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THE ROLE OF TECHNOLOGIES IN CULTURAL MEDIATION IN MUSEUMS: AN ACTOR-NETWORK THEORY VIEW APPLIED IN FRANCE

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Abstract

In this paper, we examine how museum professionals perceive the role played by Information and Communication Technology (ICT) in their institutions. We conceptualize the interaction between museum professionals, works of art, the public and ICT in terms of a mediation process, which we propose to define and discuss from an Actor-Network Theory perspective. Using a qualitative research approach, we then examine the different components of this process within four major museums in France. Our results indicate that two kinds of ICT-supported mediation types emerge: visitor-oriented (entertaining and customized) and curator-oriented (scientific and content-driven). However, the presupposed positive impact of ICT on the professional practices of museums seems controversial.

Keywords

Information and Communication Technology; Mediation; Actor-Network Theory; Curator-oriented; Visitor-oriented

Introduction

Most organizations have become reliant on their Information and Communication Technology (ICT) infrastructure to conduct their activity and achieve their objectives. While the impact of these tools in business organizations has been widely studied, the role that they play in specific organizations such as cultural heritage institutions, more specifically museums, is not a common research subject in the Information Systems field.

Museums represent key organizations in our societies in that they contribute to the economic growth of countries, especially through cultural tourism. In Europe, they represent “one of Europe’s greatest economic assets” (Carugati, Hadzilas and Demoulin 2005).

Fopp (1997) and Marty (2006) have noticed that museum professionals increasingly rely on ICT to develop new and innovative management practices. Nonetheless, the use of ICT to support communication and mediation with the museum public deserves more research. Therefore, the principal research question that this study poses is: What is the role played by ICT within the mediation processes in museums?

We propose to build an analytical framework in which ICT and mediation are conceptually defined and their interactions studied through constructive research conducted within four major cultural heritage institutions in France. We will first of all focus on the concept of mediation. We have especially to note here that the Mediation concept as it is defined in the French-speaking literature dedicated to this topic does not simply refer to what is called Interpretation in the English-speaking one. Since the early 1990s, a wide range of research and professional-oriented studies have been published to settle the theoretical underpinnings of this concept and describe how it is put into practice, especially within the French and Canadian cultural heritage institutions. Caillet (1994) explains through three comparative case studies that mediation is much more than an intermediation between what is exhibited in a cultural heritage institution and its potential different publics and audiences. She argues that it is essential to go beyond the educational role devoted to the interpretation practices as they are defined by Tilden (1957), for example, and consider that it is a means to building a social link between cultural heritage features (art objects, monuments, archaeological and scientific sites, for example) and people. To do so, mediation is inherently multifunctional, including communication, information, negotiation, reception and education-oriented roles, accomplished using different media. From the same perspective, some researchers prefer to talk about mediation to describe all the cultural actions, performed using media, to narrow the gap between cultural features and people (Lafortune 2008).

Fleury (2008) proposes to clearly put the focus on two perspectives through which mediation can be studied : (1) mediation as a social and political practice aimed at constructing the communication policy of the governmental institutions toward a greater democratization of culture within a specific setting (a region, a nation, or a group of nations like the European Union); (2) mediation as a theoretical concept that refers to the diffusion in time and space of specific linguistic, symbolic and significance patterns in order to be shared by a specific community.

From this point of view, the concept and the practices of mediation are not delimited inside the cultural heritage institutions and are conceived as social processes that involve a multitude of actors, within which we intend to specify the role of ICT. We argue in this paper that this concept of mediation needs much deeper theoretical attention rooted in a sociological research tradition.

In the following section, we present a literature review on the concept of mediation primarily based on the Actor-Network Theory. Then, we explain our methodology and display our main findings, finishing with the limitations and conclusions of this study.

