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## **An E-Culture - E-Museums Environment for Common Citizens and Disabled Individuals**

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**Abstract:** The integration of modern Information and Communication Technologies (ICTs) within the cultural domain creates what is commonly known as e-culture. The need to create an e-culture environment arose from the undeniable fact that the cultural heritage of a nation defines it and therefore, should be disseminated to all, regardless of their location and their disability. This article discusses an e-culture portal, which presents to any interested users, information regarding a significant number of Greek and Cypriot museums and galleries as well as their exhibits. The e-culture environment offers user friendly navigation techniques and contemporary multimedia tools and services for the better presentation and visualization of the e-material to the users-visitors, paying particular attention to both common citizens and to disabled individuals, in order to offer them equal access to cultural heritage information. This environment is an inter-disciplinary application, combining the ICTs, cultural and e-inclusion domains (electronic support for disabled people).

**Keywords:** E-Culture, Cultural Heritage, ICTs, Digitization, User-Centered System, Knowledge Society Strategies, Design for All, Visually Impaired Users, Digital Inclusion, E-Museums, Information for All.

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## 1 Introduction

The digitization of arts and culture has to do with the relationship between ICTs and the production and consumption of art and culture. By merging the above, the term e-culture arises (Fig. 1). In theory, e-culture comprises all processes of expression and reflection in the digital domain. That also includes, for instance, communities that share a certain lifestyle, interests or ideas (Van der Ploeg, 2002).

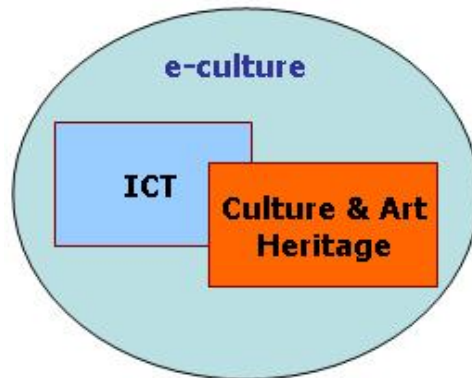
The term e-culture implied the need for a new type of policy. When it comes to cultural policy, developments surrounding ICT and digital media must be considered within a broad perspective. For this reason, the EU has already funded several projects in the framework of its i2010 policy for telecommunications (2007-2013) emphasizing on the following two axes. Firstly, on the incorporation of services on the Internet for the disabled people and secondly, on the adjustment of the provided information based on the needs of the disabled in order to render it more suitable and usable for this community of people. Net Media Lab of N.C.S.R. 'Demokritos' has begun such services for visually impaired and hard of hearing individuals as well as for teachers and students with multiple disabilities before 2000.

New museums and galleries place a high value on accessibility and also on aesthetics issues. They are moving away from rows and rows of objects each fronted by a label containing limited and specific information. When these new museums start to digitize their collections they produce huge databases with modern agent-oriented methodologies (Durbin, 2004; Giunchiglia, Mylopoulos and Perini, 2002; Trant and Bearman, 2002; Loran, 2005).

Moreover, the past years have seen the exploitation of multimedia techniques and lately the introduction of virtual reality methods to create new forms of presentation for museums' exhibitions. Virtual Reality can offer a number of advantages to museums and a way to overcome some common problems like the lack of space or the need of the visitors to interact with the exhibits (Carreras, 2005; Charitos et al., 2000; Lepouras et al., 2001); Almeida and Yokoi, 2003).

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**Fig. 1.** Merging ICT and Cultural Heritage

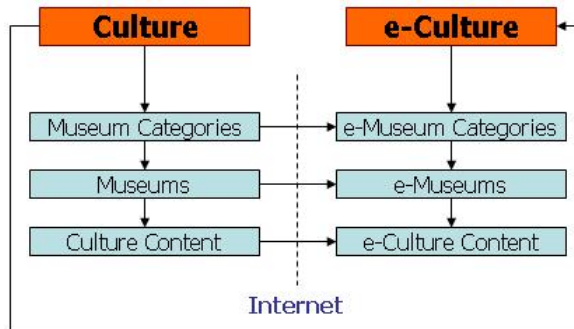


## 2 Abstract Level Description

The structure of the environment content consists of the following steps (Fig. 2):

