THE MUSEÉ IMAGINAIRE
Science, Art and Technology: Using PDA in Cultural Environments

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Abstract: Mobile devices for an imaginary museum is a proposal of a new mobile device, specifically created for its use in museums. Through the analysis of the of existing devices' characteristics, and the satisfaction grade by their users, we cogitate on how it could be like, and which features it should include.

1   INTRODUCTION

The Information Society, known as e-culture cannot afford to overlook the impact of new Technologies on institutions connected to memory: archives, libraries and museums.

The impact of new technology can be seen in many ways but the most striking in relation to the museum, the institution with which we are concerned here, is the appearance of a new type of museum, called a virtual museum and the online museum.

The online museum has digitalized its collections and now provides services never before available such as access to databases and all types of documentation.   The purpose of the institution is being redefined.

The Museum, has always been a discredited institution, mostly because it has never fulfilled the purposes for which it has been created, the democratization of culture and knowledge, in brief. It's definition has always been controversial, nowadays the basic definition of museum by ICOM, is being reconsidered. The history of thought and critics regarding the museum has shown that one of the problems is to keep on using a transhistorical and universal category.

Amongst the most distinguishable aims and purposes of a museum, since it's origin, are the **democratisation of culture and knowledge through education, and the spreading of knowledge (Universal Knowledge)** -a legacy of Enlightenment thought that gave birth to it- and the **preservation and dissemination of heritage**.

New digitalization methods have allowed to stand up to conservation and storage problems. Nevertheless, the most difficult issue is to solve the compatibility problems between these memory storages, this is one of the challenges of e-culture to which a lot of effort is being dedicated, and from many fronts. A remarkable example is what UNESCO is doing for this matter. The spreading through internet, enables people from different parts of the world to access the contents, even if in a virtual way, but it cannot be forgotten that direct experience have never been replaceable.

Moreover, nowadays, homogenization and universalization are possible thanks to virtual and digital museums, their emergency, just as the blogs- that would be the downside of this story- is going trough a spectacular peak, the possibility of the utopian "Imaginary Museum", thought by Malraux, that holds the whole of artistic creations since the birth of Humanity, is getting closer, there is no museum that takes itself into account that does not have a virtual version.

The utopia of democratizing culture and knowledge, thanks to new digital reproduction techniques, could be in process of converting itself into an aporia. What is called a *Digital Breach* is not just a subject concerning Global South countries, the digital breach is also patent in developed societies, and not just in the access to technology but also in the users ability to use it. Memorandum of Understanding for Multimedia Access to European

Cultural Heritage of the European Union, has been one of the initiatives determined to overcome the problem.

The development of new technologies –NTIC- does not entail, as it is repeatedly said, a positive capability for social development. If initiatives such as Bill Gates' ones, are to carry on, the breach will be bigger and bigger; Gates created Corbis: http://pro.corbis.com/default.aspx in 1989, a company that is gathering the biggest collection of photographies, art images, engravings and illustrations, on which, of course, he holds the copyrights. It is estimated to have more than 30 million images…we could be talking about Malraux's nightmare.

On the other hand, the didactic basis has shown its big aporías, mainly because it overlooks something basic such as cultural differences and also the diversity of cultural products.

In fact, in the conclusions of the International Congress CULTURTEC 2002: http://www.ucm.es/info/cavp2/culturtec2002/

it has been stated that "the promotion of the conception of the museum as a conservative element of the memory of the cultural difference, that promotes the common cultural elements from the diversity, thanks to its communication capacity through new technologies. The ineluctable task of extending and, at the same time, amplifying the concept of cultural heritage, which is not limited to objects, monuments, historical spaces and museums, but includes the full spectrum of human knowledge, exceeding the old conception and integrating it into the daily life of the citizens."

These days, the concerns related to financing, visitors and users number are holding much of the museums' attention and efforts. Even so, museums do not cease to proliferate and visitors do not stop do decrease, as the numbers show in annual reports. To overcome this situation, on one hand, virtual museums are being created; and on the other, the use of devices that can outwit the reception's passivity through computer and audiovisual systems and that enable a recreational and creative learning that are symbolically close. Something that contemporary art museums have already assumed, since they have started to lodge works that are based on systems, multimedia and hypermedia installations; we are talking about the nineties of the 20th century.

