

Fabbrica della Conoscenza

XIV Forum Internazionale di Studi

Le Vie dei
Mercanti

Carmine Gambardella



WORLD HERITAGE and DEGRADATION
Smart Design, Planning and Technologies

La Scuola di Pitagora editrice

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Collana fondata e diretta da Carmine Gambardella

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Carmine Gambardella

**WORLD HERITAGE and DEGRADATION
Smart Design, Planning and Technologies**

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Smart Design, Planning and Technologies
Le Vie dei Mercanti
XIV Forum Internazionale di Studi

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Via Monte di Dio, 54
80132 Napoli
Telefono e fax +39 081 7646814
www.scuoladipitagora.it
info@scuoladipitagora.it

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Conference topics:

Heritage

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History

Culture

Collective Identity

Memory

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Management

Communication for Cultural Heritage

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WORLD HERITAGE and DEGRADATION
Smart Design, Planning and Technologies
Le Vie dei Mercanti
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Luigi Corniello

Graphics and layout

Giuseppe Giannini

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**Pasquale Argenziano, Alessandra Avella, Carmine Maffei,
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Peer review

Scholars has been invited to submit researches on theoretical and methodological aspects related to Smart Design, Planning and Technologies, and show real applications and experiences carried out on this themes.

Based on blind peer review, abstracts has been accepted, conditionally accepted, or rejected.

Authors of accepted and conditionally accepted papers has been invited to submit full papers. These has been again peer-reviewed and selected for the oral session and publication, or only for the publication in the conference proceedings.

Conference report

300 abstracts received from:

Albania, Benin, Belgium, Bosnia and Herzegovina, California, Chile, China, Cipro, Cuba, Egypt, France, Germany, Italy, Japan, Jordan, Kosovo, Malta, Massachusetts, Michigan, New Jersey, New York, New Zealand, Poland, Portugal, Russia, Slovakia, Spain, Tunisia, Texas, Turkey.

More than 550 authors involved.

212 papers published.

Preface

The theme of the XIV Forum “Le Vie dei Mercanti” is an international discussion on the disciplines of architecture, design and landscape through the presentation of research and operational projects on the conservation and valorisation of World Heritage and “smart” regeneration of degradation, with analyses and proposals ranging from the design at all scales, to architectural assets, the territory, infrastructures and the landscape. Academics, along with professionals who have a role in the governing, managing and controlling of public agencies, institutions and the business world are invited to submit papers related to design objects, architecture and landscapes. This is with the aim of conserving and recovering, valorising and regenerating, managing and designing (or re-designing), for the more general improvement of the quality of life, in an innovative and contemporary relationship between man and the environment, through “beauty”, while respecting the history, traditions, identity and principles of sustainable development, as well as being attentive to the needs of our and future generations. Internet of Everything, smart design, planning and technologies, building information modelling, in this age of globalization, have become operational tools – that alongside the traditional ones of the profession – for the protection and promotion of the World Heritage, are considered as well as shared by the whole of Humanity, and the regeneration of the degradation and the “Minor Heritage”, in all aspects, and as contemplated by the UNESCO Conventions on tangible and intangible assets and the European Landscape Convention. The event aims to create a critical transversal dialogue, open to cultural and “unlimited” influences, in a logic of integration between the skills that extends, and is not limited, to the following disciplines: anthropology, architecture, archaeology, history art, cultural geography, design, ethnology and folklore, economy, history, landscape, museum management, philosophy and political science, urban history and sociology, cultural tourism, planning and integrated management. The location is exceptional. Campania, with six sites included in the World Heritage List, two UNESCO Man and Biospheres, two sites on the List of Intangible Heritage, is one of the richest regions in the world for cultural and landscape heritage.

Carmine Gambardella

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Wayfinding and environmental communication in museums for the promotion of cultural heritage and sustainability.