- In the first step, a list of the existing museums and galleries categories in Greece and Cyprus appears. As a result of this categorization, the visitor can easily and quickly access the museum of his choice, without having to spend extra time for searching.
- The second step includes the listing and placing of museums/galleries, according to the corresponding categories, mentioned in the previous step. The total number of museums/galleries belonging to each category is satisfactory (having a mean term of 30) so that the user-visitor has a spherical and objective informing about every category
- At the third step, a study of every institutions' cultural content takes place, in order to show and present it in such a way that a user-visitor will not only obtain an integrated and representative view of a specific museum, but also will ease the navigation
- Moving on, the cultural content which emerged from the previous step, is written and embedded into the whole system
- Finally, there is a thorough study of the environment standards and outlines. The further goal is to choose the appropriate techniques and technologies which will be used, so as to constitute the final product user-friendly, and more importantly, to live up to the needs of disabled people in accord with the information society strategies.

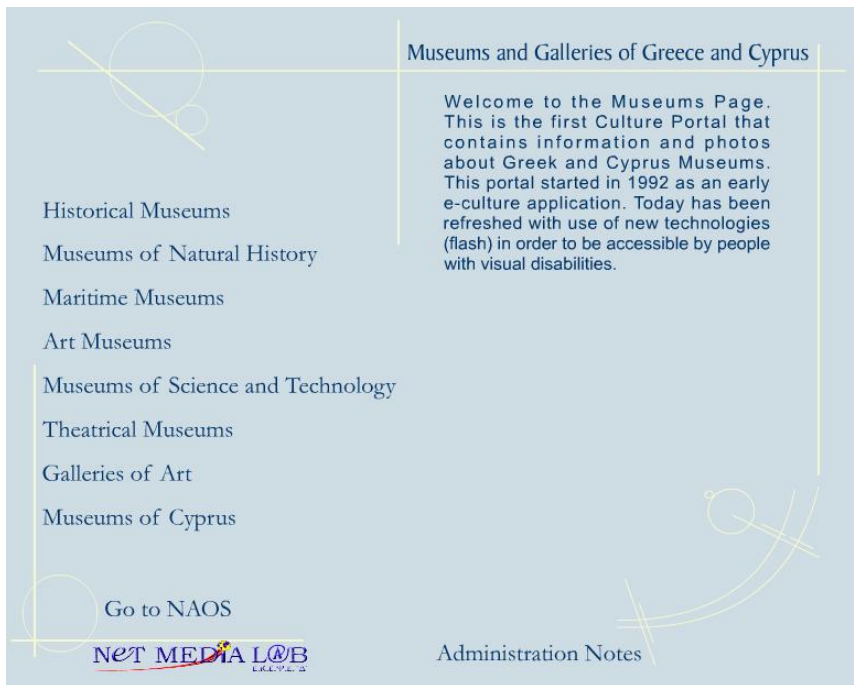
Fig. 2. System Structure



### 3 System Analysis

The e-culture portals' main page starts with a graphic and art visual application with the harmonious arrangement of lines and shapes, influenced by ancient Greece, in order to introduce the visitor from the beginning to the ambience, which it presents. It has a simple but functional structure so that the visitor can easily navigate throughout the various categories of museums and galleries. This main page is depicted in Fig. 3.

Fig. 3. Main page with graphic arts



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After extensive research on the various museums/galleries categories in Greece and Cyprus, the following list was made:

- Historical Museums
- Museums of Natural History
- Maritime Museums
- Art Museums
- Museums of Science and Technology
- Theatrical Museums
- Galleries of Art
- Museums of Cyprus

As it was previously mentioned, the above categories are representative because they reflect the Hellenic cultural activities as well as their aspects over course the centuries, such as history, tradition and customs.

At this point, the user-visitor has the option to choose one of the above categories in order to navigate through the corresponding museums/galleries. The choice of these institutions was made with the criterion to cover as much geographical space as possible in the Greek and Cypriot territories. The reason is none other than the fact that every region, although belonging to the same country, has its own cultural roots and uniqueness. Consequently, a user-visitor can be informed about the whole of a region's culture even if this region is remote.