We could even say that the contemporary art museum was, thanks to these works, the first museum institution to go on its own deconstruction process, forced to rethink concepts concerning the objects exhibited and the reach of cultural space, its

historical, communicative and educative aims. Moreover the aim was to establish a meeting point between virtual reality, culture industry, cybernetics and robotics, in which the implications between art, technology and society are studied; in this sense, it is worth pointing out: ZKM/Media Museum in Karlsruhe, Germany (1997): http://www.zkm.de/, or Ars Electronica Center or Museum of the Future: http://www.aec.at/en/index.asp that organizes since 1979 the Ars Electronica Festival: http://www.aec.at/en/festival2006/program/index.asp

Science, Technique and innovation Museums were the first in using theses new technologies, here are several examples: *Exploratorium* of San Francisco (1969): http://www.exploratorium.edu/, the City of Science and Industry in Paris (1986): http://espanol.pidf.com/page/p-311/art_id-1222/idf-PCUIDF0000000017/, Sony Wonder Technology Lab in New York: http://wondertechlab.sony.com/, Tech Museum of Innovation in Silicon Valley, California: http://www.thetech.org/

In our country, good practice proposals ensue, as it can be seen in:http://www.icom-ce.org/ and in local or national range projects, though with slowness. An example is the Museo Nacional de Ciencia y Tecnología: http://www.mec.es/mnct/museo.html, of the Universidad Politécnica de Madrid and the Ministerio de Educación y Cultura.

A virtual museum should be something more than a online museum, it shouldn't consist exclusively in digitalizing collections and archives, - or in creating a self tailored imaginary museum-, which most museums end up being. We should think about the possibilities that it allows: to put in context, more widely, the conceptual threads, the objects and the historical context in which the works have been created, access to related documentation that could be found in other places and institutions, at a global level, that would deal with the same subjects…that is to say, the possibility to think about devises of knowledge and education, through the interconnection between electronic communications online, access to search engines, information management, digitalization processes, database organization, hypertext, interactivity, multimedia, virtual reality…at the service of knowledge.

In addition, and starting with the fact that real experience can not be replaced by virtual experience and vice versa, the online museum does not replace the visit. It should encourage the real visit but differing diametrically at the same time. We must recall that a real visit is an open space-time layout,

in which each visitor builds his path and uses his time at his own free will, and the museum should recognize the opinions, the needs and users' appreciations, as well as their routes and visiting times.

Douglas Crimp brought Malraux back to us, reminding *that* **Museum Without Walls** *is a bad translation, or better even, a very creative translation of Malraux's French title*: **Le musée imaginaire**, *literally* the imaginary museum. This translation poses an interesting paradox, since actually, the museum walls are precisely the ones confining cultural production, separating, in this manner, culture from life, the transcendental from the everyday life, the artistic from the social; however, cultural practices and their users nowadays, have pulled down these walls.

To the disappearance of the museum walls, we must add up the disappearance of the passive viewer in favour of the active one, in fact, this viewer or user is part of the team. Thus writes Gardner:

"(…) a widely spread notion of intelligence, recognizes that seldom or never, productive humans work alone, merely using their head. In fact, usually the individuals work with all kinds of human and inanimate or prosthetic objects; these entities get to take part so fully in their activities that it sounds logic to consider them as part of the individual's intellectual arsenal."[1]

Simple things should be simple, complex things should be possible.

—Alan Kay

In spite of all efforts and progresses made, at the moment, it is still difficult to find mobile devices that satisfy us fairly, and even less to completely satisfy their users.

Sometimes, it might be due to the complexity in using the interface, to the lack or excess of functions, contents, to aesthetics…in any case, the final result is that the device will end, one way or another, frustrating and deceiving the user.

If the device were to have a long term use, conditioned, for example, by its cost, it would force the user to adapt his own logics to the device's one. It would be a failed device, but in use.

However, if we counted on a short period of usage time, and eliminated the cost element, as in the present case, the result would be that the user would become frustrated and deceived. By not being forced to continue to use the device, he would just simply stop using it. Our device would be a failed device and of no use.

