and events, it represents a further occasion for multimedia to support the cultural scene of the city. With MAN RAY-multimedia, Users can access the available content with the device(s) they prefer, and in the situation that suits them the most: using PC, smart-phone, iPhone, iPad. Accessing the content online, or downloading it and have it available at any time and place, including during the exhibition visit.

Furthermore, including the new feature "Virtual Tour", visitors can access the exhibition space in different ways: prior the visit, during and after.

Finally, the exhibition has been an occasion to explore the users response to an art-related social game. At the end of the competition and later on of the exhibition, the following is the result line: the structure of the game was satisfactory, and satisfied

who took part in it. Its diffusion, thou, was rather poor. In its launch, the role of existing cultural heritage – related communities and the museum's week brand (Museo d'Arte, Lugano) – has been underestimated. Moreover, this specific case study showed that a cultural competition on Facebook does not generate per se neither a community, nor a brand. If a "brand" is strong – the virtual community benefits from it. The lesson learned is that involving existing Cultural heritage communities with existing strong ties could prove cultural games successful, whereas a game "per se" does not raise vivid interest.

4.3. Case study: Consonanze Multimedia

4.3.1 Rationale

The exhibition "Consonanze: Dialogues across time", has been held by Museo d'Arte, Lugano (Tessin, Switzerland) from October 16th, 2011 to January 8th, 2012. The exhibition proposes a fascinating trip across different periods of art history, from the 15th century to Contemporary art, unveiling masterpieces from the Museum's permanent collection. According to the curators of the exhibition, paintings, sculptures, drawings and photographs are organized following an original criterion, different from the standard timeline of most exhibitions. Within this presentation, the visitor is invited to grasp the essence of each artwork by comparing it with pieces by different artists and from different periods, yet similar in their aim, subject, or formal elements. This provides an unusual aesthetic experience for art lovers. Moreover, within this set up, the exhibition underlines themes recurring assiduously over the centuries by various artists: the portrait, the human figure and face, the light, the nature and landscape, the relationship between figuration and abstraction, among many others. Emblematic artworks by Medardo Rosso, Umberto Boccioni, Camille Pissarro, Henri Rousseau, Vincenzo Vela, Giovanni Giacometti, Paul Klee, Hans Richter, Amédée Ozenfant, Joseph Beuys, Meret Oppenheim, and many others are displayed.

For this emblematic exhibition, a multimedia support has been created, including three different multimedia narratives:

- one on the general themes of the exhibition
- one on a selection of works
- one with very short biographies (around 30 seconds!) of selected artists exhibited in the show.

All three multimedia sections have been developed using the technology 1001stories.

This process has been concluded in approximately 2 months and the following are the outcomes of CONSONANZE-multimedia:

- 3 (+ 3) "interactive narratives" for the Web (themes, highlights and artists' biographies)

- A "set of playlists" downloadable for MP3 and MP4 (iPod, smart-phone, and similar devices).

- A Virtual Tour

All this in the frame of a website, hosting additional information for the press and the public, as well as practical information. More than 300 images, and hours of audio visual material, in English and Italian.

As to simplify, CONSONANZE-Multimedia comprehends a number of multimedia applications, available in various formats over several devices/channels (PC, mobile devices, like iPhone and smartphones in general, Tablets, iPad, etc.).

4.3.2 CONSONANZE-multimedia

CONSONANZE-multimedia is the result of approximately 3 months production, from the preliminary discussions with the Museum to its delivery and online publication.

Once a preliminary discussion with the parties involved has led to a communication strategy, the gathering of the content (both textual as well as iconographic), the making of the videos, the narratives, the hosting website have followed .

The multimedia introduction to the exhibition themes and the selection of the artworks have been developed using the technology 1001stories. Given the curatorial concept of "*CONSONANZE*", this multimedia multi-channel application has been created following few easy step:

- preliminary research on the topics of the exhibition
- interviews with the exhibitions' curators
- creation and editing of the content and iconographic research
- professional recording of the textual content and delivery of audio files
- creation of the website
- delivery of the multimedia- application

The result is a family of multimedia applications, available in various formats over several devices/channels: web (also from mobile devices, like iPhone, iPad, smartphones etc.), podcast, CD-rom, social spaces etc. (figures 14 and 15).

More in detail, as far as the content concerns, one multimedia section is dedicated to the general themes (in number of 16), identified by the curators of the exhibition. They explain the cultural context, the themes and the approach of the exhibition itself. Moreover, a short initial narrative introduces the exhibition. The thematic narrative is organized as a sequence of sixteen pieces of content, each about a specific subject (figure16). Each item consists of an audio, lasting an average of 1.5 minute, plus a slideshow of images (6 to 8) with their captions, allowing the user/visitor to get a complete overview of the exhibition's themes in about 15-20 minutes (Figure 16).

Figure 14. 'Consonanze-Dialogue across time': a screenshot of the (web) home page
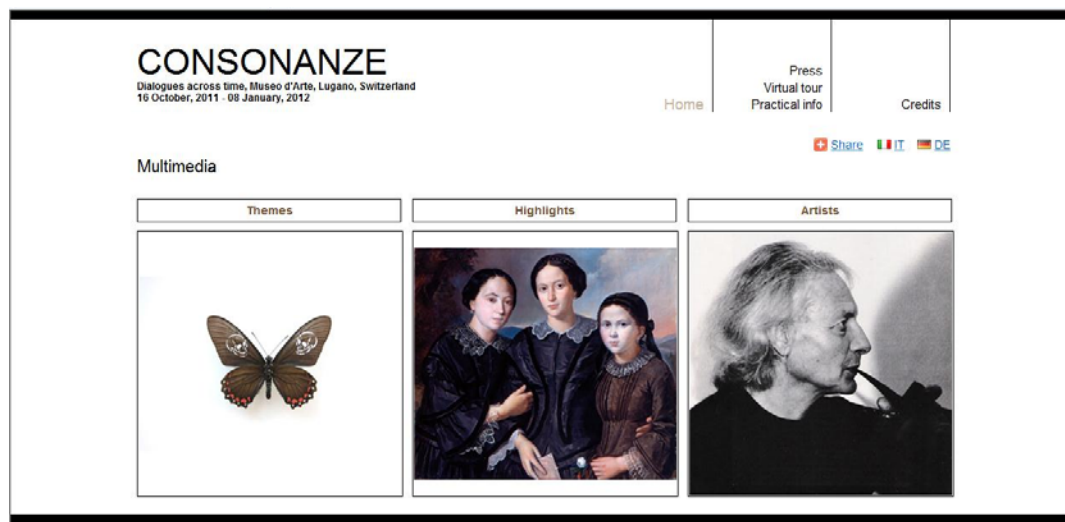
Figure 15. A screenshot from the Multimedia page for the exhibition 'Consonze-Dialogue across time'
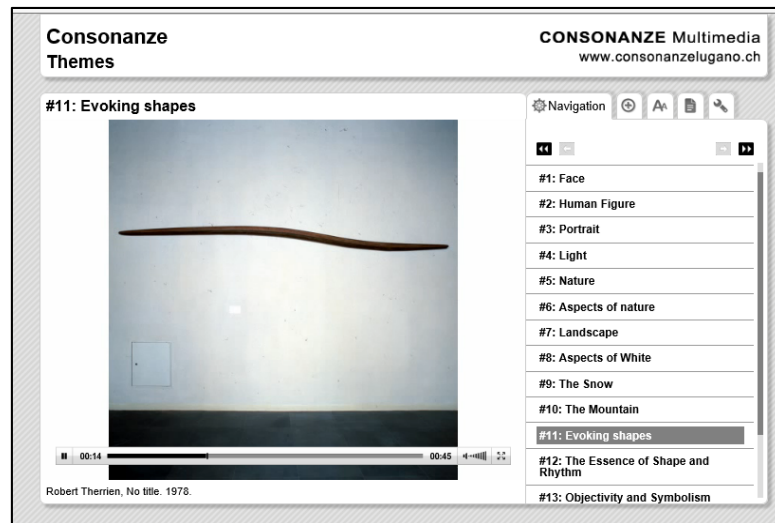
Figure 16. The sequence of topics of the thematic narrative for the exhibition 'Consonanze-Dialogue across time'.

From the "Themes", the user is pointed to related artworks and artists, thanks to links to "Highlights" and "Artists" bio, to provide insights when relevant (Figure 17). Of course, these pieces of content can also be accessed on their own, as a small multimedia catalogue, as well as the information on the Artists' bio.
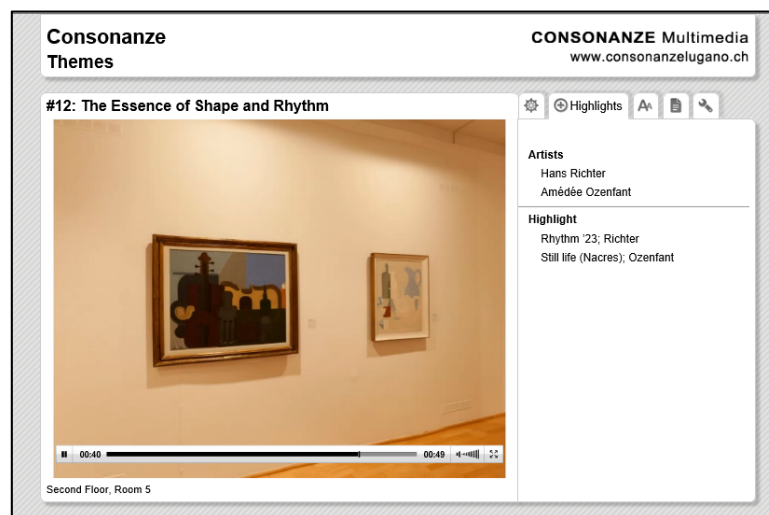
Figure 17. Screenshot of one item of the thematic narrative from 'Consonanze-Dialogue across time'. On the right, the Highlights that link to the two narratives "Artists" and "Highlights"

As anticipated, another multimedia section, the "Highlights", is dedicated to a selection of works, chosen by the curators among the many works exhibited, as particularly emblematic.

Thirdly, one section "Artists" is dedicated to short biographies (around 30 seconds!) of selected artists exhibited in the show.

All multimedia items, can be driven by random selection as well as linearly and can be accessed via PC, iPad or iPhone, smartphones and tablets in general, online as well as off-line. Once again, this multi-channel and multi-format delivery has been reached with basically one authoring effort (including some "adaptive adjustments") and one technological effort.

To effectively support a number of different user experiences, four different communication formats were developed, exploiting an innovative approach to adaptivity.

The user can either listen to the entire sequence automatically or select what interests more.

a. The Themes

The thematic narratives could act as introductions, to be used before the visit (at home, while driving to the exhibition, on a train, etc.), after the visit, to enhance recollection or during the visit, to get an overview of the themes that recur in the different rooms

b. Catalogue (of highlights) and Artists

A number of exhibited works have been selected by the curators as more representative and a multimedia item has been created, each one about 1 minute long, as well as a short Bio has been created, for each artist. As well as for the Themes, the highlights too can be consumed either following the list order or by specific selection. The Artists narrative, a very short. Possible scenarios of use include preparation before the visit (preview of the best exhibits), recollection after the visit (search for specific exhibits). If accessed via mobile device (either online

or as downloaded podcast), they can be used during the visit as audio-guides or interactive guides (see below).

c. Interactive guides

The pieces of content developed for the thematic narratives the multimedia catalogue and artists can be used as interactive guides (over mobile devices). The thematic narratives introduce the background. The themes on which the exhibition has been created and the main theme of each room. The highlights comment on the exhibits and the Biography provide a glimpse over the artists presented with their artworks in the exhibition.

d. Virtual Tour

In addition to this "consolidate" model, a virtual tour has been included, allowing the user to move around the exhibition space and room.

All these different formats were developed thanks to an innovative approach to adaptivity. With one single effort, in terms of content authoring and technology, four different versions are the deliverables.

4.3.3 Critical discussion

Developed as support to the diffusion and understanding of the exhibition, the communication strategy aimed at providing multimedia content on the artists, on the main themes as well as on a selection of masterpieces, CONSONANZE –Multimedia proved the *1001stories+* framework to be really valid tool for creating multimedia, multi-channel production, within a very short time, a very little staff and a constraining budget. Despite these restraints, this multimedia production, which includes a large number of items, and was published online in three languages, is of a very good quality, and includes Interactive guides and a Virtual Tour: used as a guide in the exhibition

premises or from home, the multimedia visitor could explore the exhibition, moving from a room to another.

4.4. Case study: Giorgio Morandi

4.4.1. Rationale

A considerable exhibition on the Italian artist Giorgio Morandi (1890-1964) was held at Museo d'Arte, Lugano, in March-July 2012. One of the most distinguishable and yet most enigmatic artists of the twentieth century and known in particular for his works, created with bottles and simple objects, Morandi is also renowned for his meticulous artistic research as well as the process of deep investigation he carried along his entire life.

This exhibition, throughout a corpus of approximately one hundred works, traces a line along the most significant moments of his production; moreover, documenting the techniques and the themes experimented during his career, this exhibition provides an overview of the artist's ability in creating volumes, lights, and the atmospheric qualities with a rather modern language.

The exhibition presents also works by other artists, whose works and artistic expressions have been influenced by the artist, emphasizing the extraordinary modernity of Giorgio Morandi, pioneer and inspiration for many generations.

For this emblematic exhibition, a multimedia support has been created, including three different multimedia narratives:

- one on the general themes of the exhibition
- one with the main techniques used by the artist along his career
- one on a selection of works

All three multimedia sections have been developed using the technology 1001stories.

This process has been concluded in approximately 3 months and the following are the outcomes of GIORGIOMORANDI-multimedia:

- 3 (+ 3) "interactive narratives" for the Web (themes, techniques and selection of works)

- A "set of playlists" downloadable for MP3 and MP4 (iPod, smart-phone, and similar devices).

- A Virtual Tour

All this in the frame of a website, hosting additional information for the press and the public, as well as practical information. More than 200 images, and hours of audio visual material, in English and Italian.

As to simplify, GIORGIOMORANDI-Multimedia comprehends a number of multimedia applications, available in various formats over several devices/channels (PC, mobile devices, like iPhone and smartphones in general, Tablets, iPad, etc.).

4.4.2 GIORGIOMORANDI-multimedia

For the exhibition dedicated to the Italian artist Giorgio Morandi an original multimedia multichannel communication have been developed. For this exhibition, three narratives have been created: the 'themes' (analysed and approached by Morandi during his life and artistic career), 'the techniques' (experimented throughout his creations) and, again, 'a selection of works/highlights'. More in detail, as far as the content concerns, the multimedia section dedicated to the general themes provides further tools to non-expert visitors in approaching the exhibition itself. The thematic narrative is organized as a sequence of six pieces of content (an introduction and five themes), each about a specific topic. Each item consists of an audio, lasting an average of less than 2 minutes, plus a slideshow of images (approximately 6) with their captions, allowing the user/visitor to get a complete overview of the exhibition's themes in about 10 minutes. From the "Themes", the user is pointed to related artworks, thanks to links to "Selected works/Highlights", to provide insights when relevant (Figure 18).

Of course, these pieces of content can also be accessed on their own, as a small multimedia catalogue. Another multimedia section is the "techniques"; this section is organized as a sequence of five pieces: an introduction to the techniques used the most by the artist and the four techniques themselves.

Each piece of content last about a minute, providing an overview of the used techniques in about 5 minutes. As for the "Themes", also for this section users are pointed from techniques to related artworks, thanks to links to "Selected works/Highlights". Or can access content freely. The user can either listen to the entire sequence automatically or select what interests more.
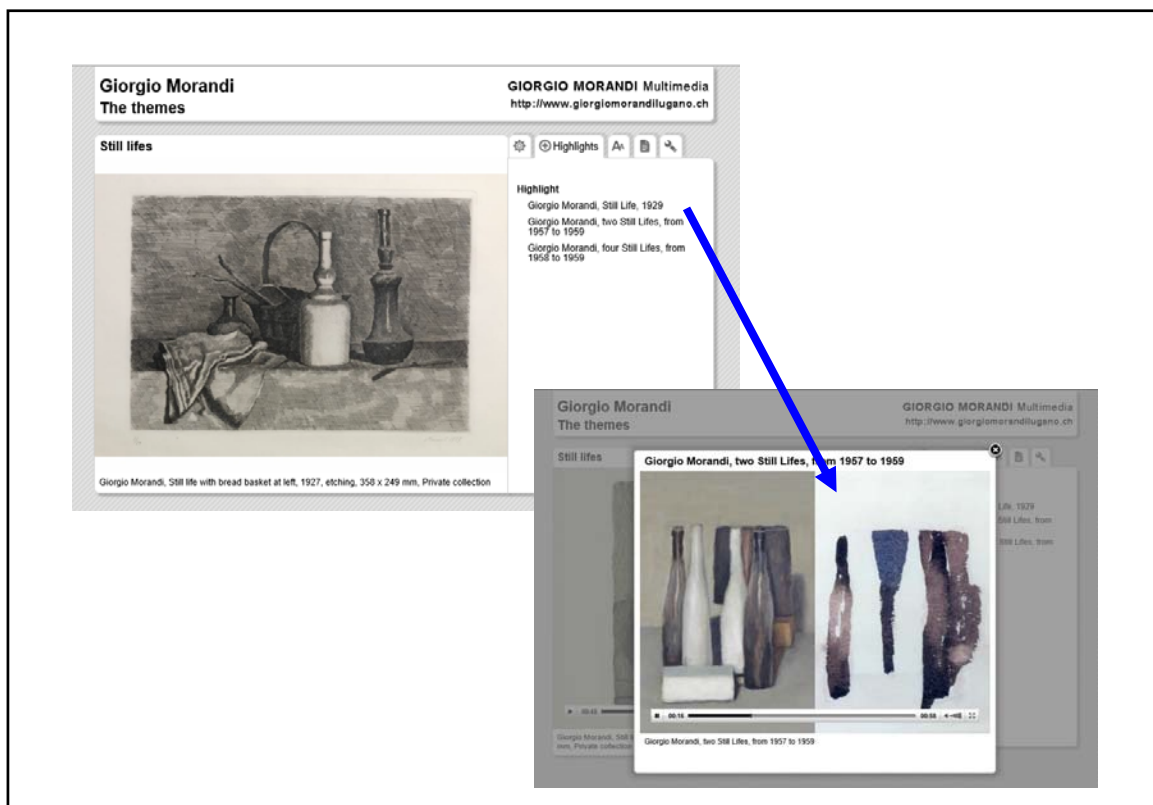
***Figure 18. A screenshot from the Multimedia page for the exhibition
'Giorgio Morandi'. From "Themes" to "Highlights"***

Thirdly, the multimedia section dedicated to "selected works/highlights"; this works have been selected by the curators among the many works exhibited, as particularly emblematic and comprehend a list of 32 multimedia item. 26 of them regarding Giorgio Morandi and 6 on other artists whose work has been greatly influenced by Morandi. Content refers to single artworks or different artworks assembled and commented at once.

All multimedia items can be driven by random selection as well as linearly and can be accessed via PC, iPad or iPhone, smartphones and tablets in general, online as well as off-line. Once again, this multi-channel and multi-format delivery has been reached with (nearly just) one authoring effort (including some "adaptive adjustments") and one technological effort.

Figure 19. A screenshot from the Multimedia page for the exhibition 'Giorgio Morandi'

a. The Themes

The thematic narratives could act as introductions, to be used before the visit (at home, while driving to the exhibition, on a train, etc.), after the visit, to enhance

recollection or during the visit, to get an overview of the themes that recur in the different rooms.
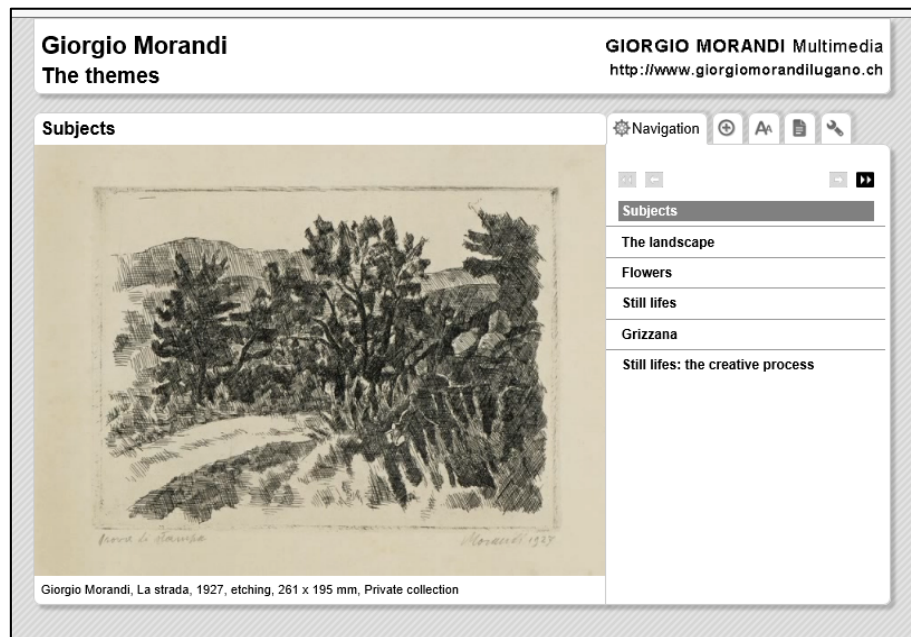
Figure 20. A screenshot from the "Themes" page for the exhibition 'Giorgio Morandi'

b. Selection of works (or highlights)

A number of exhibited works have been selected by the curators as more representative and a multimedia item has been created. As well as for the Themes, the highlights too can be consumed either following the list order or by specific selection. Possible scenarios of use include preparation before the visit (preview of the best exhibits), recollection after the visit (search for specific exhibits). If accessed via mobile device (either online or as downloaded podcast), they can be used during the visit as audio-guides or interactive guides.
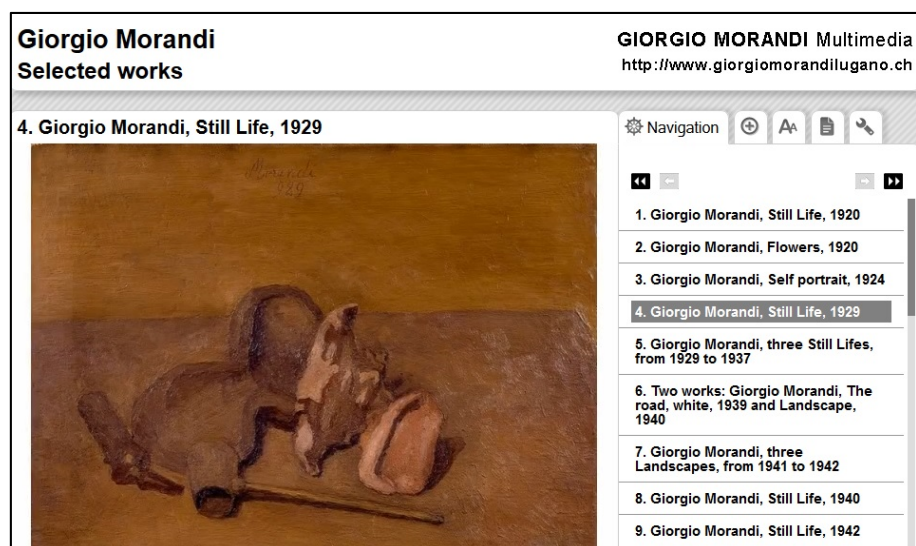
Figure 21: a multimedia story featuring an art exhibition's catalogue

c. Interactive guides

The pieces of content developed for the thematic narratives, the techniques and the selected works can be used as interactive guides (over mobile devices). The themes and the techniques provide a background on the artist. The highlights comment on the exhibits.

d. Virtual Tour

The virtual tour allows the user to move around the exhibition space and room. For this exhibition, the potential value of the virtual tour has been fully exploited, transforming panoramic photos into elements of a real multimedia guide.

Panoramic views are enriched with hotspots that can be used to activate the fragments of the narratives, and with an audio file, guidance to the most relevant information of the room. Such virtual tours may be used at home to visit the exhibition virtually, or can be used, with an iPad, an iPhone or any tablet, in the museum as a multimedia guide to support the exhibition visit.
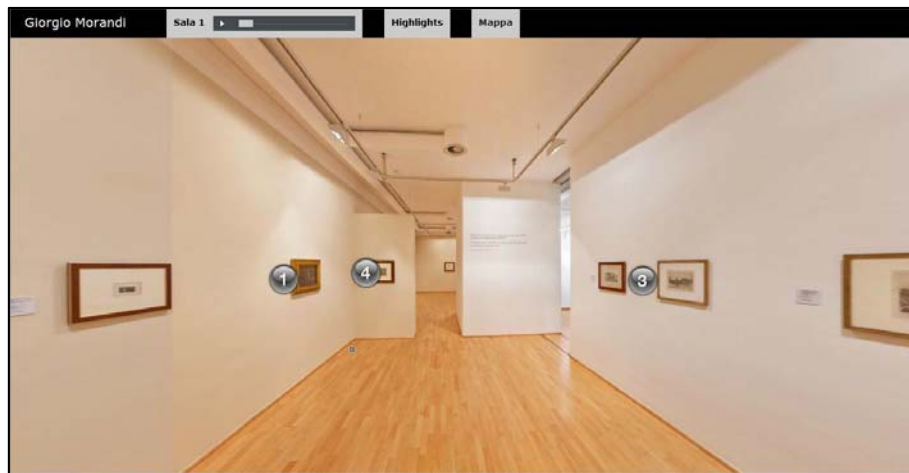
Figure 22. A screenshot from a view of the virtual tour, showing one of the rooms of the exhibition, 'Giorgio Morandi'

All these different formats were developed thanks to an innovative approach to adaptivity. With one single effort, in terms of content authoring and technology, four different versions are the deliverables.

4.4.3 Critical discussion

The Morandi story is a good example of re-use of content for different scenarios: the content items about the works of art were re-used to create a virtual tour about the exhibition.

Starting from a 2-3 hours interview, that could provide the bulk of a medium-sized story and a number of high quality images, production moved on in quick time.

Content items have been conceived as building blocks pieces that could be eventually recombined to support a number of user scenarios (going with different devices/channels) without the need of sitting down and re-creating the content from scratch.

The exhibition, throughout a corpus of approximately one hundred works, traced a line along the most significant moments of Morandi's production. Three interlaced "stories" were created to introduce visitors to the exhibition (figure 4).

At the time of the exhibition, an interactive touch table presenting the content created for GIORGIO MORANDI-Multimedia has been placed at Villa Ciani, hosting - at the time - the solo exhibition "Tony Cragg". The touch table was placed near the entrance, after the ticket counter, in a passage area where a number of signs were inviting visitors to use the touch table and explore the content. The aim was at multiple levels: providing information on the exhibition and its content; providing further information on the artist, its works, techniques and themes; informing the visitors on the exhibition held at Museo d'Arte; stimulating the visitors to visit the exhibition.

The staff at Museo d'Arte confirmed that a number of visitors (not yet relevant) came to know about the exhibition while using the table at Villa Ciani and become curious to visit the exhibition.

4.5. Case study: A WINDOW ON THE WORLD - Multimedia

4.5.1. Rationale

The exbition "*A Window On The World*, from Dürer to Mondrian and beyond. Looking through the window of art: visions from the Renaissance to today" was held in two separate venues at the Museo Cantonale d'Arte and the Museo d'Arte di Lugano, from September 2012 to January 2013. The window, one of the most intriguing and significant subjects in Western art is its theme, presented throughout a corpus of more than 200 works and featuring 114 different artists. Tracing out an itinerary that aims to illustrate how the window, both as an instrument and as a subject, helped shape and transform artistic languages through forms as disparate as drawing and video, the exhibition is arranged around a series of thematic clusters, with an itinerary that begins in the Quattrocento and ends with the historic avant-garde, to conclude with latest works from the contemporary age. For this emblematic exhibition, a multimedia support has been created, including four different multimedia narratives (two for each museum): one on the general themes of the exhibition and one on a selection of works.

The multimedia sections have been developed using the technology 1001stories. This process has been concluded in less than 2 months and the following are the outcomes of A WINDOW ON THE WORLD -Multimedia:

- 4 (+ 4 +4) "interactive narratives" for the Web (12 themes, 39 highlights)

- A "set of playlists" downloadable for MP3 and MP4 (iPod, smart-phone, and similar devices).

- A Virtual Tour

All this in the frame of a website, created independently by the City of Lugano and the two Museums, hosting additional information for the press and the public, as well as practical information. All material is available in three languages: Italian, English and German

As to simplify, WINDOW ON THE WORLD -Multimedia includes several multimedia productions developed to promote and support the exhibition's content, breaking down technological barriers. PC, iPhone, smart phones, iPad, etc.. can be used to explore the various aspects of the exhibition, such as themes, works, insights. Visitors can explore the show from home, download the multimedia content on offline devices, bring their tablets on site, or enjoy the many possibilities offered by multimedia.

The Multimedia section includes also a Virtual Tour: used as a guide in the museum, or from home, the multimedia visitor could experiment a new way of exploring the exhibition, moving from room to room accompanied by the introduction to the themes and techniques, as well as the highlights on the works. An innovative experience, with the use of the most modern technologies.

4.5.2. WINDOW ON THE WORLD -multimedia

WINDOW ON THE WORLD-multimedia is the result of a 2 months production, from the preliminary discussions with the two hosting Museums and the many stakeholders involved, to its delivery and online publication.

Once the communication strategy has been agreed forthrightly among the many parties involved, the content making process have started, including the gathering of the content (both textual as well as iconographic), the making of the videos, the narratives, the hosting website.

The multimedia narratives have been developed using the technology 1001stories and the Virtual Tour of both the hosting premises has been developed, allowing visitors to "visit" or "re-visit" the exhibition at a distance.

WINDOW ON THE WORLD-multimedia, as to simplify, has been created following few easy step:

- preliminary research on the topics of the exhibition
- interviews with the exhibitions' curators
- creation and editing of the content and iconographic research
- professional recording of the textual content and delivery of audio files
- creation of the website
- delivery of the multimedia- application

The final product allows a delivery over various formats on several devices/channels: web (also from mobile devices, like iPhone, iPad, smartphones etc.), podcast, CD-rom, social spaces etc.

More in detail, as far as the content concerns, one multimedia section is dedicated to the general themes (in number of 6 for each Museum, being then a total of 12), identified by the curators of the exhibition. They explain the cultural context, the themes and the approach of the exhibition itself. The thematic narrative is organized as a sequence of 6 pieces of content, each about a specific subject and referring to particular work of the artists exhibited. Each item consists of an audio, lasting an average of 1.5 minute, plus a slideshow of images (6 to 8) with their captions, allowing the user/visitor to get a complete overview of the exhibition's themes in about 15-20 minutes

Figure 23. 'WINDOW ON THE WORLD -Multimedia:
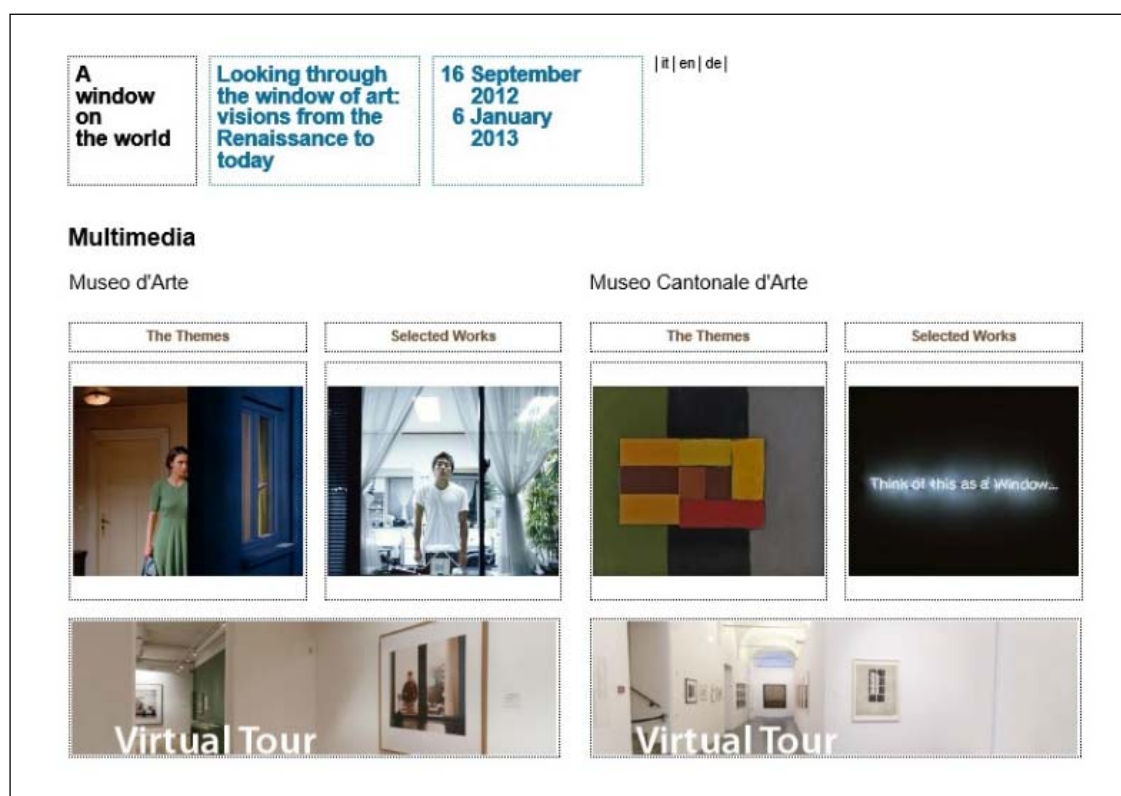***a screenshot of the (web) home page***

Figure 24. 'WINDOW ON THE WORLD -Multimedia: a screenshot of the
(web) multimedia home page

From the "Themes", the user is pointed to related artworks, thanks to links to "Highlights", to provide insights when relevant. Of course, these pieces of content can also be accessed on their own, as a small multimedia catalogue.

As anticipated, another multimedia section, the "Highlights", is dedicated to a selection of works, chosen by the curators among the many works exhibited, as particularly emblematic. This multimedia production presents a selection of 21 artists/works for Museo d'Arte and 18 artists/works for Museo Cantonale d'Arte.

All multimedia items, can be driven by random selection as well as linearly and can be accessed via PC, iPad or iPhone, smartphones and tablets in general, online as well as off-line. Once again, this multi-channel and multi-format delivery has been reached with basically one authoring effort (including some "adaptive adjustments") and one technological effort.

To effectively support a number of different user experiences, four different communication formats were developed, exploiting an innovative approach to adaptivity.

The user can either listen to the entire sequence automatically or select what interests more.

e. The Themes

The thematic narratives could act as introductions, to be used before the visit (at home, while driving to the exhibition, on a train, etc.), after the visit, to enhance recollection or during the visit, to get an overview of the themes that recur in the different rooms

f. Catalogue (of highlights)

A number of exhibited works have been selected by the curators as more representative and a multimedia item has been created, each one about 1 minute long. As well as for the Themes, the highlights too can be consumed either following the list order or by specific selection. If accessed via mobile device (either

online or as downloaded podcast), they can be used during the visit as audio-guides or interactive guides (see below).

g. Interactive guides

The pieces of content developed for the thematic narratives the multimedia catalogue can be used as interactive guides (over mobile devices). The thematic narratives introduce the background. The themes on which the exhibition has been created and the main theme of each room. The highlights comment on the exhibits.

h. Virtual Tour

A virtual tour has been included, allowing the user to move around the exhibition space and room.

All these different formats were developed thanks to an innovative approach to adaptivity. With one single effort, in terms of content authoring and technology, four different versions are the deliverables.

4.5.3. Critical discussion

In the frame of the long term cooperation with the City of Lugano and its museums, the multimedia and interactive production created on the occasion of the exhibition Window on the world represents an important success. Namely, the delivery of a multimedia production in 3 languages (Italian, English and German) with 51 narratives (12 themes, 39 highlights) and 2 Virtual Tours in less than 2 month time! For this occasion, indeed, the multimedia content have been created and provided to the Museums (and the City of Lugano) who have included a multimedia section in the website created for the occasion.

WINDOW ON THE WORLD -Multimedia, has been developed to promote and support the exhibition's content, breaking down technological barriers. PC, iPhone, smart phones, iPad, etc.. can be used to explore the various aspects of the exhibition,

such as themes, works, insights. Visitors can explore the show from home, download the multimedia content on offline devices, bring their tablets on site, or enjoy the many possibilities offered by multimedia.

The Multimedia section includes also a Virtual Tour: used as a guide in the museum, or from home, the multimedia visitor could experiment a new way of exploring the exhibition, moving from room to room accompanied by the introduction to the themes and techniques, as well as the highlights on the works. An innovative experience, with the use of the most modern technologies.

4.6. Case study: KLEE MELOTTI - Multimedia

4.6.1. Rationale

The exbition "KLEE-MELOTTI", held at Museo d'Arte, Lugano, in March-June 2013, traces a line along the production of two artists separated by 22 years and 300 kilometres: a painter, and a sculptor. One, is the Swiss German painter Paul Klee (1879-1940); the other is Italian sculptor Fausto Melotti (1901-1986). The two artist met posthumously in Lugano's Museo d'Arte through an exhibition of their works featuring more than seventy paintings, watercolours and drawings by Klee and eighty sculptures by Melotti. The exhibition moves through an itinerary of shared themes and reveals their affinities: the colours, the rhythmic or geometric design of Klee's paintings seem to find their three dimensional embodiment in Melotti's sculptures. In their youth both artists were passionately fond of music and the cadences, rhythm and melodies of music offer a hidden key to interpreting the exhibition.

For this emblematic exhibition, a multimedia support has been created, including two multimedia narratives:

- one on the general themes of the exhibition

- one on a selection of works of both artists

The multimedia sections have been developed using the technology 1001stories.

This process has been concluded in approximately two months and the following are the outcomes of KLEE MELOTTI -Multimedia:

- 2 (+2) "interactive narratives" for the Web (themes, highlights)

- A "set of playlists" downloadable for MP3 and MP4 (iPod, smart-phone, and similar devices).

- A Virtual Tour

All this in the frame of a website, created independently by the City of Lugano and Museum, hosting additional information for the press and the public, as well as practical information. All material is available in two languages: Italian and English As to simplify, KLEE MELOTTI -Multimedia includes several multimedia productions developed to promote and support the exhibition's content, breaking down technological barriers. PC, iPhone, smart phones, iPad, etc.. can be used to explore the various aspects of the exhibition, such as themes, works, insights. Visitors can explore the show from home, download the multimedia content on offline devices, bring their tablets on site, or enjoy the many possibilities offered by multimedia.

The Multimedia section includes also a Virtual Tour: used as a guide in the museum, or from home, the multimedia visitor could experiment a new way of exploring the exhibition, moving from room to room accompanied by the introduction to the themes and techniques, as well as the highlights on the works. An innovative experience, with the use of the most modern technologies.

4.6.2. KLEE MELOTTI -multimedia

KLEE MELOTTI-multimedia is the result of approximately two months production. The content making process has involved conversations and interviews to the curator of the exhibition, leading to the writing of the textual content. At the same time, the museum staff has provided the iconographic content. The making of the videos, the narratives have followed. The hosting website has been created by

the Museum and the City of Lugano, and it includes a multimedia section, where the multimedia content has been included. The multimedia narratives have been developed using the technology 1001stories and the Virtual Tour of the hosting premises has been developed, allowing visitors to "visit" or "re-visit" the exhibition at a distance. KLEE MELOTTI-multimedia, as to simplify, has been created following few easy step:

- preliminary research on the topics of the exhibition
- interviews with the exhibitions' curators
- creation and editing of the content and iconographic research
- professional recording of the textual content and delivery of audio files
- creation of the website
- delivery of the multimedia- application

The final product allows a delivery over various formats on several devices/channels: web (also from mobile devices, like iPhone, iPad, smartphones etc.), podcast, CD-rom, social spaces etc.

As far as the content concerns, this multimedia production hosts one section dedicated to the general themes (in number of 10) identified by the curators of the exhibition and a selection of works (in number of 20: 10 for each artist, juxtaposing themselves). The thematic section explain the cultural context, the recurrent themes along the artist's work. The thematic narrative is organized as a sequence of ten pieces of content, each about a specific topic. Each item consists of an audio, lasting an average of 1.5 minute, plus a slideshow of images (6 to 8) with their captions, allowing the user/visitor to get a complete overview of the exhibition's themes in a glimpse. The highlights section provides information on the artists and their works one next to the other. The curators have selected 10 work for each artist.
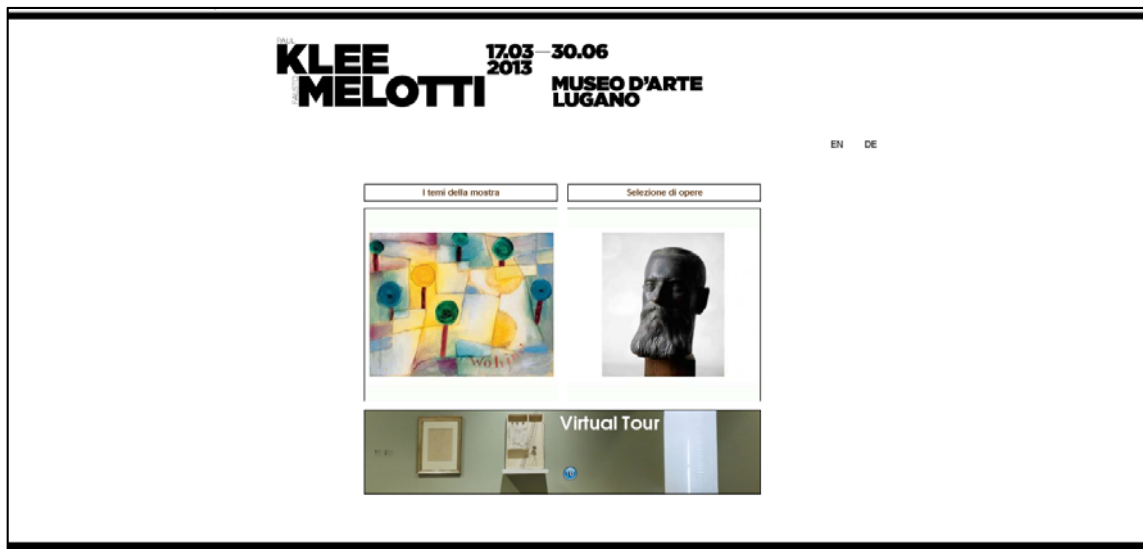
Figure 25. 'KLEE MELOTTI -Multimedia:
a screenshot of the (web) multimedia home page

From the "Themes", the user is pointed to related artworks, thanks to links to "Highlights", to provide insights when relevant. Of course, these pieces of content can also be accessed on their own, as a small multimedia catalogue.