Teresa VILLANI, Aldina SILVESTRI

Department of Planning, Design and Architecture Technology, Sapienza University of Rome

E-mail

teresa.villani@uniroma1.it

aldina.silvestri@uniroma1.it

Abstract

Complex buildings intended for public use (e.g., museums) are characterized by different spatial and functional features, and can often cause a sense of disorientation in users, forcing them to a “cognitive stress” in making a mental map of the environment. *Where to go? Where is the way out?* These are the questions that typically arise. The success of the building and of its cultural contents very often depends on how effectively the visitors’ self-localization difficulties are resolved.

In this paper, after a methodical review of the applications of wayfinding systems at international level, we propose a design methodology based on levels of action differentiated by type of museum which, in addition to directional signs, include the characterization of both space and architectural elements.

The proposed solutions, characterized by high levels of performance, specific perceptual connotations and use of innovative materials, bring about several advantages both for visitors and managers, in the perspective of cultural heritage valorization, by: (i) increasing the sense of welcoming and safety of the structure (reduction of stress factors); (ii) optimizing resource utilization, e.g., by reducing the time spent by staff to help visitors (economic factor); (iii) conveying the sensation of a well-organized service, so as to increase the number of visitors (sustainability factor); (iv) improving the dissemination of the exhibits’ cultural themes (cultural factor).

Keywords: wayfinding, signage, cultural heritage enhancement, technological solutions.

1. Introduction

Moving within an environment is one of the most complex cognitive endeavours, involving the use of several mental abilities, such as memory, attention, perception and decision-making (Thorndyke, Hayes-Roth, 1992). The term *wayfinding* represents a set of perceptual, cognitive and behavioural processes which engage the user in reaching a “destination” (Lynch, 1960). In these processes, activities such as “looking for”, “deciding” and therefore “moving” are involved (Mollerup, 2005). These activities require certain abilities: creating maps and processing information to decode the surroundings, defining an action plan and implementing decisions.

The research and experimentation field involved in the study of orientation relates to planning of space and artifacts that can be used in looking for a destination. Therefore, wayfinding does not include communication systems only (directional signage), but also involves organizing and characterizing space (Arthur, Passini, 1992). Orientation is not determined only by the ability of understanding the explicit instructions imparted by signals, but, more completely, by the ability in responding to sensorial stimuli, to solicitations coming from materials and colors, to reception and affordance of the environment (Baroni, 1998).

These stimuli are especially important in places where the attention of users is directed to something different. Such a situation occurs within museums: visitors, attracted to artworks, often lose the sense of space which causes difficulties in recognizing the correct theme-based itinerary.

Large museums create significant difficulties in orientation given the close relationship between the activities directly related to the main use of the building (fruition of the exhibition material) and the rich and complex range of supporting services (food courts, conference rooms, etc.).

In order to address these problems it is necessary to define a wayfinding strategy starting from the following elements: knowledge of behavioral and cognitive aspects related to perception of space; identification of the senses involved; and implementation of Design for All principles (Villani, 2013). This strategy is needed in order to outline efficient solutions in relation to users.

Different solutions can be defined in close relation with the type of museum, and they can acquire high performance levels and specific perceptual features as well, with the contribution of innovative materials.

This paper aims at defining a set of viable solutions that can be advantageous both for museum users and managers, by means of the identification of recurring problems and of a dedicated study of space and technological solutions applied in a number of international museums.

2. Wayfinding in museums for cultural heritage enhancement from a quality perspective

If we want to describe wayfinding with respect to museum settings, we can say generally speaking that it helps us moving in the exhibition space, choosing the correct theme-based itinerary and reaching supporting services and emergency exits. Developing an integrated wayfinding system, while including both architectural elements and directional signage in planning spaces, produces several advantages:

- the user's ability of finding directions and understanding the surrounding environment creates a sense of control and reception of the facility, which are key factors in reducing stress, anxiety and fear (Arthur and Passini, 1992);
- intuitive orientation implies less time spent by museum staff to assist people who do not understand provided information;
- a comfortable and cognitively clear environment contributes to a positive visit experience;
- easiness in orientation conveys the feeling of a well organized, quality service.