In Fig. 4, part of the art museums catalog is depicted. These museums exhibit the Greek art history over the centuries, from the ancient years to the 20th century. Some of the most important museums in this list include the Vorres museum, the National Bank museum-art collection and the Yannis Tsarouchis museum, which will be presented in more detail next.

**Fig. 4.** List of Art Museums



The final step of the navigation through this e-culture portal is the projection and presentation of a specific museums' cultural content. This presentation consists of the following parameters, which emerged after a thorough study showing their connection to the rest of the environment (Fig. 5). These are:

- Museum Address
- Museum Information
- Museum Photos
- Exhibits Images

With these elements of cultural content, the user-visitor can easily and quickly find the address and other data (telephone numbers, fax numbers etc.) of the museum, brief information about the museum itself (foundation, inauguration, founder, and exhibit pieces), a brief set of photographs showing the indoor and outdoor areas of the museum and finally representative images of the most important exhibits.

When a user has chosen a specific category, the user can proceed to the next, which is the choice of appearance of the cultural content of a particular institution (Fig. 6,7).

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Fig. 5. E-culture content

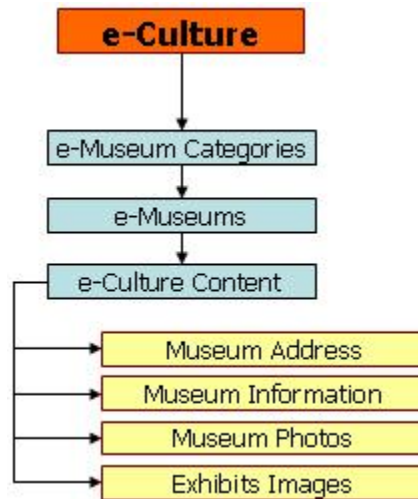


Fig. 6. Museum Address and Photos

**Yannis Tsarouxis Museum**

**ADDRESS:**  
28 Ploutarchou Street 151 22 Maroussi  
Athens Tel.: (01) 8062636-7

The Museum was founded in 1981 by the painter himself and is housed in the artist's home. It includes paintings, drawings, models and archives. Some of the works, which belong to the Tsarouchis Foundation, are:

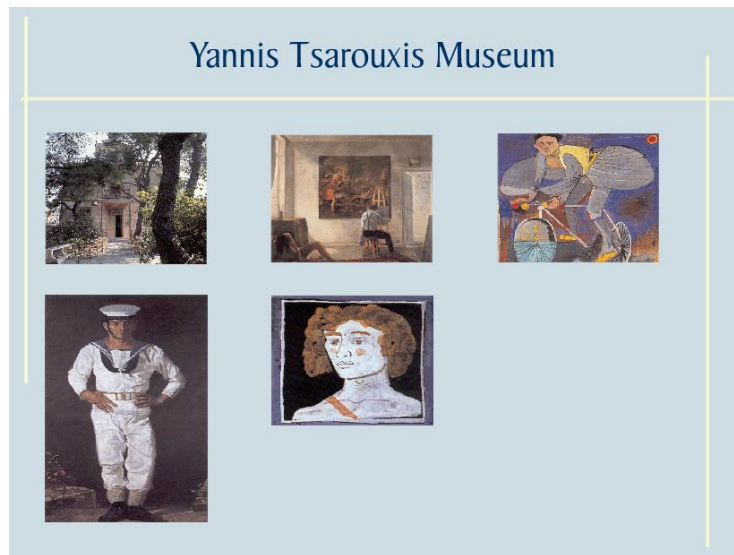
- House with masks, 1929
- Cyclist disguised as an evzone, with a temple below right, 1936
- Cyclist in front of a backdrop by Sotiris Spatharis, 1939
- The dance in life and in the theatre, 1963-68
- People with butterfly wings, 1965
- Swimming and practice in drawing, 1966-1968, and others.

The elements, which make up the art of Yannis Tsarouchis, reflect a fresh and persuasive spirit. His artistic creation is the expression of a genuine spiritual dynamism. In essence, his work exudes a lyrical romantic nostalgia, definitely sensuous in conception. In the Museum do also other artists create exhibited works. From 1982 until 1989, various other artists have held of Yannis Tsarouchis!