As anticipated, another multimedia section, the "Highlights", is dedicated to a selection of works, chosen by the curators among the many works exhibited, as particularly emblematic to confront the work of the two artists.

All multimedia items, can be driven by random selection as well as linearly and can be accessed via PC, iPad or iPhone, smartphones and tablets in general, online as well as off-line. Once again, this multi-channel and multi-format delivery has been reached with basically one authoring effort (including some "adaptive adjustments") and one technological effort.

To effectively support a number of different user experiences, four different communication formats were developed, exploiting an innovative approach to adaptivity.

The user can either listen to the entire sequence automatically or select what interests more.

i. The Themes

The thematic narratives could act as introductions, to be used before the visit (at home, while driving to the exhibition, on a train, etc.), after the visit, to enhance recollection or during the visit, to get an overview of the themes that recur in the different rooms.

j. Catalogue (of highlights)

A number of exhibited works have been selected by the curators as more representative and a multimedia item has been created, each one about 2 minutes long. As well as for the Themes, the highlights too can be consumed either following the list order or by specific selection. If accessed via mobile device (either online or as downloaded podcast), they can be used during the visit as audio-guides or interactive guides (see below).

k. Interactive guides

The pieces of content developed for the thematic narratives the multimedia catalogue can be used as interactive guides (over mobile devices). The thematic narratives introduce the background. The themes on which the exhibition has been created and the main theme of each room. The highlights comment on the exhibits.

l. Virtual Tour

A virtual tour has been included, allowing the user to move around the exhibition space and room.

4.6.3. Critical discussion

The KLEE MELOTTI-Multimedia is a good example of content adaptation for different scenarios: the content items about the works of art were re-used with little adaptation and within a short time and little manpower to create a virtual tour about the

exhibition. Indeed, all these different formats were developed thanks to an innovative approach to adaptivity. With one single effort, in terms of content authoring and technology, different versions are the deliverables.

Starting from a interviews, that provides the core of the narratives, and a number of high quality images, production moved on in quick time. Content items have been conceived as building blocks pieces that could be eventually recombined to support a number of user scenarios without having to recreate the content from scratch.

The exhibition traced a line along the lives and production of two great artists, highlighting their affinities, and sharing them with the large public with a selection of highlights.

5. Lesson learn

The multimedia content developed on the occasion on these exhibitions varied according to the museums indications, their purposes and the available material and time, proving it to be, as well as the toolkit, flexible and on ongoing development. Moreover, being the number of formats increasing, following the newest available technologies, the communication developed accordingly.

Out of the numerous aspects, the approach behind the development of this multimedia productions focuses on few specific aspects: Instant Multimedia, multi-format (multichannel), and adaptativity.

Instant multimedia – an approach common to different domains – allows to create good and affordable content for small, fast, low-budget projects that otherwise would risk to lack in quality.

Reinforcing some aspects on the toolkit, such as the production workflow, has helped further reducing time and effort required for delivering high quality applications.

Multi-format/multi-channel delivery represents today a necessary feature: the variety of devices for "content consumption" grows at fast pace, as well as the variety of user experiences and user profiles; today, the number of needs, situations, and contexts are so numerous that the family of devices and formats must be expanded parallel to the growth of technologies, to achieve a better quality and meet users' expectations.

Today more than ever, "Everywhere, for everyone and anyhow" is coming true.

Adaptativity is a very relevant feature as well. Delivering the "same" content over a variety of devices and formats implies a "making process" highly adaptable (both technologically and conceptually). Content must be re-used and therefore created accordingly. As far as architecture is concerned, content items are single "blocks", so that content items can be re-used across different content structures.

The case studies illustrated in this work have been selected to provide an example of successful multimedia production, created with these methodologies, each one including - among some recurrent aspects - different and innovative features.

All these productions show different angles and results of the very specific focus this work carried on, namely the creation of a flexible framework that could be applied to different situation and meeting a number of various requirements. The resulting framework (*1001stories +*) consists of three overall components:

- **an authoring/delivering environment** (1001stories) that can be used by non-technical content editors, to generate high quality content
- **a content development methodology** for adapting content to various needs and various devices
- **an overall workflow**, suggesting how to organize and manage the various steps for content production.

My work has been on multiple levels and includes the outlining of its conceptual development, aiming at drawing an overall workflow and a methodology for creating multimedia content that could be easily adapted for different purposes, channels and deliveries.

In particular, my work has contributed to:

- set the specifics for its conceptual and technological development (authoring and delivering environment)
- outline a content development methodology
- outline its overall workflow

Furthermore, this work aims at showing and convincing curators, directors and professional of the Cultural heritage field in general that multimedia does not only represent a way to enhance temporary exhibitions, but it is a significant instrument to better illustrate permanent collections. Indeed, a future development of this work is to create a multimedia gallery of past exhibitions held by the same institution. A sort of multimedia reenactment of past exhibitions to keep the material produced "alive". Current (worldwide) practice is to consider multimedia support as transitory "objects" rather than "stable" material. Multimedia, as this work intends it, it is not a short-lived phenomenon but a tangible, everlasting content.

Indeed, within this frame, Museums could:

- offer permanent collections a new life (or bring them to a new light)
- reuse existing content material in many different ways, according to situations and needs
- allow crossover productions

All this in a very effective and affordable way.

IV. The Framework

1. Introduction

This chapter illustrates an original approach and a new architecture for generating a framework for Multimedia-Communication in the field of Cultural heritage, enjoyable throughout a large number of devices, in different formats and for a number of situations, both for those users who visit museums and those who browse the Internet. Based on the "Instant Multimedia" approach and the "1001stories" engine, this framework sprang from the basic idea that content must be flexible, reusable, adaptable and agile to move from one experience to the next, according to the different needs and scenarios.

Moreover, in this particular age in which short time and low budget appears to be the mainstream characteristic of Museums and Cultural heritage institution in regard of communication, Multimedia applications must be easy to produce and – not secondary - to maintain.

Therefore, this framework has its roots in adaptivity, a crucial aspect taken into consideration while proceeding with its design, aiming at producing content that - within a single effort - could be organized for a variety of devices and formats.

At the origin of this work, there has been several Multimedia application developed for different purposes: museums' and exhibitions guides and supports, a large number of narratives developed for schools, companies, museums, etc.

These previous experiences, developed with the "1001stoires" engine, showed interesting examples of tailor made multimedia narratives. To this original "proposal", this work added a component: a set of actual cases that could become a more complete "package". We felt that while there have been many theories, discussions and many solutions on creating multimedia narratives, yet there was a need for practical experiments from which much knowledge could be gained.

This publication, accompanied by a number of websites and multimedia material available online, is integral to my goal of sharing information and directly involving Cultural heritage institutions concerned with multimedia, multichannel communication.

This framework's goal is to engage the museums and cultural heritage institutions in general as a critical and intellectual space able to embrace new approaches, responding to new developments globally. Furthermore, it aims at establishing a process bringing to a flexible attitude in looking at multimedia and therefore in using it.

2. Design

The increasing number of technologies and devices allows cultural institutions to provide a large variety of different user experiences. For a number of reasons, however, these different communication "channels" often diverge; it is common practice, indeed, to prepare different texts for the exhibition space and for the web, even when referring to the same artwork; for the audio guide and for the interactive APP; etc.

The occasion to concentrate on a novel design for a new, complete framework, has been provided firstly around the end of 2010 by the necessity of developing a multimedia support for the exhibition and events "NIPPON: Between Myth and Reality: Arts and Culture from the Land of the Rising Sun". In less than three months, providing online and offline multimedia application on four exhibitions, in addition to a websites and some videos.

This project represented a great challenge, for a number of reasons:

- The short available time from commission to development to delivery
- The huge amount of content
- The numerous stakeholders
- The limited budget

These constraints favored reflection on a unifying conceptual/technological framework allowing a unique content development that can be (adaptively) delivered on the various channels.

What is the design needed behind this result? The developing plan of this framework has taken into consideration functionality, structure, interface. In other words, capturing the most important ideas and communicate in an effective way.

The requirements have been narrowed down to the following:

- Variety of intended users' profiles: the framework must allow targeting specific user profiles at reasonable cost and effort, to address specific categories of users;

- Variety of users' experiences: the multimedia narratives must be played with a variety of devices and for different types of user experiences;

- One authoring environment = several outcomes.

2.1 Model for adapting content

Previous chapter have shown the authoring environment, 1001stories, its structure and technology. This paragraph focuses on the model for adapting content, allowing the framework to be valuable in Cultural heritage, satisfying different needs, scenarios and version of the same application, sketching both the guidelines for authors and the requirements for the authoring environment.

Moving content across different channels entails a number of often underestimated issues, like media transfer. When transferring a text supporting a video to an audio only support, is the text still appropriate and clear? Or when text is specific indocations for audioguides to be used in exhibitions spaces, what purpose does this optional content serve?

Few examples are:

- Directions
- Information on the institution
- etc…

Being adaptivity the first need, content must have been modeled first, narrowing a number

of cathegories in which content items could be organized, in the Cultural heritage domain,

as argued elsewhere (Di Blas, Negrini, Paolini et alii, 2011) [1]

- α-Alfa: a general cultural observation
- β-Beta: a general "factual" information
- γ-Gamma: an interpretation of a factual information
- δ-Delta: a specific factual information about an artefact

This categories belong to different subjects, such as – to mention a few - interpretation of the exhibited objects, artist's biography, historical context, technique, etc... In this perspective any cultural heritage communication product (catalogues, educational materials, audio-guides, …) can be modeled as a set of different α-β-γ-δ statements, each one with its own different – and peculiar – features.

Mixing the above categories, or with only some of them; providing the others in separate sessions or assuming they are already in the knowledge of the users.

On the ground of the above content modeling, adaptation can now be discussed. Adaptation means that the multimedia application needs to be "adjusted". Four are the major reasons for adapting content (that often intermix with each other.)

- *Adaptation to devices*

  Besides the strictly technological aspects (formats, players, etc…) the type of device determines the relative weight of media and the amount of information that can be delivered together. A device with a large screen allows a proper combination of images (video), audio, text and links whereas with a small device, text must be used parsimoniously, audio becomes very important, images can be used, but not many at once. On a small device (eg. a mobile phone) content items can be delivered one at a

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[1] Campione, P., et al., *A "Smart" Authoring and Delivery tool for Multichannel Communication*. In J. Trant and D. Bearman (eds). Museums and the Web 2011: Proceedings. Toronto: Archives & Museum Informatics. Published March 31, 2011.
http://conference.archimuse.com/mw2011/papers/smart_authoring_delivery_tool_multichannel

time and few links can effectively be used. Due to their technical features, the information architecture presents different levels of complexity for different devices. If several links can be displayed at once, a greater control (with a larger number of options) can be left to the user. For small devices, simpler structures (such as sequences in semi-automatic playing) should be preferred.

Solution:

o Each content item ($\alpha/\beta/\gamma/\delta$) should be available in different versions, each one suitable for a class of devices.

o In order to support the same "user experience", different information architectures fitting different devices should be defined.

- *Adaptation to user experiences*

  The same application may be tuned to fit different needs. As argued elsewhere (Paolini & Rubegni, 2009)[2], 4 main situations of use must be distinguished.

  ➢ Before the visit

  o users browse through the application, in order to decide if the exhibition is worth a visit

  o users prepare for the exhibition they have decided to visit

  ➢ At the exhibition

  o users want to understand the overall subject of the exhibition

  o users want to get information about a specific exhibit

  o users want to be "taken around" in a path across the exhibition

  ➢ After the visit

  o users want to better understand the overall subject of the exhibition

  o users want to "virtually reenact" the visiting experience

  ➢ Independently from any visit

  o users want to understand the overall subject of the exhibition

  o users wants to be "taken around" in a virtual tour of the exhibition

This list is not exhaustive and inflexible, but many are the possible variants, to be considered in addition to other elements, such as device, profile and context, as well as the physical situations Content modeling is crucial for the user experience, determining the relevance of the different items, for the overall understanding (α/β items) and the understanding of the specific exhibits (γ/δ items).

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[2] Di Blas, N., Rubegni, E., Paolini, P. (2009) Instant Multimedia (Multichannel) Communication for Cultural Heritage: the Enigma Helvetia Case-Study, JoDI, Journal of Digital Information Vol 10, No 3 (2009), Texas Digital Library

Solution:

- o decide the user experiences to be supported
- o for each user experience:
  - shape a different (adapted) information architecture
  - select the most relevant $\alpha/\beta/\gamma/\delta$ items and place them within the architecture
  - (possibly) adapt the content items and the architecture to fit different devices

- **Adaptation to user profiles**

  Different user profiles may need different content for a number of reasons:
  - different general backgrounds
  - different individual backgrounds: experts and professionals vs non experts.

  Solution:
  - o decide which users profiles need to be supported;
  - o define the α/β- γ/δ-items to be provided for each user profile (few variations are foreseen);
  - o Create the proper information architecture to hold the items. This may be very difficult, since straightforward solutions can't be easily adopted.

The common solution, today, is to take a "generic profile" as point of reference, to which everyone has to accommodate. This solution is easy to implement but quite unsatisfactory for the user: no one is a real "generic" user; each user, in a given situation, is more or less qualified with respect to the information provided. We should strive for truly adaptive information architectures, instead.

- **Adapting to the "context of discourse"**

  Content, in general, is created in a specific context for a specific purpose. The context could be: "overall subject", "section of an exhibition", "an exhibition", "date of the exhibition", "institution where the exhibition is happening", "city", "country". Reusing the same content item in a different contexts may disorientate users, from a mild to a severe degree.

  Solutions:
  - o If possible, make content items context independent; this would work well only in a few cases, where the subject is so neutral that it can be placed anywhere.
  - o Make the context description part of the content; this would not work well if the user has to go through a series of items all sharing the same context.

o Use different media (like ARTBABBLE) for the content (video) and the context (text). This will not work well when text can't be visualized (e.g. small screen, visual impairment, user driving etc.)

2.2 An innovative authoring environment

The production of content items "adapted" to different devices, user experiences, user profiles and contexts, requires a good design methodology and a good authoring environment. Since its first development, 1000stories has been implemented becoming a full authoring/generation/delivery environment, still easy to use, but supporting a variety of options and features. Two are its most relevant features, sketched in figures 26 and 27.
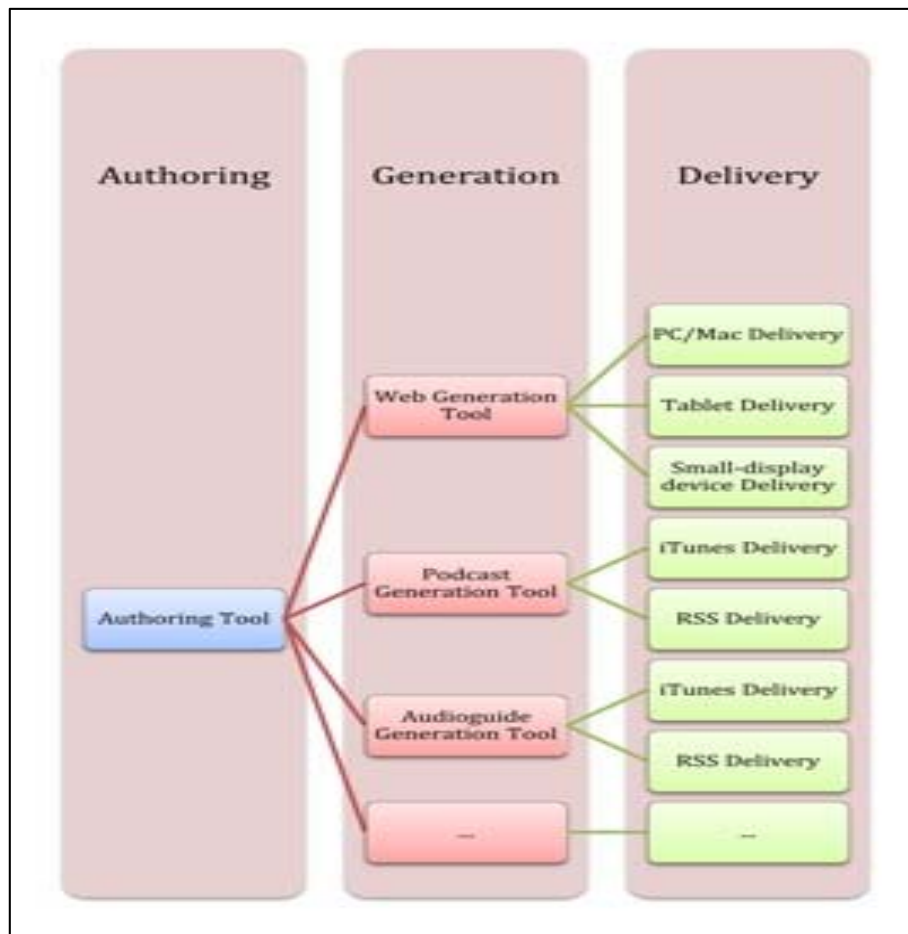

Figure 26. Contents-items are first authored and later "adapted" to different devices and user experiences, "generating" different applications.

a. One authoring for several applications

The core idea is to split "authoring" in strict sense (text, images, audio creation) from the generation of specific applications, tuned for specific devices and/or specific user experiences, user profiles or contexts. Generating a specific application means shaping the interface and the interaction mechanisms, selecting the content items, adapting them and organizing them into an information architecture. Some of the above can be automated 100%, some requires additional authoring (to be kept at minimum, however). For example, the same multimedia narrative can be delivered in several versions:

- Online, via WEB from PC or via a mobile device;

- As podcast, for taking the playlist at the exhibition;

- As one element of a broader multimedia production, supporting a pre or post-visit presentation;

- As the basis for a complete audio-guide or an interactive multimedia guide.

The first two versions can be generated 100% automatically. The third requires a small authoring addition per each content item, which is easily done. The fourth (building an audioguide/interactive guide) requires (a small) additional authoring intervention, for example for providing directions at the exhibition premises.
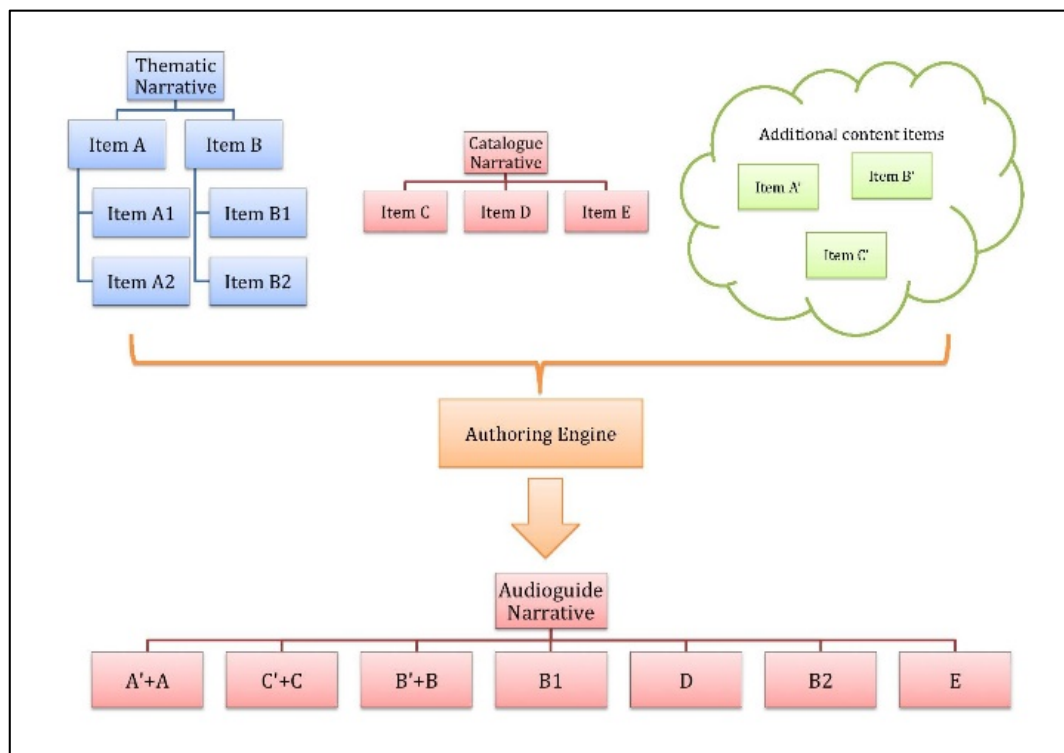

Figure 27. Content-items can be reused, adapted and combined in order to provide different user experiences.

b. Supporting reuse and adaptation

Aiming at maximizing reuse and adaptation, information architectures can be morphed, fragmented, merged, mashed-up, etc… The ultimate goal is to take the developed content and reuse it (possibly with some little adaptation) for a number of different and original multimedia productions: for exhibitions, retrospectives, touristic guide, catalogues, , etc….

Proper reuse of content means providing substantial benefits:

- "Horizontally", at a certain time:

  Authoring is intrinsically expensive, since knowledgeable people are involved to convey information and emotions to users. It is therefore important to maximize the outcome:
  - o Supporting a variety of devices
  - o Supporting a variety of user experiences and profiles
  - o Supporting a variety of contexts of usage
  - o All the above combining quality with low costs and short development time.

- "Vertically", over time:

  Multimedia content, developed for a specific event, is "locked" in the audio-guides or multimedia guides and thrown away when the event is over, or "archived", becoming practically invisible, not to be used anymore. It would be desirable for each institution to reuse its content over time, repurposing it for different situations (a different exhibition, a catalogue, etc...).

3. The Framework: 1001stories+

At the very core of this work is the full-fledged framework "*1001stories+*", developed for facing the various issues related to delivering high quality content over various technologies and devices, serving various purposes and various situations of usage.

The framework consists of three overall components: an authoring/delivering environment (1001stories), a content development methodology and an overall workflow.

1. An authoring/delivery environment that can be used by non-technical content editors, to generate high quality content.
2. A combination of methodologies for adapting content to various needs and various devices.
3. An overall workflow, suggesting how to organize and manage the various steps for content production.

My work contributed to dictate specific features and requirements. Specifically, the framework does not include aspects such as:

- Entertainment
- Gaming
- Social spaces

which have been proven by other case studies to add little benefits to museums.

Therefore, they are not part of my proposal, or my thesis, although experimented in two occasions (Case studies: *Nippon* and *Man Ray* Multimedia, Chapter 3, Section 4 "*Case studies*"). At present time, still very few are the positive case of use.

The framework can be simplified using metaphor of a box of building blocks, each one representing a piece of multimedia communication that can be combined with the other allowing the creation of unique multimedia products.

This structure allow the creation of different products according to the needs, the situation, the available material, the requirements, etc.

Moreover, it allows a development according to the many available technologies and the future to come. The "*1001stories+*" can be considered with no doubt as the offspring of the authoring environment 1001stories, described in chapter II.

With respect to that ancestor, it represents an evolution in some respects:

- The authoring environment is much more powerful and flexible
- The generation/delivery engine has become more general and tunable (in order to fit various deployment needs)
- Content production methodologies have been better defined
- The overall production workflow has been identified and standardized

The following are the components of the framework. The first component, authoring/delivering environment is here split and described in two paragraphs, each one dedicated to a single aspect.

A. The authoring environment

The authoring environment allows a sophisticated production of small multimedia "items". Each item can be created by one or more "fragments", which cannot be played individually (as fragments), but only as whole items. The typical structure of each fragment presents a "read-component", a "visual-component" and a "audio-component".

The read component is textual (with no specific formatting required). The visual component can be of various kinds: a sequence of images (e.g. pictures or slides) a video or an animation. The audio component consists of an ordinary audio.

An item consisting of several fragments (in a given order) is a stich of the constituents fragments (each one created by its specific components).

The above structure is easily adaptable, and can host complex situations; for instance when fragments do not have all three components, may this be the case of an item composed by two fragments, each one "missing" a component. For examples the first fragment has 3 pictures, the second fragment has a "silent video", and there is a unique audio track spanning over the two fragments. A set of rules defines the "length" of an item when it is played.

Advanced features

There are special fragments, generically labelled "pre" or "post". A fragment "pre" can be stitched only before all the other fragments, while a "post" can be stitched only at the end. There are several uses for these special fragments: for example they can be used to provide context information (e.g. the name of the museum) or practical info (e.g. "in order to reach next stop you have to…").

These fragments are a key aspect of content adaptation and they can be "tagged". During the generation phase (see below) only the fragments with a given tag will be used, and in the specified order.

Items are combined into "narratives". Presently, we have two types of formats (with two more already "designed"):

- Flat: basically a playlist of items
- Tree: items are arranged in a hierarchical fashion (two levels). The top level represent the "short version" of the narrative, while for each item of the top level a sub-tree provide details.

A format corresponds at the same time to an information architecture and to a way to play it. Consider for example" a catalogue with 20 works. We would probably associate to it a flat narrative, which is a playlist. This playlist can be played in a number of ways: sequentially (following the exhibition), randomly (in correspondence to a number displayed on the side of the work), automatically (e.g. by position detection), etc.

Advanced features

Narratives can be grouped in a "cluster". For example, for a multimedia production, including 4 narratives ("themes", "techniques", "catalogue", "virtual visits"), items can be linked to other items of narratives belonging to the same cluster. Items can be also linked to "external resources": files that can be played, PdF files, URLs and alike. Narratives therefore can be used to access a host of external information.

B. The generation/delivery environment

During the "generation phase" a "content editor" decides which narratives must be generated and selects the proper "generation parameters". The parameterization may include the identification of the device(s), the selection of the media should be included, the indication if tagged fragments must be included or not, or if linked items must be included or not, etc. The output of the generation phase is a "generation database", where the items are stored (processing the various fragments) only including the needed media and with the suitable organization.

After the generation, there is a "delivery process" that makes the final results available: e.g. a website, a playlist, a podcasts, an interactive APP, videos for YouTube, etc.

The separation between "generation" and "delivery" may seem useless, but actually, it is crucial for saving costs and times. Generation corresponds to an editorial choice, while the deployment depends more on technology. Therefore the generation process has some intrinsic complexity (e.g. properly combining the media of various fragments) while the deployment has only strictly technical problems.

This solution has several advantages. Just to mention a few, whenever a new technology appears, it simply needs to have a new driver added for deployment (which is relative simple) without needing other

modifications for the generation process (which is cumbersome and expensive); in other words, narratives can be easily adapted to a new technology not foreseen at the time the narrative was created.

C. Production Methodologies

A key point of this framework is the identification of a suitable production methodology that allows to keep costs down and delivery time fast, while ensuring a good balance with quality. The central procedures are the following:

- In the very first stages the "story" to be told is fragmented in a number of items
- Each item is developed almost independently from the others; sometimes different people work at the different items, with a parallel production process
- For each item the "visual" component is developed independently form the other components
- By far, the "generation" of video from images and pictures is preferable, rather than editing real video which is high time consuming
- The visual components are assembled with the textual components and tested with an "in-house" audio track (using non professional speakers)
- When the final version of the textual components is available, professional audio (with professional speakers) is recorded.
- Once everything is assembled, the visual components are revised and still improved in order to better match the audio

The production flow depicted above ensures that complex stories can be delivered in a rather short time, allowing to work on several stories at once.

D. Overall workflow

Once the backbone of a story is created, it is often "morphed" into several versions: for standard delivery on the web, for smartphone, for a virtual visit, for a visit on site, for a YouTube channel, for a "paper" version, etc.

Sometimes these various incarnations require some degree of content adaptation, in the sense previously described in this section. In most cases, content is added rather than modified. Assume, for example, that a "Catalogue" is created for the web, with a short story for each exhibit; if we wish to obtain an "on-site guide", the following could be the steps:

a) The works are rearranged in the proper order for a visit

b) Pre-post fragments are created in order to support the visit; i.e. before moving to next exhibit (or after the current exhibit) the visitor is given proper instructions about how to move around.

c) A proper "introduction item" is created (for introducing the visit), and a "closure item" as well (for a farewell to the visitor).

One working day is an approximate and realistic estimation for transforming the web catalogue into the guide that can be delivered as a web application or an interactive APP. The overall workflow is agile and flexible, allowing to quickly reacting to new usage needs or for modifying the delivery technology.[3]

3.1 Issues and objectives

After more than a decade of innovative research and development, today Cultural institutions aim at delivering multifaceted cultural experiences, and therefore they have come to become not only home of artifacts, but also publishers and broadcasters of engaging, educational and authoritative digital content. With the rise of Internet, social web and the many available devices, digital culture is being intertwined into the daily lives of consumers and have contributed to the transformation of the way cultural institutions think of themselves.

Furthermore, in recent years the possibilities of deploying Cultural heritage content has been greatly enhanced, with the large varieties of channels available: "traditional" web, web for mobile devices, apps for mobile devices, audio guides, multimedia guides, YouTube, Facebook, other video channels, large displays, multi-touch tables, podcasts, virtual visits, phone calls….

The various channels serve different purposes: providing practical info, allowing would-be visitors to prepare their visits, supporting visitors during their visits, allowing past visitors to further explore content, allowing some kind of virtual visits, supporting "learning activities" for students and teachers, supporting research activities by scholars, etc.

It is often the case that a cultural institution facing a new delivery channel or supporting a new purpose, create new content rather than reusing (possibly after some kind of adaptation) an existing one.

There are several reasons for such an apparently surprising behavior:

- Technical motivations: each device/technology may require different technical formatting, different interfaces, different interaction paradigms, …

- Organization motivations: different channels/devices are often taken care of by different teams. Thus, it is often the case that the web, the multimedia guide, the podcasts, the audio guide, are all different.

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[3] M. Negrini and P. Paolini, *A framework for multipurpose content development*. In Museums and the Web 2013, N. Proctor & R. Cherry (eds). Silver Spring, MD: Museums and the Web. Published June 16, 2014. http://mwf2014.museumsandtheweb.com/paper/a-framework-for-multipurpose-content-development/

- Communication motivations: changing device and technology often corresponds to different situations of usage. A visitor standing in front of an exhibit needs a different kind of communication with respect to a user sitting at home and looking at a web page.

The above situation has some unpleasant consequences for the user who by now is often "multi-channel", i.e. using (at different times) a Pc, a smartphone, an interactive installation, the multimedia guide of the museum, YouTube, podcasts, etc… The user is often getting non-coordinated content (with minor or major differences among the various channels), without understandable motivations.

Negative consequences surface also for the institutions: duplications of efforts, length of time for deployments, costs, just to mention a few. This is especially negative for small institutions that cannot afford to start a new content effort every time that a new technology or a new device must be used.

On the ground of the above considerations, this work aims at improving the situation and making the deployment of content over various channels more consistent, less expensive and more effective.

Hence, the need of producing an effective and affordable multimedia, multi-format communication framework.

The core principles underlying this framework are:

- to separate the process of creating digital content from the specific requirements of how it is delivered.
- to create content simply and quickly
- to repurpose content across many different platforms (increasing hugely the potential reach of that material)
- to keeping pace with changing technology

Until now, museums and cultural institutions in general have faced a very specific problem in embracing these principles.

At present, Cultural Heritage content may embody a number of different devices and technologies; numerous situations of usage and purposes, leaving us to a key combinatorial complexity.

The objective of this work is to support to museums in reaching the widest possible audience, now and in the future, with effective and affordable multimedia, multi-format communication, making the COPE model "Create Once, Publish Everywhere" becoming true.

This work presents a possible solution: a framework for multimedia, multichannel communication that:

1. Provides methodologies and guidelines
2. Is supported by tools
   - Authoring
   - "Adaptation" of content and info-architecture
   - Delivery
3. Is usable by "professionals" with no specific "technical background"
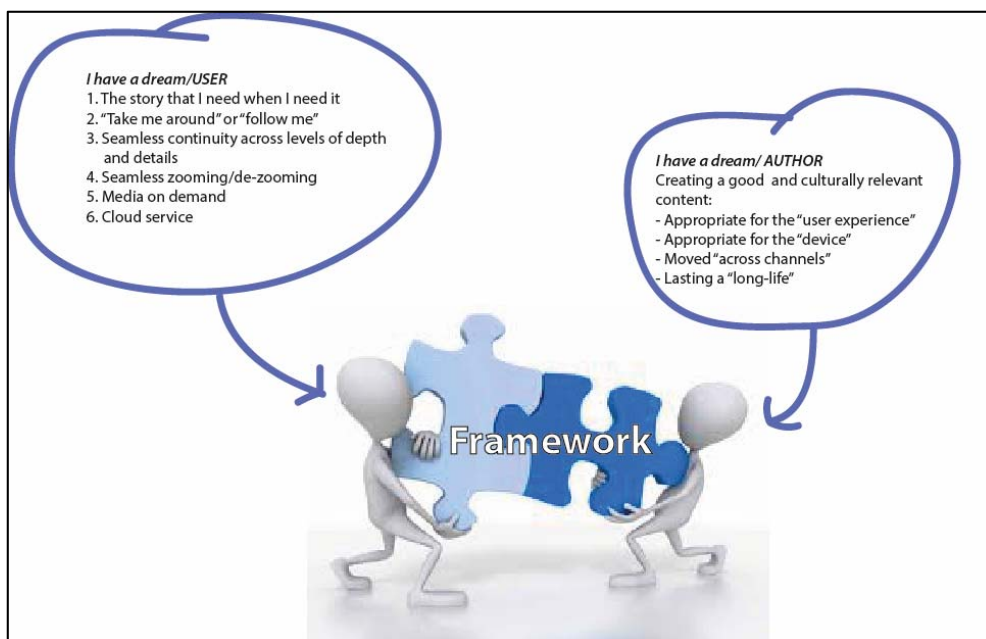
Figure 28. A framework for multimedia, multichannel communication. User and Author perspectives

In its conception and development, this framework has taken into consideration both the perspective of the user and of the author, aiming at producing economically and culturally worth multimedia content.

The *1001stories+* framework allows creating multimedia content that can be moved and reused with simple and little adaptation, according to the different users, scenarios and devices.

Deriving from the TPACK framework (short for Technological Pedagogical Content Knowledge), which has become an increasingly popular framework, it introduces the concept of TCM model, **Technology, Content, coMmunication**, where it highlights that intersections are the crucial point. Furthermore, it emphasizes that understanding the relationship between content organization (information architecture) and content impact is crucial, as well as understanding the "background content".

3.2 Scenarios and different use of Multimedia content

Users access multimedia content at very different time, and different locations and for many different purposes. The following paragraphs present a non exaustive list of the most likely situations users spend some (scarce) time actually going through multimedia content.

1. Before they go to the exhibition (assuming actual attendance)
2. While visiting the exhibition (through panels, interactive kiosks, mobile devices,…)
3. After visiting the exhibition (at the exhibition's premises, on the way back, at home, ...)

4. At any time, independently from a visit to the exhibition
5. Any combination of the above.

It is not the aim here to provide exhaustive scenarios, but rather to provide insights on the different scenarios.

1. <u>Before the visit</u>

- **Possible objectives**: promoting the exhibition (i.e. encouraging the user to visit it), stimulating cultural interest, preparing the user for the visit
- **Possible content**: quick overview of the exhibition, practical information (how to get there, schedule, ticketing …), a few strong cultural "messages", a detailed description of the exhibition and its rationale, detailed descriptions of the works on display (catalogue)
- **Remarks**: preparing the user for a possible visit seems to be a wide-spread desire. Almost all the communication tools that currently circulate (e.g. brochures, Web sites, catalogues…) apparently assume that (a) the readers have not seen the exhibition yet and (b) they are interested into visiting it.

2. <u>While visiting the exhibition</u>

- **Possible objectives**: stimulating cultural interest, conveying the exhibition messages and rationale, allowing the visitors (not just 'users') to enjoy a longer and more rewarding visit
- **Possible content**: quick overview of the exhibition, overview of the main sections/themes of the exhibition, detailed descriptions of the works on display (catalogue), a guide (i.e. a synthetic description of a selected set of objects).
- **Remarks**: there is a large consensus about the need to support visitors during their visits. There are, however, different opinions about which tools to use (e.g. traditional vs. technology-based). There are concerns about competition for time and attention: should visitors take time away from actually looking at the exhibits? Should multimedia information compete for visual attention, with respect to the exhibits? In addition, some detractors argue that interactive devices (whatever the technology supporting them) create a barrier against socialization among the members of a visiting group (e.g. families, friends, couples…).

3. <u>After the visit</u>

- **Possible objectives**: allowing visitors (not just 'users') to reenact the emotions of the visit, supporting a better understanding of the exhibition's meaning and rationale, providing in-depth information (about the artists, the exhibits, related issues …)
- **Possible content/services**: overview of the main themes of the exhibition, detailed descriptions of the works on display (catalogue), issues and information related to the exhibition, 'social spaces' for discussion
- **Remarks:** this is probably the least considered of the various scenarios, in spite of the fact that the catalogue as well as any other material related to the exhibition is usually read (although by a few people) after the visit. What is the right time to provide content? Right after the visit (e.g. at the cafeteria or on the way back)? A few days after the visit? A long period of time after the visit?

4. <u>At any time, independently of any visit</u>

- **Possible objectives**: allowing users to understand what the exhibition is about and its rationale; allowing users to 'virtually browse' the exhibition, offering what may be defined as a 'virtual visit'
- **Possible content**: an overview of the main themes of the exhibition, a 'virtual guide'; i.e. a guide for users who will not actually visit the exhibition, introducing some of the exhibits.
- **Remarks**: does anyone actually want to understand an exhibition that they will never visit? This may be true for special categories of users (e.g. students, researchers, professionals of the field, …) but could also work for normal users as a way to get exposed to something interesting.

5. <u>Any combination of the above</u>

- Objectives and possible content are, clearly, a combination of the above.

This preliminary discussion highlights a few important points: first of all, objectives can be quite different, in relation to the timing. Persuading users to become visitors is quite different from helping them to understand better an exhibition that they have already seen, or that they will never see. Secondly, the corresponding content can be quite different: explaining an exhibition to a visitor who is visiting it (or who has just visited it) is quite different from describing it to someone who has not seen it yet, nor will ever see it.

Thirdly, the purposes moving Users/visitors to use multimedia content are a wide array.

Here follows a selected list of examples:

- **Preparing for a visit:** I would like to challenge the implicit assumption that 'before the visit' is the best time for delivering synthetic, promotional and practical information,
- **Curiosity:** also, non-visitors could be interested in receiving in-depth communication.
- **Learning**: also, non-visitors could be interested in receiving in-depth communication.
- **Supporting a visit:** 'during the visit' is the best time for providing in-depth information.
- **Understanding after a visit:** 'after the visit' could be a suitable time for pursuing a strong cultural impact (providing in-depth content, multimedia material, links to interesting sources, etc.).

Many are also the locations where Users access multimedia content:
- At home
- On site (e.g. visiting the museum)
- On the move (e.g. driving a car, walking, …)
- Public space (e.g. a square)
- Special space (e.g. hall of a museum)
- Etc….

3.3 Production and workflow

Some are recurrent actions for creating material within this framework. The production workflow, indeed, consists of few easy steps

- preliminary research on the topics of the exhibition
- interviews with the exhibitions' curators
- creation and editing of the content and iconographic research
- professional recording of the textual content and delivery of audio files
- creation of the website
- delivery of the multimedia application

and it allows a fast and reliable content production, when flexibility, short time, limited budget but high quality results are constraining aspects.

To sum up, a Multimedia production for a temporary exhibition, including approximately 40 items, a Virtual Tour and a mobile guide can be created in approximately 3 months.

1001stories+ framework offers:

- pleasurable and light-weight approach to cultural topics
- quick reaction to needs (e.g. an exhibition, a special event)
- focus on niche target and content (e.g. "children", "foreign visitors")
- easy update of new content
- easy elimination of obsolete content

and it allows:

- efficient use of a limited budget
- scalable use of budget (low budget –> few productions; high budget -> more production)
- fine-tuning with new trends and technologies

Following is a list of the multimedia production created within the framework.

- **Audioguide:**

The pieces of multimedia content can be re-purposed to work as interactive guides (over mobile devices). The highlights comment on the exhibits; the pieces of content of the thematic narratives introduce the background, providing information about the exhibition's main themes, the artist(s) involved, the artistic movement, the historical context, etc... Each narrative is organized as a sequence of pieces of content, each piece consisting of an audio. The audioguide is created assembling the audio files created for thematic narratives and highlights items, following the layout of the exhibition.