The diversity and variety of museum facilities over the Italian territory makes it difficult to plan general or common operations needed to effectively enhance the sites themselves.

Each site should be deconstructed and analyzed in detail as regards its peculiarities (both from the building and symbolic perspective).

Therefore, each orientation system should be conceived according both to the hosting "container" and to the "content". This means that actions to be taken depend on the factors defining the identity of a museum:

- the historical and cultural value and its relevance within cultural heritage;
- protection rules of the site;
- the value of displayed artworks;
- artistic, esthetical and architectural features.

These factors outline the quality standards to be achieved. These should be complemented by adequate parameters concerning the wayfinding system, in order to assess the overall satisfaction and appreciation level.

Today, many quality assessment systems for museums (or archaeological sites) are present all over Europe. In these systems, the communication framework is considered as a distinguishing element for accreditation by certification authorities.

For example, in the *Accreditation Scheme* (UK), one of the requirements is the presence of a legible and comprehensible signage, both indoors and outdoors[1]. In Spain, instead, the accreditation system is entrusted to local administrations, that include as a minimum requirement the presence of proper guarantees regarding indoor and outdoor signage and information tools for exhibits[2].

The program *Herity* (*Heritage + Quality*), widespread at international level, examines four fundamental aspects to determine quality: perception of cultural value; the state of preservation and renovation; information conveyed to visitors; reception quality[3]. The evaluators are the visitors themselves, as well as internal staff, other than external evaluators. It is apparent that, even though not explicitly, meeting the orientation requirement positively affects the overall assessment of museums.

2.1 Good practice examples in wayfinding strategies for museums

In many museum facilities the wayfinding system's choice, with different levels of action and technical solutions, interacts emotively and sensorially with the visitors, but it often contributes to improving the museum's public image as well. There are several cases in which this solution was adopted, which were found by means of a detailed study of international museum projects, where wayfinding was used to promote their uniqueness.

Two case studies are briefly described here, for the sake of example, which effectively exemplify two different approaches to wayfinding planning. They also represent opposite museum contexts in terms

of building consistency, relevance, permanent or provisional nature of the exhibitions and architectural constraints system.

The traditional approach used for reorganizing the entire wayfinding system of the British Museum in London, and the unusual wayfinding adopted for the Walker Art Center in Minneapolis, both share the intent of improving the museums' public image through a new found identity.

In the case of the British Museum in London, the objective was to improve the contemporary image of the great international museum by making spaces and signals more functional, which gave a hierarchical order to the information being provided. The chosen technical solutions ensure that requirements related to ergonomics, legibility, clarity of symbols, durability and safety are met. The system of artifacts (graphical banners, totems, directional aids, paper maps etc.) has been particularly well-crafted in its coherence and all elements have been located in "decisional points" of the museum. The system is very articulated, but with its simplicity and clarity it succeeded in revitalizing the museum, despite the extremely rigid and protected context (Fig. 1).

The approach adopted in the Walker Art Center in Minneapolis (contemporary museum) is completely different: the idea of a new identity system of the museum facility derives from the intent of accompanying the audience and involving it in the visit experience. Given the smaller size and the flexibility of the architectural structure, it was chosen to apply an organic design experimentation, which is open and participatory at the same time. It is based on the creation of a new language, by means of digital technologies to create "lines of words and textures" containing information, that can be installed on any supporting material (Fig. 2).

Many other projects like these, applied in museum contexts, were able to use wayfinding not just as "user instructions" for the buildings, but as narrative elements conveying new messages, with positive effects on the enhancement of their cultural contents.

3. Roman museums: a teaching and research experience

The studies performed allowed to propose an approach to designing wayfinding systems in museums with the objective of defining, for each museum type, different action levels to implement by means of choosing techniques and materials appropriate to the features of the sites. Some of the several museum centers spread over the territory of the Capital City of Rome were selected for the experimentation[4].

The identified action levels are consistent with the experiences performed on the field and experimented while teaching the university course "Technologies and planning II", part of the graduate degree in Industrial Design of the Faculty of Architecture, University of Rome "La Sapienza".