But, why does this happen? , Of all devices we know of, which would be the most suitable for its use in a museum? The problem might be the question itself, maybe the appropriate device still doesn't exist, and for that reason a new one can't be created by adapting software based upon the existing hardware.

2 DEVICE PROPOSAL

People who are really serious about software should make their own hardware.

—Alan Kay

Through the analysis and critic of existing mobile devices at the present time, that fulfil the needs of the users, we can get into the conclusion that it is possible that the ideal device to be used in a museum, would be a combination of hardware and software, specifically created for this purpose, capable of communicating with other devices, and that would include a physical interface provided with advanced sensors, that would permit the use of a multiscale graphic interface.

2.1 Advanced Sensors
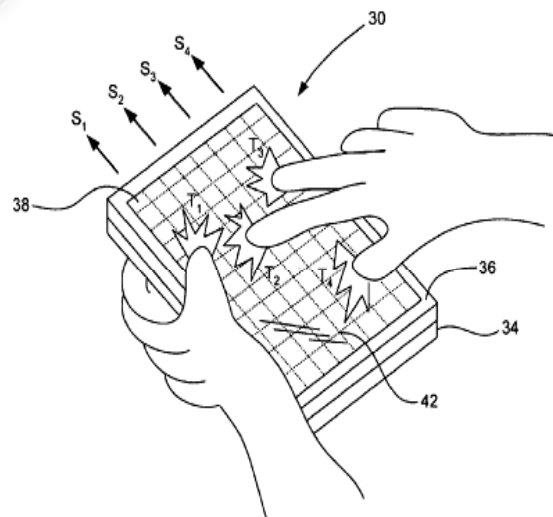
2.1.1 Multi-touch Sensor

Figure 1: Sensor Multi-touch.

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[1] Manuel Oliveira. *Les projets culturels dans leur contexte.*

http://www.lafriche.org/nta/ressources/contributions/molveira.html

Figure 2: Sensor Multi-touch. (US Patent Application Publication US 2006/0097991 A1. Hotelling et al.).

Multi-touch is the name given to both the human-computer interaction technique, and the hardware that contains a touch sensitive mechanism, usually placed on a display, and able to recognize simultaneously several contact spots.

Consequently, as opposite to traditional touch sensitive devices that can only recognize one, this kind of sensor allows to identify gestures made by different fingers, both hands or even its simultaneous use by several users.

Gestures allow the user to manipulate the objects directly, which converts this kind of device into the most suitable for interaction with zooming user interface (ZUI), a kind of graphic interface that has turned out to be difficult to handle through a single "click" device like the mouse, the stylus, etc...

The first commercially available device to include a multi-touch sensor will be Apple's iPhone (http://www.apple.com/iphone). While watching the product's presentation one can reach the conclusion that, chances are, that in the next few years we will live through a revolution similar to the one that introduced the mouse and GUI.

We will see how these devices develop, and consequently, our way of interacting with them. Figure2: Apple iPhone.

Copyright © 2007, Apple Computer Inc

Another example of a device integrating a multi-touch sensor can be found on this link:

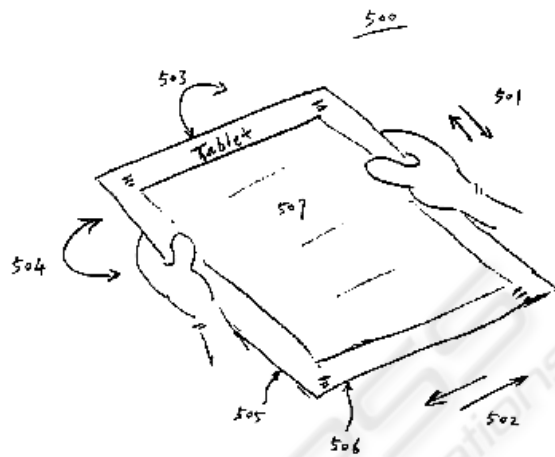http://cs.nyu.edu/~jhan/ftirtouch/

2.1.2 Accelerometer

Figure 3: Accelerometer. (US Patent Application Publication US 2006/0017692 A1. Wehrenberg et al.).

An accelerometer is a kind of sensor that apart from measuring the acceleration of the device in which it is integrated, just as its name suggests, allows to measure the relative inclination of the device, regarding the three axes.
As a result, a device that has it as a feature, would allow new ways of interacting with it.