Audioguides suit a number of different devices, such as

- Mobile phone
- Ipod, mp3, mp4
- iPhone, Smartphone
- iPad, Tablet

Audioguides (or audio tour) provides a recorded spoken commentary on exhibits (indoor and outdoor) and therefore are used within the exhibition/museum premises: the visitor is accompanied while proceeding along the exhibition path; visitors can either listen to the entire sequence automatically or select freely what interest the most.

- **Multimedia guide:**

A multimedia guide is the enhancement of the audio guide, including video (and text). The same items of content are organized as a sequence, each one consisting of an audio and a video. The multimedia guide is created assembling the audio files created for thematic narratives and highlights items. It could be

organized in different ways: following the exhibition layout, or structured by thematic narratives and highlights items.

Multimedia guides suit a number of different devices, such as

- PC
- Ipod, mp3, mp4
- iPhone, Smartphone
- iPad, Tablet

Multimedia guide (or interactive guides) provides content that could be used either at the exhibition, and at any other suitable time, according to the device.

- **Virtual Tour**

A virtual tour is a representation of an existing space. Created using still images, it could include other multimedia elements (sound effects, music, narration, and text).

In the exhibition space, the Virtual tour allows to move through the various rooms, looking at the exhibits. A text or an audio could accompany the view of the room. Moreover, exhibits could be "highlighted" and linked to its item in the audio or the interactive guide. Starting from the exhibition layout and plan (and according to the exhibition space structure/building), the virtual tour develops showing each room of the exhibition. The exhibition plan allows to check the layout on a map and eventually to select the room to explore. Multimedia guides suit a number of different devices, such as:

- PC
- iPhone, Smartphone
- iPad, Tablet

Users and visitors can benefit from Virtual tours either at the exhibition, and at any other suitable time, according to the device and the user need. Virtual Tour could accompany the visitor during the visit, as a multimedia guide, or be used at any other time, to visit the exhibition at a distance. Virtual tour also serve archival purposes, offering a perpetual "image" of the exhibition works and set up, that professional and experts of the field may find of great use.

- **Panoramic photo:**

A Panoramic photography is a technique of photography, using specialized equipment (or software) that captures images with a wide format, making an image a panorama (from Greek πᾶν "all" + ὄραμα "sight"): a wide-angle view or representation of a physical space. Panoramic photography soon became a substitute to painting for creating wide views. Approximately 150 years after the introduction of the Daguerreotype (in 1839), when photographers began assembling multiple images of a view into a single wide image,

Digital photography greatly simplified this assembly process, and such stitched images are used to create extremely high resolution panoramic images. Panoramic photos suit a number of different devices, such as

- Mobile phone
- iPhone, Smartphone
- iPad, Tablet

Panoramic photos provide a glimpse on exhibits (indoor and outdoor) and exhibitions, and can be used within the exhibition/museum premises or independently; at the exhibition, the visitor is accompanied while proceeding along the exhibition path; at any other time, the user can access the exhibition remotely. Panoramic photos can reproduce each exhibiting room, or a selection. Users can visit them all, or by choice.

3.4 Reusing content: Giorgio Morandi case study

The following describes a case study in which the *1001stories+* framework has been largely adopted: the occasion was an exhibition on the Italian artist Giorgio Morandi (1890-1964), held at Museo d'Arte, Lugano, in March-July 2012 and largely described in Chapter 3, *Case Study 5*.

For this emblematic exhibition, a multimedia support was created, including three different "narratives":

- one on the general themes of the exhibition (Figure 30a)
- one with the main techniques used by the artist along his career (Figure 30b)
- one on a selection of artworks (Figure 31)

Each "narrative" consists of a set of content elements: videos (audios + a slideshow of images) with text visible on demand. Each content item lasts between 1 and 2 minutes at most, to fit the time preferences of the typical "digital user". The whole work was developed exploiting the 1001stories workflow and all the multimedia content (texts, images and audio files) were introduced into the 1001stories authoring environment to generate the desired versions: "traditional" web for PC (interactive), a Youtube video (with a linear, non-interactive sequence of elements) and an on-site guide (again linear, but including instructions on how to move from one work to the next). The whole work is available over several devices: PC, mobile devices, smart-phones etc.

The authoring environment and the production workflow have been widely discussed elsewhere; let us now focus on the content adaptation procedure.
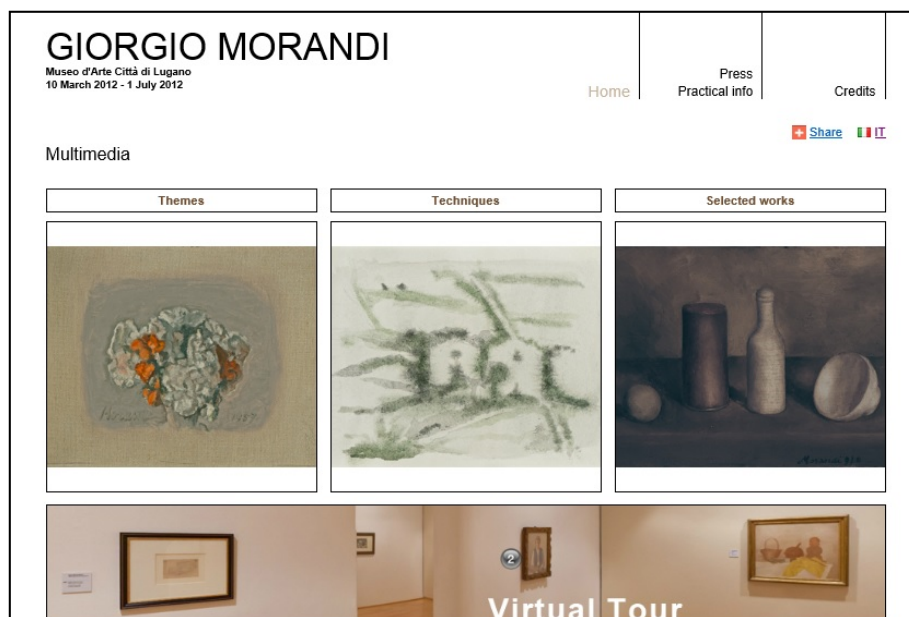
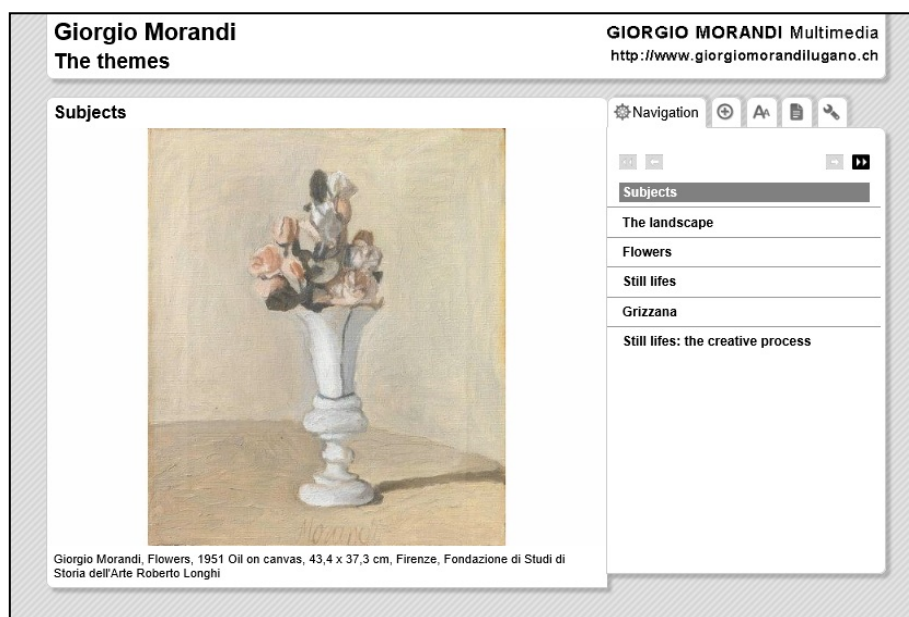*Figure 29. GiorgioMorandiMultimedia, the homepage*

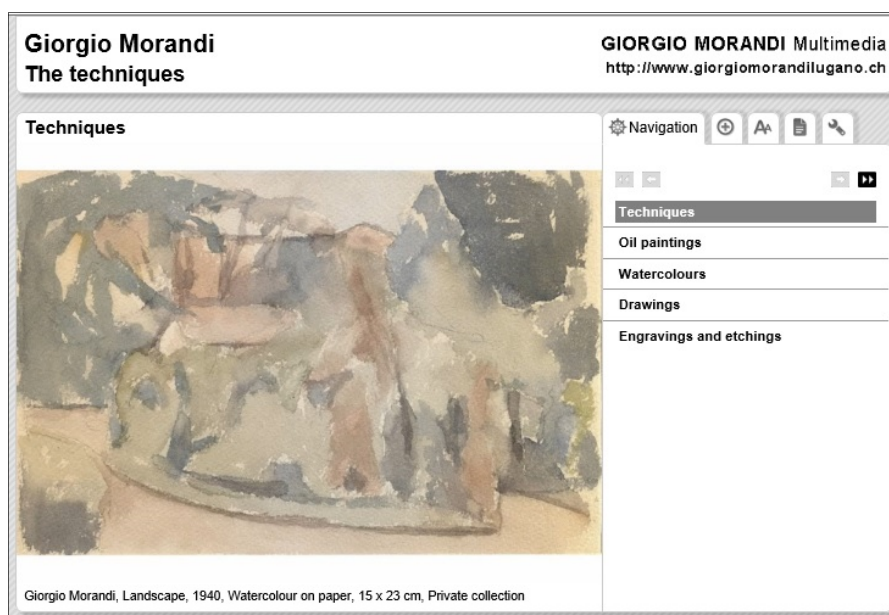*Figure 30a. GiorgioMorandiMultimedia, the narrative on the themes*

Figure 30b. GiorgioMorandiMultimedia, the narrative on the techniques
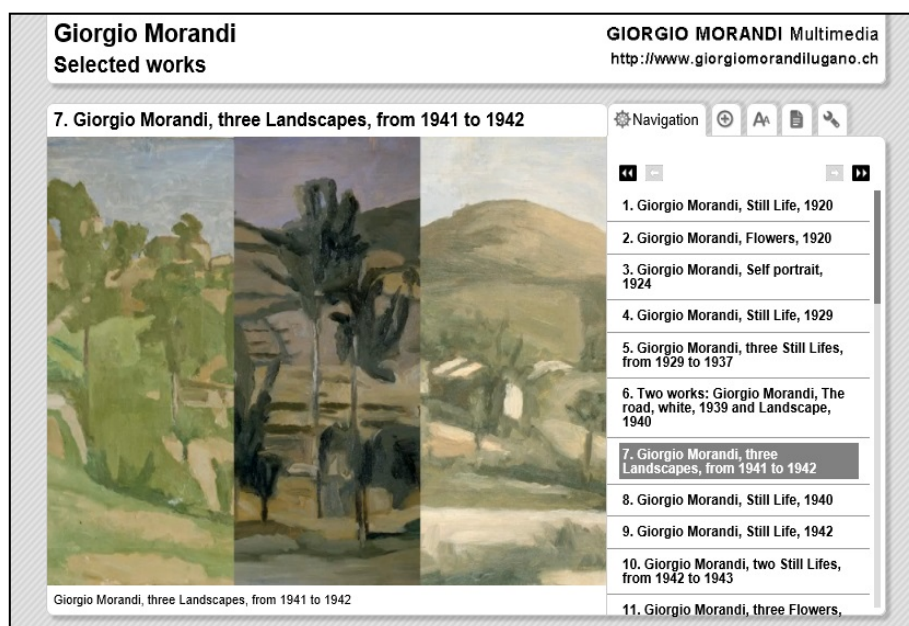

Figure 31. GiorgioMorandiMultimedia, the narrative on a selection of works

The multimedia content created for the exhibition can be easily adapted, allowing a number of deliveries and addressing the available technologies and devices, serving various purposes and various situations of usage.

Three different versions of the same communication were envisioned:

- o Interactive on the web (e.g. users access the online material when preparing for the visit, or after a visit, for curiosity, …)
- o Linear (e.g. users may access the multimedia content on Youtube)
- o Guide on site: users may look for additional content, such as physical instructions, while visiting the exhibition

For Giorgio Morandi exhibition, the multimedia content was created once and for all, and thanks to small adaptations, it was reused to fit the above needs. Each content element can be dismembered and recombined to serve different deliveries and purposes. Let us see an example (Figure 32): a content element from the "Themes" narrative (here in text only for practical reasons) is dismembered, obtaining different and self-standing content items, ready to be reconstructed and repurposed.

THEMES

The landscape

Morandi preferred landscapes to other artistic genres, yet they represent only one-fifth of his production. On the banks of the River Savena or – in summer – at Grizzana and Roffeno, he painted outdoors, depicting his natural surroundings with its hills, grassy expanses and the occasional farmhouse.

From the window of his studio in Via Fondazza, in Bologna, he instead captured the sequence of gardens and houses beyond his courtyard. He used a cardboard frame to isolate a section of the landscape and thus choose his angle, and then turned to a telescope to bring details into focus.

Morandi's landscapes are compositions with a clear and decisive structure, and their complete lack of people or animals gives them a sense of severity.

The artist also demonstrates extraordinary sensitivity in his palette, and his pondered and extremely sophisticated colours contribute to the balance of the composition. His ability to render the landscape so concisely links him with the research of Paul Cézanne.

Figure 32. GiorgioMorandiMultimedia, text from the MM "Thematic" item "The Landscape"

Figure 32, indeed, shows the multimedia content of item "Landscape". The text is being analyzed and dismembered in four parts. The text in RED shows the different text items (3 in this case) that will be recombined, forming new adapted items.

In order to generate the Youtube (linear) video, each fragment from the selected element is recombined with an item from the "Selected work" narrative, forming a new piece of content, as shown in Figure 34 and Figure 35.

In order to generate the on-site guide, the same process is done, but adding new content: instructions on how to move from one work of art to the next. As the reader can see, the same content travels across the different delivery channels and only few adjustments and very simple new content needs to be added. Summing up: the web content is organized into themes, techniques and selected works, whereas the Youtube (linear) version and the guide on site version present a combination of bits of the general theme and the artwork together, allowing the user/visitor to acquire pieces of information little by little, gaining a complete overview by the end of the content fruition. This case-study example illustrates how, starting from the same content, in a multimedia environment, the same items can give vent to different versions, in a cost-effective way. Let us now formalize the process:

1. Interactive version on the web (Figure 33)
- Narrative about themes $T1, T2 \ldots Tn$
- Narrative about selected works : $W1, W2 \ldots Wm$
- Interactive links : $T1 \rightarrow \{W2 , W4\}$, $T2 \rightarrow \{W6 , \ldots W12\}$,

The thematic (T) and selected works (W) narratives are organized as sequences of content. The first are about a specific topic whereas the second are dedicated to a number of exhibited works. The interactive links allows users to move from themes to selected works (Figure 33). Different works share the same thematic item, and therefore are linked to the same theme, providing the user with an interactive exploration and a deeper understanding on the artist's work.

2. Linear version (Youtube): content about themes is distributed (Figure. 6)
- $T1: F1+F2+F3$
- The theme T1 consists of 3 "fragments"
- The linear version (e.g. YouTube) is: $<F1.W1, F2.W2, \ldots>$

The thematic narrative (T) consists of a number of fragments (F), as shown in the above (text-only) example (Figure 4). When a linear version is created, the thematic content is fragmented and distributed across the number of selected works (W), resulting in a combination of bits from the general theme and the artwork.

3. A guide on site (FIG. 7)

- Additional content items for physical instructions

- G1, G2, G3

- <F1.W1.G1, F2.W2.G2, …>

The guide on site could be considered a sort of evolution of the linear version with additional instructions (G) on how to move in the exhibition space.
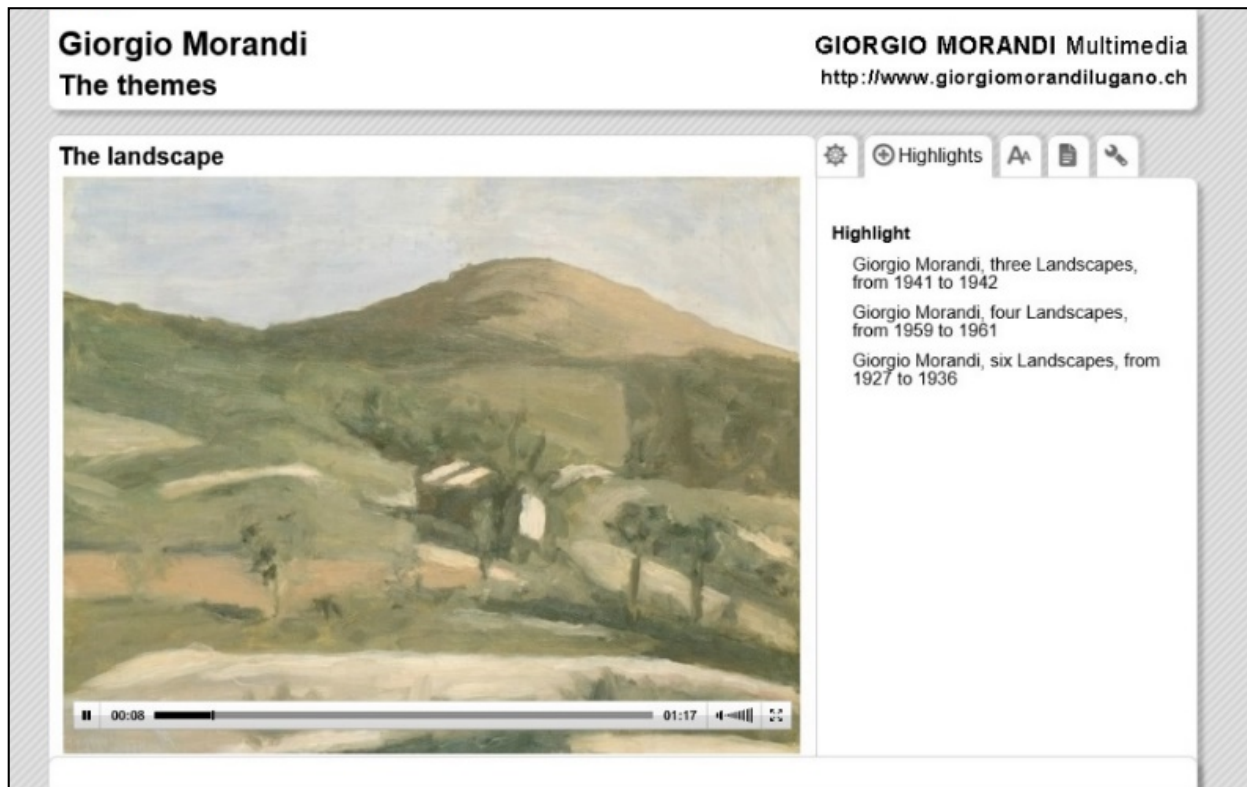

Figure 33. GiorgioMorandiMultimedia, the Web version supports interaction: the user can move from themes to selected works (links on the right-hand side)

Giorgio Morandi, three Landscapes, from 1941 to 1942

Morandi preferred landscapes to other artistic genres, yet they represent only one-fifth of his production. On the banks of the River Savena or – in summer – at Grizzana and Roffeno, he painted outdoors, depicting his natural surroundings with its hills, grassy expanses and the occasional farmhouse.

The grouping of these three landscapes portraying Grizzana, where the artist lived during the war, shows us that in the Forties Morandi returned to a meditative approach and studied the use of sunlight and diffused lighting. Morandi achieved intensely personal results that differ in the three works. The one from 1941 is clearly a reflection on Cézanne's landscapes, and it achieves a highly original balance between optical mobility and formal immobility. Landscape at Grizzana, painted the following year, reinforces the characteristics of the previous work in the way it inserts the various elements of the scene into each other to create perfect geometric and formal balance. The 1942 landscape is even terser than the other two. The lines of the hill in the background set the pace for the entire composition, and the artist merely hints at any detail that escapes perfect geometrization.

Giorgio Morandi, four Landscapes, from 1959 to 1961

Morandi's landscapes are compositions with a clear and decisive structure, and their complete lack of people or animals gives them a sense of severity.

In his final works, Morandi returned to the genre with which he debuted in 1910: landscapes. These four views of Grizzana date to his last summers there between 1959 and 1963. Here he has limited his colours to a virtually monochromatic palette, using only a greenish-grey tone that also characterizes his 1959 watercolour. The two pencil drawings also pertain to his time in Grizzana and depict the well-known Villa Vegetti, which still stands across from Morandi's residence and wartime refuge.

Figure 34. GiorgioMorandiMultimedia, linear version for Youtube

GUIDE ON SITE

Giorgio Morandi, three Landscapes, from 1941 to 1942

Morandi preferred landscapes to other artistic genres, yet they represent only one-fifth of his production. On the banks of the River Savena or – in summer – at Grizzana and Roffeno, he painted outdoors, depicting his natural surroundings with its hills, grassy expanses and the occasional farmhouse.

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NOW WALK TO YOUR RIGHT, TO NEXT PAINTING

Giorgio Morandi, four Landscapes, from 1959 to 1961

Morandi's landscapes are compositions with a clear and decisive structure, and their complete lack of people or animals gives them a sense of severity.

In his final works, Morandi returned to the genre with which he debuted in 1910: landscapes. These four views of Grizzana date to his last summers there between 1959 and 1963. Here he has limited his colours to a virtually monochromatic palette, using only a greenish-grey tone that also characterizes his 1959 watercolour. The two pencil drawings also pertain to his time in Grizzana and depict the well-known Villa Vegetti, which still stands across from Morandi's residence and wartime refuge.

NOW MOVE TO THE NEXT ROOM, and walk straight forward

Figure 35. GiorgioMorandiMultimedia, guide on site version

This example shows that by creating multimedia content once, and with simple adaptation efforts, proper reuse allows a number of different and original multimedia productions, providing substantial benefits:

- "Horizontally", at a certain time:
  Authoring is intrinsically expensive, since knowledgeable people are involved to convey information and emotions to users. It is therefore important to maximize the outcome:
    o Supporting a variety of devices
    o Supporting a variety of user experiences and profiles
    o Supporting a variety of contexts of usage
    o All the above combining quality with low costs and short development time.

- "Vertically", over time:
  Multimedia content, developed for a specific event, is "locked" in the audio-guides or multimedia guides and thrown away when the event is over, or "archived", becoming practically invisible, not to be used anymore. It would be desirable for each institution to reuse its content over time, repurposing it for different situations (a different exhibition, a catalogue, etc...).

V. Critical Overview and Future Works

1. Rationale

1001stories+ considers the needs Cultural heritage institutions face in approaching their public (both on site and on line) and the content to be delivered: what to provide and how.

Bearing that in mind, the work undertaken has focused on implementing standards that could provide links between multiple strategies, aiming at producing an effective and efficient framework, capable of multifaceted features:

- o Multi-target: a various array of devices/technology and formats for delivering the same content in different contexts of usage and scenarios to be able to reach different users;

- o Adaptable: not only the content is created to be delivered on a number of formats (one content= many deliveries), but it is created to allow quick and simple "adaptations" across the different channels and formats both in terms of technology and interaction aspects;

- o Reusable: single "items" of content are created to be reused with light effort and intervention;

- o "Fine-tuning": users can enjoy content on their most suitable device, accordingly to the many different scenarios;

- o "Whole package": content varies from the most classic "paper", to web, from mobile phone, to tablets, from smartphone to touch tables; each device support the whole communication "package";

- o Easy: access and use are designed aiming at guaranteeing the use by non-technological staff;

- o Streamlined: maximum automatism in the shortest time and effort; (nearly) one authoring process for all the different outputs;

- o Content and Context mash up: the numerous pieces of content (images, texts, audio files, video, etc) are integrated automatically with a single effort; content can be used among different museums, institutions, etc..;

- o Multy-purposed: content is always available, and therefore usable before, during and after the event/exhibition, as informational material, promotional, etc…

Such instrument demands a layered designed strategy that takes all of these elements into account and allows each of them to be applied in the best possible manner, while also allowing future improvements.

The increasing complexity generated by the use of different devices and user experiences propelled new and ambitious efforts, focusing on a new architecture. This new architecture – continuously ongoing - is indeed a number of frameworks, composed by a set of "pieces" available according on different situations and needs. Perpetually, three of the most overwhelming obstacle for cultural heritage institutions in general are funding, dedicated staff time; the next is budget.

This framework, which intent is not to be exhaustive or universal, could offer a fair alternative.

Several multimedia applications were developed (see Chapter 3, section "*Case Studies*" for a selected list of case studies), each one being a territory for new exploration and experimentation, adding novel features and allowing a "one step at the time" improvement.

The overall approach, the production workflow, and the delivery technology are the key aspects taken into consideration for perfectioning the tool.

To summarize, at the time of writing, this framework consists of a backbone structure with a set of optional features. A universal framework has not yet being applied. All features are adaptable accordingly to the communication needs and aims, and content can be reused for different experiences.

It currently supports all available devices and formats, which grow and expand along the technological improvements. The applications produced can be delivered over the web, mobile devices (smart phones, iPhone, iPad), off-line (CD-rom, USB key, mp3 players, iPod) or on-line, over standard mobile phones (audio only), through social spaces, etc., needing only one authoring effort (including some "adaptive adjustments") and one technological effort.

It allows customizing content, device and usage suitably to all different situations and scenarios: playlists, loop-playing (for information points), images driven interaction, etc…

Furthermore, with its main structure and array of independent features, is fairly easy to use and therefore manageable also by a non-technical staff (to create/adjust/update the application). The production process is streamlined and effective and the authoring environment's process requires only basic technological skills: creating text, audio files (MP3), pictures (jpeg), and uploading files.

The main strength is the cost effectiveness. Quality, quantity, VT, archive, reuse of material.

2. Ongoing projects

The framework presented in this paper, 100stories+, has been developed as result of various applications developments.

At present time (July 2014) current test beds are the following:

- "Sala delle Asse" (http://www.saladelleassecastello.it/?lang=en): an effort in cooperation with the City of Milan, to communicate the restoration of a room in the "Castello Sforzesco" that was painted by Leonardo da Vinci (either directly or with his workshop).

- "Lugano Mobile": an experimental effort to improve communication of the various museums of the city of Lugano (in Switzerland) in view of the opening of the new building LAC, foreseen for the end of 2015. At its preliminary stage, Museo Cantonale d'Arte and Museo d'Arte are involved

2.1 Sala Delle Asse

The project "Sala delle Asse" is an innovative communication project developed for the restoration of "Sala delle Asse" (literally, "the hall of planks") by Leonardo da Vinci at the Sforza Castle in Milan. Its ultimate goal is quite innovative: allowing the public to follow the restoration at almost real-time, sharing hypothesis, discoveries, successes as well as discomfitures, fostering a sense of belonging and care for this long-forgotten work of art.

The room, located on the first floor of the north-east tower of the Castello Sforzesco derives its name from the wooden planks that once covered the walls, probably to protect against moisture. It was an important setting in which important guests were welcomed by the Sforza. In 1498 Leonardo Da Vinci was called by Ludovico Sforza to proceed with the decorations. It is still unclear if the frescos were completed in the whole room as in 1949, when Milan was conquered by the French, it began a period of decline and Sala delle Asse was used as a barn. Above the painting of Leonardo a white lime plaster was laid and it has been removed only at the end of the nineteenth century. Today, the spread of media (images, video, audio, etc, ..) and the diffusion of mobile devices (tablets, smart-phones, players of various kinds) has made multimedia stories the most natural way to talk about culture, and digital storytelling appears to be a modern tool for spreading cultural heritage content, hence, the development of this project. Sala delle Asse, indeed, is a multi-faceted communication project showing that many are the communication goals to be fulfilled in order to make the visitors' experience complete and satisfactory.

Namely, to provide background information from a cultural, historical and artistic point of view; to illustrate the restoration's issues (like what kind of analysis are to be performed and what kind of choices are made); to "tell stories", long or short, about what goes on, etc. (Figure 36)
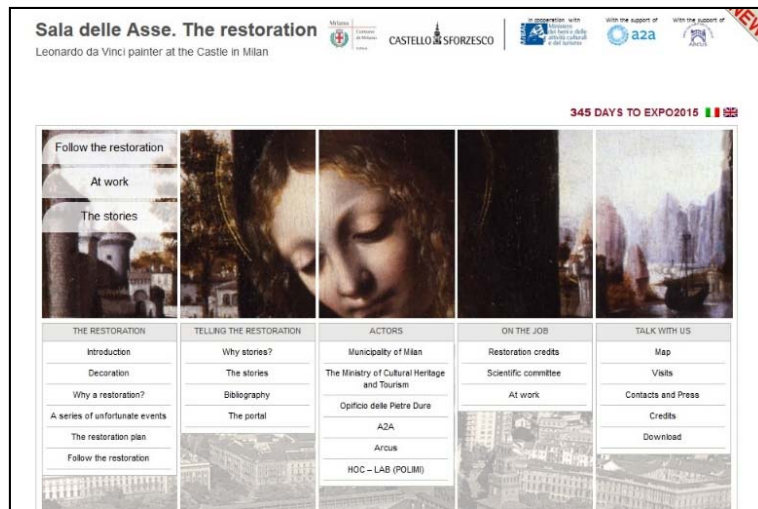
Figure 36. The "Sala delle Asse" MM project, website homepage

Following the above, a complex multimedia communication project has been designed, allowing people to:

- follow the restoration day by day
- sharing hypothesis, discoveries, etc..
- fostering a sense of belonging and care

While developing the project, a number of communication goals were kept high on the agenda:

- provide background information from a cultural, historical and artistic point of view;
- illustrate the restoration's issues
- "tell stories" on the restoration

Within such requirements, the project was developed including a set of different features:

- a website, with monthly content updates
- a set of short interviews to the people involved (experts, restorers, archivists, historians, politicians, sponsors…)
- snapshots of the room and the people at work

- an exploratory portal including various materials, such as documents, images, videos, etc...
- digital multimedia stories, illustrating the room's history, the decoration, the diagnostics and analysis techniques

This Multimedia project offers the Users a set of desirable features:

- Multi-timing: users could use multimedia whenever they desires and for different purposes.

- Multi-technology: users could use multimedia with their preferred device and with their preferred connectivity.

- Content priority: the cultural message (delivered through audio, images, text, captions, etc …) is more important than the delivery channel (no matter how innovative or glamorous it is).

- Possibility of targeting different audiences: from the naïf users to the experts and even the scholars.
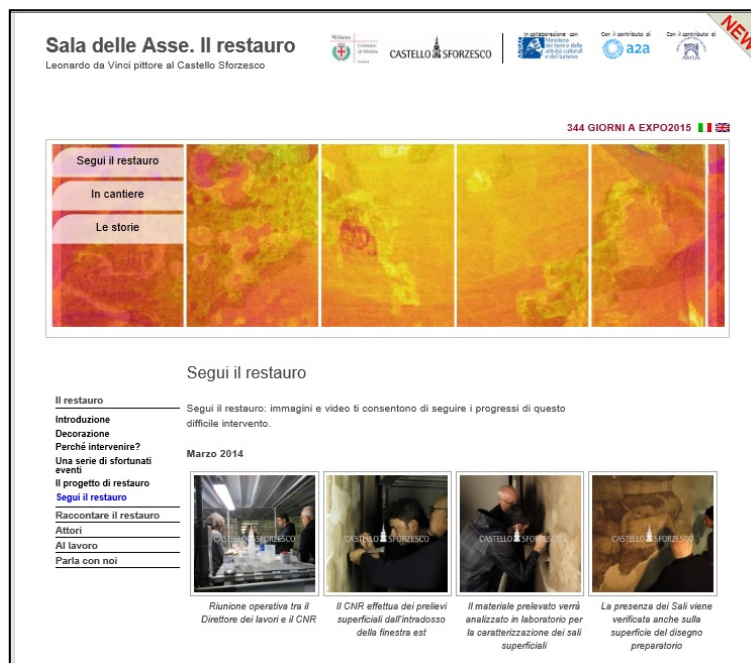
Figure 37. The "Sala delle Asse" MM project, detail on the restoration content material
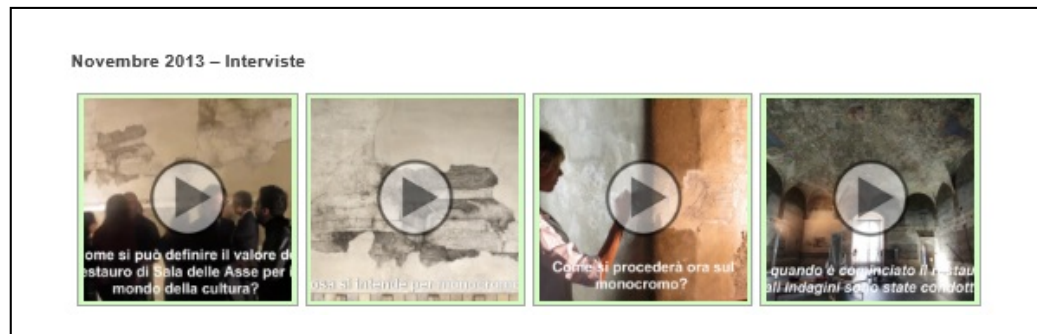
Figure 38. The "Sala delle Asse" MM project, detail on the November 2013 interviews

All this MM content offers users insights on the most relevant issues regarding this restoration (Figure 37).

All content is created following interviews with experts and professional restorers (Figure 38).

Along the development of the restoration, thanks to the collaboration of archivists, art historians and restorers, we are collecting a large variety of documents.

This will be conveyed in a rather innovative "exploratory portal" on which the material will be made available online. A sophisticated taxonomy will allow the various types of users to explore and investigate the content according to preferences and needs.

Users are envisaged to visit the website repeatedly, to check the new content and get acquainted with the news about the room. In the case of *Sala delle Asse* project, the restoration has not closed but rather opened the room's doors to all eyes, showing what goes on day by day: it is probably the first (brave) example in the world of a restoration work being told as it unfolds rather than when it is completed.

The stories of the *Sala delle Asse* can be enjoyed with a variety of equipment and in different ways. Furthermore, it can be downloaded or used online whilst visiting the Castello Sforzesco.

At present, the aim is to expand the number of formats, and introducing new technologies (for example making a better use of multi-touch tablets and tables) aiming at creating more Multimedia communication projects of such complexity.

Our efforts include the aim of convincing curators and directors to consider multimedia as an important mean to enhance Users and Visitors experiences, by providing a complete set of information.

This goals stems from the belief that that Multimedia narratives could appeal to a wider audience and help opening doors to "hidden" treasures.

2.2 Lugano Mobile

The "Lugano Mobile" project is an experimental effort to improve communication of the various museums of the city of Lugano (Switzerland) in view of the opening of the new building LAC, foreseen for the end of 2015. Moreover, it aims at creating a versatile tool able to support both on-site and online visitors. At its preliminary stage, Museo Cantonale d'Arte and Museo d'Arte are involved and at present a mobile guide prototype has been created with a selection of artworks and object provided by both Museums.

The work, following the many collaborations with this two museum and the implementation of the 1001stories+, has come quite natural, steaming from preliminary researches and analysis of both museums, which we know present different weaknesses, strength and aims.

In particular, relevant for this approach and work is the following:

- Museo Cantonale d'Arte: with a rather traditional website, artworks find a little space online and are often presented in a rather poor intuitive way. The Museum's presence on social networks is very scares, relying on a Facebook page which lacks of updates. At present, Mobile Guides for supporting the visits, both onsite and online, are made available on a selected number of exhibitions.

- Museo delle Culture: its website is quite structured and intuitive; it is hosted within the one of the City of Lugano, but along it pages it provides visitors the possibility to "stroll" along a detailed virtual tour. Mobile guides are not available, but the Museum has improved a more up to date approach in social networking

Within this frame, the project "Lugano Mobile" has been conceived aiming at developing a mobile application - suitable for smartphones and tablets - that could be used by Visitors and Users as guide throughout the museum space and whose multimedia content could be re-used for a virtual visit and on the web when not in the Museum's premises.

Hence, the creation of "thematic paths" that could be easily interchanged and adapted as well as a strong focus on the structuring of the content, allowing future content assembly according to the different paths.

For each museum, different "thematic paths" have been identified. The following are examples for each museum.

Museo Cantonale:

- ***Museo Cantonale***: conceived for the general public, it guides the visitor along the exhibition premises. In addition to basic information, it includes more in-depth content on artistic movements, artworks, techniques, material, art history, etc…
- ***Artistic movement***: conceived for those visitors who look at the works throughout a specific perspective; visitors who have a fair knowledge of the artworks and know what they are looking at and looking for. This "path" will be a support for moving around the museum premises following their chosen criteria.

- *Historical*: conceived for those visitors who wish to move around the museum premises looking at artworks following a chronological and geo-cultural order.

- *Thematic*: conceived to guide visitors who are deeply interest in the artworks themselves, rather than the general contextualization.

Museo delle Culture:

- *Travelling:* conceived for those visitors who wishes to enjoy a "traditional" visit, it guides along the exhibition premises creating an imaginary trip through the places, the art and the cultures behind the objects exhibited.

- *Ethnic:* conceived for those visitors who are more interested on the cultures and the populations that have created the objects exhibited

- *Thematic:* conceived for those visitors who are particularly interested in understanding the objects exhibited, their uses and the traditions of the populations who created them.

- *Stilistic:* conceived for those visitors who wishes to gather a deeper understanding on the objects themselves rather than on the cultures behind them.

Within the development of this prototype, for each Museum 10 artworks/objects have been selected and each one is being narrated at three different levels:

1. Quick: A concise description of the work. Within approximately 60 seconds, the work is described, including images on different perspective. It allows a "fast" visit, providing all the basic information.

2. Curatorial: A video clip by the Director or the curators of the museum, providing personal insights, curiosities and personal thoughts on the artworks.

3. <u>Connection</u>: A brief comment pointing out similarities with other artworks, enabling a more in depth knowledge of the artwork.

A "text only" section compliments the guide. Developed for deaf visitors, it includes the two levels "quick" and "curatorial"; "connections" do not appear in this section, as it refers to other artworks and the visitor would lack the images and therefore the comprehension of the comparison.

Moreover, the prototype's structure include a section for multimedia items that can be enjoyed before, during and after the visit.

Finally, a number of video on general topics of interest (the permanent collection; the exhibition's layouts and set up; the art market; etc..) represent additional multimedia content of useful interest for the visitor.

For both Museums, the same structure has been used, with simple case by case adaptations. The result is a Mobile Guide created with 1001stories +, created for medium-small portable devices, such as tablets or smartphones. It can be found at www.tourmuseocantonale.usi.ch and www.tourmuseodelleculture.usi.ch

The production plan has follow a number of consolidate steps:

- meetings with the coordinators of the work, the museum directors and staff
- interviews
- outline of the script's draft
- video shooting
- script revision and completion
- professional audio recording
- creation of the multimedia item

Along the production process, few technical obstacles have been experienced: the quality of the audio recording instrumentation has affected the "live" interviews and video clips quality, despite "sound cleaning" has been made possible thanks to some editing software.

More in detail, the mobile guide homepage offers two options:

- *"Code" artwork*: choosing a number directly referring to a specific artwork/object
- *Playlist*: choosing a specific "thematic path" among one of the many offered

and each item presents:

- Museum's name + logo
- Author, title, year
- Player with audiovisual material
- Tabs for selecting content
- "Next" button (also available with a touch option : slide to the right: next/ slide to the left: previous)
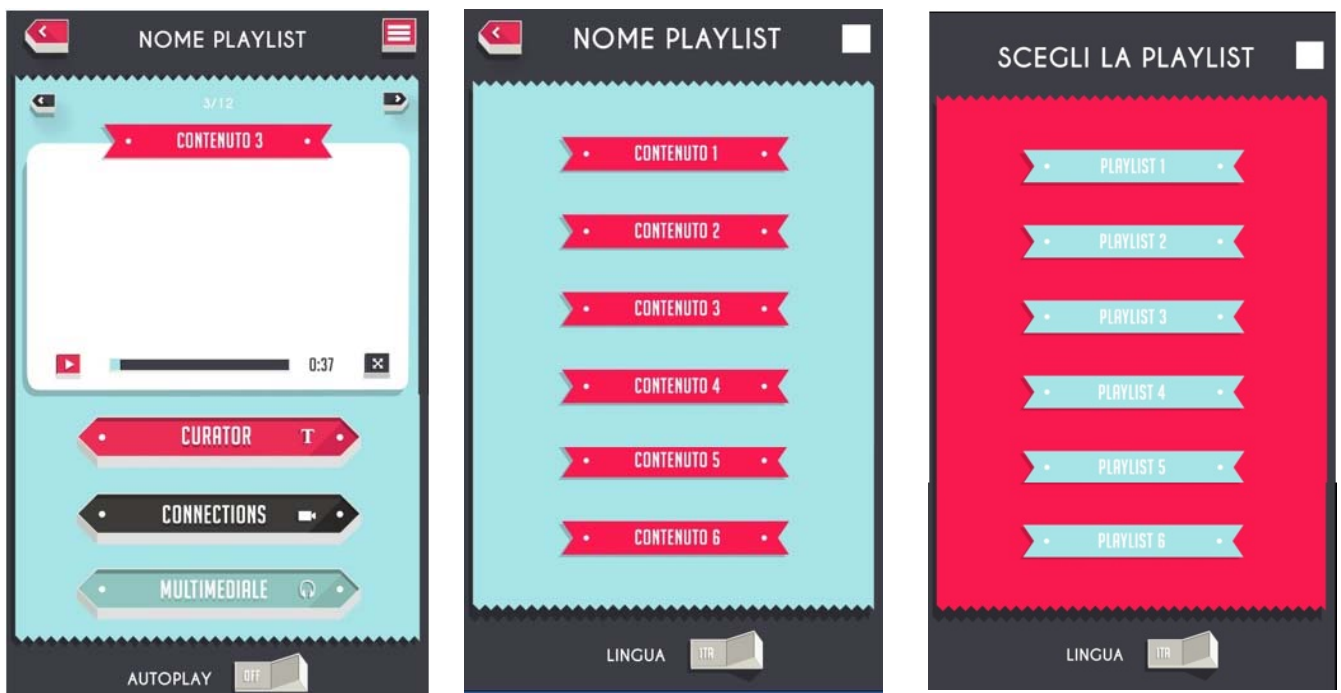- "Back to general menu" button

Figure 39. "Lugano Mobile": mock up for the homepage and playlist

"Lugano Mobile", created for a specific situation and Museums, represents an effective and affordable mobile guide prototype not only for supporting museums visits but also for providing multimedia content that could be accessed at all times and venues and for a number of purposes.