The Meaning of Mediation: Theoretical Background

It is important to start our analysis by describing explicitly the concept of mediation in order to create the theoretical foundation for our approach. In the everyday language, to ‘mediate’ means to effect or convey as an intermediate agent or mechanism. A mediator in this perspective is someone or something situated in a middle position and serving as a medium to facilitate a result or transfer objects, information and so on. Mediation is also associated with legal and social conflicts, in which mediators resolve differences by working with the conflicting parties.

For the purposes of our research, we consider mediation as an active process of intermediation within a network of social and technical interactions in which cultural heritage institutions, the public and ICT are involved. To describe and analyze this process, we propose mobilizing complementary streams of research, predominantly the Actor-Network Theory, which we complement with phenomenological and interpretative views of ICT and mediation within cultural heritage institutions.

Mediation studied from an Actor-Network Theory (ANT) perspective

Actor-Network Theory (ANT) is an influential sociological research stream that seeks to explain social order not through an essentialist notion of ‘the social’, but through the networks of connections between human agents, technologies and objects. What is important to remember here is that the so-called ANT covers a heterogeneous body of knowledge founded by two French sociologists: Michel Callon (1986) and Bruno Latour (1987) in the *Ecole des Mines de Paris*, including the sociology of innovation, sociology of controversies and the theory of translation. In the English language literature dedicated to this topic, ANT is predominantly referred to, even though the theoretical elements used are not always stated; namely Callon’s contribution (theory of translation) or Latour’s (theory of controversies). In fact, ANT is simultaneously an ontological, methodological and theoretical approach (Akrich 1993).

To understand this body of research, a dedicated vocabulary initiated in the founding article: “Some elements of a sociology of translation: Domestication of scallops and fishermen of St Brieuc” by M. Callon, first published in 1986 and widely adopted afterwards, is crucial. Table 1 presents the definition of some of the key concepts used in ANT-based studies.

Concept	Definition
Actor	Human beings and non-human objects and artefacts playing specific roles
Actor network	<p>“Heterogeneous network of aligned interests, including people, organizations and standards” (Walsham 1997, p. 468).</p> <p>“A meta-organization bringing together humans and non humans as intermediaries for each other” (Amblard, Bernoux, Herreros, et al. 1996) .</p>
Translation	<p>“The operation which implies changing an intelligible statement into another intelligible statement to enable the understanding of the initial statement by a third party”(Amblard, Bernoux, Herreros, et al. 1996).</p> <p>“The translation process acts as a link between heterogeneous activities, statements and issues” (Callon and Latour 1991).</p>
Spokesmen and Inscription	Spokesmen are delegated actors who “stand in and speak for particular viewpoints which they feel strongly about, e.g., software as frozen organizational discourse” (Walsham 1997, p. 468).
Controversy	“Any situation where the representativeness of the spokesmen is questioned, discussed, negotiated, rejected” (Callon 1986, p. 15).

Table 1. The Vocabulary of Actor-Network Theory: Some Key Concepts

Callon (1986) proposes handling the research issues in which technology, social facts and objects are interrelated or networked in terms of a four-stage ‘translation’ process:

1. Problem identification or how to identify all the actors involved: human and non-human;
2. The devices of “interressement”¹ or how the allies are locked into place and actively encouraged to take part in the controversy²;
3. “Enrolment” or how to define and attribute roles to actors and let them accept these roles;
4. “Mobilization” of allies or how to define the spokesmen who are representative of each category of actors defined.

In the same article, Callon outlines the three principles according to which he proposes to analyze the relationship between technology and society; those of agnosticism (impartiality between actors engaged in controversy), generalized symmetry (the commitment to explain conflicting viewpoints in the same terms) and free association (the abandonment of all distinction in principle between natural and social, human and non-human actors).