The work that was carried out involved the selection of representative museum sites, the preliminary analysis of problems found in the wayfinding system, and the development of design guidelines – addressing professionals charged with planning decision-making and operative activities (contractors and investors, designers etc.). These guidelines are illustrated by means of technical choices related to artifacts to improve orientation and consequently the enhancement of the site itself.

3.1 Methodology and results

The methodology involved planning and carrying out a set of phases whose results required the contribution and interaction of several multidisciplinary stakeholders (researchers, museum managers, designers, cultural heritage enhancement experts, visitors, students etc.). The general objective was raising awareness in designers and museum managers as regards the potential of wayfinding with respect to cultural heritage enhancement. The specific objective was proposing design guidelines in which, by a focused usage of principles and artifacts for wayfinding, different action levels can be identified in relation to the type of museums.

3.1.1 First phase: classification of museum sites by typology and function, based on three macro groups corresponding to homogeneous actions and selection of a representative case study for each group:

a) Historical-archaeological museum. This category includes all museums placed in historical and therefore protected buildings. The main feature of these sites is their twofold function: both the building and the artworks it contains are valuable elements that can be enjoyed and enhanced through minimum action strategies.

b) Interactive museum. This group includes scientific, technological and astronomical museums, namely, all those facilities that must necessarily allow the observer to interact with space, contents and artifacts, in order to better understand their shape, composition and functioning. Buildings hosting this type of museums have a higher level of flexibility and therefore a potential action level involving installations, variations and reconfigurations of spaces and equipment.

c) Contemporary museum. The numerous exhibition buildings created in recent years by means of renovation actions are more and more inclined to become mutable spaces, whose structure and contents allow more substantial actions. The contemporary museum loses the rigidity of historical

museums, acquiring adaptability features for different needs. Spaces covered by visitors are different each time, exhibitions are mostly temporary and itineraries are variable and surprising.

Selected case studies:

- a) Etruscan museum of Villa Giulia, Rome.
- b) Civic Zoology museum, Rome.
- c) MACRO in Via Nizza, Rome.

3.1.2 Second phase: analysis of museum features and of the adopted wayfinding system. Detection of problematic aspects.

Each facility has been subjected to an accurate direct investigation organized by a sequential analysis of distinguishing features: the museum context, the characteristics of the building complex, the exhibition theme, the exhibition itinerary etc.

The orientation system was also examined, identifying peculiar elements, the usage level of information provided by signage, adopted technological solutions and finally shortcomings and critical aspects.

a) Etruscan Museum of Villa Giulia for the group "Historical-archaeological museum":

Once beyond the entrance, one immediately realizes that the museum completely lacks an appropriate wayfinding plan. The information system appears to be uneven and fractured. Several supporting materials are used: wooden *palettes*, improvised paper stamps, metal plaques, appliques on glass surfaces, etc. An overall semiotic or unified graphical project cannot be identified. Directions have been written in different font sizes and styles, together with unconventional symbols which could be misinterpreted by the user (Fig. 3).

b) The Civic Zoology Museum for the group "Interactive museum":

Located behind the *Bioparco* (zoological garden), the museum is formed by eight exhibition theme units, along with a room for temporary exhibitions and a research laboratory in the lower floor.

Found problems are related to the contrast between the engaging aspect of the museum and the recurring orientation difficulties (see Fig. 4). Although the overall surface is quite small, the lack of a clear "division" between a room and the other produces a sense of disorientation. In fact, the itinerary, though being circular – and therefore quite intuitive – is not marked by supporting artifacts. Identification plaques or plates are placed on the walls, but are not clearly visible or understandable, especially considering the young age of the 90% of visitors (students, scout groups, etc.).

c) MACRO in Via Nizza, for the group "Contemporary museum":

The museum was created by recovering part of the spaces of a former brewery. It extends over a surface of about 10.000 square meters, distinguished by wide perspectives, dynamism, fluid spaces and flexible environments. It is difficult to grasp the spatial "boundaries", since the surface of the building, the height and spread of environments convey a sense of confusion and loss of orientation, amplified by the scarcity of visual and directional indications. Several artifacts are used for the wayfinding system, but they are not very effective, both because of chosen colors (white, red, and black which blend with the walls) and location (vertical totems are lost in the wide space where they are placed). Identification plaques have low visibility because of poor contrast; landmarks are not sufficiently identifiable in relation to space; maps or brochure supporting visits are completely lacking (see Fig. 5).