Moreover, for this particular case, we have developed a guide that could be used directly on the Users and Visitors devices – smartphones and tablets – reducing technological barriers in its use.

Further development of the prototype are presently high on the agenda, but even at this stage it represents a very useful multimedia support for the two Museums, contributing to their multimedia communication efforts, being a mobile guide and an excellent channel to convey messages, both to the public and to stakeholders.

Moreover, at the time of writing, it has already been discussed as an option for creating mobile guide in museums.

3. Conclusion

The actual *1001stories+* framework, implemented thanks to the contribution resulted by the case studies illustrated in chapter IV, represents a positive reply to the driving questions at the core of this work. Indeed, this framework attempts to overcome the difficulties, with a methodology and a technology that can be used also by non-technical content editors; the framework is especially designed for small-medium institutions, unable to afford large staff and duplication of efforts.

1001stories+

- can easily be adapted to the very many situations and organization existing, with little effort, time and costs;
- can created content within a short time;
- can create content within a limited staff and a very reasonable budget;
- allow to reuse content, with little adjustments, according to the different needs, situations, purposes, target, etc..

The specific concerns strongly taken into consideration while developing *1001+* framework have found a positive answer, as shown in Figure 40. Indeed, it is effective, affordable, multi-media and multi-format.
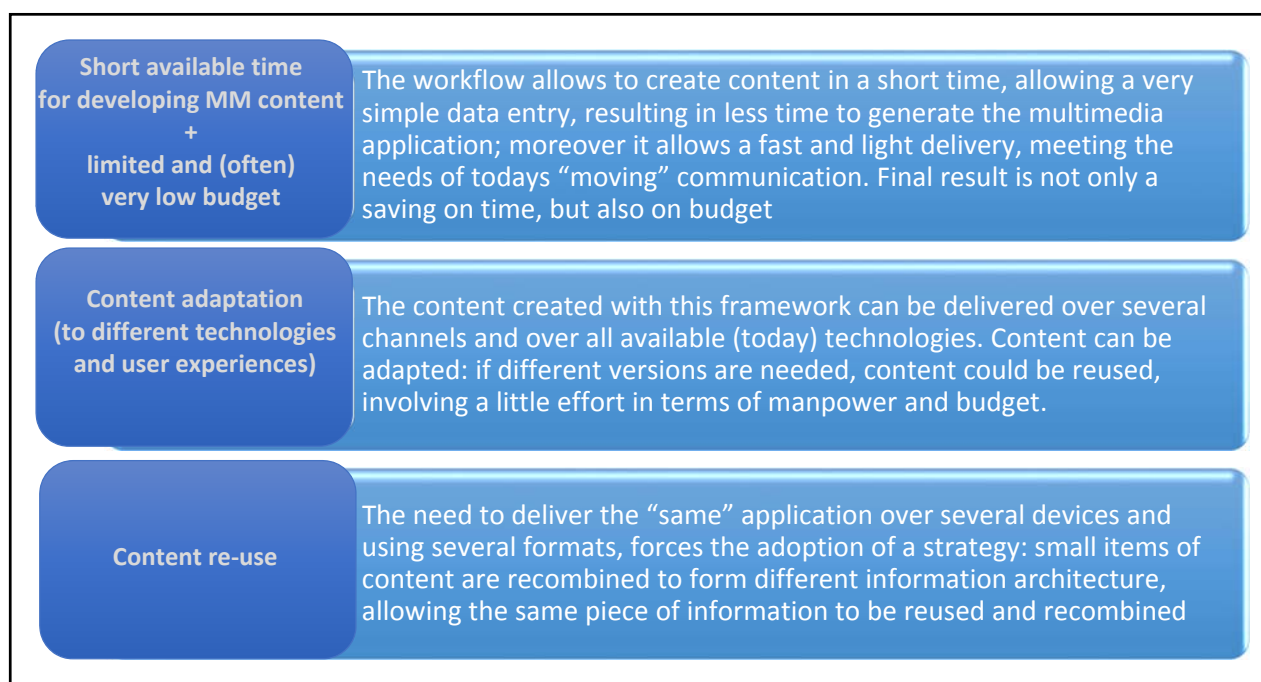

Short available time for developing MM content + limited and (often) very low budget	The workflow allows to create content in a short time, allowing a very simple data entry, resulting in less time to generate the multimedia application; moreover it allows a fast and light delivery, meeting the needs of todays "moving" communication. Final result is not only a saving on time, but also on budget
Content adaptation (to different technologies and user experiences)	The content created with this framework can be delivered over several channels and over all available (today) technologies. Content can be adapted: if different versions are needed, content could be reused, involving a little effort in terms of manpower and budget.
Content re-use	The need to deliver the "same" application over several devices and using several formats, forces the adoption of a strategy: small items of content are recombined to form different information architecture, allowing the same piece of information to be reused and recombined

Figure 40. 1001+: specific concerns and outcomes

This framework can be used by museums in many ways: for permanent collection, temporary exhibition, collections, objects, travelling exhibition. As audio guide, as home visit. As leisure exploration. Moreover, it allows different deliveries: not only the multimedia delivery, but the paper delivery, such as catalogues, for example. Indeed, *1001stories+* is a cross boundaries delivery tool.

Is that the ideal solution? Again, is not the only possible solution, but is a great one in terms of performance, budget, time and effort.

A further step will be the availability (free of charge) of the framework to cultural institutions worldwide.

Finally, its flexibility makes it a perfect trampoline for experimental uses of the framework, and presently few possibilities are being discussed with other major cultural institutions such as Museo Galileo, in Florence.

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Case Studies and developed multimedia project

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www.finestrasulmondo.progetti-lac.ch/

www.giorgiomorandilugano.ch

www.klee-melotti.progetti-lac.ch/

www.lookatme.usi.ch

www.manraylugano.ch

www.nipponlugano.ch

www.saladelleassecastello.it

www.tonycragglugano.ch

www.tourmuseodelleculture.usi.ch

www.tourmuseocantonale.usi.ch

Selection of inspirational sites:

Museum Blog: www.museumblogs.org:

Art Babble: www.artbabble.org

National Gallery Washington: www.nga.gov

Louvre: www.louvre.fr

Ima Indianapolis: www.imamuseum.org

Pinacoteca di Brera www.brera.beniculturali.it

British Museum: www.britishmuseum.org

Rijks museum www.rijksmuseum.nl

Poldi Pezzoli: www.museopoldipezzoli.it

www.childrensmuseum.org/100toys.

www.objectstories.org.

www.sfmoma.org/about/research_projects/storyboard.

Annex 1

Exhibitions and Multimedia productions

A) Enigma Helvetia, 2008

B) Look at Me. Faces and Gazes in Art 1969-2009, 2009

A) ENIGMA HELVETIA: Brief description
www.enigmahelvetia.usi.ch/en/

Enigma Helvetia. Arti, riti e miti della Svizzera moderna, held at Museo d'Arte and Museo Cantonale d'Arte, Lugano, from April to August 2008, is an exhibition dedicated to the complex relationship that has characterized the production of art, history, culture and the imagery of that singular and unique laboratory that is Switzerland, from the late nineteenth century to present day. *Enigma Helvetia* is the first exhibition created and produced jointly by Museo d'Arte and Museo Cantonale d'Arte, as the first event of LAC (Lugano Art and Culture). The exhibition aims at investigating the peculiarity of Swiss artistic culture, through artworks, design, photography, video and installations, while showing the extraordinary number of artists who, throughout the twentieth century have achieved international recognition. Among them are: Cuno Amiet, Albert Anker, Jean Arp, Max Bill, Fischli & Weiss, Franz Gertsch, Alberto, Augusto and Giovanni Giacometti, Ferdinand Hodler, Paul Klee, Markus Raetz, Hermann Scherer, Roman Signer, Daniel Spoerri, Sophie Taeuber-Arp, Jean Tinguely, Ben Vautier, Not Vital. Enigma Helvetia is presented over two different premises, and along the exhibition, visitors can capture and enjoy some of the most enigmatic aspects of Swiss culture. The exhibition hosts extraordinary works of art from the most important museums in Switzerland and abroad. For this exhibition, a multimedia narrative has been produced, namely ***Enigma Helvetia Tales***. It is a production of TEC-Lab (Università della Svizzera Italiana), in collaboration with the two Museums and the City of Lugano. The multimedia productions is based on interviews to Pietro Bellasi, one of the curators of the exhibition and the "voice" of the Italian edition. The narrative includes 8 general topics and 29 subtopics. It has been published in English and Italian. And it is available both online and offline (web, podcast, downloadable from the website and CD-ROM). *Enigma Helvetia Tales* has been the first (of many) collaboration with the Museums of Lugano for the development of multimedia production.

B) Look at me. Faces and Gazes in Art 1969-2009: Brief description

www.guardami.usi.ch/en

The exhibition *Look at me. Faces and Gazes in Art 1969-2009*, held at Museo Cantonale d'Arte from October 2009 until February 2010, explores one of the most crucial iconographic themes of Western art: the face. Throughout a corpus of approximately 80 works by over 40 artists, the exhibition intends to investigate how, in the past 40 years, the face, with its alterations and transformations has been represented on an international scene. The works come from museums, foundations, galleries and collectors throughout Europe, as well as by the artists themselves. A reflection on the subject needs to compel with the crisis of the subject, now definitively undermined in its unity and centrality, and which brings into play the very possibility of having or not having a face. At this occasion, the Multimedia production *Look at me Tales* has been created.

The narrative has been created from an interview to Marco Franciolli (Director of the Museum and co-curator of the exhibition) and Bettina della Casa (co-curator of the exhibition).

It includes 7 general topics and 18 subtopics (for a total of 25 items), including general themes, highlights on the artists and artworks.

It has been published in English and Italian and is available both online and offline (web, podcast, downloadable from the website and CD-ROM).
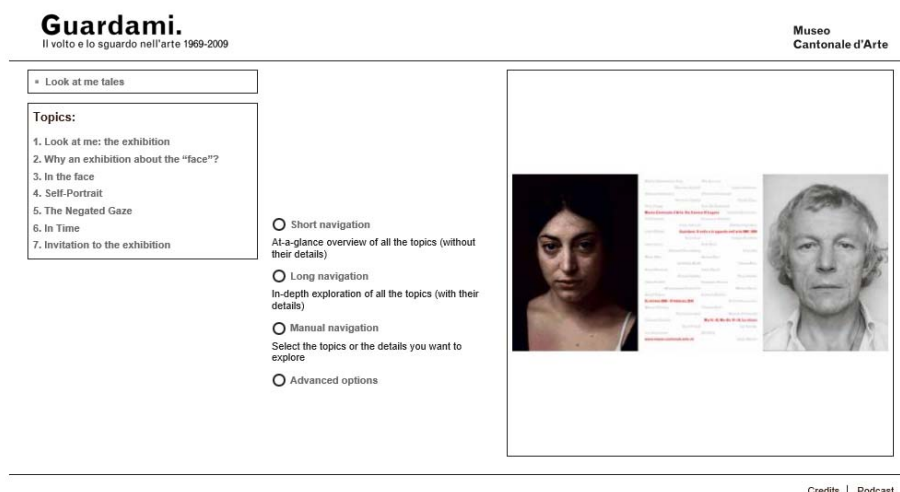
Annex 2

Report on the User Study

A) Enigma Helvetia, 2008

B) Look at Me. Faces and Gazes in Art 1969-2009, 2009

C) Nippon, 2010-2011

D) Consonanze, 2011-2012

"Enigma Helvetia Tales"

Report on the User Study

An investigation related to the exhibition "Enigma Helvetia", an initiative organised jointly by Museo Cantonale d'Arte and Museo d'Arte of Lugano, from April 27th to August 17th 2008

www.enigmahelvetia.unisi.ch

TEC-LAB (www.tec-lab.ch)
November 2008

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

"Enigma Helvetia" was an **exhibition** that took place in Lugano (Switzerland) in spring-summer 2008. It has been jointly organised by the "**Polo Culturale of Lugano" (**a new organization of the municipality, coordinating several cultural institutions) and the **Museo Cantonale d'Arte**, where it was held jointly with **Museo d'Arte** (which is part of the "polo")

As part of an ongoing cooperation between Polo Culturale and the University of Lugano, a **"multimedia narrative",** called **"Enigma Helvetia tales"**, was developed by **TEC-LAB**, a specialized laboratory of the **Communication Faculty.** The narrative was created in about **30 days** using the "**1001stories**" engine, created by **HOC-LAB of Politecnico di Milano**. The authoring was based upon a set of **interviews to Pietro Bellasi**, one of the curators of the exhibition. The narrative (English and Italian) was delivered as a **website**, a **CD-rom**, and a set of **playlists** for **iPod** and **iPhone** (downloadable from the website).

After the completion of the narrative, it was decided to launch a **user study**, in order to investigate whether the **narrative was effective into conveying the "cultural message" of the exhibition**. A questionnaire was put online and (through a mailing list provided by Museo Cantonale d'Arte and **Museo d'Arte**) nearly 1,000 museum-goers were contacted encouraging them to take a look at the website and then to answer the questionnaire; 119 did complete the online questionnaire. In addition some students volunteered to go to the exhibition and kindly ask visitors to use the CD-rom version and to answer questions from the questionnaire; 82 visitors did it. So we had a total of **201 questionnaires** to investigate.

This report presents many facets of our interpretation of the answers to the questionnaires. The first surprise concerned the amount of time spent with the application: **84% of the online users spent more than 5 minutes with the website**, of which **26% more than 20 minutes**, which is an incredible amount of time.

Using a scoring between 1 (very bad) and 5 (optimal), on subject matters like **overall appreciation** of the narrative, **interest raised** and **cultural level**, **positive opinions (score 3 to 5) were above 90%, with highly positive scores (4 or 5) around 70%**.

More detailed analysis was carried on subdividing users by **age** (4 ranges) and "**expertise**" (interpreted in terms of number of exhibitions visited in the previous 12 months: less than 3, between 3 and 6 or more than 6).

As detailed in the report, with variations (due to age, expertise or other factors), users seemed to appreciate very much Enigma Helvetia Tales.

We would like to outline just two specific findings:

Understanding the Exhibition

In a rather crude manner we tried to understand if the users felt that the narratives helped them to understand the exhibition. More than 86% of users felt that the narratives helped them to understand the themes of the exhibition, and 72% declared the help above average (score 4 or 5). The surprise is that even users who had actually visited the exhibition reported similar opinions (around 64%).

Interest to visit the exhibition

Although we did not mean the narrative as a marketing device, we did ask the users who had not visited the exhibition yet, whether they felt an increased interest for visiting it. More than 89% of the users declared an increased interest, with more than 70% declaring a "highly" increased interest.

As future work we would like to continue our user study with Enigma Helvetia Tales, checking if its effects are still valid (do users still remember it?) and if it is still interesting (after the exhibition is over).

We are also planning new narratives and new user studies.

2 THE EXHIBITION

The "Enigma Helvetia" exhibition was jointly organised by Polo Culturale of Lugano (a new organization of the municipality, coordinating several cultural institutions, including Museo d'Arte) and Museo Cantonale d'Arte, in spring-summer 2008. The exhibition was jointly hosted by Museo d'Arte and Museo Cantonale d'Arte (Figure 1).

One of the major challenges of the exhibition was to "demonstrate" the inherent contradictions between the Swiss stereotypes about a "quiet and clean" everyday life and the Swiss artistic creations, often surprisingly anguished (Figure 2). The multidisciplinary team of curators (from art historians to anthropologists) put together a show that is original in conception and even startling for its ability to match up expressions of high art with objects from everyday life. The peculiarity of the exhibition consists in the fact that it is not only an art show (with paintings, sculptures, installations etc.) but it provides an analysis of the history, identity and above all the everyday life of the Swiss. Therefore it puts on show objects and installations that denote some of the salient (perhaps stereotyped) features of Swiss culture such as accuracy, cleanliness, conscientiousness and so forth. Yet, these soothing features (components of the Swiss myth and its legend) clash quite strongly with some dark expressions of Swiss artistic production. The conflict between uplifting stereotypes and Swiss art underpins the whole exhibition.

The curators are experts from different disciplines: Marco Franciolli, director of the Museo Cantonale d'Arte , is an art historian, Cristina Sonderegger, researcher of the Museo d'Arte of Lugano, is an art historian, Carlo Piccardi, in charge of the musical component of the exhibition, is a musicologist, Pietro Bellasi is an art anthropologist.

Figure 1 The exhibition's poster, "raising" the question about Swiss (CH) identity

Figure 2 Two examples of the exhibition artworks: on the left a clock symbol of Swiss precision and on the right a Comensoli's painting called "Gentle death" depicts youngsters dying of overdose in Zurich's park.

3 THE MULTIMEDIA "NARRATIVE": "ENIGMA HELVETIA TALES"

In order to better convey the exhibition's content and message, a multimedia application was created by the TEC-LAB of University of Lugano, using an innovative technique of "Instant Multimedia" authoring developed by HOC-LAB at Politecnico di Milano (Italy). Following the vision of Instant Multimedia (for details see the references section), the development was completed in about 30 days and on a very tiny budget.

Figure 3 "Enigma Helvetia: Tales", the Home Page of the Web version
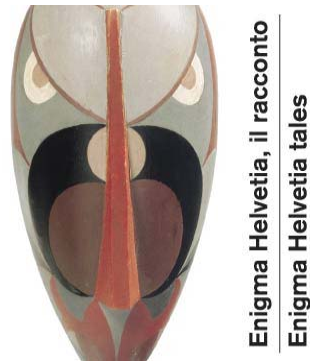
Figure 4 The CD-rom's cover

The application can be defined as a "narrative" in that it is meant to introduce the exhibition's theme to the user by means of some short "tales" to be "listened to and looked at", in a pleasurable and relaxed manner. The narrative consists of a set of "short movies" built using pictures from the exhibition; each movie goes with an audio comment (based on interviews to one of the curators).

Figure 5 Each topic consists of a short movie commented via audio (the text is available on demand – right column). When on iPod (the picture in the right side), only the movie and the audio are available.

As a small trial, a few pictures and also a few narratives were also made available via Flickr and You Tube, respectively.

One of advantages provided by 1001stories is that several channels are covered at ones: web, podcast (and iPhone), CD-ROM, cellular phones (forthcoming) and others in the future. The overall organization of the items is organized around the notion of "overall understanding" (a few minutes) or "in depth understanding" (30-40 minutes), or "specific choice" (each item is accessed individually).

The precise organization of the items and the navigation options depend on the "channel" being used.

On the web and CD-rom the organization is the one depicted in following figure.
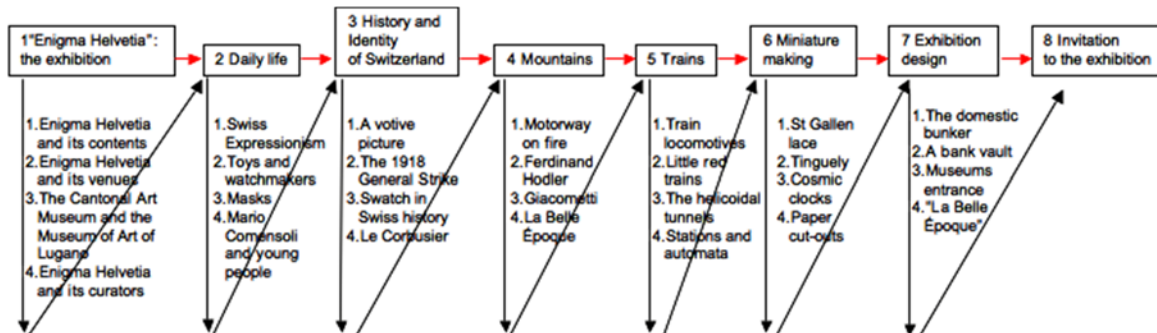
Figure 6 The structure of a 1001Stories Enigma Helvetia tales narrative.

Three types of navigation are provided:

- Short navigation: only the headlines are played

- Long navigation: everything is played in a long sequence

- Manual navigation: each item can be played individually

The "loop" option (either short or long) allows also the use as a self-standing unattended information point (and it has been used even in commercial fairs, for industry applications). On iPod (or iPhone) the narrative is organized as a set of playlists (several options available): e.g. one playlist corresponding to the short navigation and one playlist for each sub-story, or a playlist corresponding to the long navigation. The actual navigation mechanism is the one offered by the device being used.

As far as "Enigma Helvetia Tales" is concerned, the overall editorial plan was created thanks to the active participation of one of the curators, Prof. Bellasi. The text of the narrative was extrapolated from two interviews (as it is usually done for 1001stories developments). The images were taken from the catalogue; the audio in Italian was recorded by Prof. Bellasi himself, while a professional speaker was used for the English version.

Everything was developed and published in 30 days (16th of April- 16th of May). Enigma Helvetia Tales was promoted through the websites of the two museums, posters displayed at the entrance of the museums and at the tourist office.

4 THE USER STUDY

One of the purposes for the development of "Enigma Helvetia Tales" was also the possibility to investigate **the impact of computer-mediated communication for cultural heritage,** in other words the capacity of technology to promote an exhibition and then to support people in their understanding of the exhibition itself, even after the visit.

The interest for this type of investigation stems also from the need of elaborating educational material for TEC-CH (http://www.tec-ch.unisi.ch/), a master program offered since 2004 by the University of Lugano, concerning the use of technology for communication in Cultural Heritage, and TOL (http://www.tec-ch-on-line.unisi.ch), its on-line counterpart that was experimented in 2008 and that will officially start in 2009.

We had in mind a number of research questions such as:

- Is the narrative engaging enough to keep the user attention for a reasonable amount of time?

- Does the narrative convey the actual themes of the exhibition (as intended by the curators)?

- If the user has not yet visited the exhibition, is the narrative a spur for visiting it? Does it allow a good grasp of the exhibition value?

- If the user has already visited the exhibition, is the narrative still interesting and effective? and in what sense "effective"?

- Is the narrative still engaging and effective after the exhibition is over?

- Do the channels (e.g. web vs iPod) make any difference for all the above?

Given the relatively short span of time available and the budget limitations, we had to focus only on some of the above aspects, deferring the rest for future user studies.

A simple questionnaire was delivered on-line, and promoted in a number of ways and especially through a mailing list of Museo Cantonale d'Arte . The same questionnaire was used on-site, by asking visitors to take a look at the narrative and complete the questionnaire.

The activity was carried on from June 17th to August 17th, 2008 (when the exhibition closed) and **201 questionnaires were completed: 119 on-line and 82 on-site.**

Table 1 The demography of the user study

(notice: demographic questions were optional: not everyone answered them)

The demographic spectrum		ON-LINE		ON-SITE		ALL	
		#	%	#	%	#	%
Use of Internet:							
More than 3 hours a week		91	94%	51	63%	142	80%
1-3 h		5	5%	17	21%	22	12%
occasionally		1	1%	7	9%	8	4%
Almost never or never		0	0%	6	7%	6	4%
		97		**81**		**178**	
AGE							
	18-25	6	6%	12	15%	18	10%
	25-35	30	32%	11	14%	41	24%
	35-50	39	41%	29	37%	68	39%
	over 50	20	21%	27	34%	47	27%
		95		**79**		**174**	

The vast majority (80%) of the subjects answering the questionnaire use Internet quite often; the percentage is 94% for those answering on-line and 63% for visitors on-site.

The age distribution of on-site visitors seems typical for museum visitors; with a slight surprise, on-line questionnaires were completed by a smaller fraction of young people (18-25 years), but a larger fraction of middle-aged (25-50 years), and a good percentage (21%) of over 50.

As far as visiting the exhibition is concerned (Figure 7), more than 50% of the subjects had already visited the exhibition, 19% were planning to do it, and 5% had no intention to visit it. The remaining ones were undecided.

As far as the "expertise" of the users is concerned, we asked to specify the number of exhibitions visited in the previous 12 months. We considered "non-experts" the users who had visited less than 3 exhibitions (probably meaning 1 or zero), while we considered "experts" those users who had visited more than 6 exhibitions. Figure 8 shows the percentage of users and the different ranges.
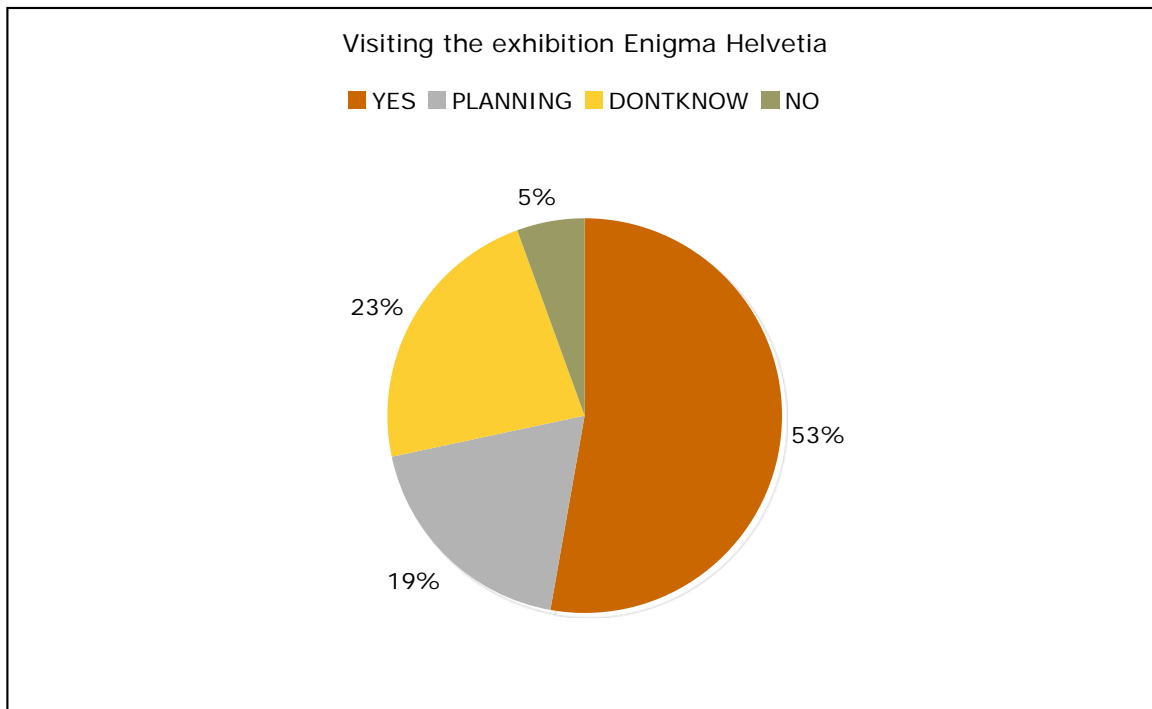
Figure 7 Had the user already visited the exhibition or was s/he planning to do it?
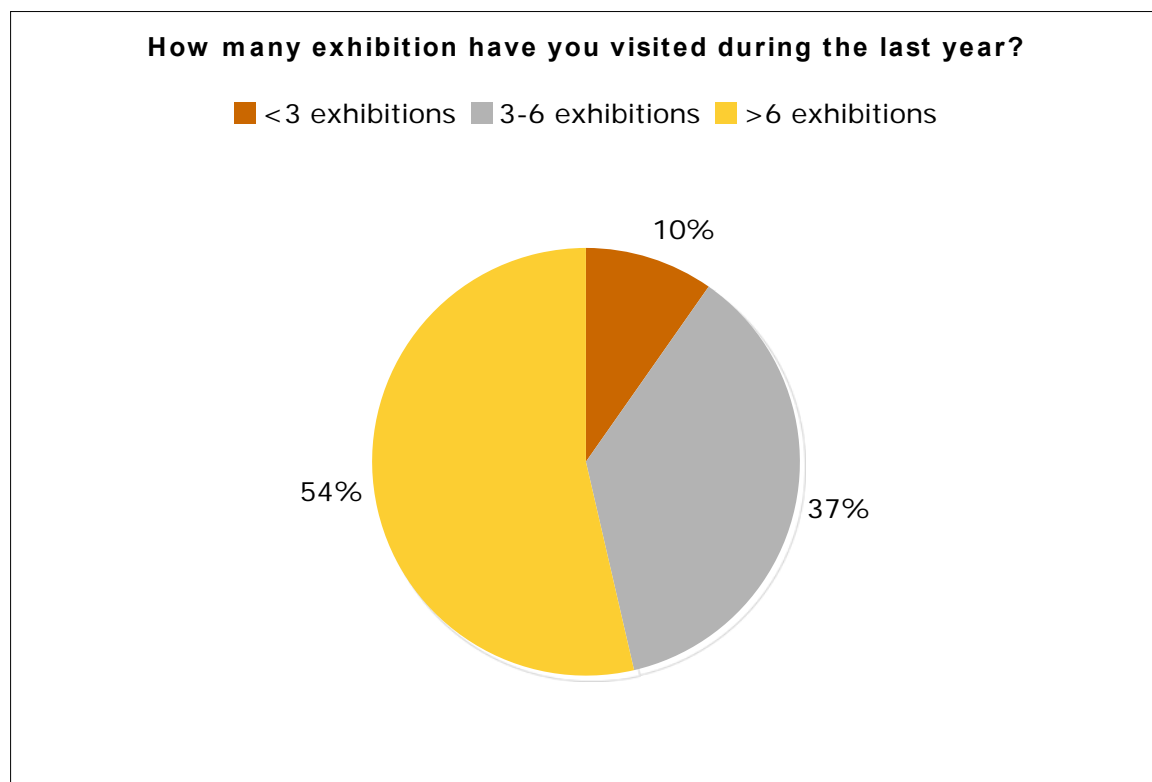
Figure 8 The "expertise" of the users.

5 SOME RESULTS

While in the appendix a wide spectrum of data is reported, we would like to comment here a few interesting facts emerging from the answers to the questionnaires.

The following are the questions we wish to address here:

a. *Length of consultation*: how long did the narrative keep the user's attention?

b. *How interesting is the narrative*

c. *Does the narrative adequately introduce the themes of the exhibition?* i.e. does the the narrative convey the purpose and the "message" of the exhibition?

d. *The "cultural level" of the narratives*: i.e. does the user consider the narrative of an appropriate cultural level?

e. *Overall Appreciation*: does the user appreciate overall the narrative?

f. *Does the narrative acts as a spur for visiting the exhibition?*

Before discussing the data we would like to put forward a disclaimer (to be discussed again in the conclusions): the study is about "user perception", not objective evaluation. In other words, we do not have any way to double check what the user is telling us. In addition, we realize that the sample of users was not scientifically calibrated: it is likely, for example, that the on-line users who really didn't like the narrative did not bother to look at it or did not bother to fill up the on-line questionnaire.

5.1 Length of consultation

Overall 16% of users used (or declared they had used) the narrative for more than 20 minutes, and 62% between 5 and 20 minutes. So we have an impressive 78% usage above 5 minutes.
Realizing that the data collected on-site were less relevant (given the special situation, with visitors asked to look at the narrative on the spot), we decided to look at the results for on-line users separately. Considering on-line users only, figures go up to an impressive 84% of usage above 5 minutes.
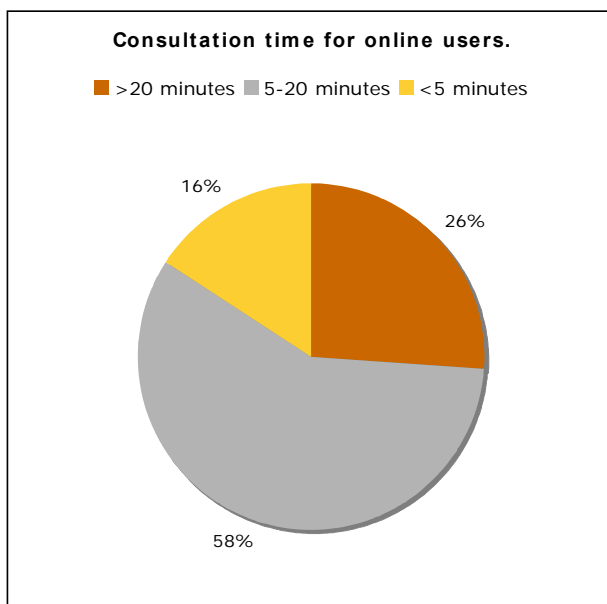
Figure 9 Consultation time for on-line users: an overview.
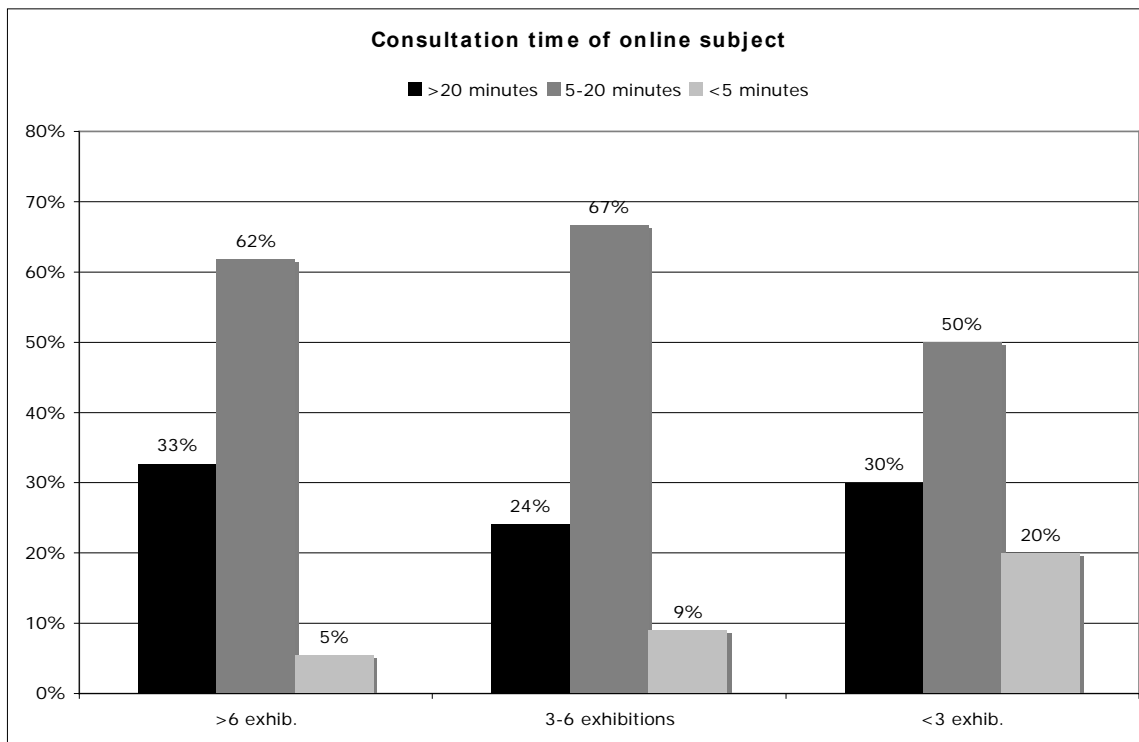
Figure 10 It shows the correlation between length of consultation and "expertise".

Expert users have the longest consultation overall, with 33% consulting the narrative for more than 20 minutes. Non-expert visitors show a remarkable behaviour; as it could be expected, the 20% of them consulted the narrative for less than 5 minutes but at the same time the 80% consulted it more then 5 minutes, and 30% of them for a long time (more than 20 minutes) a comparable figure with respect to expert users.

5.2 How interesting is the narrative?

Overall users found the application quite interesting, with online users showing a slightly higher interest. It is likely that the situation (more relaxed for online user) had an influence on this.

As shown by figure 11, for both on-line and onsite users the level of "no interest" is below 10%. While 75% of online users declare high interest (score 4 or 5), for onsite users the percentage is 62%.
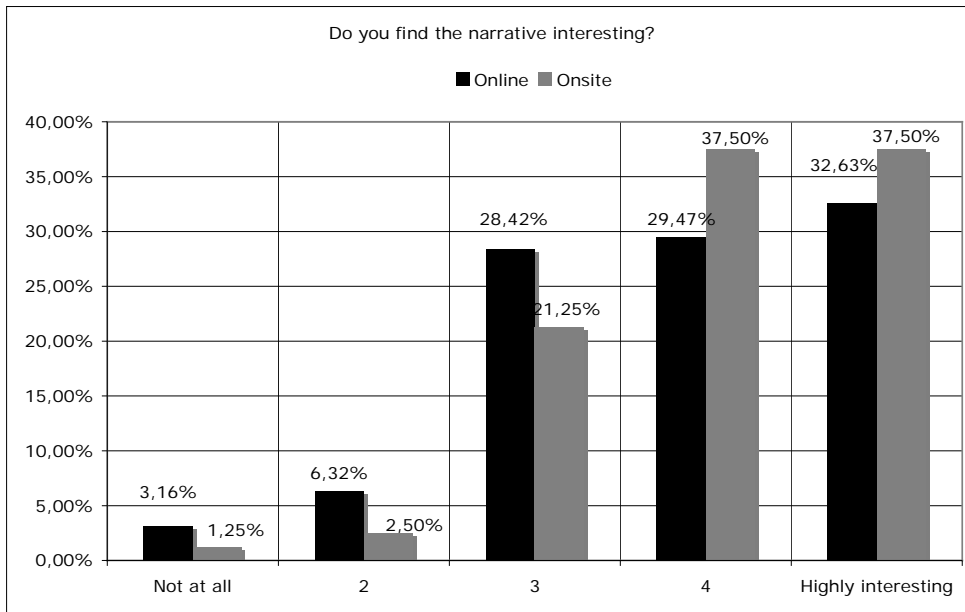
Figure 11 Level of interest, on-line and on-site.

Non-expert users show a level of interest higher than the expert ones, with an impressive 82.35% high interest (score 4 or 5).
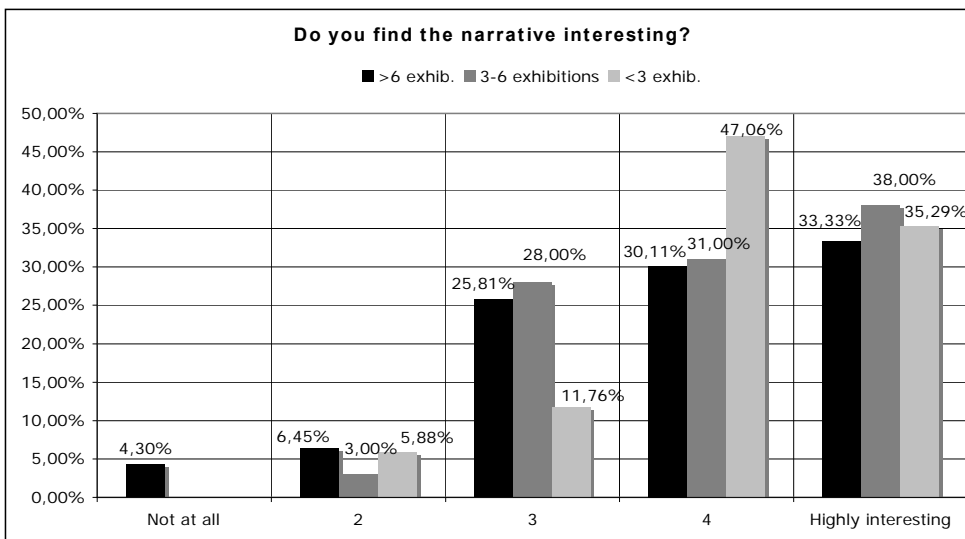
Figure 12 Interest by "expertise" of the users.

5.3 Does the narrative adequately introduce the themes of the exhibition?

The perception of the users about the ability of the narrative to convey the "message" of the exhibition was rated quite high . Overall 86% of the users found the narrative adequate, and 72% very adequate (score 4 or 5).