Based on these three principles, and applying the translation vocabulary presented above, ANT is connected to various research areas, such as the sociology of media (Silverstone and Hirsch 1992; Silverstone 1994), Management Information Systems (Walsham 1997) and the sociology of culture and cultural practices (Gomert and Hennion 1999). The latter research stream is particularly important to our study for at least two reasons; first, it specifically addresses cultural practices and second, it is the body of research affiliated with ANT which proposes and defines the concept of mediation. In their essay: “A Sociology of Attachment: Music Amateurs, Drug Users”, Gomert and Hennion (1999) argue that ANT opens up a new approach to cultural production and cultural engagement.

Gomert and Hennion define mediation as the toolkit for the analysis of actions-events that emerge from the networks shaped by the social and material organization of work in some institutions (such as cultural institutions), and the means of communication and media. The emergence of what exactly? Gomert and Hennion analyze the example of the emergence of the passion that a music lover (actor, human) feels and experiences for music (actor, non-human), a passion that is not reduced to a simple relationship between these two actors but is considered “a long set of mediations (instruments, bodies, stages and media at certain moments), ultimately something [passion] might happen” (1999, p. 245).

Using this example, Gomert and Hennion define ‘mediation’ as “a move towards what emerges, what is shaped and composed, what cannot be reduced to an intersection of causal objects and intentional persons” (1999, p. 226). From this perspective, mediation is not only the output (the result), but also the set of processes (including resources and competencies) that shape people’s cognitive and emotive frameworks vis-à-vis cultural objects, such as paintings and other works of art. According to this view, a cultural heritage institution such as a museum is a mediator, i.e. a network in which a more or less well defined boundary is set up between exhibitions and visitors. Curators, political and social contexts, predominant curator practices and the ICT used play certain roles and interact in a way that cannot, in principle, be predefined.

This ANT-based view of mediation is fundamentally coherent with a well-established tradition in the sociology of art in France which is derived from the history of French social thought and draws fundamentally on Emile Durkheim’s notion of social ‘categories’ and Bourdieu’s notion of ‘habitus’ (Fleury 2006). This concept of mediation has actively

¹“Interressement” as defined by Callon means investment or engagement of the parties. However, to be faithful to the vocabulary specific to ANT, we prefer to keep using Callon’s term “Interressement”.

² As defined by Callon, a “controversy” is not always a conflict situation between the parties and can refer to a dialogue, a conversation or the search for a compromise.

participated in the renewal of social sciences and especially the history and sociology of art. It is especially relevant as it questions the relationships between aesthetic objects, opinions on taste, and society in general (Simon 1993). This renewal concerns not only the traditional levels of analysis, artists and cultural products, but also new levels of analysis involving, for instance, diverse stakeholders, including institutions and the public. Upon initial analysis, the mediator can be defined as an intermediary between the work of art and the public. We argue here that mediation is inextricably related to the reception of a work of art by the public. Ginzburg (1980) studies this issue of reception by analyzing not only the intrinsic value of the work of art (for example, a painting), but also the historical context: the competition between painters in a given historical era, the established classification or hierarchy between artists or streams of art, for example.

From this perspective, mediation refers to the contextualization of a cultural object within a specific setting and cannot be considered as a “neutral” intermediary.

Hennion (1993) has highlighted the significant gap between the social analyses of the conditions of art and aesthetic or semiotic analyses of the “works themselves”, a gap that has contributed to what he called the opacity of mediators. He argues that the analysis must consider mediations, from humans and institutions, to frameworks of perception, material elements, and even the finest details of works of art and their production. This author also considers the role of the mediator as a simple operator or a link between the work and the public, which must disappear or become completely invisible to let the connection happen efficiently.