Up  
Down

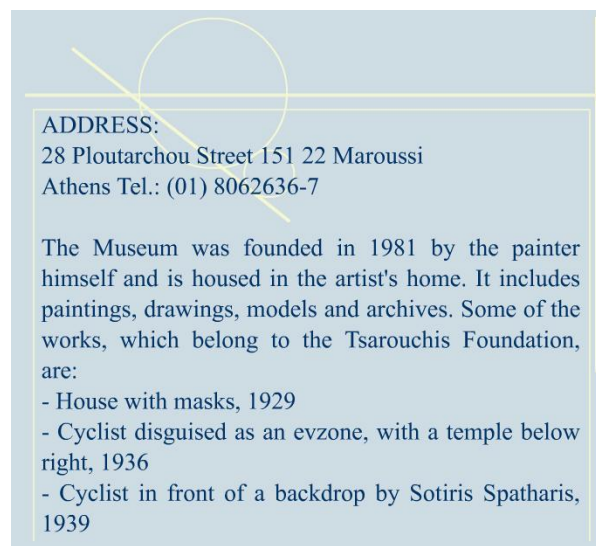
back  
Home

**Fig. 7.** Museum Photos



As it can be seen in the above figures, the parameters Museum Address and Museum Information are depicted in regular size and the parameters Museum Photos and Exhibits Images are depicted in a small (thumbnail) size. With the use of Flash technology within the e-culture environment, the user-visitor has the option to enlarge the parameters Museum Address and Museum Information rendering the cultural content legible by visually impaired individuals (Fig. 8).

**Fig. 8.** Zoom of Museum Address & Information





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In addition, by clicking on an image from the parameters Museum Photos and Exhibits Images, the visitor can view them in real size so as to have a clear view of the exhibit or the museum areas (Fig. 9).

**Fig. 9.** Photo of an Exhibit in Real Size



To sum up, it can be said that the user-visitor has an integrated point of view of a museum and its exhibits as they are presented through the e-culture environment. In addition, as it was previously mentioned, one cannot omit the fact that the knowledge-information presented within the environment is also available to people with visual disabilities, through the use of Flash technology. This way, this e-culture environment follows the «Information and knowledge for all» logic and scheme as well as knowledge society strategies for user-centered systems that provide knowledge and learning to everyone (Lytras and Sicilia, 2005; Lytras, 2007).

#### **4 Benefits**

The benefits of an e-culture environment like the one described in this article and its importance to the information - knowledge society can be focused on the following:

- The diffusion of Greek civilization and generally of the Greek cultural heritage in a universal level. Additionally, this form of cultural heritage is at the disposal of every Greek citizen, that is, to the Greeks abroad and finally to foreign people who are eager to learn about Greek culture
- The cultural information is accessible by anyone, anywhere, anytime and with minimum cost (Mayer, 2004)

- Saving and creating digital cultural content can lead to the preservation of cultural information during the course of time due to the constant physical degradation of monuments, statues etc.
- Easy access to cultural information for disabled people complying with the user-centered strategy and the «equal access and knowledge for all» logic
- The projection of a country's cultural heritage can yield immediate results to the social sector of a country like the development of tourism, and in a wider sense the development of its economy (Veltman, 2005; Go, Lee and Russo, 2003)
- The electronic projection of a country's cultural heritage is also a tool for education, study and research by scientists and students
- Finding new information out of existing information from other resources
- Creating new arts with the help of ICT tools, like graphic design, digital photography etc. As a result, new modern artists appear and simultaneously new professions and job vacancies are created (Drigas, 2005).

## **5 Future Work**

The e-culture environment presented is the first creative stage of an integrated e-culture environment for navigation through Greek and Cypriot museums. It was created with the use of the HTML programming language embedding at the same time the FLASH technology in order to achieve better visualization. The aforementioned technologies are compatible with every operational system as well as every Internet browser. A future goal of the presented environment is the creation of an up-to-date integrated e-culture system using modern techniques and technologies. Great importance will be given to the promotion and presentation of cultural information, due to the fact that there are new techniques and tools in the area of informatics towards this direction.

For a start, there are thoughts that future work on this e-culture environment will include virtual reality technology, which is a technology that permits the user to interact with a computer-simulated environment, be it a real or an imagined one and which is commonly associated with its immersive, highly visual, 3D environments. Like most current virtual reality environments the goal is that this particular environment will be a visual experience, displayed either on a computer screen or through special or stereoscopic displays.