The final result of this phase produced a scheme of critical points that should be addressed, both in terms of efficiency of the orientation system and from the perspective of enhancement and promotion of the quality of the museum.

3.1.3 Third phase: definition of action levels classified by museum typology and implementation of technical choices in the selected case studies.

In order to configure possible approaches to planning, three strategic levels were defined according to implementation complexity, financial feasibility and potential impact on the building.

Level 1: low financial/physical impact action, through the improvement of traditional existing signage with "minimum change" actions, favoring the use of traditional materials, or by replacing existing signage with "light" signage reconfiguring images and spaces to make them more visually appealing and accessible.

Level 2: more intense action, applied by replacing the entire signage and thus reconfiguring the entire wayfinding system, by means of interactive or customizable technologies. This can be augmented by a more modern morphology created with innovative materials (such as sensory materials or nanotechnologies).

Level 3: radical rearrangement action, acting on the reorganization and reconfiguration of spaces and indoor itineraries. In this case, wayfinding is integrated within a renovation program, and is therefore an integral part of the project. The assignment of new functions to spaces is planned together with the wayfinding system, the indoor design, the environmental aspects (lighting, ventilation etc.), and multimedia aspects (sound, visual effects, apps, etc.).

Choosing one of these three action levels depends on the identity of the museum and is gauged according to the features of the site, in order to avoid disruptive and inconsistent actions.

In the implementation phase, an action level was assigned to each case study, with the purpose of developing a “planning guide” able to point out, though synthetically, the objective to pursue:

a) Etruscan Museum of Villa Giulia – Level 1

In order to protect the identity of the site, while evening out the orientation system, it would be appropriate to create a “thematic” project to be applied to each wayfinding artifact: a new distinguishing symbolism (identifying the Etruscan art theme), a new font style, new pictograms or new images. The choice of supporting materials for signage should favor light elements to be placed in critical points and anchored using non disruptive systems, so as to preserve the visibility of the architecture and artworks. If possible, they should be made of durable materials and be integrated seamlessly with the exhibition style and theme. An experimental project interpreting these indications is given here as an example (Fig. 6).

b) Civic Zoology Museum – Level 2

The museum is a veritable teaching center: each item and exhibit can be an element of discovery and play, given the target user group. The prevalence of children will steer technical choices towards interactive and amusing artifacts. A child should be able to discover the contents of the museum by using all senses; natural habitats recreated in the museum could be the setting for new surprising objects, changing each time: audio, tactile or perfumed elements; appealing graphical items; shape-memory or iridescent materials; luminous objects. The circular itinerary could be characterized by new elements to confer visibility to each room and facilitate the understanding of the proposed themes. In order to facilitate the understanding of these planning guidelines an operative experimentation is proposed (Fig. 7)

c) Macro in Via Nizza – Level 3

The possibilities for reconfiguring the entire wayfinding system in such a wide and open space can be several: it could be possible to add new architectural elements, new landmarks, or completely change both itineraries and the setting of indoor spaces, by means of three-dimensional elements.

The large available space could host the installation of distinguishing decoration items, in which a built-in orientation system could be embedded. More complex technical elements (luminous, tactile or sound objects) could also be used.

The difficulty in operating in such a flexible space should be addressed by trying to create a hierarchy of spaces and information to be used. The ostensible planning freedom could also be exploited with actions aiming at assigning several functions to each space, defined so as to provide the users with a customizable visit according to their needs and interests. Reception and guidance should be therefore guaranteed by using supporting elements spread over the space, independent of the chosen itinerary (see Fig. 8).