We expected, for this specific question, a difference between visitors, who could compare the narrative with the actual exhibition and non visitors, i.e users who had only the narrative as a way to understand the exhibition. As a matter of fact a stunning 97.5% of non visitors found the narrative adequate (scores from 3 to 5), and more than 80% found it very adequate (score 4 or 5).
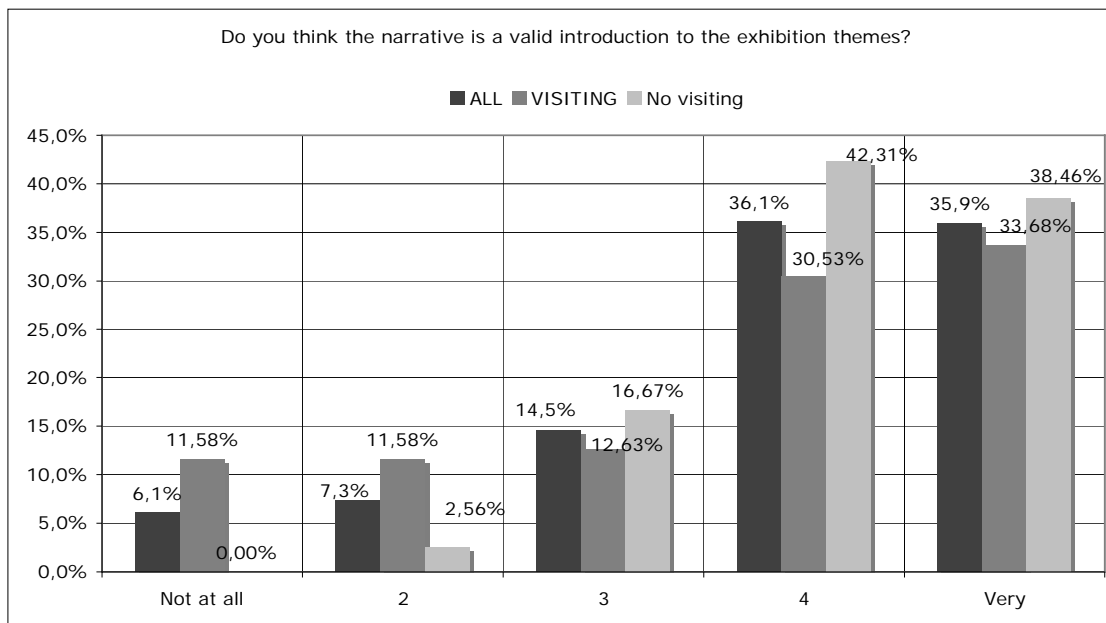
Figure 13 The narrative as an introduction to the exhibition's themes.

To our surprise, even the "visitors" rated the narrative quite well: more than 76% found it adequate and more than 63% very adequate. Another way of interpreting it is that the narrative was helpful to understand the exhibition even for those who had actually seen it.

5.4 The "cultural level" of the narrative

The cultural level of the narrative was found good by more than 94% of the users, and more than 70% found it very good (score 4 or 5).
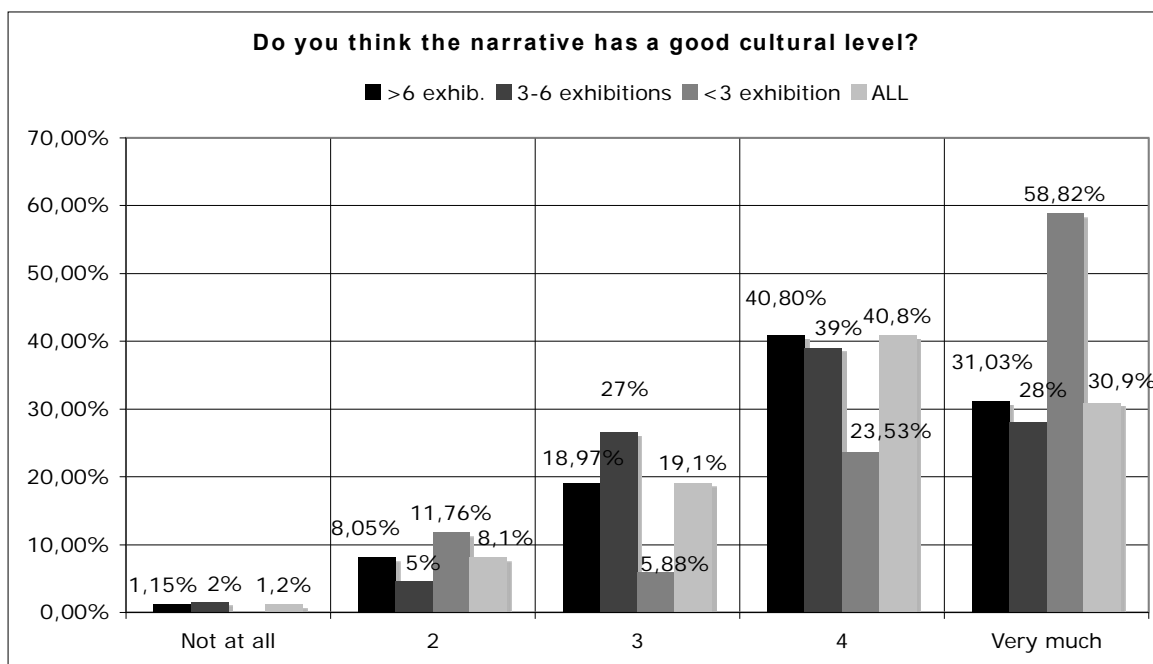
Figure 14 Cultural level of the narrative.

As shown by Figure 14, "non expert" users found the cultural level slightly better than the expert ones.

5.5 Overall Appreciation

As shown by figure 15, the vast majority of the users (more than 94%) evaluated the narrative positively (scores from 3 to 5), with no significant differences due to age.

As far as high appreciation (score 4 or 5) the overall percentage is 70%, which seems to be quite high. Younger users show slightly lower percentages: with less than 65% for age between 18 and 25, and 53% for age between 25 an 35. The "central age", between 35 and 50 years, shows an impressive 84%!
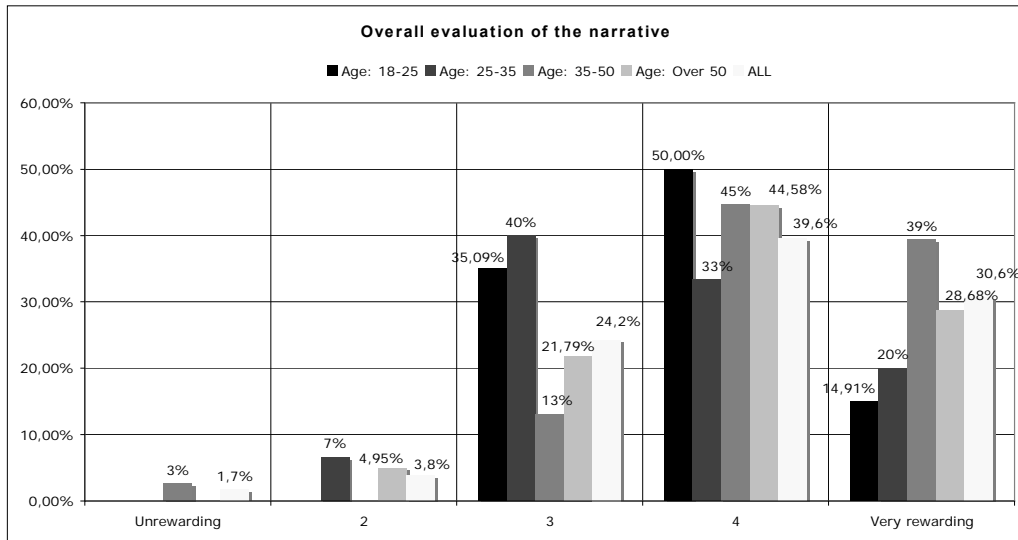
Figure 15 Appreciation by age.

As shown by figure 16, "expertise" of users does not make much of difference for positive appreciation (score from 3 to 5). As far as high appreciation (score 4 or 5) is concerned, instead, non expert users show the highest appreciation, above 70,4%.
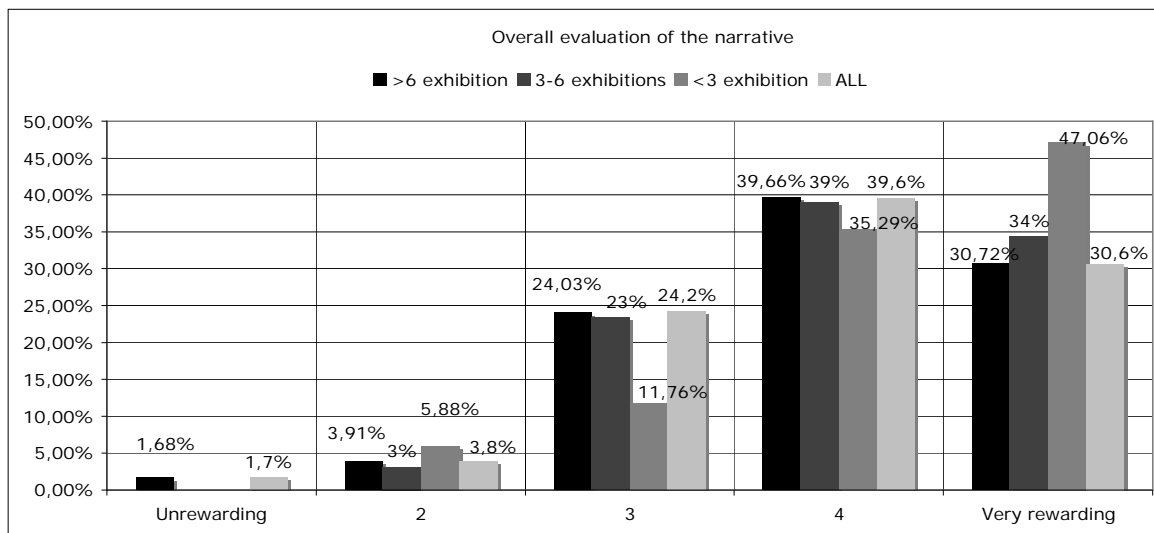
Figure 16 **Appreciation by "expertise".**

5.6 Does the narrative stimulate a visit?

The purpose of the narrative was cultural (helping users to understand and appreciate the exhibition) rather than "marketing". It was interesting, anyway, to investigate whether it generated (or increased) the desire to visit the exhibition. The question, clearly, made sense only for "non visitors", i.e. those on-line users who declared that they had not yet visited the exhibition.

Overall more than 89% of users declared an increased interest for visiting the exhibition (score from 3 to 5), and more than 70% a high interest (score 4 or 5). Young users showed an interesting pattern: overall there was less interest, but 50% gave a score of 5, i.e. declared the maximum level of interest for visiting the exhibition.

As far as expertise of the users is concerned (figure 17), it does not seem to be relevant for general interest, while for high interest expert users are above average (72%). Not experienced users, instead, showed less "high" interest (around 62%) but a strong "very high" interest (score 5), of about 37% (against 34% of experienced users). The users with "medium experience" have an impressive 46% of very high interest.

The small size of the sample (and of the subcategories) does not allow us to understand whether these phenomena have a real semantic, or they represent just statistical fluctuations.
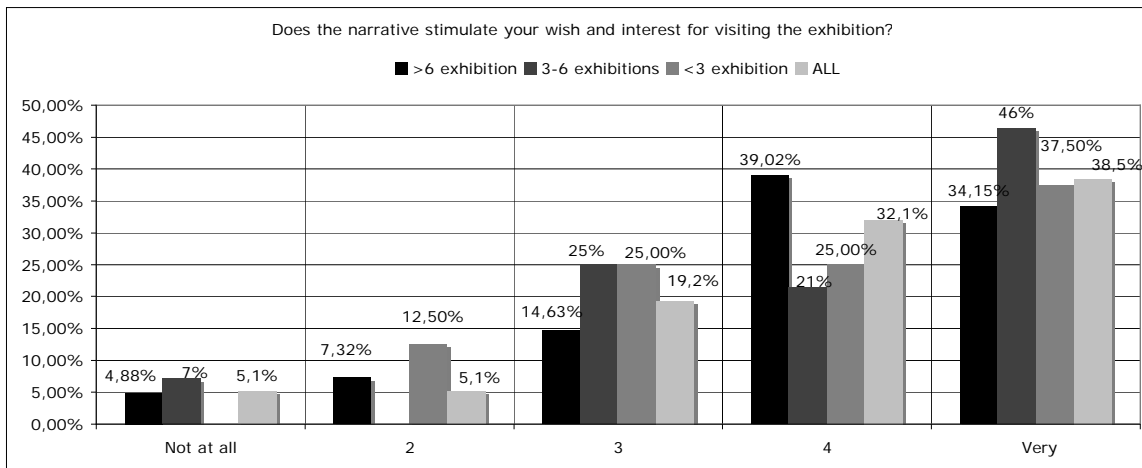

Figure 17 Interest for a visit, overall and by "expertise".

6   CONCLUSIONS AND FUTURE WORK

The first conclusion is that, from the data collected so far, Enigma Helvetia Tales seems to works well: it attracts the user's interest, it delivers the "message" (what the exhibition is about and what are its main themes) for everybody and promotes the visit (for those who have not visited the exhibition before).

A number of pitfalls with the user study, however, can be detected:

· The research method has problems in defining (a) the sample of users, (b) the best way to approach them and (c) the most appropriate questions to ask them.

We are planning to improve our method, using both quantitative and qualitative research.

· We do not understand well the influence of the user profiles (e.g. age, expertise, ...) over the different aspects.

We want to refine our profiling and to better understand how different profiles react to what stimuli.

Given the above, we are planning 3 lines of action:

a. Perform another user study about Enigma Helvetia Tales, detecting the following.

o   do the users who consulted already the narrative, still remember it (and how)?

o   do the users still feel like looking at it (in spite of the fact that the exhibition is over)?

b. Improve the methodology for user study, both from a quantitative and qualitative point of view.

c. Build another narrative performing different user studies at different points in time.

There is an underlying hypothesis that we would like to verify: maybe the best timing for getting the user's attention and providing him/her with cultural info and messages is, above all, **after the visit**: that is the moment when s/he may want to know more and pay more attention to what is being said.

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7 Annex 1 THE QUESTIONNAIRE

1. Visiting the exhibition ENIGMA HELVETIA:

- o You have already visited the exhibition
- o You are going to visit it soon
- o You don't know if you are going to visit it
- o You won't visit it

2. You have explored ENIGMA HELVETIA tales:

- o More then 20 minutes
- o From 5 to 20 minutes
- o Less then 5 minutes

3. Language used:

- o Italian
- o English

4a. To be filled in if you have already visited the exhibition.

 If you have already visited the exhibition, you should answer to the following answers:

Do you find the narrative interesting? (1-5)

Do you think the narrative has a good cultural level? (1-5)

Does the narrative allow you to understand better some themes of the exhibition? (1-5)

Please give an overall evaluation of the narrative. (1-5)

4b. To be filled in if you have not visited the exhibition yet.[1*]

If you haven't yet visited the exhibition, you should answer to the following answers:

Do you find the narrative interesting? (1-5)

Do you think the narrative has a good cultural level? (1-5)

Do you think the narrative is a valid introduction to the exhibition themes? (1-5)

Does the narrative stimulate your wish and interest for visiting the exhibition? (1-5)

Please give an overall evaluation of the narrative.

Optional data

For our research purpose it would be useful to have the following information (that, anyway, you are not obliged to be filled).

[1*]This question was not included in the on-site version of the questionnaire.

1. Do you use Internet?

- o More than 3 hours per week
- o From 1 to 3 hours per week
- o Occasionally
- o Never

2. Age:

- o 18-25
- o 25-35
- o 35-50
- o More then 50

3. How many exhibitions are you used to visit per year?

- o Less than 3
- o From 3 to 6
- o More than 6

"Look at me"

Report on the visitors' study

An investigation concerning the exhibition "Look at me", held at Museo Cantonale d'Arte, Lugano, from 25th October 2009 to 21st February 2010.

www.guardami.usi.ch/en

TEC-LAB (www.tec-lab.ch)
July 2010

EXECUTIVE SUMMARY

This document reports on the results of an extensive visitors' study run by TEC-LAB (University of Lugano) for the Museo Cantonale d'Arte in the occasion of the exhibition "Look at me. Faces and gazes in Art" (October 2009-February 2010).

The study focuses on the **relationship among visitors/cultural information about the exhibition and the works of art on display,** in order to answer to the following questions: do visitors get prepared before going to an exhibition? Do they make use of the informative material provided by the museum? After the visit, what do they remember most? Does the exhibition trigger a wish to know more? When would be the

In this study, **108 visitors were interviewed** at the museum's premises, immediately after their visit. The largest group was aged between 40 and 60 (35,6%) but all age-ranges were well represented (from people younger than 18 to people older than 60). The large majority (63,7%) of the visitors can be considered "experts", in the sense that they are in the habit of visiting art-exhibitions (they had visited more than 6 exhibitions in the previous year).

The main results of the study are:

- **The majority of the visitors (55,4%) DO NOT GET PREPARED BEFORE THE VISIT** (i.e. they do not browse the internet in search of cultural information, they do not read papers etc.). The most interesting reasons why are that **they want to be surprised by the exhibition**, they already know the artists on display, therefore they do not feel they need any specific preparation (the expert visitors).
- DURING THE VISIT, THE LEAFLET and the CONTENT ON THE WALLS provided by the museum (offering basic data on the works of art) are used by approximately half of the visitors (52,6%). An interesting reason for NOT using it is that **people do not want anything "in between" themselves and the work of art**.
- Immediately AFTER THE VISIT, most people (49%) are struck by the works of art in general, followed by specific artists (38,8%) and the overall topic of the exhibition (31,6%). Surprisingly enough, preparation before the visit does not seem to play a crucial role in the capacity of people to remember/be impressed by the various exhibition's aspects. It even turns out that those who had prepared themselves remembered more works of art with respect to those who had undergone some sort of preparation (59,5% against 40,5%).
- **AFTER THE VISIT, the large majority (60,3%) of the visitors expressed a wish "to know more" about the exhibition**; most of those who would like to know more are expert visitors.
- Eventually, the largest percentage of **visitors (43,5%) state they prefer to get cultural information about the exhibition AFTER THE VISIT** rather than before or during the visit.

On the whole, the study confirms that the traditional supports (like the leaflet) do work fairly well for those visitors who want to make use of them: but the interesting thing is that these visitors are a half of the museum's public. The remaining half, and the "expert" ones especially, have a different attitude: they do not get prepared before the exhibition, they want to be "surprised" by it, they do not want anything in between themselves and the works of art, that may interfere in their emotional relationship with art and the artists. Rather, they express a wish to know more after visiting the exhibition, for example about an artist or a work of art that has struck them in particular. The study therefore sheds light on an usually neglected moment: the after-visit, to which museum communicators should start paying attention.

1. INTRODUCTION

In the field of cultural heritage communication, investigating the cultural impact of an exhibition and how to enhance by means of additional materials is crucial. This means trying to answer to the following (and other – similar) questions:

- Do visitors get prepared for a visit to an exhibition? If yes, how?
- What do they remember about the exhibition, after the visit? What are they struck by?
- When would it be appropriate to provide them with additional information on the exhibition's theme, artists, works of art? Before, during or after the visit? When would they like to get this material?
- What kind of material would be appropriate?
- …

In order to answer the above questions, the TEC-LAB of University of Lugano has run an extensive visitors' study on the occasion of the exhibition "Look at me. Faces and gazes in art", held at the Museo Cantonale d'Arte (as part of a more comprehensive initiative by the Polo Culturale in Lugano, involving also the Museo d'Arte with an exhibition about "Bodies, Automatons and Robots in Art, Science and Technology"). 108 visitors were interviewed – at the museum's premises – form January to February 2010. In this report, the methodology, the profiles of the interviewees and above all the results of the study are presented, followed by a critical discussion in the conclusions section.

2. THE STUDY

2.1 METHODOLOGY

For this study, 108 visitors were of the exhibition were interviewed at the museum's premises, immediately after their visit. All the interviews were audio-recorded and then transcribed.

Interviews included multiple choice questions as well as open-ended questions. Multiple-choice questions were interpreted considering the selected options; open-ended questions were interpreted by means of **tags** (i.e. relevant keywords). The answers were tagged using a "new" word selected by the staff, apt at describing the answer's focus. The tags are:

- Specific artist/s (when the name of one or more specific artist was mentioned)
- Artists in general (when the interviewee recalled/showed appreciation for all the artists of the exhibition as a whole)
- Specific work of art/s (when the title of one or more specific work of art was mentioned or they were described in details even without remembering the exact name)
- Works of art in general
- Overall topic of the exhibition (i.e. the faces and gazes in art)
- The exhibition's design
- Techniques (when the interviewee was struck, rather than by a work of art or an artist, by the technique per se, e.g. the videos)
- Sections of the exhibition
- Everything (an overall impression of the exhibition)
- Nothing

An answer could be assigned more than one tag. The tag strategy allowed transforming the qualitative data into quantitative data.

Not all 108 interviewees did answer to all the questions, for various reasons (lack of time primarily). Still, the rating response was very high. For each question, we will specify how many answers were collected (the raw data can be seen in the appendix section).

2.2 VISITORS' SAMPLE

108 visitors were interviewed. Their **age** distribution reflects the typical public of the Museo Cantonale d'Arte (as it emerged from other studies by the museum): the largest fraction is middle aged, between

40 and 60, but also the other age-ranges are well represented. The youngest (below 18) are students that are taken to the museum by their teachers.
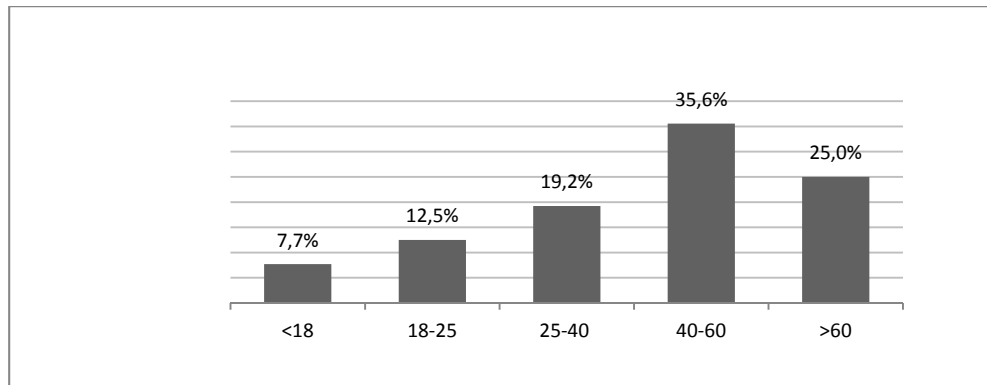

Figure 1. Age distribution of the interviewees (museum visitors).

We decided to measure the visitors' expertise of the domain (art) by checking the number of art exhibitions visited during the previous year: less than 3 ("low expertise"), between 3 and 6 ("medium expertise"), more than 6 ("high expertise"). It turned out that most of the visitors could be considered as "experts", since they had visited more than 6 exhibitions in the previous year. A few visitors were even professionals in the field: curators, artists, journalists, researchers and museum guides.
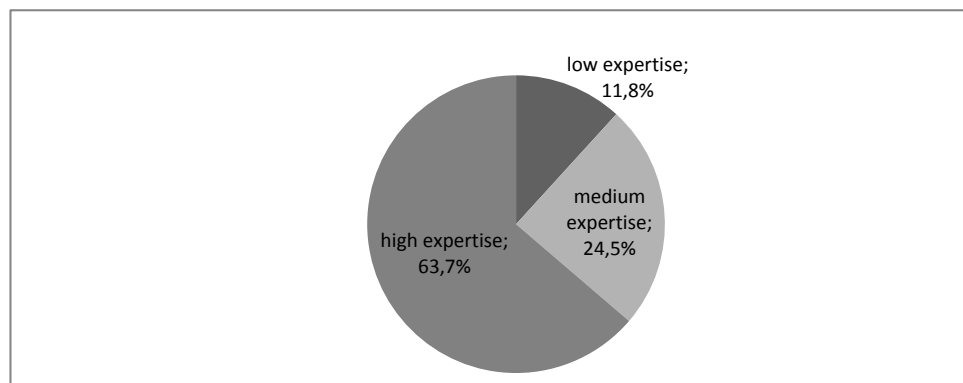
Figure 2. Interviewees' expertise measured in terms of number of exhibitions visited in the previous year: less than 3 (=low expertise), between 3 and 6 (=medium expertise), more than 6 (=high expertise).

Crossing the data on age with those on expertise, we can see that, as it may be expected, the most expert visitors are the older ones (over 40).
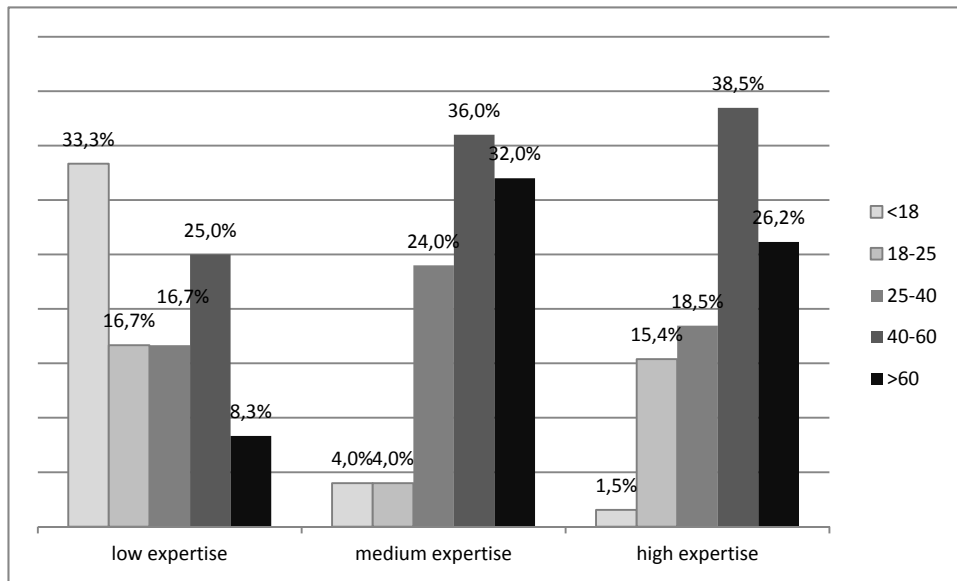
Figure 3. Age distribution of the interviewees according to the expertise.

3. RESULTS

In the following paragraphs, we present the most relevant results of the study. Quantitative data will be followed by some quotes, translated into English. The original quote – in Italian – can be found in the footnotes.

3.1 PREPARATION BEFORE THE VISIT

*Question: "Did you prepare for the visit? For example, did you read any publications or did you visit the website?"*

RESPONDENTS: 92

As regards some sort of cultural preparation before the visit, the situation on the whole is almost average: the visitors who had NOT prepared themselves before the visit slightly outnumber those who had. It is interesting to notice that visitors with low expertise do not try to prepare themselves before the visit (they do not try to become "experts"!). Another interesting observation is that **the majority (though not the large majority) of the expert visitors do not get prepared before the visit**. Eventually, those with a medium expertise are the most proficient ones: most of them look for some preparation.

4.a
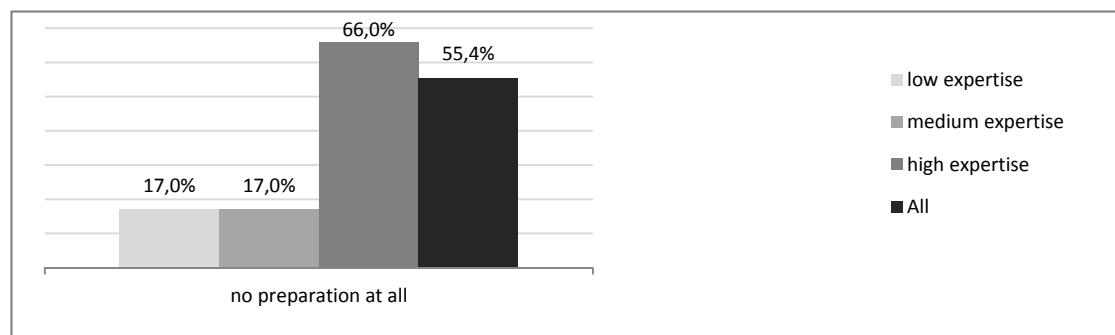
4.b
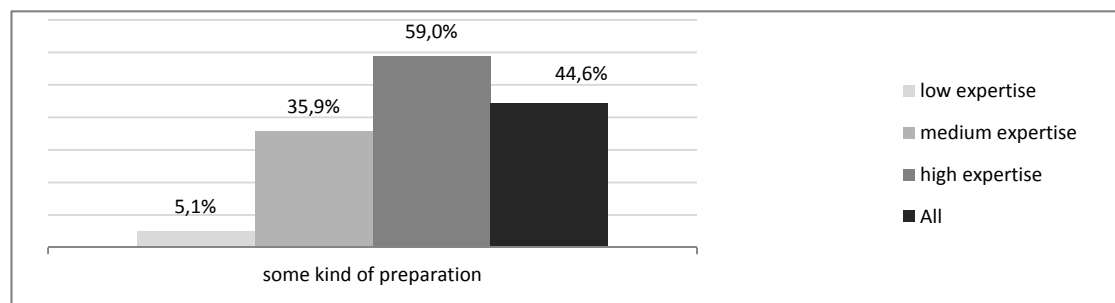
Figures 4.a and 4.b. Visitors' preparation before going to the exhibition, according to their expertise.

The reasons for not getting prepared are quite interesting: **visitors want to be "surprised by the exhibition",** they "already know some of the artists" etc.

QUOTES FROM VISITORS' INTERVIEWS:

Absolutely not, I browsed through the museum's web site quickly but I wasn't absolutely prepared because I wanted to be surprised by the exhibition[1] (high expertise, age range: 40-60).

I read some articles, however I know the majority of the artists exhibited[2] (high expertise, age range: 40-60).

I read something, but I didn't do any research nor did I visit the website, but I knew some artists on the exhibition. Rather, I had heard some colleagues' and friends' impressions and opinions about the exhibition[3] (high expertise, age range: 40-60).

…I just browsed the internet for some information, to get an idea of what was there[4] (low expertise, age range: 18-25).

---

[1] No assolutamente no, ho guardato velocemente ma non mi sono assolutamente preparata perché volevo essere stupita.
[2] Ho letto qualche articolo e la maggior parte degli autori esposti qua comunque li conosco.
[3] Letto si, ricercato no, e non ho nemmeno visto il sito, poi conosco già alcuni degli artisti che son qui esposti. Ho piuttosto sentito da altri colleghi e conoscenti le opinioni le impressioni.
[4] Solo internet per farmi un'idea di quello che c'era

3.2 USE OF THE MUSEUM'S INFORMATIVE MATERIAL DURING THE VISIT

*Question: Did you use the informative material provided by the museum?*

RESPONDENTS: 95

The question concerns the use of the leaflet visitors are given when they buy the ticket. As it can be seen from the quotes below, some interviewees interpreted the question as referring to the labels on the wall too. The leaflet is four pages long (A4) and it provides an overview of the exhibition's theme (faces and gazes in art) plus a description of the works of art on display, according to their physical location in the museum. Each work of art goes with its basic data: name of the artist, technique,… and a short description (a few lines overall). On the whole, the usage is average: a slight majority of visitors do use the leaflet and read the texts while moving around in the exhibition. The highest percentage of people who did use these materials are the expert ones.

5.a
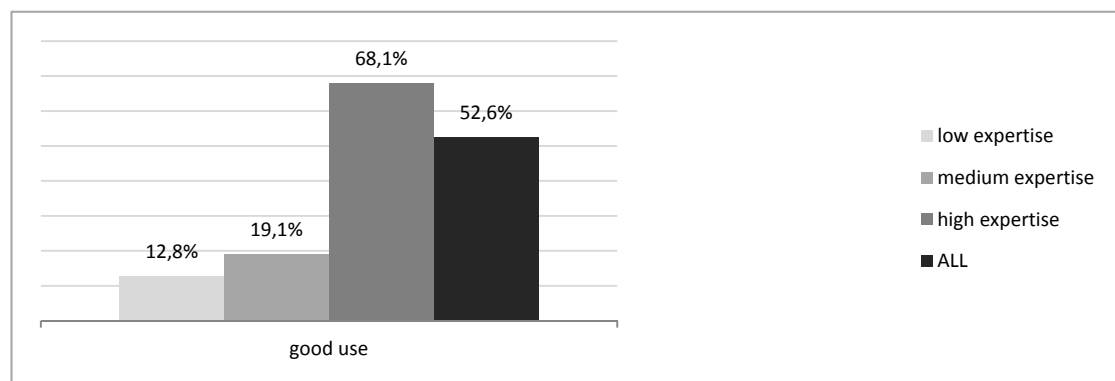
5.b
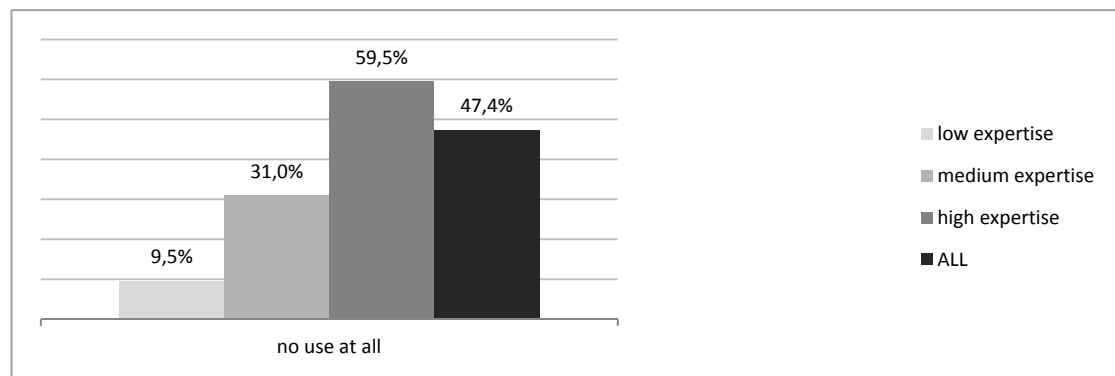
Figures 5a and 5b. Visitors' usage of the museum's leaflet according to their expertise.

The reasons for NOT using the informative materials are interesting, as it can be seen in the quotes below: people do not want something "in between" themselves and the works of art.

QUOTES FROM VISITORS' INTERVIEWS:

In my opinion, museums do have to provide visitors with information on the exhibits; still, I appreciate the fact that this information is "basic" (a general introduction), not detailed, so that you are not too much influenced in your interpretation[5] (high expertise, age group: 18-25)

We visited the exhibition attracted by the works of arts, without any support. Honestly whenever I go to a museum, I let myself be guided by my instinct; I either like the works of art or not, they always trigger in me some kind of reaction[6]. (medium expertise, age group: 25-40, she got prepared before the visit)

My attitude [towards informative material] is controversial: it can be disturbing... In the sense that if you read too much then you say – okay, I've read it all – but then maybe you miss the emotional impact the artist tried to convey[7] (high expertise, age group: > 60, s/he got prepared before the visit)

I focused mainly on the works of art and not so much on understanding the concept[8]. (s/he did not get prepared before the visit)

Some of the interviewers found **the leaflet very useful after the visit.**

I read the information on the walls only, because I was in a hurry, but I will read the informative material tonight[9]. (high expertise, age group: > 60, s/he didn't get prepared before the visit)

No, maybe later, but during the visit I do not like [to read extra material]. I like being surprised and trying to understand [the works] on my own, then if I'm interested in something, I investigate later[10]. (high expertise, age group: 18-25, s/he got prepared before the visit)

No, not during the visit, I read the texts on the wall but I will read the informative material later[11]. (medium expertise, age group: > 60, s/he got prepared before the visit)

Someone considered the leaflet **very useful for getting the overall meaning of the exhibition**.

While I walked, I told myself that I was lucky to have the informative material otherwise I might not get the exhibition's overall meaning. It helps focusing on the most relevant aspects, as for example the gaze or the negated gaze[12]. (high expertise, age group: > 60, s/he got prepared before the visit)

Yes, because without it would be a bit difficult, once I found something interesting, I could just read about it on the leaflet[13]. (high expertise, age group: > 60, s/he didn't get prepared before the visit)

Generally speaking, many visitors expressed a **discontent for materials (of any kind) that may interfere during the visit;** they would rather have direct "relationship" with the works of art:

---

[5] Si secondo me è importante se nei musei e nelle mostre sono presenti questi supporti informativi, però è bello che ci siano dei testi generali che ti introducono un po' ma non sono neanche troppo dettagliati, così che tu prendi quello che ti può dare la mostra senza essere troppo influenzato.

[6] Ci siamo lasciati attirare dalle opere, senza supporti. Sinceramente tutte le volte che sono andata in un museo mi sono lasciata più prendere da quello che era l'istinto non da quello che mi dicevano, quindi una cosa o mi piaceva o non mi piaceva, difficilmente mi era indifferente.

[7] Ma è controverso il mio atteggiamento rispetto a questi mezzi nel senso che effettivamente come dice lei potrebbero anche essere elementi di disturbo. Nel senso che se uno comincia a leggere eccessivamente poi dice va beh l'ho visto leggendolo, quindi perde tutto l'impatto emotivo che c'è dietro e che l'artista in fondo cerca di trasmettere.

[8] Ho letto le scritte al muro, però forse non ho sfruttato tutto quello che 'era, cioè io mi sono interessata prevalentemente alle immagini e non è che volevo capire tanto il concetto.

[9] Ho guardato solo le informazioni posizionate sui muri perché ero di fretta, ma il plico lo leggerò stasera.

[10] No magari dopo, però durante la mostra non mi piace. Cioè mi piace farmi sorprendere, cercare di capire da solo, poi alle volte che m'interessa qualcosa, vado ad approfondire dopo.

[11] No durante la mostra no, ho letto le scritte sui muri ma questo lo leggo dopo.

[12] Io si, mi sono basata molto sul testo scritto, e intanto che giravo, mi son detta per fortuna che c'è l'ho in mano perché senza avrei perso molto senso. Quello l'ho trovato molto importante, mi è servito molto per guardare meglio perché fa filtrare bene l'attenzione sulle cose sulle differenze, sugli sfondi, sullo sguardo che c'è o non c'è o che viene negato. Senza si perde molto, si gira così ma è difficile notare le cose senza avere quell'aiuto.

[13] Sì, perché se no senza era un po' difficile, allora non so quando m'interessava particolarmente qualche cosa, volevo andare a leggere a guardare cosa mi diceva.

Generally speaking, I acknowledge that such things [i.e. audio guides, informative materials, leaflets...] are useful; there may be some artist you do not know and thus you can get some information. But I don't like audio guides, I find them hideous, I'd rather kill myself than using them, because they interfere in the interaction with the space and damage the visit[14]. (high expertise, age group: 40-60, s/he didn't prepared before the visit)

I like the simple boards, I don't like when information overlaps with a work of art, especially multimedia information on a multimedia work of art. I prefer something more neutral. Maybe in a separated room, as an explanatory video, but I do not like it when the information interferes with the works[15]. (high expertise, age group: 25-40, s/he got prepared before the visit)

---

[14] In genere penso che queste cose a volte servano perché c'è qualche autore che non conosci e allora ti danno qualche riferimento, quindi servono; l'unica cosa che trovo odiosa, che preferisco spararmi un colpo piuttosto è utilizzare le audio guide, quelle sono una cosa allucinante, creano un interferenza con l'interazione con lo spazio con la visione pazzesca, e danneggiano.

[15] … mi piacciono i semplici tabelloni, diciamo che non i piace quando si sovrappone ad un opera soprattutto se è multimediale un'altra opera multimediale per spiegare, preferisco una cosa più neutra. Un conto è se è un intervento a parte, tipo una saletta in cui è presente un video esplicativo allora va bene, ma non mi piace che sia accostato all'opera perché interferisce

3.3. RECOLLECTION AFTER THE VISIT

Question: what were you struck by in the exhibition? Can you quote any work, artist or theme?

RESPONDENTS: 98

The majority of visitors (49%) were struck by the works of art in general; many remembered a specific artist by name (38,8%). In many cases, visitors quoted well known artists (e.g. Warhol), artists that made pieces of a great emotional impact (e.g. Boltansky), and artists that exhibited particular works of art (e.g. Viola for his videos). Eventually, many visitors were struck by the overall topic of the exhibition.
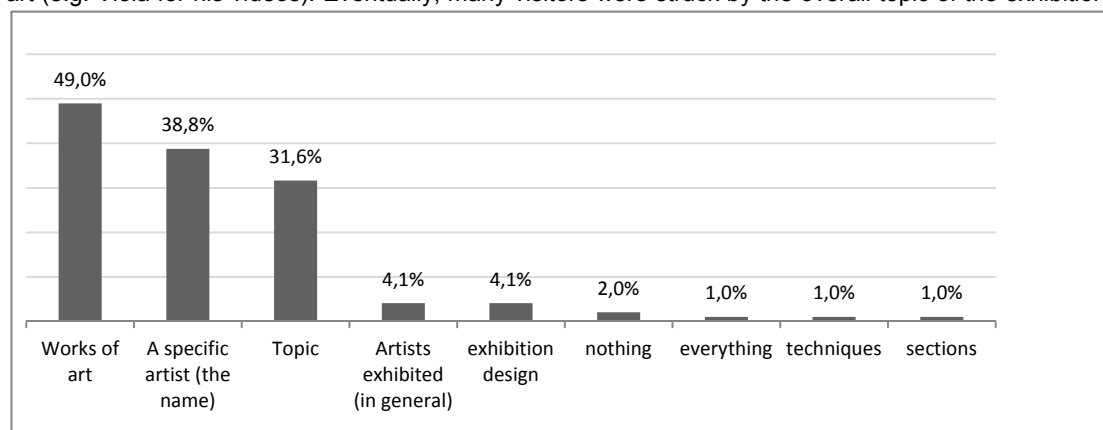
Figure 5. What visitors are struck by/remember most when getting out of the exhibition

QUOTES FROM VISITORS' INTERVIEWS:

I liked Boltansky, I'm glad I had the opportunity to see his work. For the rest, let's say that my interests in art are a bit different, however, the exhibition intrigued me[16]. (medium expertise, age group: 40-60, s/he did use informative material during the visit)

I really enjoyed the installation by Bill Viola on this floor, it is one of the works that Gianfranco Ragno [the museum guide] decided to show us [...]. I liked the two portraits by Warhol, one of them is "One Woman", an anonymous woman we may say, especially for us who are not Americans; the other is a character that I personally do not know. These are less-known works [by Warhol][17]. (low expertise, age group: 25-40, s/he used informative material during the visit)

I was impressed by Roman Opalca, and I also found the video by Marina Abramovich interesting, but that was because she is an artist that I already knew before coming[18]. (high expertise, age group: 40-60, s/he did use informative material during the visit)

A good percentage of visitors – 31,6% were struck by **the overall topic of the exhibition.**

I think that the good thing of this exhibition is the overall topic: identity. It is quite a unique topic, and each artist is providing her own personal interpretation from her own point of view. Even if an artist wants to be impersonal, she always leaves a trace of her personality[19]. (medium expertise, age group: 18-25, s/he didn't use informative material during the visit)

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[16] Boltansky mi piace, son contenta di aver avuto l'occasione di vederlo, quello sì. Per il resto, diciamo che i miei interessi nell'arte sono un po' diversi però m'incuriosisce dare un'occhiata.