Many authors have questioned the usefulness of ANT in addressing issues related to social order analyses and less broadly to the technologically-supported changes in society and organizations (Winner 1993; Reed 1997). The first limitation to be noted concerns the descriptive rather than analytical potential of ANT, which ‘narrates’ events in hindsight and ultimately has limited prescriptive power. ANT is also less concerned with long-term interactions within networks. Other critiques point out the heavy conceptual – and more or less convincing – background on which the theory is based, such as the supposed total symmetry between human and non-human actors, which may have fundamental consequences, notably the neglect of the human element and, therefore, the orientation toward the sociology of action. Another limitation concerns ANT’s lack of interest in the possibility that networks and their output could be reinterpreted long after they have been established. This constitutes an important problem with regard to networks that produce objects whose main purpose is to be interpreted (such as cultural and artistic products). ANT does not argue from this perspective for a sociology of interpretation.

Because of all these limitations, it is legitimate to look for alternative and complementary approaches to address our issue: in particular, what views support the specific role attributed to ICT within mediation processes, and how to model interactions between two important actors within these processes; museum professionals and visitors.

How to address the role of ICT

A common view considers ICT as an artefact or a tool used by humans to achieve their objectives and accomplish specific tasks. This view is primarily concerned with the “impacts” of ICT in terms of a cause-effect relationship where they produce certain determinate effects on their usage context. This view can generate what we call technological determinism, broadly criticized because it is restrictive, static and descriptive (Postman 1993).

Another view considers ICT as a socially constructed artefact, which should not affect organizations and society as a totally exogenous object, but much more precisely as the outcome of a complex set of interactions between many cultural, political and economic forces (Bijker, Hughes and Pinch 1987).

An alternative view drawing upon a phenomenological approach to technology goes beyond the determinist or “impact view” of ICT and the constructive one. According to the phenomenological view, ICT is definitively not an artefact but an ongoing horizon of meaning and action (Introna and Ilharco 2004). It can, therefore, be considered as the outcome of a technological way of looking at and relating to the world; what Heidegger (1977) calls the technological mood framing.

Recent studies have focused on a visitor-oriented mediation approach based on a phenomenological approach and called Interpretive Archaeology (Tilley 1993; Thomas 2000). Some of this work tries to evaluate the potential of ICT to address the requirements of visitors and is particularly useful for our study (Monod, Klein, Missikoff, et al. 2006; Monod and Klein 2005). We argue that this phenomenological view is the most appropriate for our study and will, therefore, be adopted.

Interactions between Museum Professionals and Visitors

Kotler and Kotler (2000) propose three dimensions on which museum professionals could focus in order to facilitate the reception of a work of art and to improve the visitors’ experience. Those dimensions are: (1) the variety of experiences; (2) the level and depth of experiences; and (3) the design of experiences. The first dimension goes from visual and sensorial experiences to enchantment. In the second dimension, the level and depth of experience imply an evolution from the more moderate experience (objects and collections) to the most intense experience (applied learning). Kotler and Kotler (2000) label the moderate experience in museums “visitors on their own”, while the more intense experience is called “orchestrated experience”. Since the third dimension refers to services, like the availability of restaurants and other facilities in museums, it will not be addressed in this paper (and is not represented in Figure 1 below).