4. Conclusions

Design and planning solutions, defined based on action levels, were identified with the purpose of bringing out the potentials of wayfinding in terms of promotion and enhancement of museum facilities, while respecting protection requirements of valuable sites. Critical points highlighted and tentatively addressed here, shifted the focus towards aspects that are often ignored and seldom integrated in the design of museum spaces.

Wayfinding is not a secondary discipline with respect to design, but it integrates the latter and affects its quality in terms of understanding of designed space. The clarity and straightforwardness of information being conveyed should be absolute, as well as the planning and function of spaces.

A more scientific approach to wayfinding will allow solving many problems related to user needs, reception, organizational image of the facility, management of visitors flow, which are all strategic factors for assessing quality.

By adopting a functional wayfinding project, complete and integrated with spaces and configuration of sites, visitors will be able to appreciate the richness of cultural heritage. Unknown museums will therefore acquire reliability and pleasantness that determine their financial (increased number of visitors) and educational-didactic (quicker dissemination of proposed cultural themes) success, ensuring their full sustainability.



Fig. 1: Traditional wayfinding to improve the public image of the British Museum, London, UK.
Design: Lucy or Robert, 2006-2011

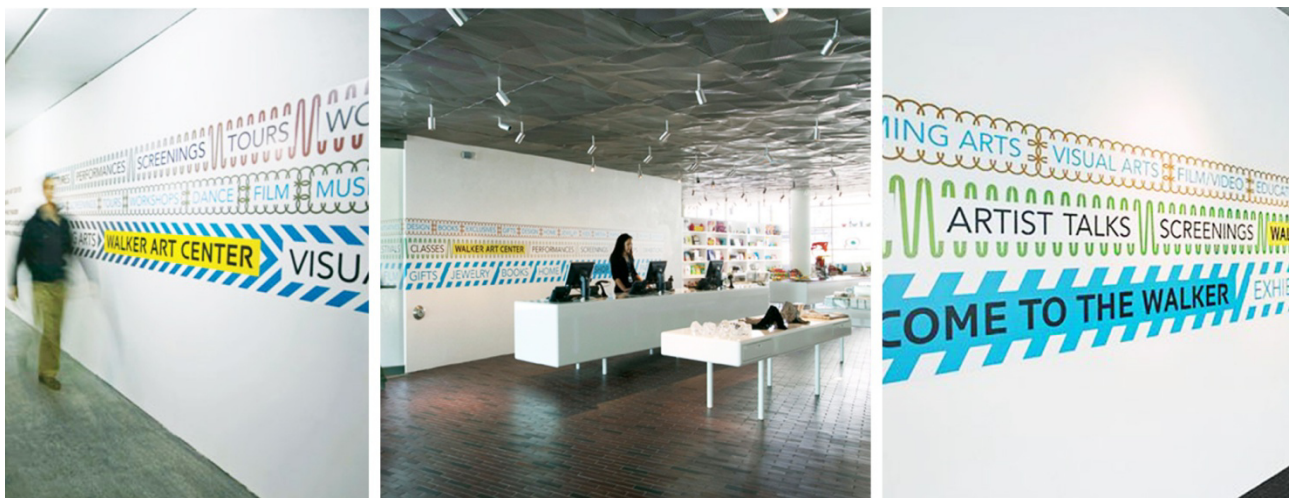


Fig. 2: Unusual wayfinding in temporary settings. Walker Art Center, Minneapolis. U.S.A
Design: Andrew Blauvet, 2005



Fig. 3: Etruscan Museum of Villa Giulia, Rome. Critical aspects found in the current wayfinding system: poorly organized signage and dazzling phenomena.



Fig. 4: Civic Zoology Museum, Rome. Critical aspects found in the current wayfinding system: excess of information near the main entrance; request for interactivity by target users.