[17] A me è molto piaciuta l'installazione di Bill Viola che c'è a questo piano, è una delle opere che Gianfranco Ragno ha deciso di presentarci […]. Mi son piaciuti moltissimo i due ritratti di Warhol, uno dei due intitolato "One Woman" quindi diciamo un'anonima in qualche senso per noi che siamo un pubblico non americano di quegli anni, e l'altro è un personaggio che io personalmente non conosco, quindi insomma opere che vanno al di là di quelle più conosciute.

[18] Sicuramente mi rimangono impressi Roman Opalca, trovo interessante anche il video della Marina Abramovich, ma perché è una che seguo un po'.

[19] Ma secondo me la cosa bella di questa mostra è proprio il fatto che il tema è abbastanza unico, quello dell'identità, del volto così, però il bello è che escono proprio le varie visioni e punti di vista di ogni artista diverso nelle diverse e

Crossing the data on recollection with expertise, it turns out, not surprisingly, that expert visitors are those who recall most elements, from works of art to artists, exhibition design and techniques: their feedbacks are the richest and most detailed. Interesting enough, while almost all of the expert visitors declare to have been struck by the **exhibition design**, neither the medium nor low expert ones made any appreciative comment about it. The low expert visitors were the ones who remembered less details; rather, they declared to have been struck by "everything" (which means they had been impressed by the exhibition as a whole).

Eventually, preparation before the visit does not seem to play a crucial role on the capacity of remembering specific aspects of the exhibition nor on the exhibition's impact. It even turned out that those users who had not prepared themselves before remembered more works of art than those who had prepared before the visit (59,5% against 40,5%). The only – predictable – difference between the two groups lies in the fact that those who had not prepared before the visit were more keen on declaring they had been struck by the exhibition as a whole (tagged as "everything").

poche e correnti quindi è bello vedere come c'è sempre qualcosa di personale quando magari l'artista vuole essere impersonale.

4. WISH TO "KNOW MORE" AFTER THE VISIT

Question: "After the visit, would you like to know more about any aspect of the exhibition?"

RESPONDENTS: 73

The large majority of the visitors expressed a wish "to know more" about the exhibition. As it may be expected, most of them are the expert ones. The low-experts are the least keen on knowing more.
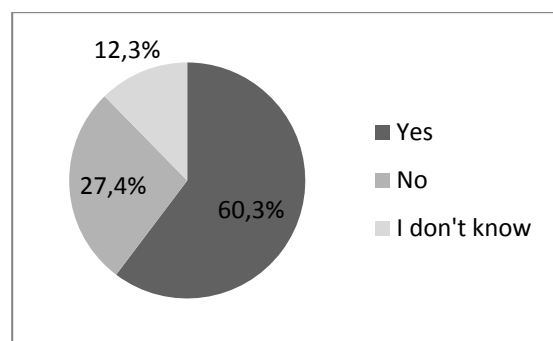

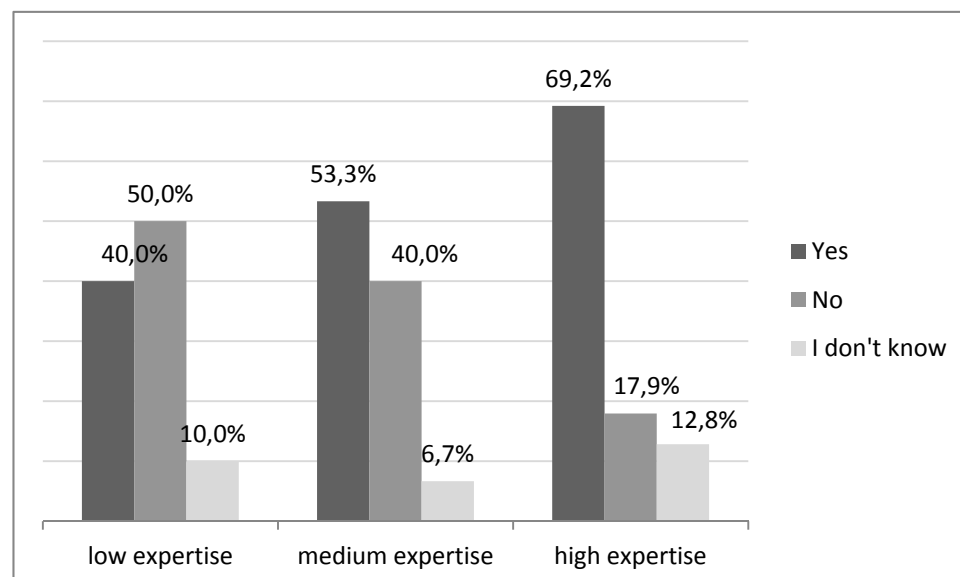Figure 8. Expressed wish to "know more" after the exhibition.

Figure 9. Expressed wish to "know more" after the exhibition, according to the expertise.

QUOTES FROM VISITORS' INTERVIEWS:

There were a few artists whom I did not know and I'd like to get to know more[20]. Interview 17 (high expertise, age group:40-60, s/he didn't get prepared before the visit, s/he didn't use the informative material during the visit)

Yes, yes. We really appreciated the artists, and we would like to know more regarding other works of these artists and their history[21]. (high expertise, age group: 18-25)

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[20] Ci sono degli artisti che non conoscevo e mi piacerebbe approfondire.
[21] Si, si. Ci siamo interessate particolarmente a degli artisti, quindi viene voglia di andare ad approfondire anche le altre opere di questi artisti, la loro storia.

Yes, I'm already looking for more information regarding Boltanski, I would have gone to Paris too, but unfortunately the exhibition in Paris is finishing soon[22]. (medium expertise, age group: 40-60, s/he got prepared before the visit, s/he did use the informative material during the visit)

Some visitors do not want to get more information:

No, I am not at that level. I visit exhibitions just for the pleasure of the moment and maybe for learning something at that moment but nothing more[23]. (medium expertise, age group: > 60, s/he didn't get prepared before the visit, s/he didn't use the informative material during the visit)

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[22] Si sicuramente su Boltanski lo sto già facendo, sarei anche andata a Parigi, però purtroppo dura troppo poco quello che c'è adesso, quindi indipendentemente dalla mostra sì.
[23] No, non sono a questi livelli glielo dico subito. Vado alle mostre proprio per il piacere del momento e magari imparare qualcosa in quel frangente, ma niente più.

5. "KNOWING MORE": PREFERENCES ON TIMING (BEFORE, DURING OR AFTER THE VISIT)

Question: "Generally speaking, when do you like to get 'good' information about an exhibition? Before, during or after the exhibition itself?"

RESPONDENTS: 86

By "good information" we try to translate an Italian expression that means "something more than just the basic information about the exhibition", something more substantial from a cultural point of view. The result here is very interesting: **visitors** in general (and the expert ones in particular) **seem to prefer the "after-visit" moment for getting more information**.
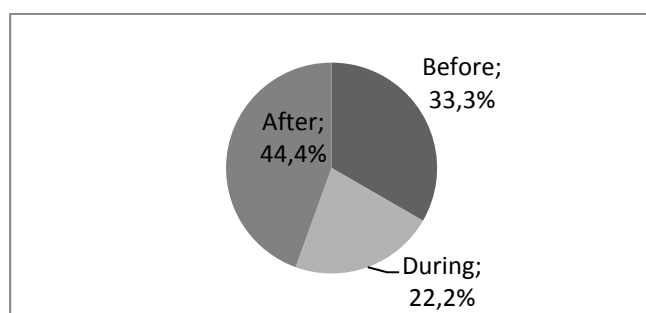
Figure 10. When visitors prefer to receive "good information" (i.e. substantial information, from a cultural point of view) about the exhibition.
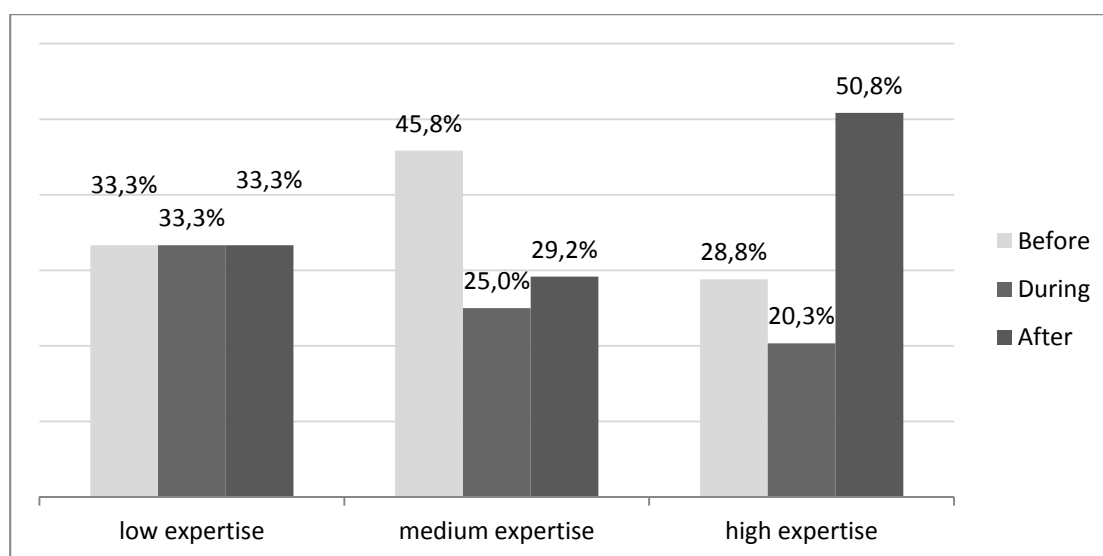
Figure 11. Preferences on when to receive more information according to the visitors' expertise

QUOTES FROM VISITORS' INTERVIEWS:

Why some people would like to have information **after the exhibition**:

I think after the visit, to have more information on the things I liked best[24]. (high expertise, age group: 40-60, s/he prepared before the visit)

Usually I do not like getting information before the visit, I prefer to go to the museum and be surprised, in a good or bad sense. I'd rather have more information after the visit, when I'm "intrigued" and I feel like investigating. I'd definitely not get information before (high expertise, age group: > 60, s/he didn't get prepared before the visit, s/he didn't use the informative material during the visit)

Yes I like to get more information when I can, I like to find out more before so I am prepared and I can contextualize what I see[25]. Interview 20 (medium expertise, age group: 18-25, s/he prepared before the visit, s/he didn't used the informative material during the visit)

Why some people would like to have information **during the exhibition**:

During and after. I do not like to get information beforehand, it would waste my "rhythm" when I get into the exhibition [26]. (high expertise, age group: 40-60, s/he did not get prepared before the visit nor did she use the informative material during the visit)

Why some people would like to have information **before**.

I prefer before, in order to have an idea of what I'm going to see ... where the artists lived, when they were born, what they did, ... this kind of things[27]. (high expertise, age group: > 60, s/he didn't get prepared before the visit, s/he did use the informative material during the visit)

Usually I prepare before the visit, reading newspaper articles, then I go to the exhibition and I read something else during the visit in order to compare. This time I couldn't do it because I did not have my glasses.[28] (high expertise, age group: > 60, s/he got prepared before the visit, s/he didn't use the informative material during the visit)

I usually get information before [visiting the exhibition], to get an idea. While visiting the exhibition, I do make use of short guides like this one. If there is something particularly interesting, I go more in-depth through the Internet or catalogues, books, magazines or whatever is out there[29]. (high expertise, age group: > 60, s/he didn't get prepared before the visit, s/he didn't use the informative material during the visit)

... but the interesting thing is that those who declared that they would like to have information before, actually DID NOT GET PREPARED before going to this exhibition!

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[24] Penso dopo, dopo la visita, riguardo a quello che mi piace, riguardo a quello che mi è piaciuto e interessato cioè su singole opere.
[25] Si io mi documento quando posso, mi piace farlo anche un po' prima di modo che sono un po' preparata e riesco a contestualizzare quello che vedo.
[26] Durante e dopo. Prima no perché interrompe il mio ritmo che voglio avere nell'ingresso della mostra, voglio entrare e ho la curiosità immediata, a metà magari qualche cosa e soprattutto adesso mi piacerebbe.
[27] Io preferisco prima, prima farmi almeno un'idea di quello che vado a vedere degli artisti ... dove hanno vissuto quando sono nati cosa hanno fatto, queste cose.
[28] E di solito mi preparo prima, di solito tengo da parte articoli anche sul Corriere e me li leggo, poi vado alla mostra e rileggo qualcos'altro per confrontare quello che ho visto ma in questo caso non potevo perché non avevo gli occhiali.
[29] Ma guardi io generalmente m'interesso prima, mi faccio un'idea prima, poi cerco di guardarlo con una breve guida tipo questa qua, e poi se c'è qualcosa che mi ha colpito particolarmente lo approfondisco su internet o su cataloghi, libri, riviste o quant'altro.

APPENDIX

RAW RESULTS

AGE		%
<18	8	7,7%
18-25	13	12,5%
25-40	20	19,2%
40-60	37	35,6%
>60	26	25,0%
TOTAL	**104**	**100,0%**
NA	4	3,8%
AVERAGE EXHIBITIONS VISITED IN THE RPEVIOUS YEAR		
<3	12	11,8%
3-6	25	24,5%
>6	65	63,7%
TOTAL	**102**	**100,0%**
NA	6	5,6%
1. Did you prepare for the visit? For example, did you read any publications or did you visit the website?		
Yes	41	44,6%
No	51	55,4%
TOTAL	**92**	**100,0%**
NA	16	17,4%
2. Did you use the informative material provided by the museum?		
Yes	50	52,6%
No	45	47,4%
TOTAL	95	100,0%
NA	13	13,7%

3. What do you remember of the exhibition? What were you struck by?		
A specific artist (the name)	38	38,8%
Artists exhibited (in general)	7	7,1%
Works of art	48	49,0%
Topic	31	31,6%
nothing	2	2,0%
exhibition design	4	4,1%
everything	1	1,0%
techniques	1	1,0%
sections	1	1,0%
TOTAL	**98**	**100,0%**
NA	10	10,2%
4. After the visit, would you like to know more about any aspect of the exhibition?		
Yes	44	60,3%
No	20	27,4%
I don't know	9	12,3%
TOTAL	**73**	**100,0%**
NA	35	47,9%
5. Generally speaking, when do you like to get 'good' information about an exhibition? Before, during or after the exhibition itself		
after	28	32,6%
before	13	15,1%
before/after	9	10,5%
before/during	5	5,8%
before/during/after	6	7,0%
depends on the subject	9	10,5%
during	11	12,8%
during/after	1	1,2%
I don't know	1	1,2%
never	3	3,5%
TOTAL	**86**	**100,0%**
NA	22	25,6%

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NIPPON: the visitors' study

An investigation concerning four exhibitions held in Lugano (Switzerland), at Museo d'Arte, Museo Cantonale d'Arte, Villa Ciani, Villa Ciani's Park, Museo delle Culture from October 23rd, 2010 to February 27th, 2011
www.nipponlugano.ch

TEC-LAB (www.tec-lab.ch)
June 2011

PART I – Introduction

CONTEXT
This report presents a visitors' study about "NIPPON. *Between Myth and Reality: Art and Culture from Japan*", 4 exhibitions and a number of events about Japanese culture (from the ancient traditions to contemporary artistic expressions), held in Lugano (Switzerland) from October 23rd, 2010, to February 27th, 2011.
The four exhibitions were:

- *Araki. Love and Death* (Museo d'Arte, Villa Malpensata)
- *GUTAI. Painting with Time and Space* (Museo Cantonale d'Arte and Villa Ciani's park)
- *Ineffable Perfection. Japan's Photography. 1860-1910* (Villa Ciani)
- *Shunga. Art and Eros in Japan During the Edo Period*, (Museo delle Culture, Heleneum)

For each exhibition, 2 different multimedia 'narratives' were created by TEC-LAB, USI (Università della Svizzera Italiana):

- **Thematic narrative**: about the exhibition's main themes
- **Highlights narrative**: a multimedia catalogue of the most relevant exhibits.

The two narratives were linked together, so that users could relate a specific theme to its most relevant exhibits.
In addition, the various pieces of content were assembled in an emotional interface taking the form of a "mosaic" ('**Nippon-at-a glance**').

THE STUDY
The study was conducted with a set of surveys, filled up through interviews taken from visitors coming out of the exhibitions. Overall 255 visitors were interviewed: 48 from the Araki exhibition, 37 from the Shunga exhibition, 69 from the Gutai exhibition and 101 from the Ineffable Perfection exhibition.

The purpose of the study was threefold:

- to know the users' **demographics**
- to investigate the point of view of users towards **information** (what they used – what they would have wished to use, and how, . .)
- to investigate the **relationship between users and technology** (what they used – what they would have wished to use, for what purpose, …)

The users' appreciation of **NIPPON-multimedia** (the multimedia communication) was not the specific focus of this study, since this particular format of multimedia support had already been investigated in previous studies (respectively for the exhibitions "Look at me"[1][2][3][4] and "Enigma Helvetia" [5][6]).

In Part II, we comment what we believe are the most interesting data of the study; in Part III, a number of figures shows most of the details.

We must warn the reader that the sample was not big enough, and not carefully calibrated, therefore the percentages should not be taken at "face value". Still, they are quite valuable as trends' indicators.

PART II – Commentary

BASIC DEMOGRAPHICS (Figures 1, 2, 3)
- PROVENANCE (Figure 1)
  Visitors came from Italy (39.2%), Ticino (36.4%), the rest of Switzerland (17%) and Europe (7.1%)
- AGE (Figure 2):
    - o Young: 30 years of age or less (24.7%)
    - o Middle-aged: between 31 and 60 years of age (59.6%)
    - o Aged: more than 60 years of age (15.7%)
- GENDER (Figure 3)
  Females were the majority (57%).

The composition seems to correspond, roughly, to the standard mix of visitors for exhibitions in Lugano, with little more young visitors than we expected.

RELEVANT FEATURES (Figures 4, 4a-c, 5, 5a-c)
- EXPERTISE (Figure 4)
We asked visitors: "how many exhibitions have you visited in the last 12 months?" and, according with our past experience [4][6], we classified visitors into the following categories:
    - o **Low-expertise**: visitors who had visited less than 4 exhibitions in the previous 12 months.
    - o **Medium-expertise**: visitors who had visited between 4 and 7 exhibitions in the previous 12 months.
    - o **High-expertise**: visitors who had visited more than 7 exhibitions in the previous 12 months.

In the sample we had 19.20% of visitors with low-expertise, 51% with medium-expertise, and 29.8% with high-expertise.
This is, more or less, what we expected and it shows the good quality of the visitors of exhibitions in Lugano.

As we expected, age has an influence over expertise (Figures 4a-c):
    - o Young visitors: 33.3% have low expertise, 12.7% only have high expertise.
    - o Aged Visitors: low expertise gets down to 7.5% and high expertise jumps up to an impressive 42.5%.
    - o Medium-aged visitors: they fall in between, with 16.4% with low expertise and 33.6% with high expertise.

- CONFIDENCE WITH TECHNOLOGY (Figure 5)
Visitors self-declared their level of confidence with technology and computers. 18.4% declared a very high confidence, while 30.2% low confidence or no confidence at all; the majority (51.4%) has a reasonable confidence.
Overall, visitors showed a technological confidence higher than expected.

As we expected, there is a *strong correlation between technology and age* (Figures 5a-c):
    - o Young visitors: only 9.6% had a low confidence, and 46% had high confidence;
    - o Aged visitors: 37.5% had a low confidence, and 15% had high confidence.

GETTING NOTIFICATION AND INFORMATION (Figures 6, 7, 8)
- NOTIFICATION (Figure 6)
  Most visitors got to know about Nippon exhibitions from friend; following, from Internet, posters and newspapers; very few from the radio or TV.

- INFORMATION (Figure 7)

  As regards information about the exhibitions, Internet was by far the most important source (56%), followed by traditional materials by the organizers (37%), newspapers (27%) and Radio/TV (a mere 11.7%).

  Most visitors looked both for practical *and* cultural information (42.34%); 29.06% looked for practical information only and 16.76% for cultural information only (Figure 8).

VISITING THE EXHIBITION (Figure 9)

The vast majority of the visitors (60.4%) went to visit the exhibition as a couple; 20.4% went by themselves, 9.8% with a small family and 7.5% with a small group of friends. Large groups of friends or large families were marginal.

NIPPON-MULTIMEDIA (Figures 10, 11)

- AWARENESS (Figure 10)

  Only 14.9% of the visitors were really aware of the existence of Nippon Multimedia, and 17.3% were slightly aware.
  The obvious comment is that multimedia needs to be better promoted (also through traditional media).

- USAGE (Figure 11)

  A surprisingly high percentage of the 'aware visitors' did actually used Nippon multimedia. The percentage ranges from 5.9% for Shunga, to 8.2% for Ineffable perfection, up to a surprisingly 13.7% for Nippon-at-glance.
  The fact that nearly 93% of the visitors who were aware of the existence of Nippon Multimedia did use Nippon-at-glance, clearly shows the potential of technology.

ADDITIONAL INFORMATION (Figures 12, 12a-c, 12d-f, 13, 13-a)

MEDIUM (Figure 12)

  Web from a PC was by far the preferred medium (42.7% very much and 61.5% overall). The second preferred medium was the *traditional publications* (24.3% and 45.5%) and then *web from a mobile device* (20.4% and 29.4%). The least preferred was the *PODCAST* (13.3% and 18.4%).
  It is worth noticing that the web is more important than paper, and that the usage of mobile devices for accessing the web is rapidly growing.

Age is relevant for the choice of medium (Figures 12a-c):
  o Young visitors: technological media are higher and traditional media are lower. *It can be noticed that web with mobile devices is nearly as important as traditional publications.*
  o Medium aged visitors: they follow the overall pattern.
  o Aged visitors: they reverse the pattern. Traditional media are the preferred ones (over 55%), followed by the web (over 32%). Web on mobile and download are down in the preference.

Confidence with technology is even more relevant for the choice of medium (Figures 12d-f):
  o Low-technology visitors: they prefer traditional publications by far.
  o Medium-technology visitors: they follow the overall pattern, but with traditional media well ahead of web for mobile devices.
  o High-technology visitors: they reverse the pattern. Web for mobile devices (over 37%) is above traditional media (above 33%). Download is also high (26%).

- CONTENT (Figure 13, 13a)
  Additional content after the visit is desired by all visitors, and especially by 'expert' visitors.
  The preferred additional content is about the *life of artists* (47%) and *comments about artworks (46%)*. Next come the *themes of the exhibitions* (39%) and *socio-historical context* (37%). Low was *art history* (29%).
  It is worth noticing that visitors with high-expertise were above the average (by 10% or more) for all the different categories of additional content; 'art history', in particular, is above average by more than 16%.

USAGE OF NIPPON-MULTIMEDIA (Figures 14, 15, 16, 17)

- AGE (Figures 14, 15)
  The use of multimedia is rapidly decreasing with age, both for the individual exhibitions and Nippon-at-glance.

- CONFIDENCE WITH TECHNOLOGY (Figures 16, 17)
  The use of multimedia is strongly related to the confidence with technology. Visitors with high confidence use the multimedia 8 times more than visitors with low confidence.

PART III – Relevant data

Provenance of visitors

7,10%

36,40%

39,20%

17,30%

Legend:
- Ticino
- Switzerland
- Italy
- Europe
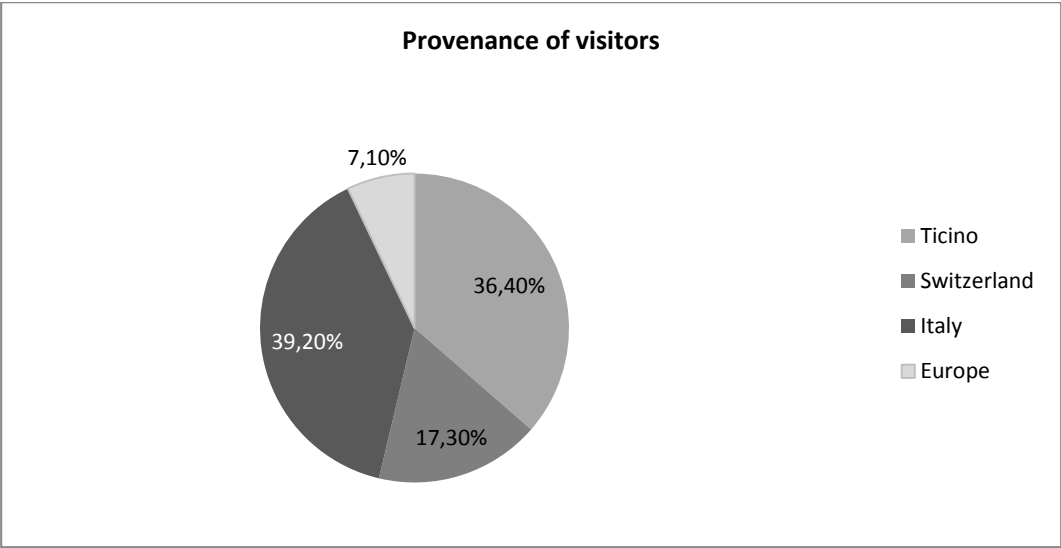
Figure 1 The geographic provenance of the visitors.

Age of the Visitors

15,70%

24,70%

59,60%

Legend:
- <= 30
- 31-60
- Over 60
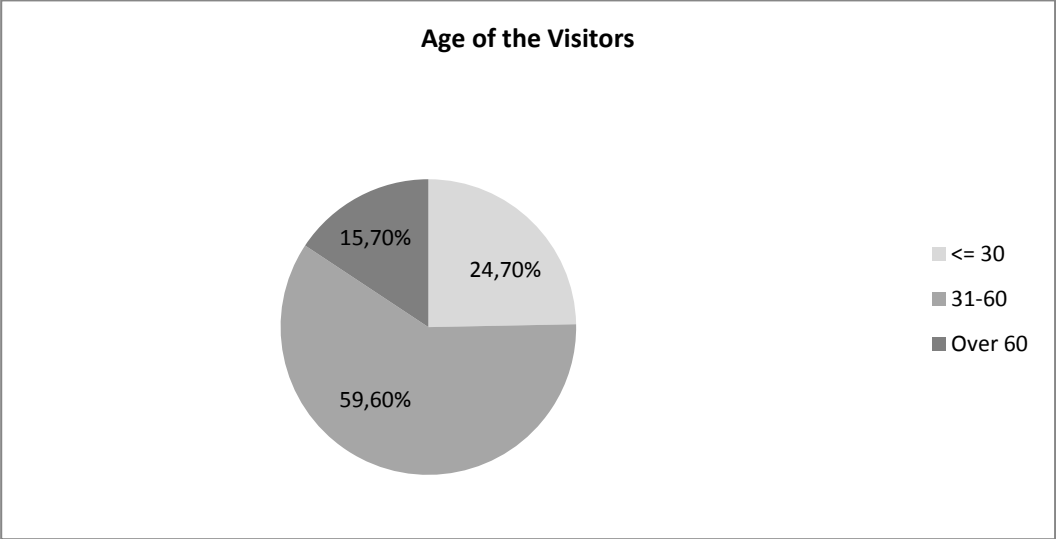
Figure 2 The age distribution.

Gender of the Visitors

43,50%

56,50%
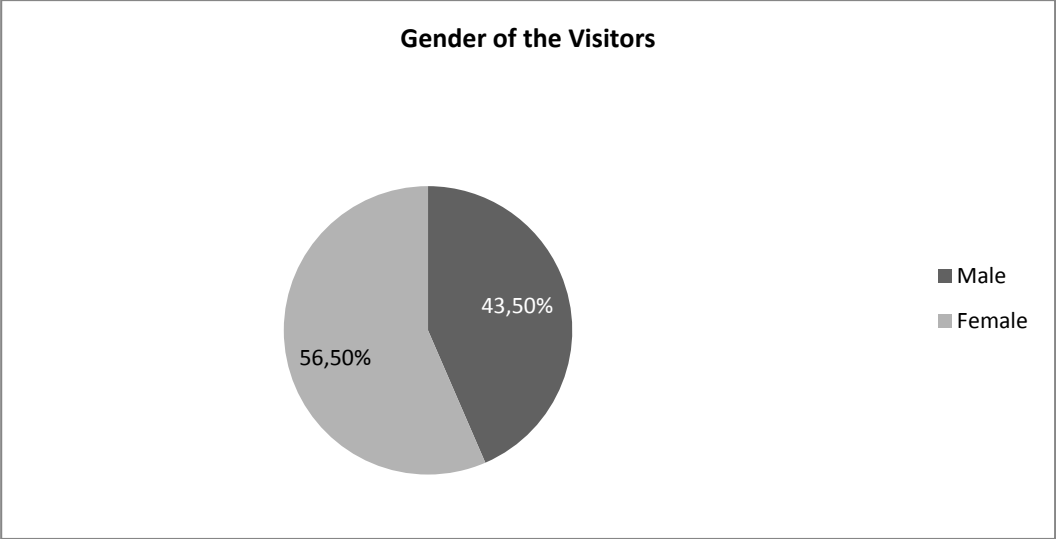
Legend:
- Male
- Female

Figure 3 The gender distribution.
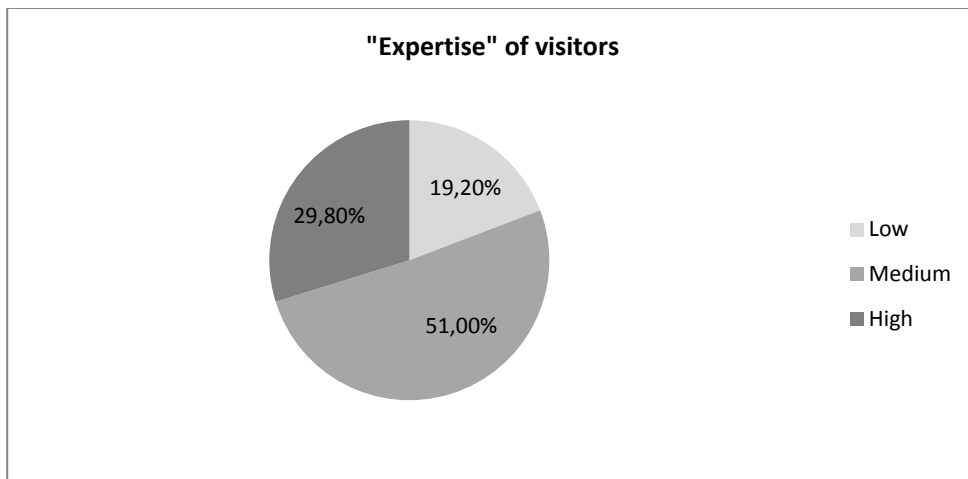
Figure 4 Expertise of visitors: number of exhibitions visited in the previous 12 months.
0-3=low expertise; between 4 and 7=medium expertise; more than 7=high expertise.

Figure 4a Expertise of young visitors.
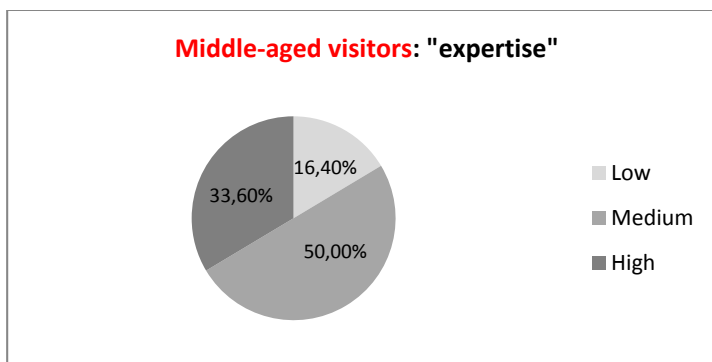
Figure 4b Expertise of middle-aged visitors.
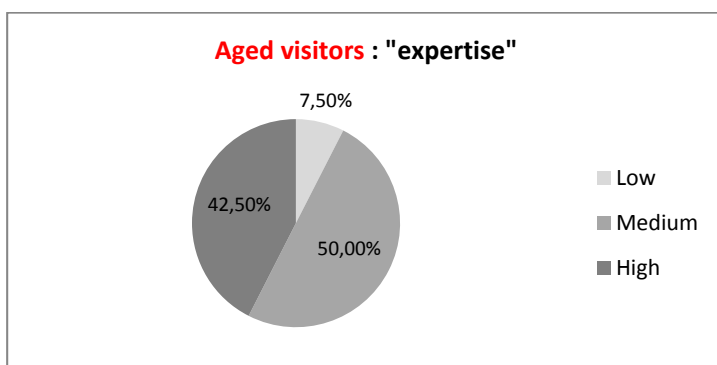
Figure 4c Expertise of aged visitors.
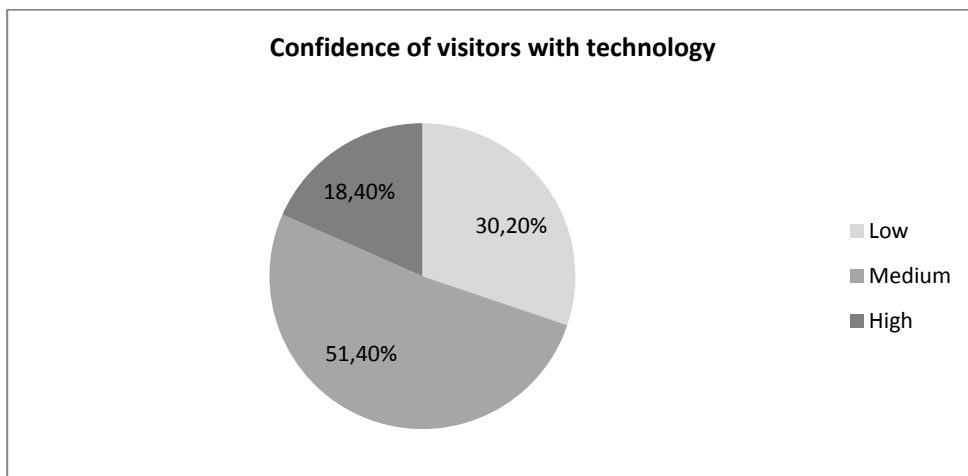
Figure 5 Confidence in using digital technology (as declared by visitors).
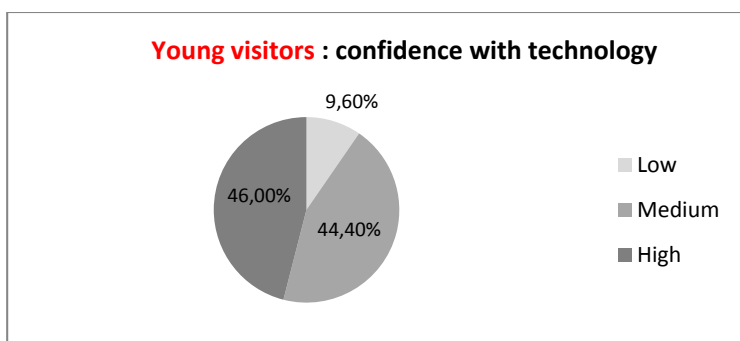
Figure 5a Confidence of young visitors in using digital technology.
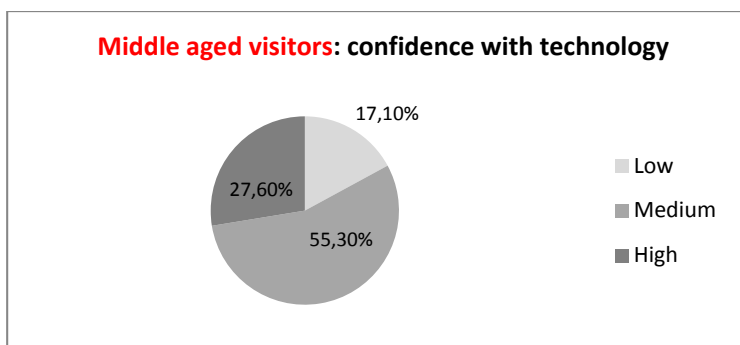
Figure 5b Confidence of middle-aged visitors in using digital technology.
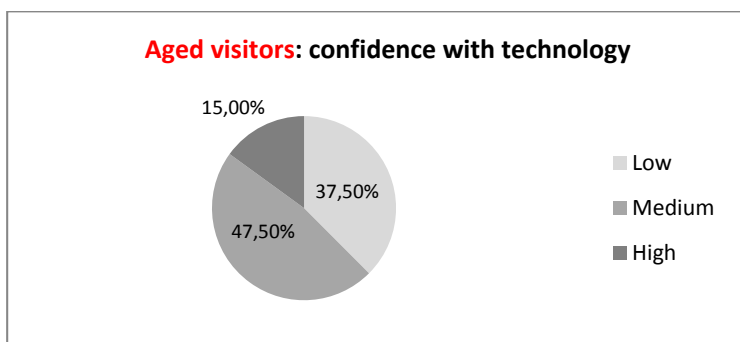
Figure 5c Confidence of aged visitors in using digital technology.

Knowing about the existence of the exhibitions

	Newspapers	Posters	Radio TV	Internet	Word of mouth	Other
A little	17,60%	14,10%	10,60%	23,90%	10,20%	1,60%
Extensively	25,50%	32,20%	3,50%	24,30%	40,00%	22,40%
Total	43,10%	46,30%	14,10%	48,20%	50,20%	24,00%
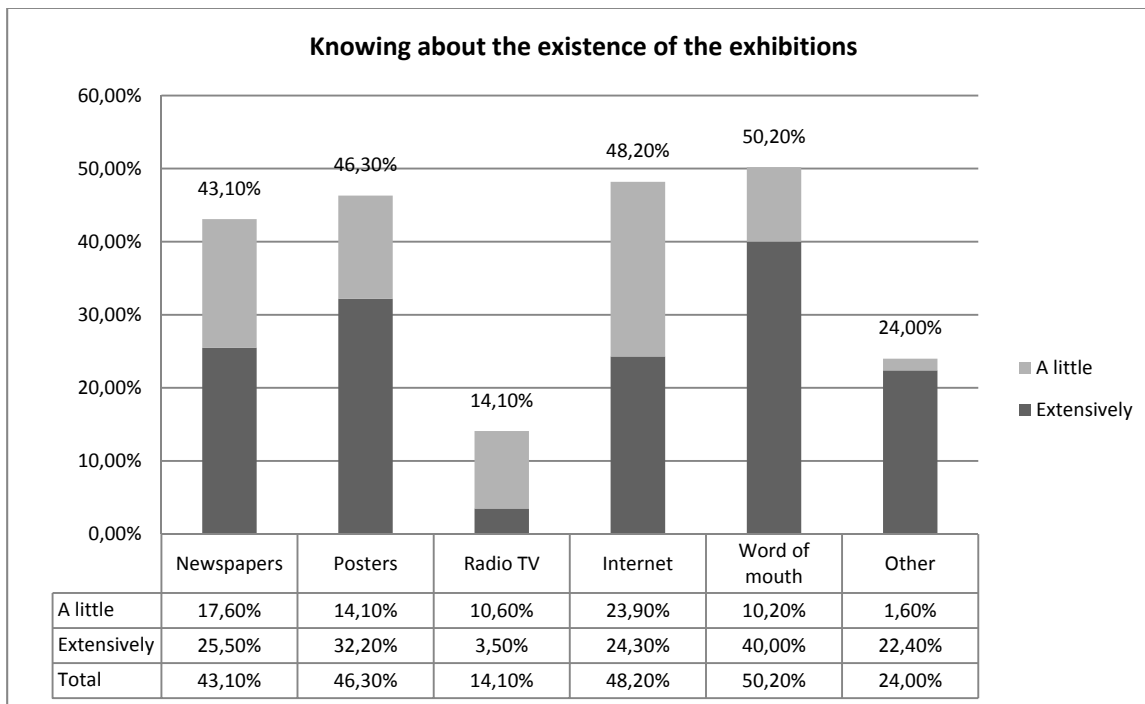
Figure 6 How visitors got to know about the existence of Nippon exhibitions.