In addition to virtual reality technology there is also the possibility of embedding virtual learning environment software, which is a software system designed to support teaching and learning in an educational setting (e-learning) (Albano, Gaeta, and Salerno, 2006). Such an environment can be used for educational purposes at schools or in a virtual learning community and provide a collection of tools such as those for assessment, communication, uploading of content, return of students' work, peer assessment, administration of student groups, collecting and organizing student grades, questionnaires, tracking tools, wikis and blogs (Fuchs, 2007).

Additionally, another goal is that the architecture of the environment becomes 3-tier. 3-tier is a client-server architecture in which the users interface, functional process logic, computer data storage and data access are developed and maintained as independent

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modules, most often on separate platforms. Moreover, the use of agents (virtual human figure representation that is created and controlled by computer programs) and avatars (a digital representation of a user in a virtual reality site) is also considered for the future.

In the framework of the 'Design for All' and 'Universal Accessibility' logics and principles another future goal regarding this project is the creation of a section within the presented e-culture environment for the deaf and hard of hearing people. This section will render the deaf and hard of hearing people equal members of the e-culture community as it will enable them to overcome the difficulties of the digital age and ease their integration to the Internet and the new technologies and in particular, to what is known as e-culture. This will be achieved by creating Sign Language videos which will be embedded in the e-culture environment and which will navigate and guide the deaf and hard of hearing people to the e-museums of this e-environment. Since the Greek Sign Language (GSL) is the principal language that the Greek deaf community uses and since GSL is a natural visual language it is apparent that this development will considerably ease the integration of this community to e-culture.

It is common knowledge that the difficulties and barriers that people with disabilities and in particular deaf and hard of hearing people face regarding the Internet and the digital world are numerous but soluble. One of the main scopes of this e-culture environment is to overcome these difficulties and barriers, understand the informative and communicative needs of this special group of people and support their equal rights in order that all people regardless of their disability can easily access and be equally included in the e-culture community.

In other words this e-culture environment will offer Greek Sign Language videos, which will correspond to every available text in the environment. This way, the special needs of the deaf and hard of hearing people will be satisfied to the full since information will be provided in two languages (written and their own language that is, GSL). Recent studies have shown that the use of both written language as well as sign language in special schools increases the reading skills of the deaf and hard of hearing students significantly. In addition, the environment will provide high level visualization as well as interactive and explorative learning (Drigas et al (2005)). A typical example of this video is presented below (Fig. 10).

The mere creation of an e-culture environment that presents exhibits from a large percentage of the Greek and Cypriot museums gives people with mobility disabilities the unique opportunity to visit these museums online since their physical presence may be difficult or even impossible. In addition, with the use of Flash technology the information provided on the screen is magnified for the visually impaired people and finally, with the use of sign language through flash videos embedded in the system the deaf and hard of hearing have the opportunity to be guided through the museums and to be informed about the various exhibits in their own language. This way the digital inclusion of a vast number of special communities is ensured (Molla and Al-Jaghoub, 2007).

**Fig. 10.** Sign Language Guide through the E-Museums



All the above play an important role towards the creation of a user friendly e-culture environment, especially to children and the elderly who are not familiar with the use of a computer and its features (Geser and Mulrenin, 2002, 2004).

## **6 Conclusions**

From the detailed analysis carried out throughout this paper, the numerous advantages of the system that supports e-culture services became clear. Its main advantage is none other than the fact that it offers the pioneering experience for either a simple user-visitor or a scientist-researcher to combine two completely different worlds, the physical and online worlds, simultaneously.

This new e-culture challenge will drastically change the structures and relations that existed up to nowadays. Museum staff, volunteers and a wider public will require new skills to create, manage and maintain participatory and truly interactive digital applications. Museum people will need to understand experimental learning and the techniques of information management and multimedia creation. They will also need to draw on inputs from a wide range of disciplines, in the arts, sciences and humanities.

Culture is dynamic and creativity is at its core. Museums and galleries are centers for creativity. Their collections embody the accumulated cultural energy of contemporary and other times. They can be powerful catalysts for innovation. By making museums more accessible, a more creative society can be built.

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