Figure 4: Apple iPhone. (Copyright © 2007, Apple Computer Inc).

The use of this kind of sensor made by the formerly referred Apple iPhone, is an example. Through the sensor, the device can detect if it is in a horizontal or vertical position, an act in consequence, either rotating the graphical interface,

or rotating a landscape image until it fills the whole screen, or even activating other software features.

But this kind of sensor allows making gestures that are much closer to the human imaginary. Combining a connexion system to other devices (Bluetooth, wi-fi, or others) it could allow us to make the gesture of pouring, as if pouring water on a glass, to pass information from one device to another.

2.1.3 Other Advanced Sensors

Other advanced sensors that could be integrated in this hypothetical device, would be the ones on proximity and presence. Proximity of one device to another, of not necessarily the same kind, and presence both of a user and of a device. This way, the device could detect another, and also find out if it was being used by someone, in order to know if it could shut down.

2.2 Communication

Apart from the former sensors, this mobile device, specifically developed for its use in a museum, should include different possibilities of wireless connection to communicate with other devices. This way the device would be able to increase its functionality.

The most logic options, at the moment, would be to provide it with Bluetooth and Wi-Fi.

2.3 Zooming User Interface

Multiscale interfaces represent a big leap facing the traditional concept of graphical interface (GUI).

We mean by multiscale interface (ZUI – Zooming User Interface) a graphic environment that allows interaction between the users and the objects, and choosing different scale levels, and consequently, of detail. This makes more room available in a reduced space, which is supposed to be a big advantage regarding traditional GUI devices with small displays, just as it happens in many mobile devices.

In multiscale interfaces, information elements are shown directly on an infinite virtual desktop (usually created with vectorial graphics) instead of windows. Users can pan across on the virtual surface in two dimensions and move towards the objects of interest. For example: if zooming on a text, represented by a dot, this one would convert into a thumbnail image, and zooming further to a full size editable file.

Multiscale interfaces are the interface paradigm, considered by some as the most flexible and more realistic heir of traditional GUI based upon

windows, but for the moment, the effort dedicated to multiscale interface development is small when compared to efforts dedicated to traditional GUI improvements. Although each day we can find more of them.

The biggest and largest effort dedicate to ZUI development was a project called PAD++, started by Ken Perlin, Jim Hollan and Ben Bederson in New York University, and continued subsequently in New Mexico University, under Jim Holland's direction.

The PAD++ project was abandoned after being seduced by Jazz project and later by Piccolo project developed by Ben Bederson in Maryland University, with Java language and C#.

Recent efforts in ZUI field, include an Archy project idealized by Jef Raskin and currently developed in The Raskin Center for Human Interface.

2.3.1 Projects and Tools

Pad++ (Abandoned).
    http://www.cs.umd.edu/hcil/pad++/
Piccolo.
    http://www.cs.umd.edu/hcil/piccolo/
ZoomDesk.
    http://www.btinternet.com/~duncan.jauncey/zoomdesk/index.html
AutoBAHN.
    http://www.cs.umd.edu/hcil/piccolo/applications/autobahn/
GeoPhoenix Zoomspace.
    http://www.geophoenix.com/products.htm

2.3.2 Examples

2.3.2.1 Web navigation Leo Burnett.com
    http://www.leoburnett.com/
    Relevare. http://www.relevare.com/site/

2.3.2.2 Applications
  Archy The Raskin Center's Humane Interface.
    http://rchi.raskincenter.org/index.php?title=Core_Principles
  Topicscape.
    http://www.topicscape.com/download/demo/MBA_Control_Panel.html
  PhotoMesa.
    http://www.windsorinterfaces.com/photomesa-demo/photomesa-demo-swf/photomesa-demo-swf.html

3 CONCLUSIONS

The best way to predict the future is to invent it.
—Alan Kay

If mobile devices that are actually being used in museums do not satisfy the user, it is, to a great extent, because, they are based upon existing devices that have been adapted through software.

Nevertheless, if our approach to the project would also comprehend the development of a new specific hardware, provided with advanced sensors, we could create a device that would really fulfil the users needs.

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The Raskin Center for Humane Interfaces. rchi.raskincenter.org

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