Sources of Information

	Newspapers	Material from the exhibition organizers	Radio TV	Internet
A little	16,90%	26,70%	8,60%	33,30%
Extensively	10,20%	11,00%	3,10%	23,10%
Total	27,10%	37,70%	11,70%	56,40%
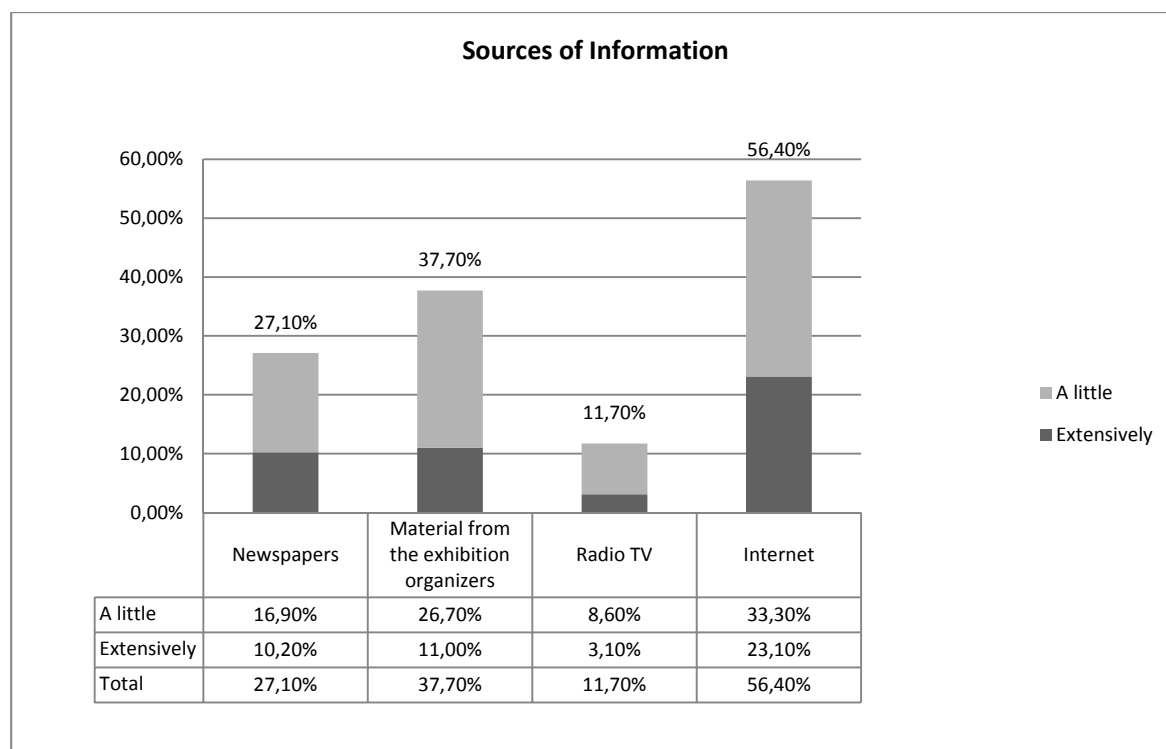
Figure 7 Where visitors found additional information about the exhibitions.

The type of information that visitors looked for

	Practical info	Cultural info	Practical and cultural info
A little	21,22%	11,22%	35,68%
Extensively	7,84%	5,54%	6,66%
Total	29,06%	16,76%	42,34%
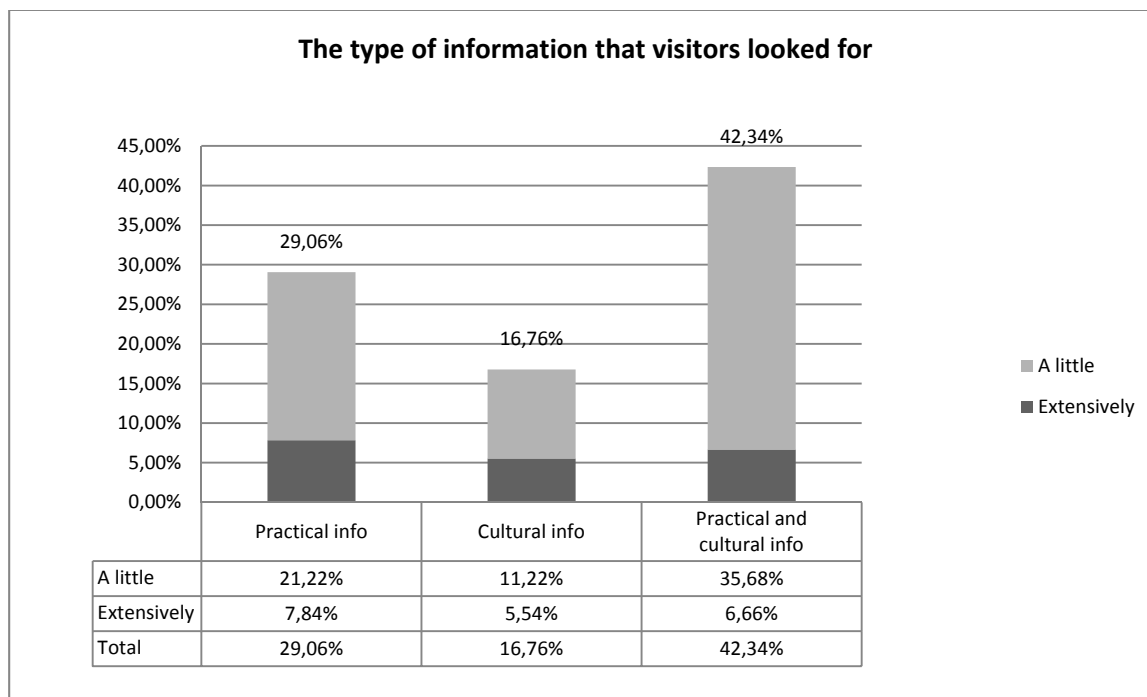
Figure 8 Type of information looked for before going to the exhibition.

How did the visitors come to the exhibition?
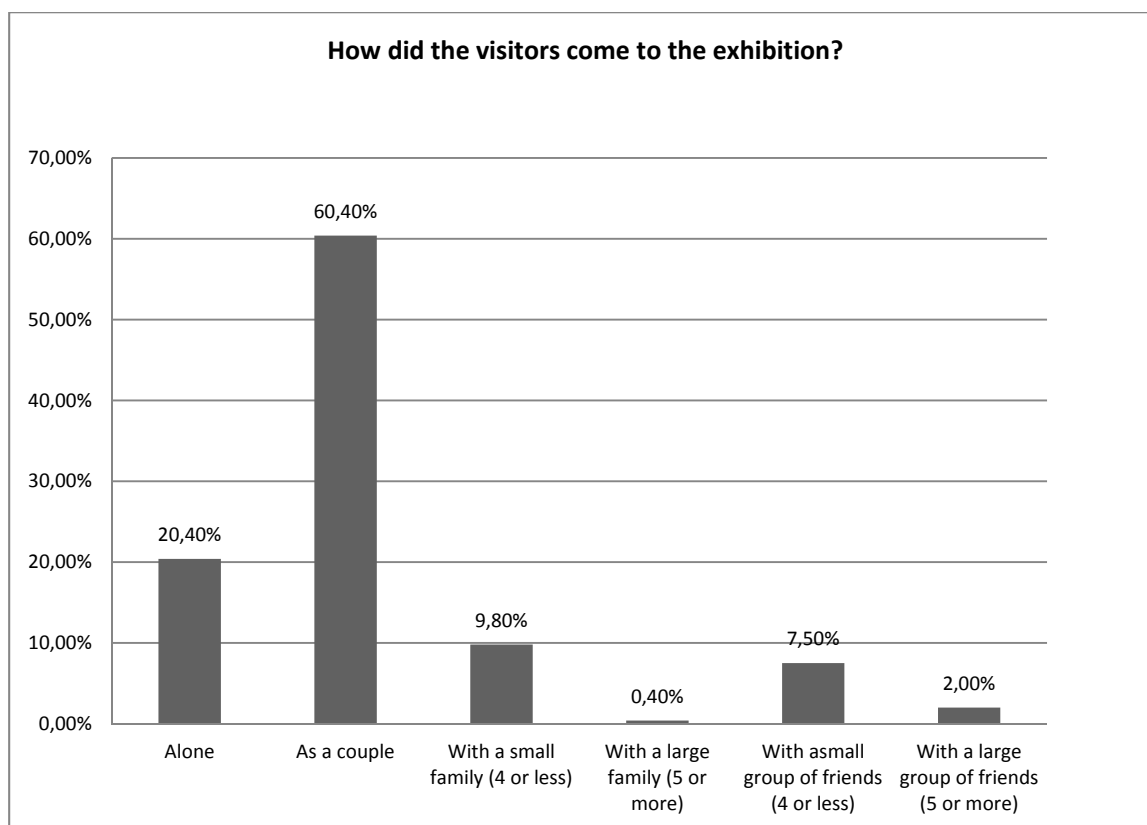
Figure 9 How visitors visited the exhibitions.

Did visitors know about "Nippon Multimedia"?

14,90%

17,30%

67,80%

- Yes
- A little, but not well
- No
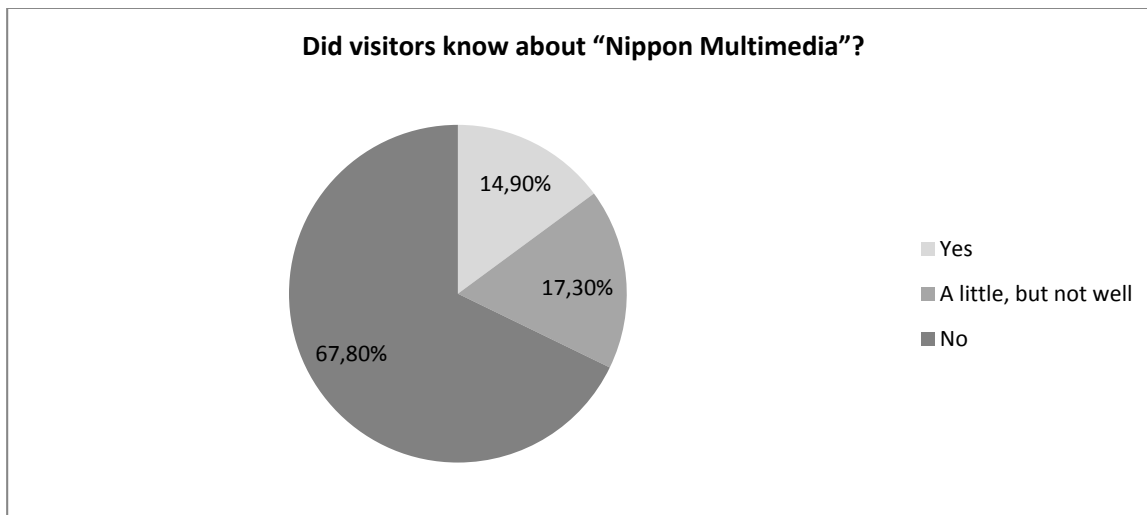
Figure 10 Awareness of the existence of "Nippon Multimedia".

Did visitors use "Nippon Multimedia"?

Shunga	Araki	Ineffable	Gutai	Nippon at glance
5,90%	7,50%	8,20%	7,60%	13,70%
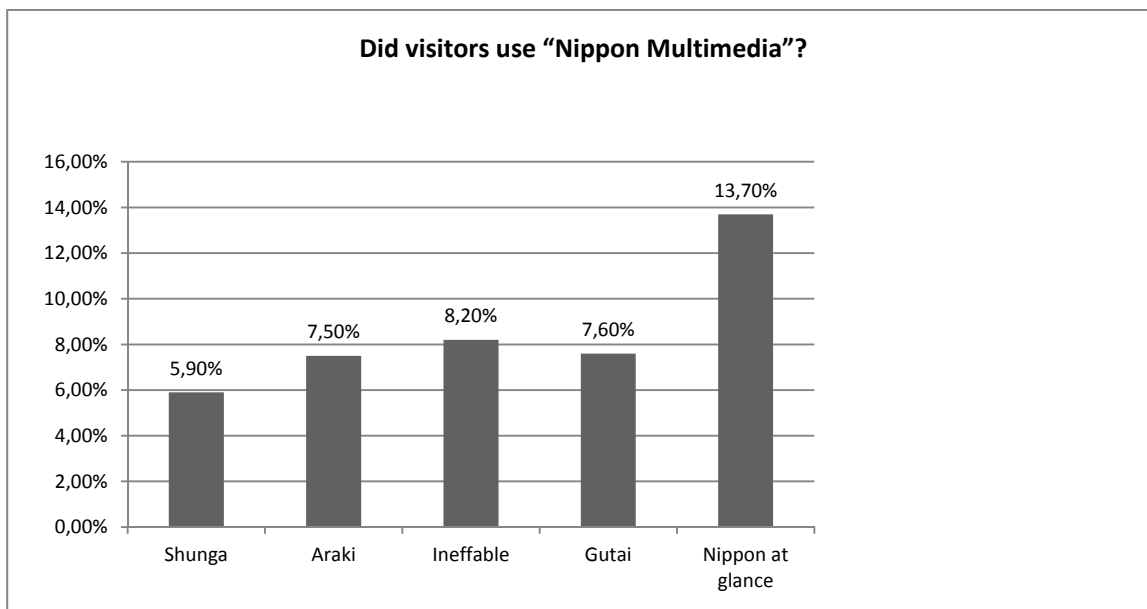
Figure 11 Usage of "NIPPON-multimedia"
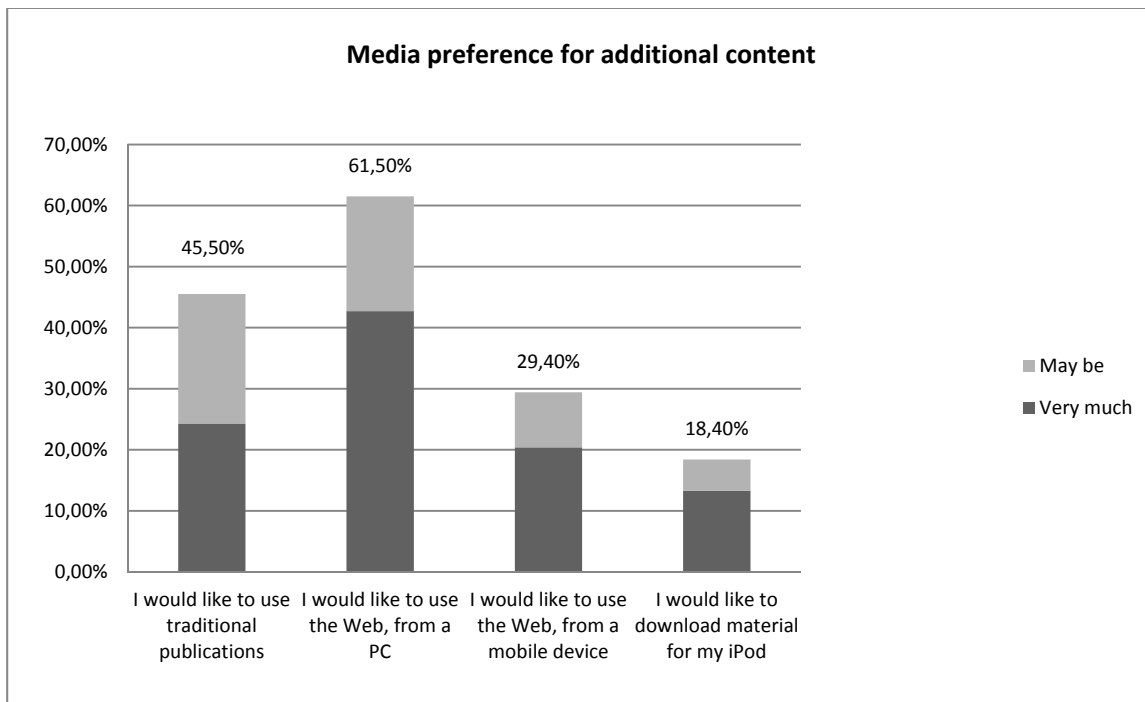
Figure 12 Preferred media if additional information were available.
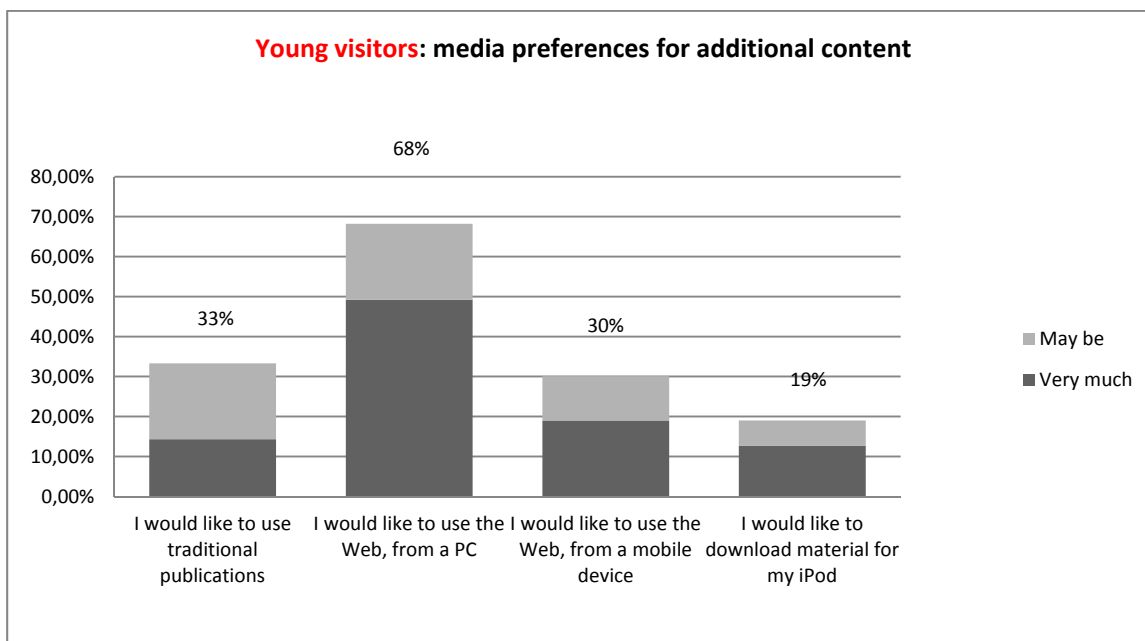
Figure 12a Preferred media, for young visitors, if additional information were available.
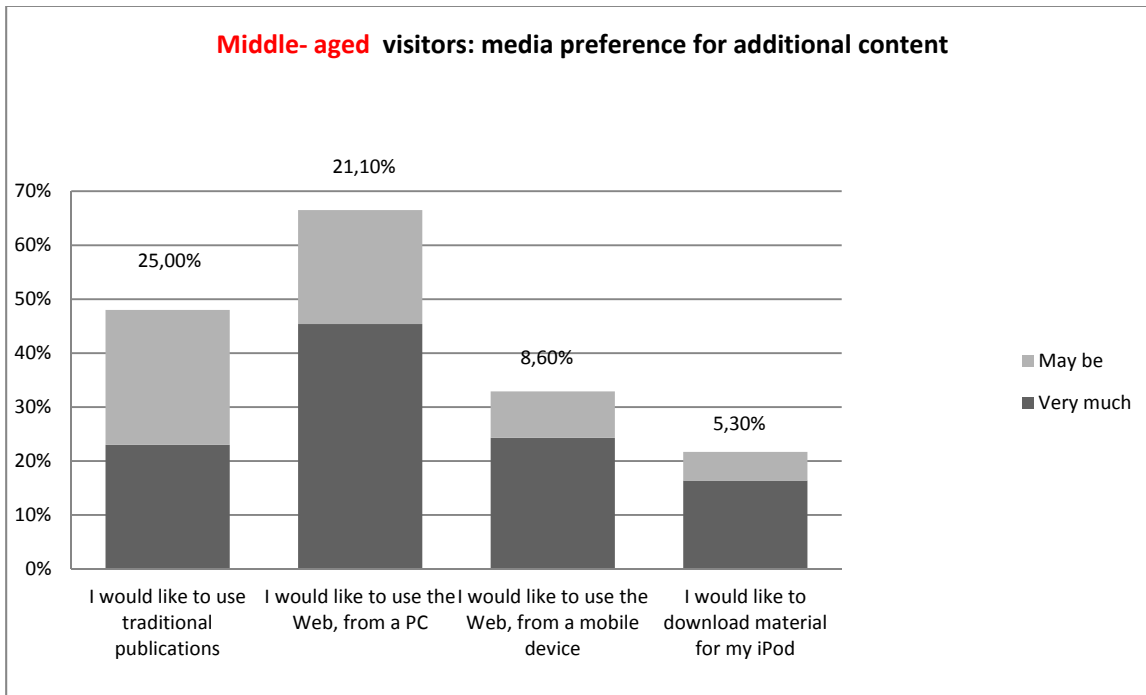
Figure 12b Preferred media, for middle-aged visitors, if additional information were available.
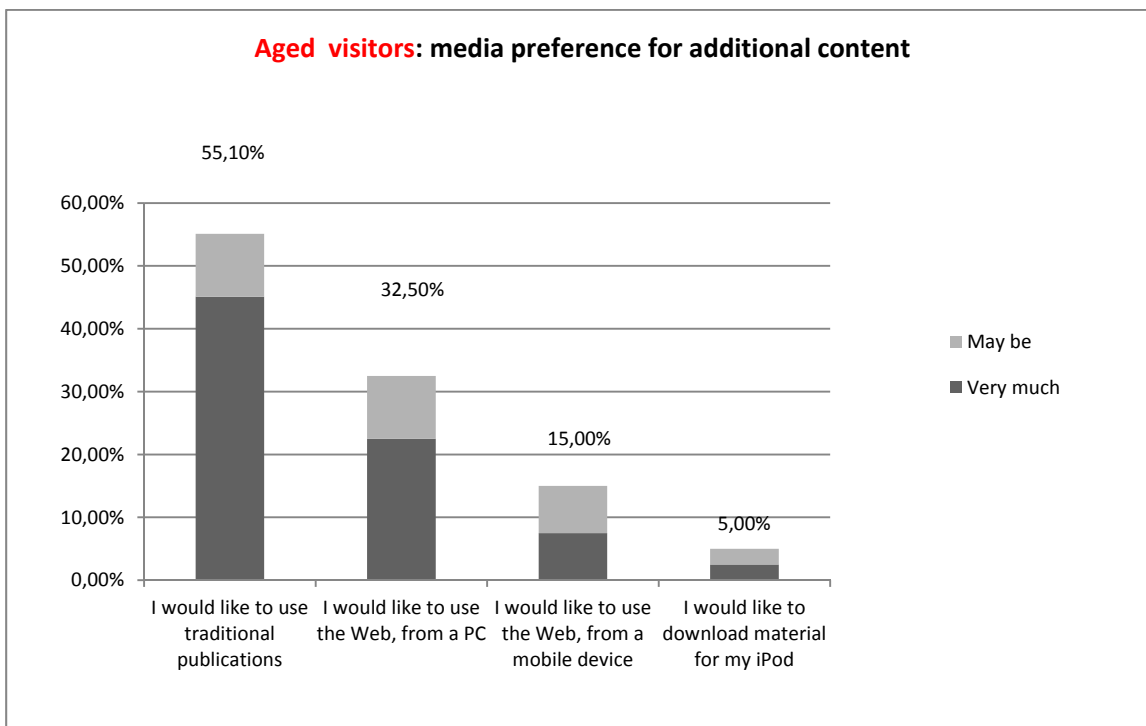
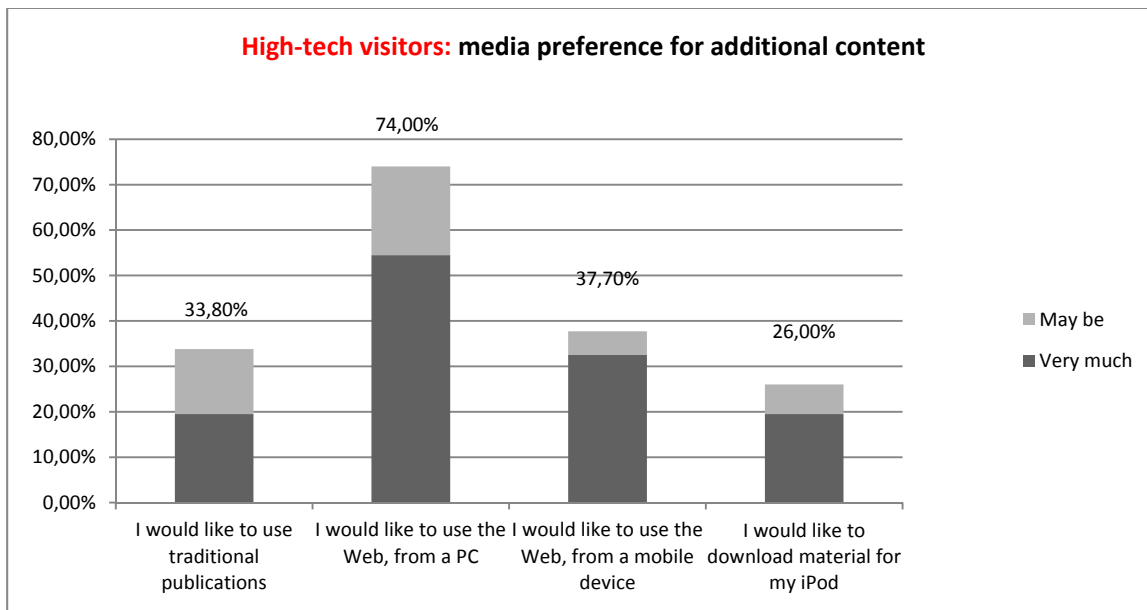Figure 12c Preferred media, for aged visitors, if additional information were available.
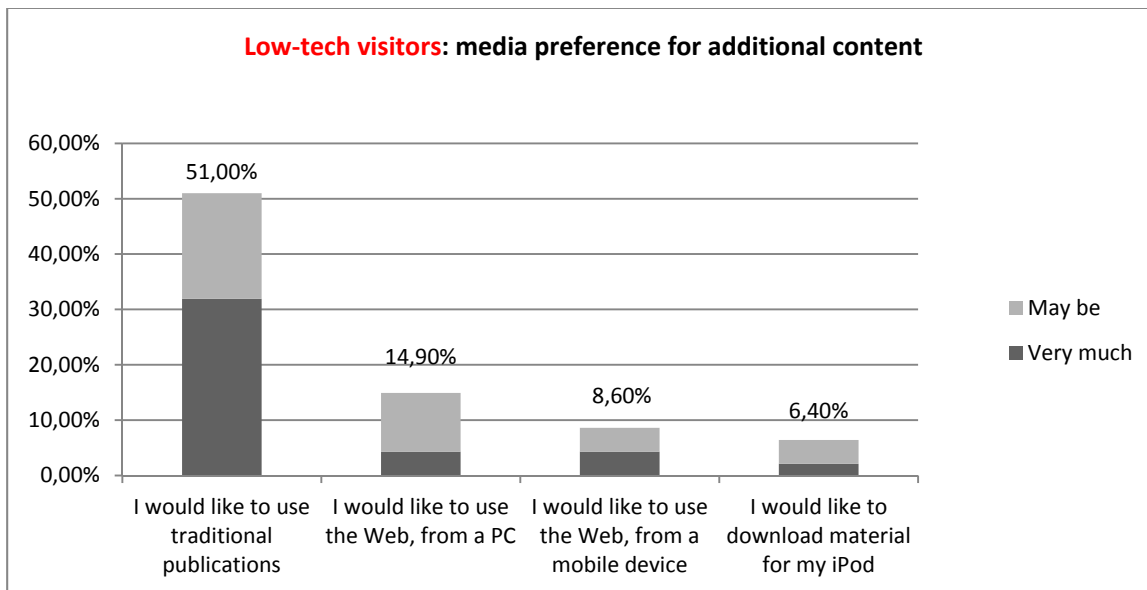
Figure 12d Preferred media, for low-tech visitors, if additional information were available.
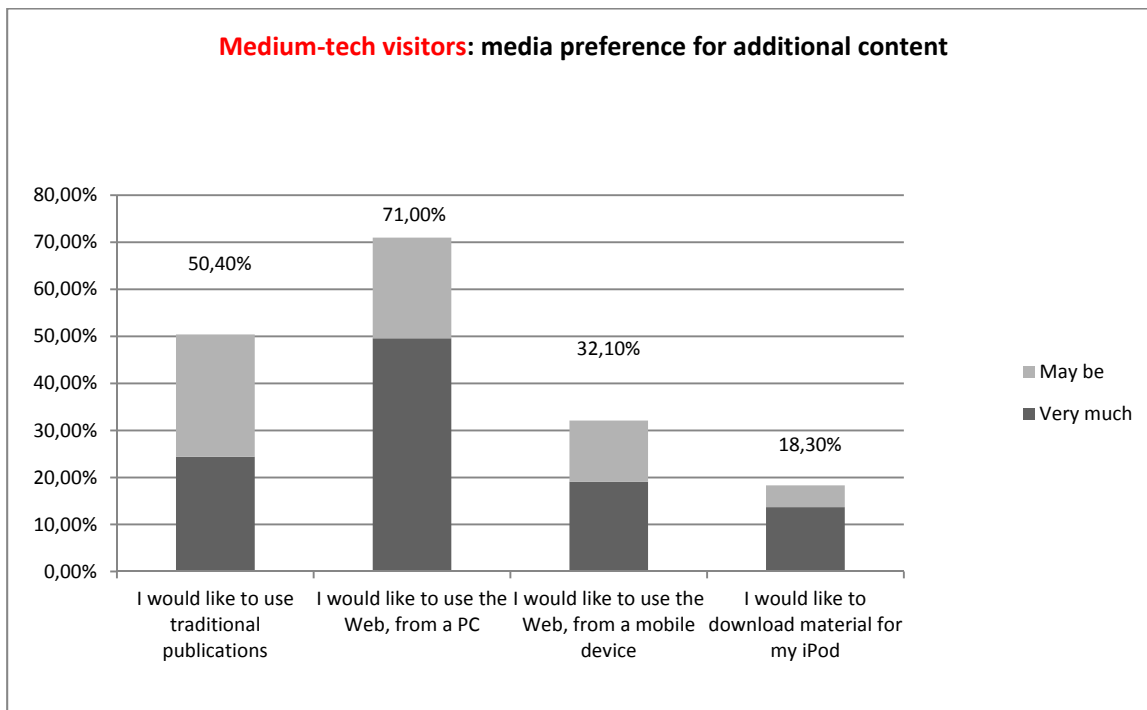
Figure 12e Preferred media, for medium-tech visitors, if additional information were available.

Figure 12f Preferred media, for high-tech visitors, if additional information were available.
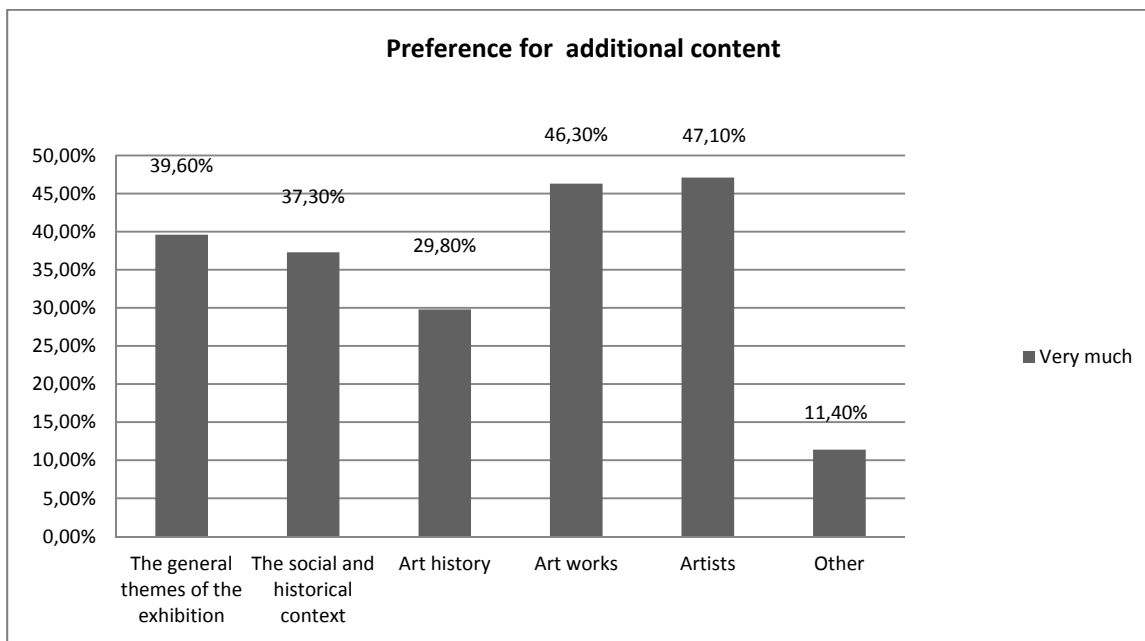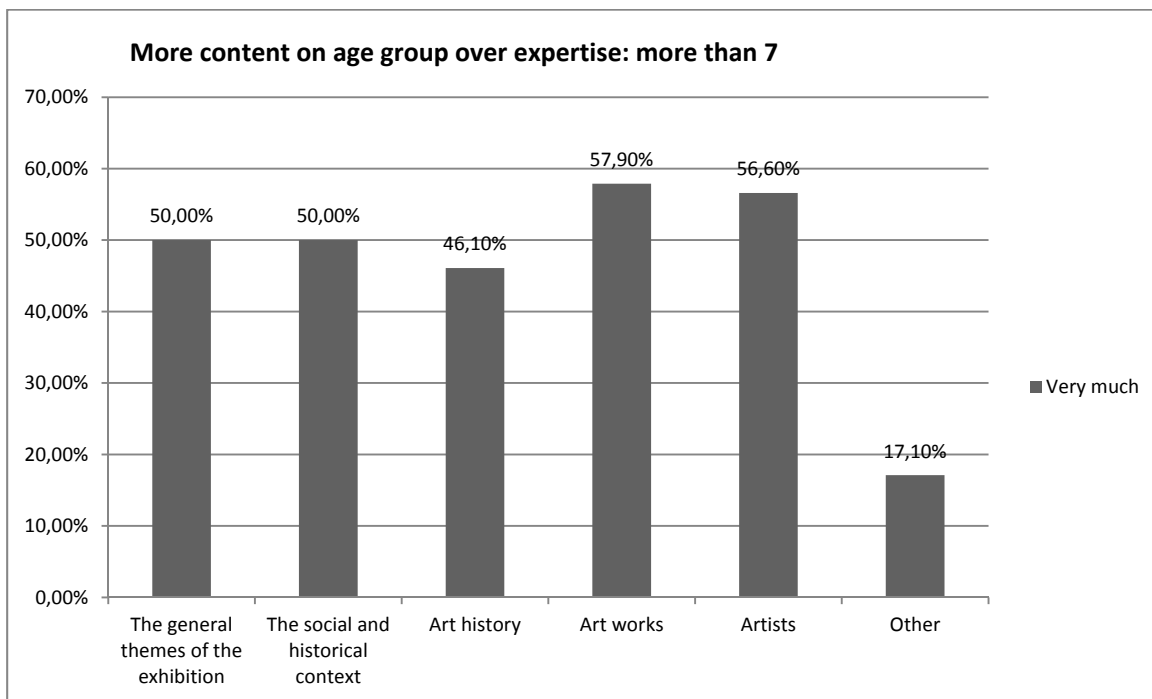
Figure 13 Preferences for additional content

Figure 13a Preferences for additional content for visitors with High-expertise
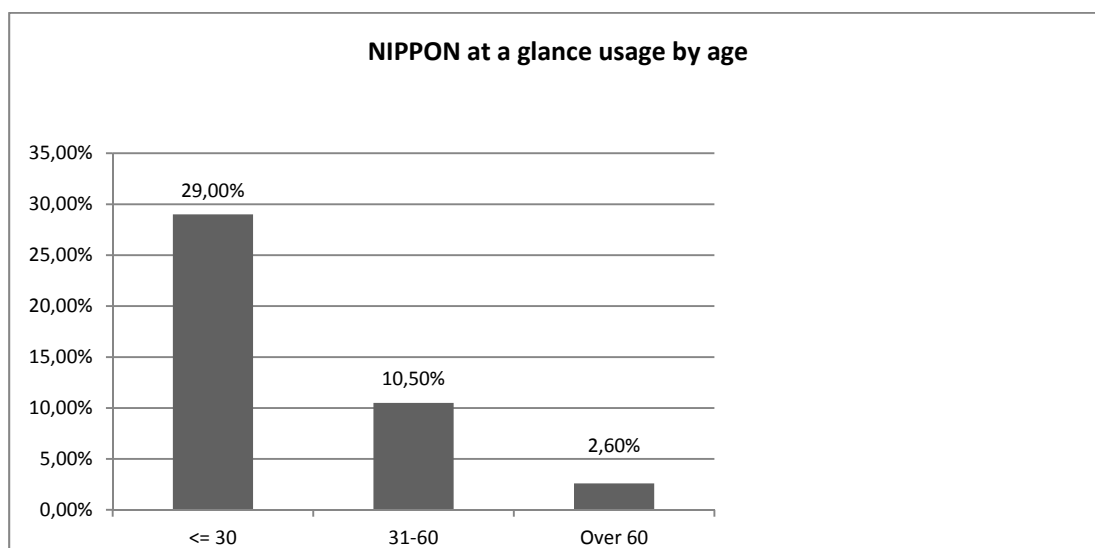
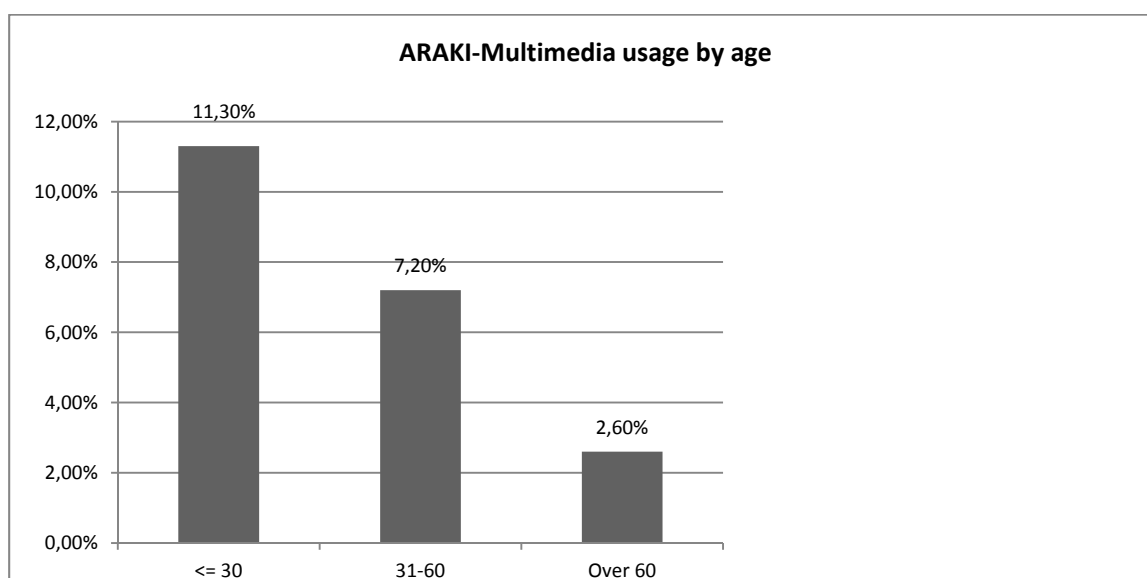Figure 14 Usage of "Nippon at glance" by age.

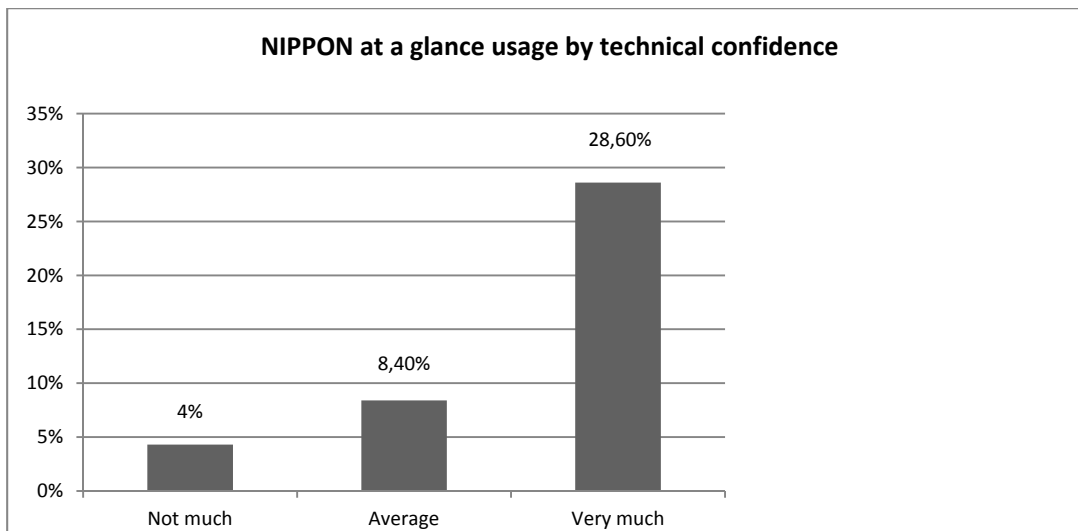Figure 15 Usage of "ARAKI-Multimedia" by age.