Fig. 5: Museum of Contemporary Art MACRO in Via Nizza, Rome. Critical aspects in wayfinding are related to space configuration, to the dynamic and articulated system of connections, ramps, gangways, and to poorly visible color choices for the current artifacts.



Fig. 6: Possible artifacts proposal for wayfinding in the Etruscan Museum of Villa Giulia: composite wooden engraved plaques, light and coherent with the indoor style. The shape, font and colors recall the Etruscan art theme.

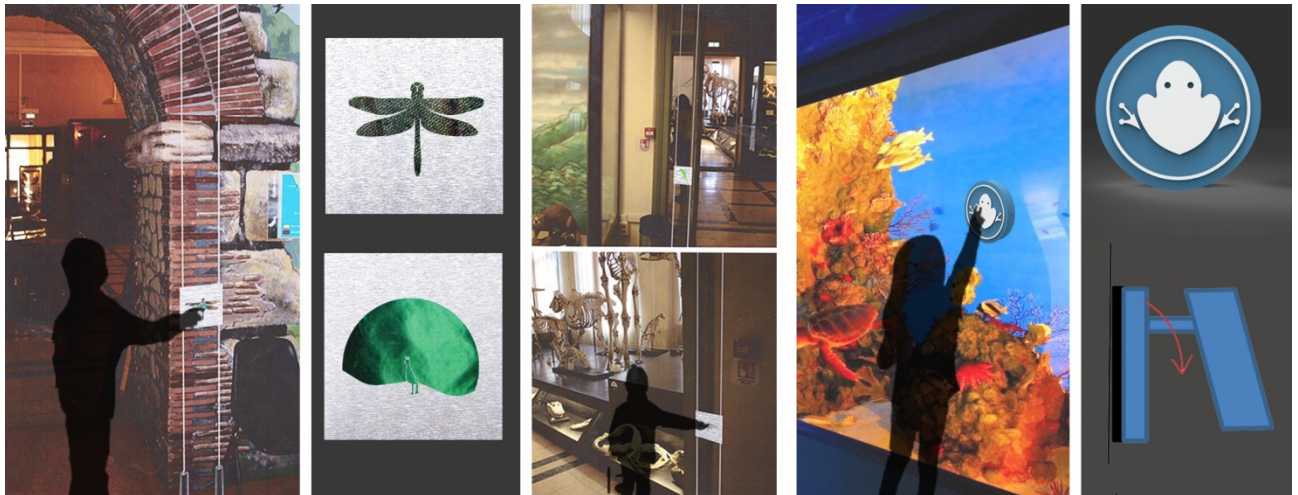


Fig. 7: Possible artifacts proposal for wayfinding in the Civic Zoology Museum. In the first three images, tactile artifacts made of metal plates supporting various cloth textures to simulate the skin of the animal being exhibited. These artifacts, hanging from or fixed to the wall, become interaction elements for younger visitors. On the right, a scented diffuser whose shape identifies the theme of the room and whose functioning involves the user through sensorial stimuli.



Fig. 8: Possible artifacts proposal for wayfinding in the MACRO in Via Nizza. Suspended signage suitable to large spaces, simple in shape and chromatically consistent with the museum theme. This signage is augmented with the help of innovative technologies using vibro-transducers embedded in the artifacts, which, thanks to a special magnetostrictive alloy, create a link between movement and emitted sound, guiding visually impaired visitors as well.

Notes

[1] *Gli standard di qualità in ambito museale*, 2013. Report by “Agenzia per il controllo e la qualità dei servizi pubblici locali di Roma Capitale”, p. 7.

[2] Op. cit., p. 8.

[3] <http://www.herity.it/4615/index.html>

[4] The city of Rome is characterized by a museum heritage including more than 46 state museums (almost 20% of those found in Italy overall) and more than 160 civic or private museums (including monuments and archaeological areas). In 2014 alone, more than 16 million visits were recorded (41% of those all over Italy), which have been increasing in the last two years, thanks to recent initiatives by MiBACT (Source: Sistan http://www.statistica.beniculturali.it/Visitatori_e_introiti_musei_14.htm)

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