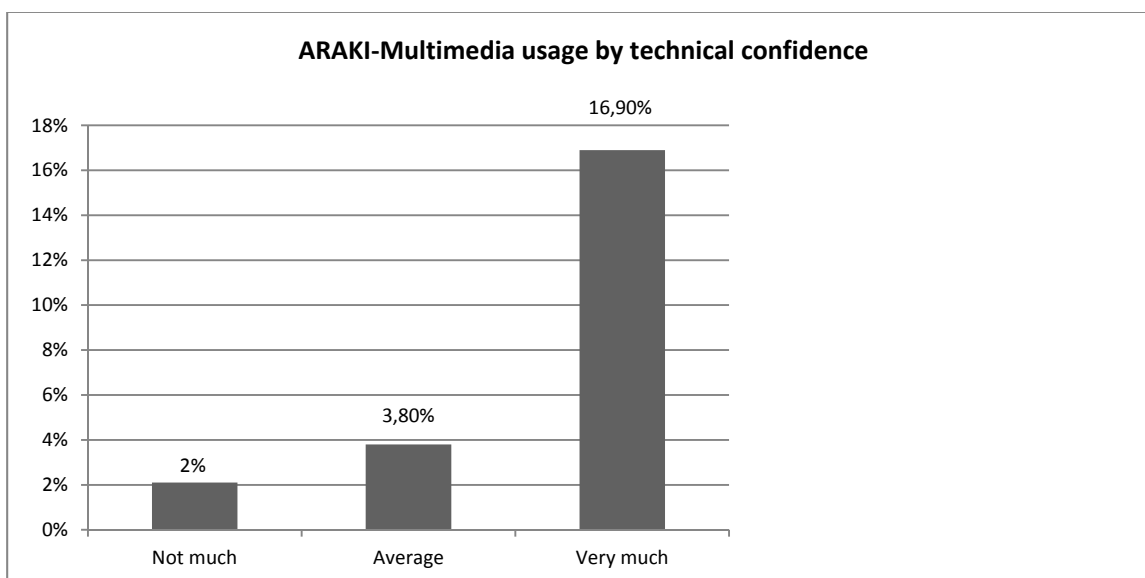Figure 16 Usage of "NIPPON at a glance" by technical confidence.

Figure 17 Usage of "ARAKI-Multimedia" by technical confidence.

PART IV – References

[1] Rubegni, E. and Paolini, P. (2010) Multimedia communication in cultural heritage: a case study on impact assessment. In proceedings of 3rd edition of the ESA Research Network Sociology of Culture mid-term Conference, Milan, 7th-9th October 2010

[2] Franciolli, M., Paolini, P., Rubegni, E. (2010) Multimedia Communication Issues: Why, What and When. In J. Trant and D. Bearman (eds). Museums and the Web 2010: Proceedings. Toronto: Archives & Museum Informatics. Published March 31, 2010.
http://www.archimuse.com/mw2010/papers/francioli/francioli.html

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[4] Paolini, P., Rubegni, E., Di Blas, N., "Look at me", report on visitors study, July 2010, Internal Report TEC-Lab

[5] Di Blas, N., Paolini, P., Rubegni, E. (2009) ICT for Cultural Heritage Communication: Investigating the Impact, Proceedings of ESA conference, RN07 Sociology of Culture, 4-9 September 2009, Lisbon, Portugal

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"Consonanze : Dialogues across time"

Report on the User Study

An investigation concerning the exhibition "Consonanze: Dialogues across time", held at Museo Cantonale d'Arte and Museo d'Arte, Lugano, from October 16th 2011 to January 8th, 2012

www.consonanzelugano.ch

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1 Introduction

The exhibition "Consonanze: Dialogues across time" was held by Museo Cantonale d'Arte and Museo d'Arte of Lugano (Canton Ticino, Switzerland), from October 16th, 2011 to January 8th, 2012.

Tec-Lab (http://www.tec-lab.ch) a multidisciplinary laboratory of USI, at the Faculty of Communication Science, has created the multimedia support for the exhibition (www.consonanzelugano.ch) and also carried on a small visitor study.

Data were gathered at the museum where the visitors were interviewed right after they visited the exhibition. The survey is based on a questionnaire filled up by the researcher who interviewed the visitors. 120 questionnaires have been collected.

Main subjects of the survey were how visitors had used content before visiting the exhibition (in order to prepare themselves) and how (and when) they would have liked additional content. In addition, standard demographic data have been collected.

This report synthesizes the most relevant data, and in the annex all the details can be found.

2 Commentary

Geography (Fig. 1)
With respect to other exhibitions (monitored before) with can notice a much higher proportion of local visitors (62.5% from the region and more than 73% from Switzerland). As always the largest "foreign community" was from Italy (20%).

Expertise (Fig.2)
A large proportion of visitors (37.5%) was well qualified, having visited more than 7 exhibitions in the previous year. This reinforces the hypothesis that the most of the visitors came from the local community which includes frequent visitors of the exhibitions held in Lugano.

Confidence with technology (Fig.3)
A surprisingly high number of visitors (46,7%) a declared a strong confidence with technology; we are suspicious of the reliability of this self-evaluation, also at the light of following answers.

Age-Sex (Fig.4, 5)
Usual distribution, with no particular feature.

Way of visiting (Fig.6)
It is no surprise that most visitors were alone or in a couple. Small groups and small families were next.

Knowing about the exhibition (Fig. 7)
Posters (in town), (local) newspapers and "word of mouth" were the sources for knowing of the exhibition. This reinforces the hypothesis that a local community was mainly involved.

"Preparation" before the exhibition (Fig. 8)
Most people (38,3%) admitted having gone to visit the exhibition with no preparation at all. Also practical information (location, hours, ticketing, ….) were most popular.

Sources of information (Fig. 9-10)
Promotional material (available in town), newspapers and Internet were the main sources, both for practical information and for in depth content.

Additional content (Fig. 11).
At least one third of visitors would like to have more information about "Artworks", "Artists" and the "Themes of the exhibition". "Social context" and "Art history" are less in demand.

Media for additional content (Fig. 12. - 13)
Traditional media are favorite vs. technology, for getting additional content. This is contradictory with respect to previous users studies carried on in 2011 and 2010. There is also a contradiction with the self-declared "confidence with technology". The geographic origin compared with media preference shows contradictory results (with visitors from Switzerland, but not from Ticino, more inclined to use technology).

Timing for additional content (Fig. 14).
Most of the visitors would like to have more content while visiting (and this understandable) or before visiting (which is contradictory with the fact that most visitors did not prepare themselves at all, before the visit).
Very few would like to have additional content after the visit; this again contradicts our previous user studies.

Awareness of multimedia support (Figure 15)
Most visitors ignored the existence of the multimedia support (on the web, and for mobile devices). This is a clear consequence of the lack of adequate promotion (and also of the lack of interest for technology of this specific community of visitors).

3 Filtered Data

3.1 Fig. 1 Geography
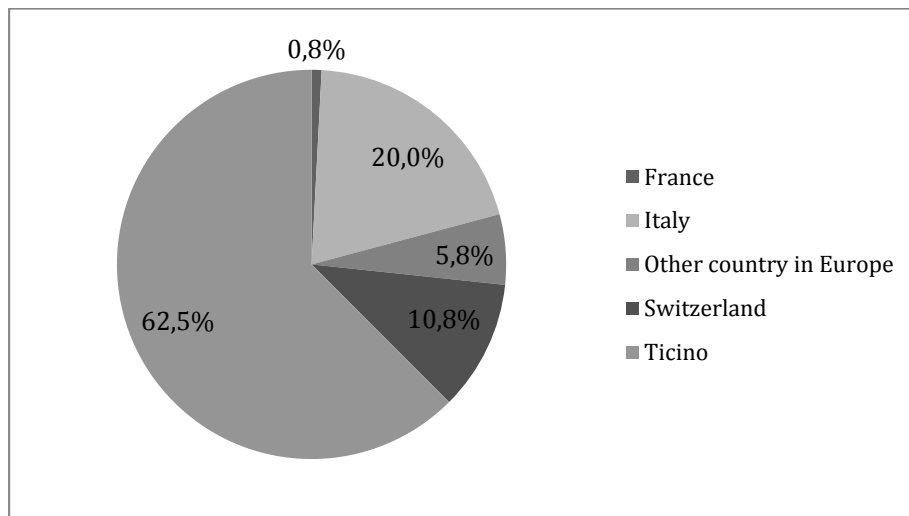
3.2 Fig. 2 Expertise: number of exhibitions visited in the previous 12 months
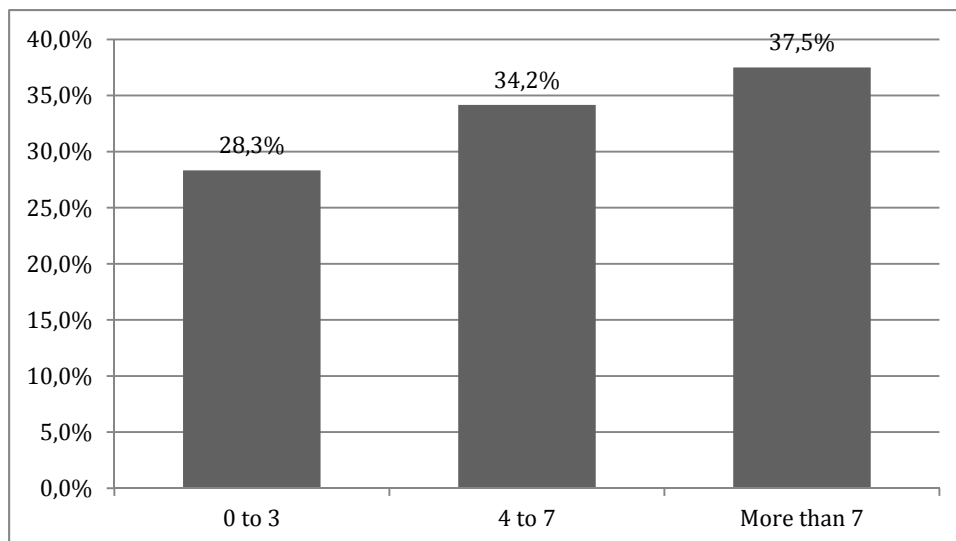
3.3   Fig. 3 Confidence with technology
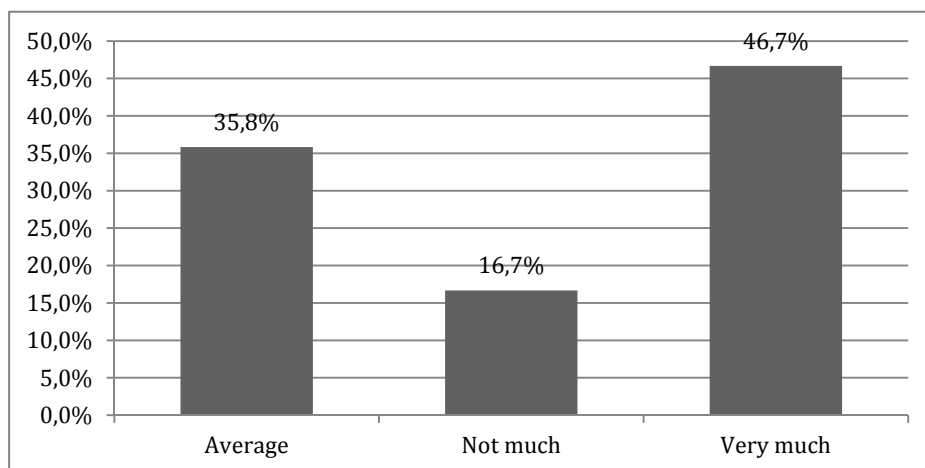
3.4   Fig. 4 Age
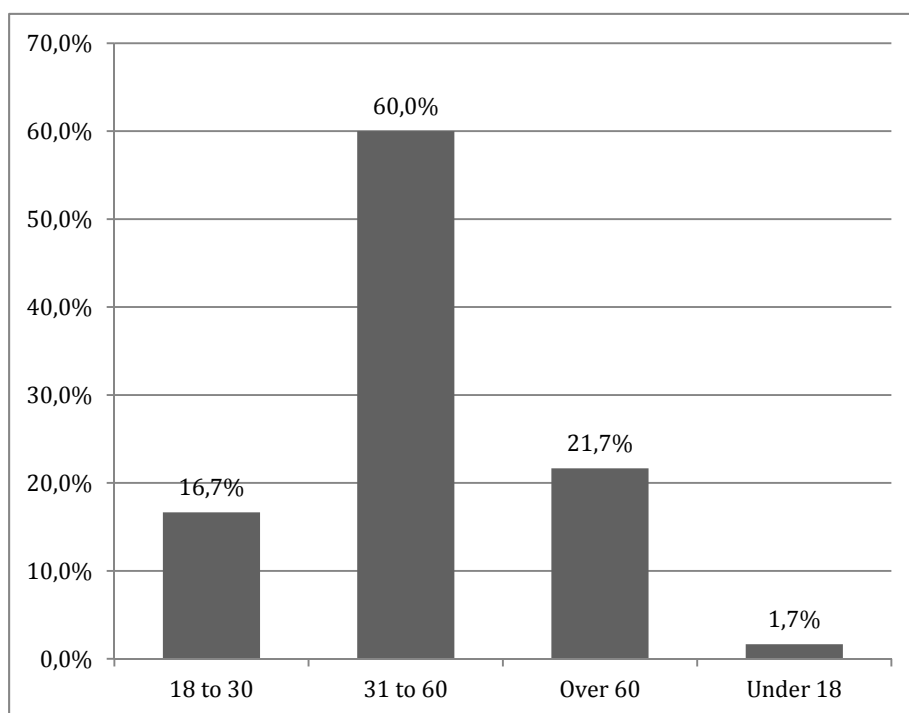
3.5   Fig. 5 Sex
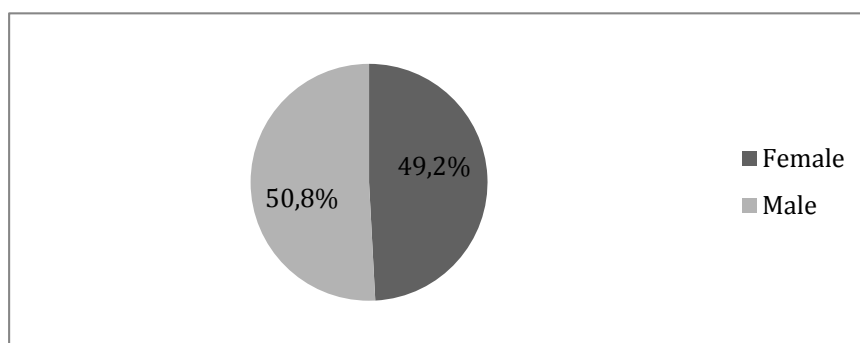
3.6 Fig. 6 Visiting
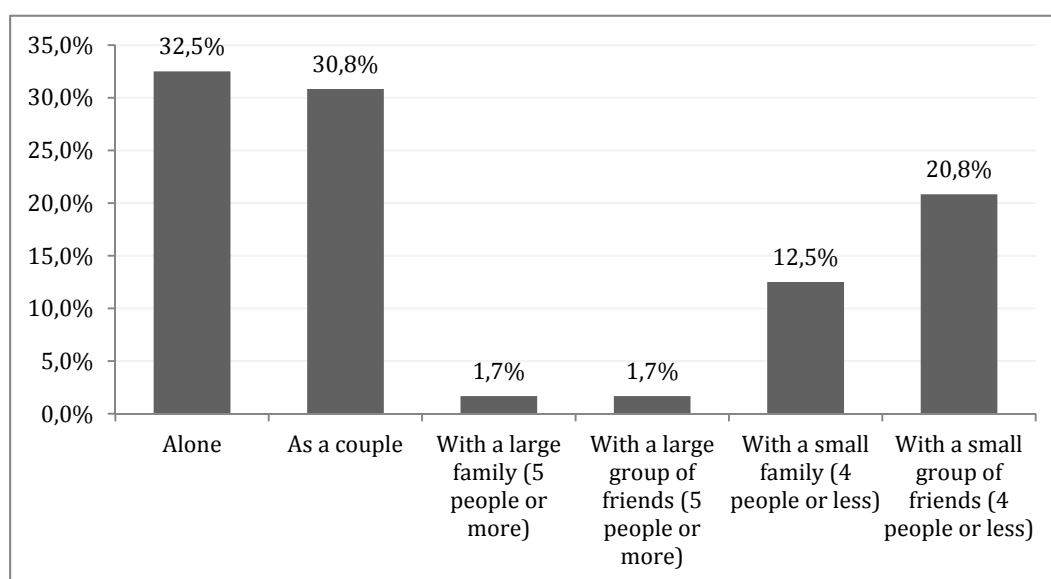
3.7   Fig. 7 Media to know about the exhibition
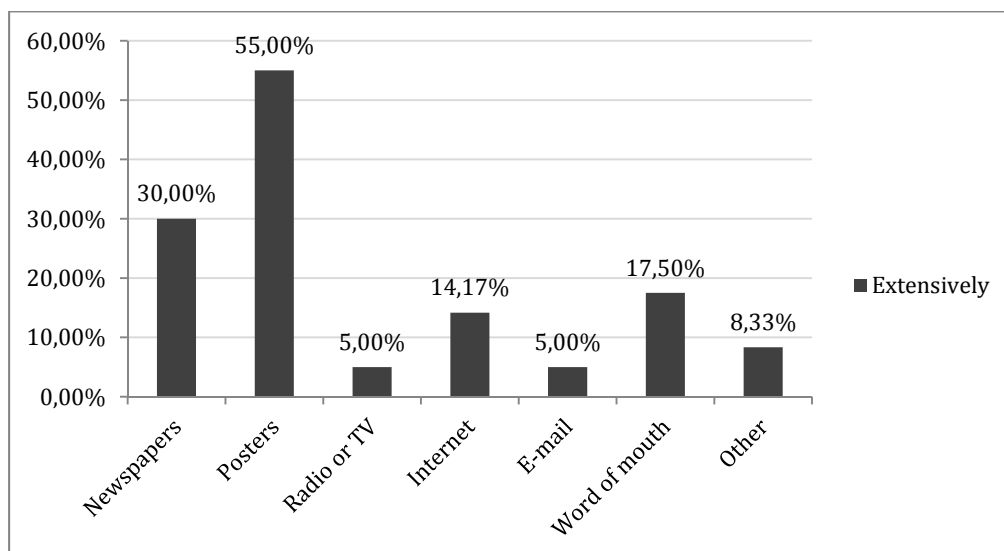
3.8   Fig. 8 "Preparing" before visiting the exhibition
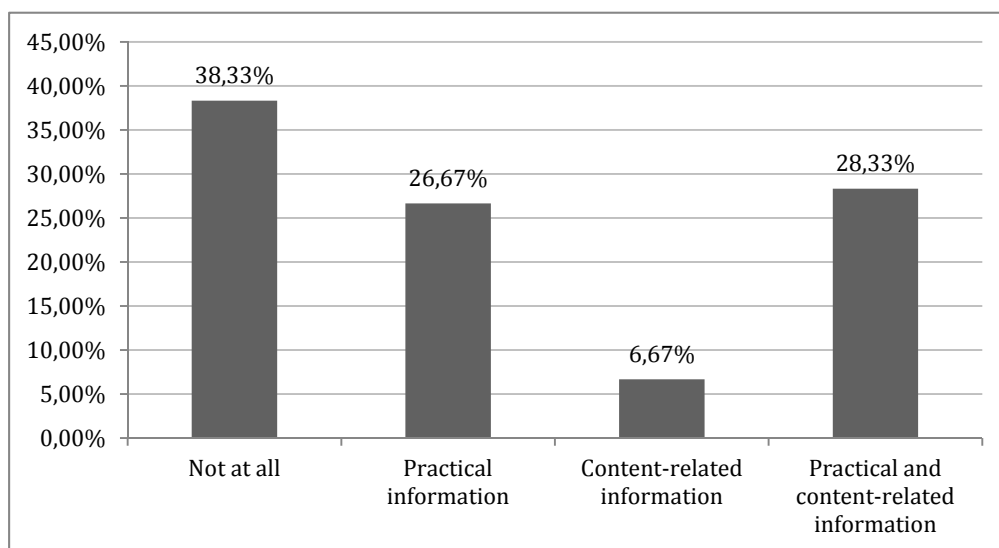
3.9   Fig. 9 Getting practical information

	Newspapers	Promotional materials	Radio or TV	Internet	Friends
5	28,3%	30,0%	3,3%	22,5%	12,5%
4	3,3%	8,3%	0,0%	3,3%	4,2%
Total	65,0%	57,5%	55,0%	72,5%	59,2%
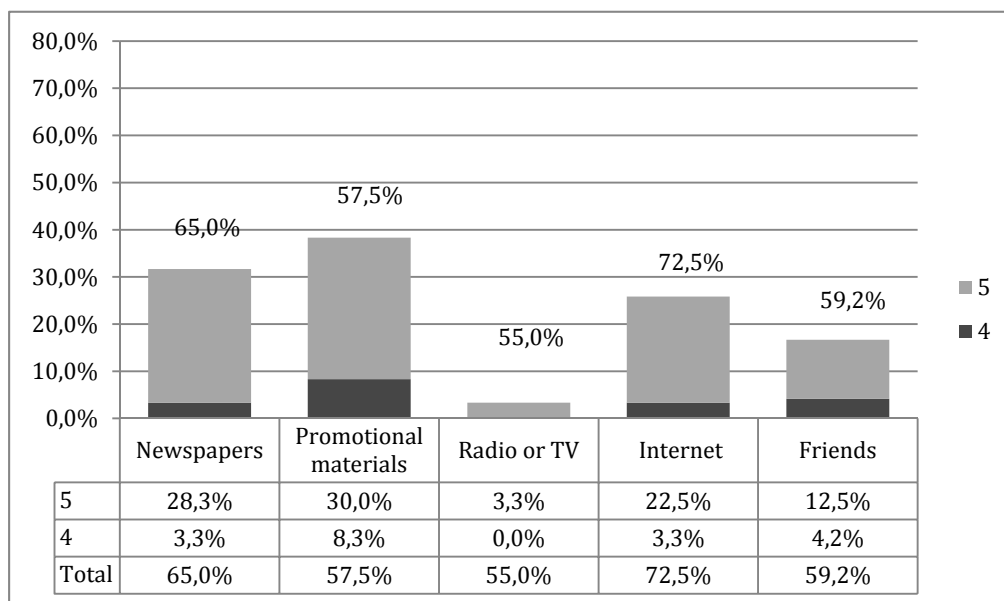
3.10   Fig. 10 Getting content-related information

	Newspapers	Promotional materials	Radio or TV	Internet	Friends
5	15,8%	17,5%	1,7%	12,5%	8,3%
4	1,7%	5,0%	0,0%	3,3%	4,2%
Total	57,5%	54,2%	52,5%	60,0%	58,3%
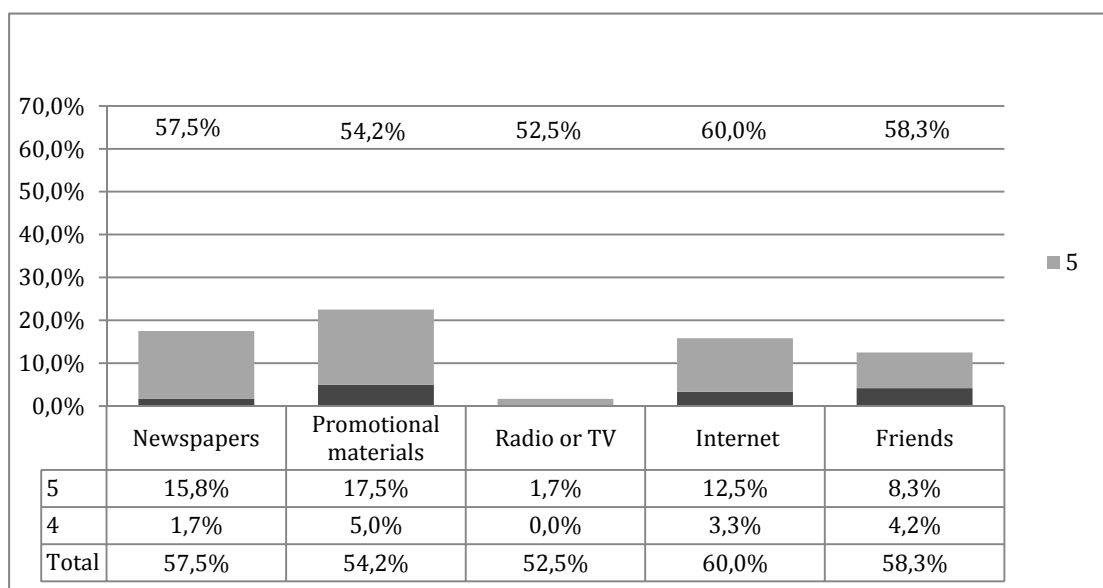
3.11 Fig. 11 Interest for additional content

Very much	The general themes of the exhibition	The social and historical context	Art history	Artworks	Artists	Other
Very much	35,8%	22,5%	14,2%	37,5%	35,8%	5,0%
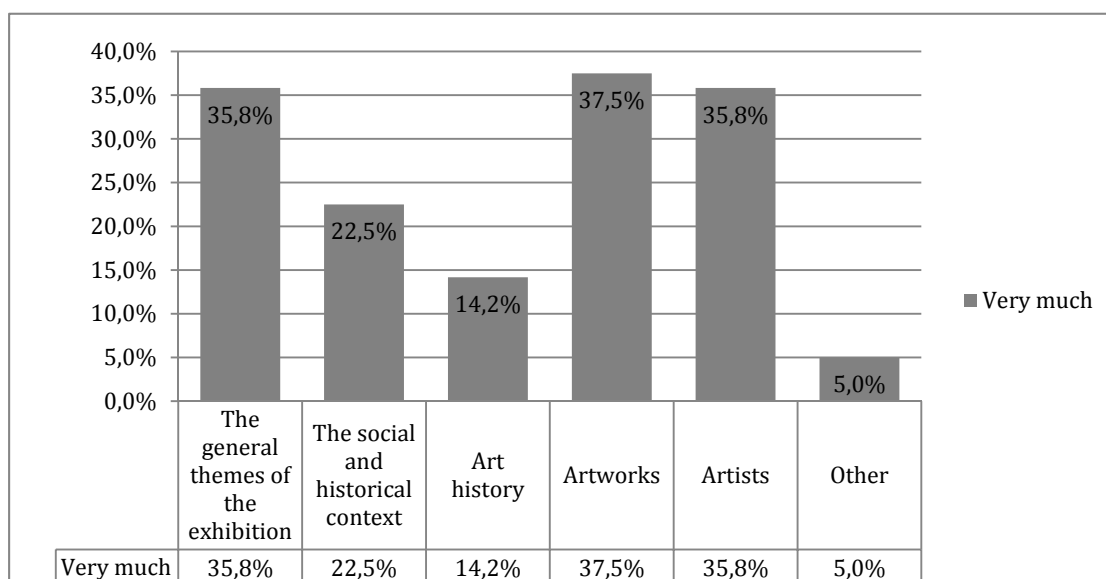
3.12 Fig. 12 Media for additional content

Very much	I would like to use traditional publications	I would like to use the web, from a PC	I would like to use the web, from a mobile device (iPhone, smartphone, iPad..)	I would like to download material for my iPod	Other
Very much	55,0%	28,3%	18,3%	15,8%	10,8%
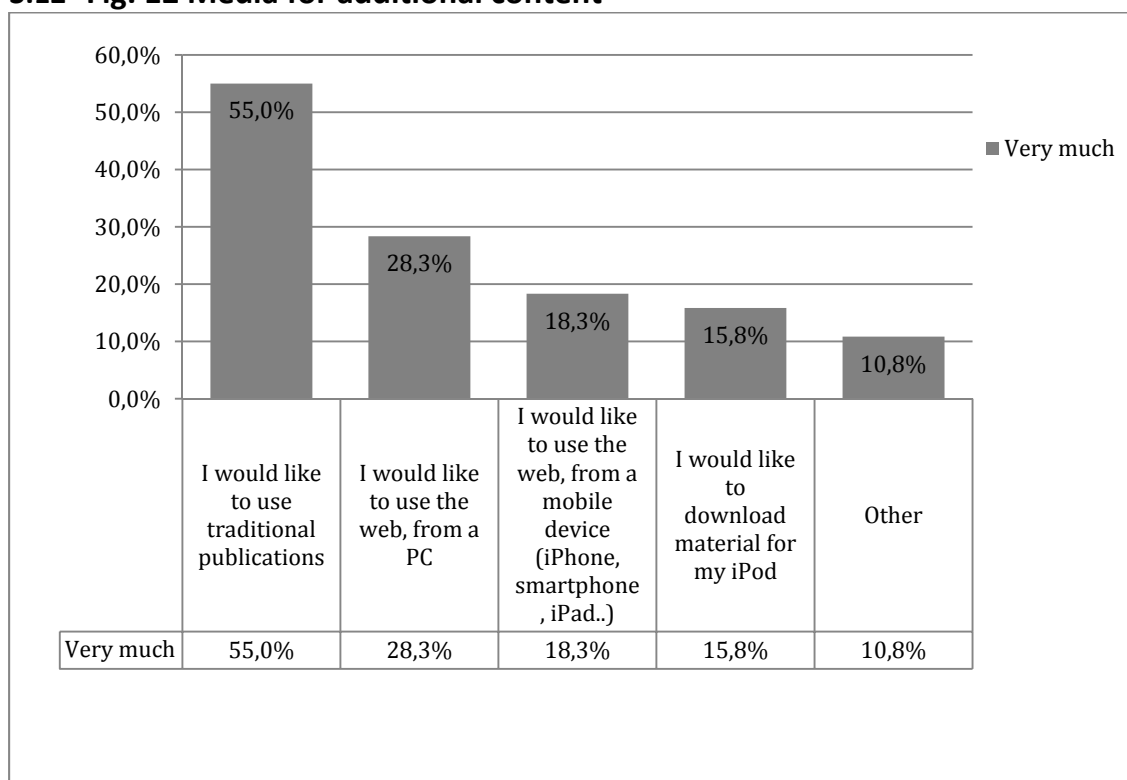
3.13 Fig. 13 Media vs. Geography

	I would like to use traditional publications	I would like to use the web, from a PC	I would like to use the web, from a mobile device (iPhone, smartphone, iPad..)	I would like to download material for my iPod	Other
Italy	62,5%	12,5%	16,7%	8,3%	12,5%
Switzerland	23,1%	30,8%	23,1%	30,8%	0,0%
Ticino	60,0%	34,7%	18,7%	16,0%	13,3%
Other (France, Germany)	28,6%	14,3%	14,3%	14,3%	0,0%
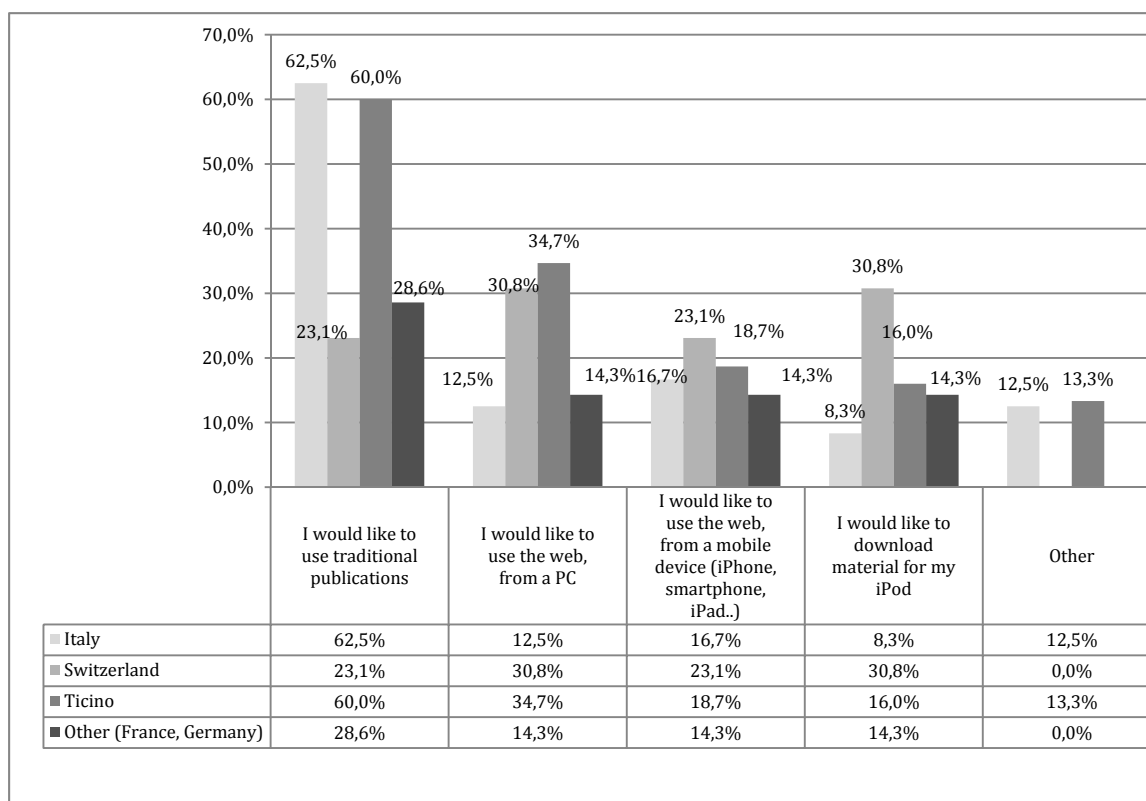
3.14 Fig. 14 Timing for additional content

	Before the visit for being prepared	During the visit for being assisted	After the visit for having a deeper understanding
Very much	40,8%	44,2%	14,2%

205
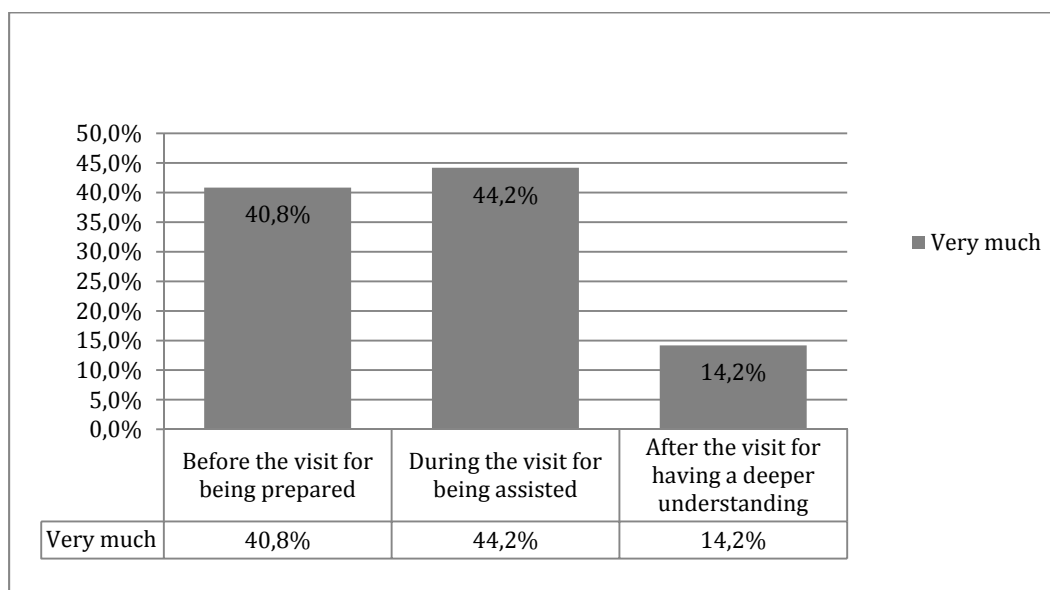
3.15 Fig. 15 Awareness of "CONSONANZE Multimedia"

	No, I am not	Yes, thanks to information in the newspaper	Yes, thanks to the Internet	Yes, thanks to an e-mail, I received	Yes, thanks to word-of-mouth	Yes, thanks to other sources of information
Series1	85,0%	2,5%	7,5%	0,8%	3,3%	0,8%
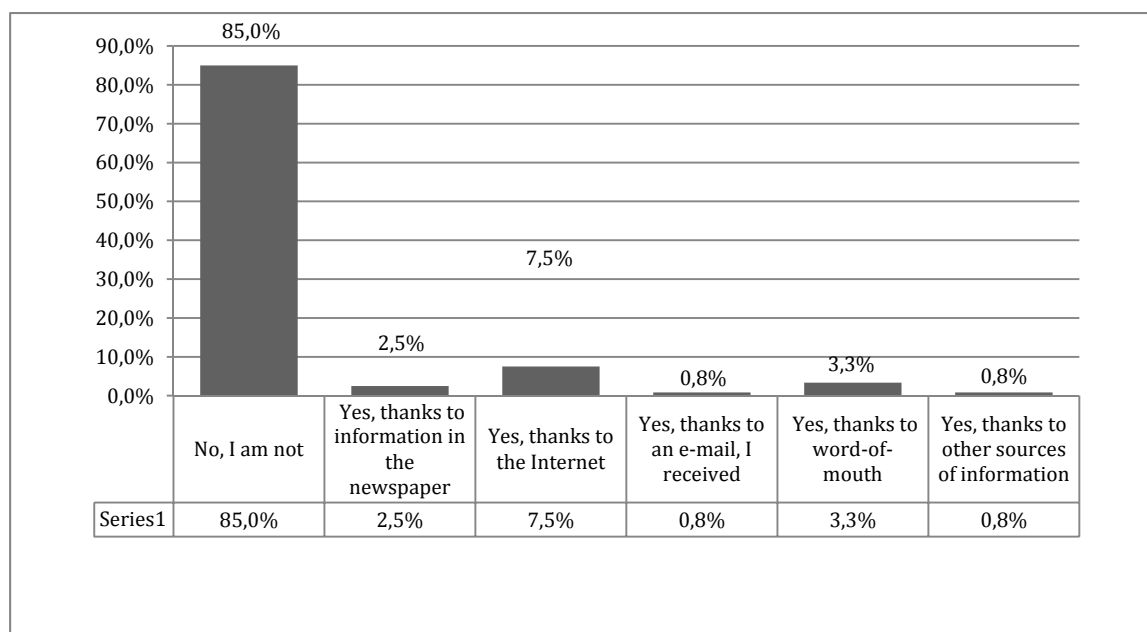
4 ANNEX (detailed data)

How did you come to know about CONSONANZE?

	Not at all	A little	Extensively
Newspapers	32.50%	3.33%	30.00%
Posters	15.83%	8.33%	55.00%
Radio or TV	50.83%	3.33%	5.00%
Internet	40.83%	12.50%	14.17%
E-mail	57.50%	2.50%	5.00%
Word of mouth	40.83%	3.33%	17.50%
Other	47.50%	0.00%	8.33%

Did you prepare for your visit to the exhibition?

Not at all	Practical information	Content-related information	Practical and content-related information
38.33%	26.67%	6.67%	28.33%

Where did you acquire practical information? Please rate (1: not at all; 5: extensively)

	1	2	3	4	5	Total
Newspapers	28.3%	2.5%	2.5%	3.3%	28.3%	65.0%
Promotional materials	18.3%	0.0%	0.8%	8.3%	30.0%	57.5%
Radio or TV	47.5%	3.3%	0.8%	0.0%	3.3%	55.0%
Internet	38.3%	3.3%	5.0%	3.3%	22.5%	72.5%
Friends	40.8%	0.8%	0.8%	4.2%	12.5%	59.2%

Where did you acquire content-related information?   Please rate (1: not at all; 5: extensively)

	1	2	3	4	5	Total
Newspapers	35.0%	4.2%	0.8%	1.7%	15.8%	57.5%
Promotional materials	30.0%	0.0%	1.7%	5.0%	17.5%	54.2%
Radio or TV	47.5%	2.5%	0.8%	0.0%	1.7%	52.5%
Internet	40.0%	2.5%	1.7%	3.3%	12.5%	60.0%
Friends	44.2%	0.8%	0.8%	4.2%	8.3%	58.3%

Would you like to have more contents about…?

	Not at all	Maybe	Very much	Total
The general themes of the exhibition	28.3%	20.8%	35.8%	85.0%
The social and historical context	33.3%	20.0%	22.5%	75.8%
Art history	40.8%	21.7%	14.2%	76.7%
Artworks	29.2%	19.2%	37.5%	85.8%
Artists	28.3%	20.0%	35.8%	84.2%
Other	45.0%	5.0%	5.0%	55.0%

If you could have access to more content, how would you like that content delivered to you?

	Not at all	Maybe	Very much	Total
I would like to use traditional publications	10.0%	13.3%	55.0%	78.3%
I would like to use the web, from a PC	22.5%	17.5%	28.3%	68.3%
I would like to use the web, from a mobile device (iPhone, smartphone, iPad..)	27.5%	20.0%	18.3%	65.8%
I would like to download material for my iPod	28.3%	15.0%	15.8%	59.2%
Other	28.3%	5.8%	10.8%	45.0%

What is your preference for the timing?

	Not at all	Maybe	Very much	Total
Before the visit for being prepared	15.0%	15.8%	40.8%	71.7%
During the visit for being assisted	6.7%	25.0%	44.2%	75.8%
After the visit for having a deeper understanding	29.2%	15.8%	14.2%	59.2%

Are you aware of the existence of CONSONANZE Multimedia (www.consonanzelugano.ch)?

No, I am not	Yes, thanks to information in the newspaper	Yes, thanks to posters	Yes, thanks to radio or TV	Yes, thanks to the Internet	Yes, thanks to an e-mail, I received	Yes, thanks to word-of-mouth	Yes, thanks to other sources of information
85.0%	2.5%	0.0%	0.0%	7.5%	0.8%	3.3%	0.8%

Where do you live?

France	Italy	Other country in Europe	Switzerland	Ticino
0.8%	20.0%	5.8%	10.8%	62.5%

During the last year, did you visit other exhibitions or museums?

0 to 3	4 to 7	More than 7
28.3%	34.2%	37.5%

How confident are you with technology?

Average	Not much	Very much
35.8%	16.7%	46.7%

How old are you?

18 to 30	31 to 60	Over 60	Under 18
16.7%	60.0%	21.7%	1.7%

Are you...

Female	Male
49.2%	50.8%

How did you come to this exhibition?

Alone	As a couple	With a large family (5 people or more)	With a large group of friends (5 people or more)	With a small family (4 people or less)	With a small group of friends (4 people or less)
32.5%	30.8%	1.7%	1.7%	12.5%	20.8%