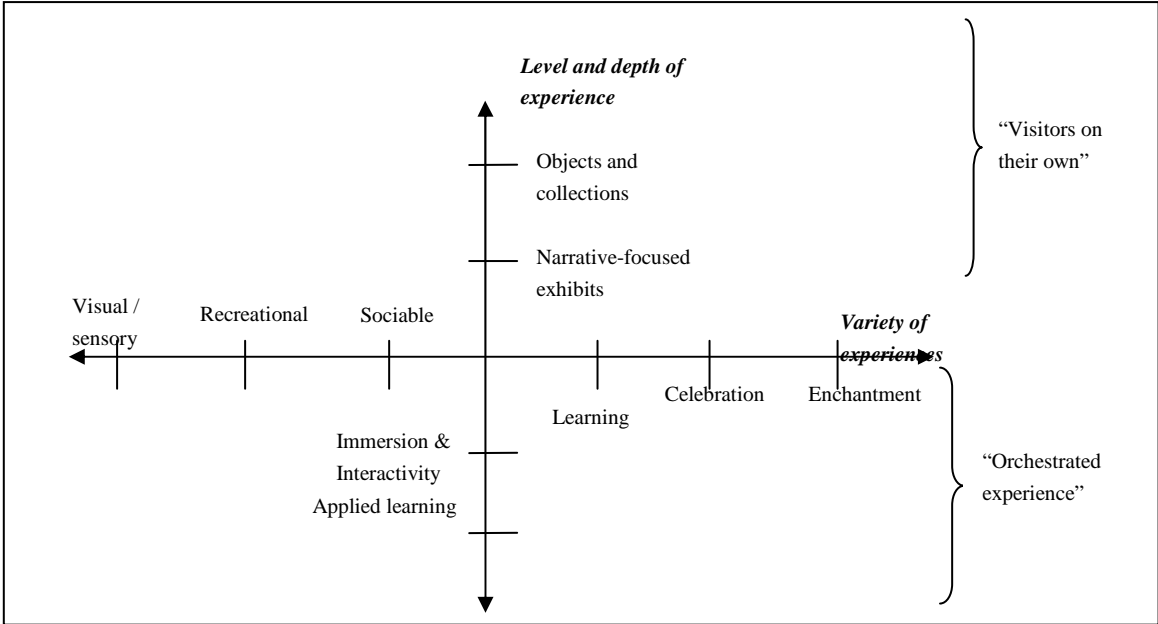


Figure 1. User Perspective Framework (Kotler and Kotler 2000, p. 280)

This framework indicates that mediation can be content-driven when curators put the emphasis on objects, collections or narrative-focused exhibitions. Museum professionals can also promote a more orchestrated experience that will aim to enhance visitor experience through more immersion, interactivity and applied learning. The question that may arise here

is how these tasks attributed to museum professionals could be achieved through the use of ICT.

Research Methodology

With respect to the sociology of translation upon which our study relies, we acknowledge and examine these different components: actors, actor-network, translation and spokesmen. In our study, actors correspond with museum professionals and museum technologies. For the actor-network, we focus on the organizational context of our interviewees. We explore translation through the concept of mediation. Finally, in order to examine spokesmen and inscription, we focus on professionals' discourse and perceptions.

The first step was to identify the actors and their relationships as suggested by the Actor-Network Theory (Latour 2005). In this research, the relevant actors include: the technologies implemented according to public policies developed by external actors at national (Ministry of Culture) and European Community (i-2010 strategic plan) levels; the different categories of internal actors who develop and integrate these technologies: curators and computer science engineers, for example; the external actors who are involved in this development process as financial or technical partners; and the users of these technologies: visitors, scientists and curators.

Several contacts were made, and we finally interviewed nine professionals from the cultural heritage sector in France (and we gained access to four major museums located in Paris, and to the Research and ICT department of the French Ministry of Culture). Table 2 presents the details of our semi-structured interviews.

Interview number	Institution	Interviewee's position	Gender	Duration
Interview #1	The Louvre Museum	Head of the Internet Department	Female	35 minutes
Interview #2	The Louvre Museum	Assistant head of the auditorium	Female	65 minutes
Interview #3	The Louvre Museum	Project manager in the Department of Cultural Development	Female	54 minutes
Interview # 4	The Louvre Museum	Assistant head of the Library department	Female	90 minutes
Interview #5&6 (x2)	French Ministry of Culture	Coordinator of the National Program of Digitalization Head of the research and ICT department	Female Male	60 minutes
Interview #7	Luxembourg Museum	Director of operations	Female	120 minutes
Interview #8	Science Museum	Webmaster	Female	110 minutes
Interview #9	Chinese Art Museum	Webmaster	Female	90 minutes

Table 2. Interview Details

The second step of our study consists of reconstructing the whole network of interactions that characterize ICT-supported mediation in the cultural heritage institutions studied.

We coded and analyzed our interviews according to the themes from our interview guide and their corresponding variables (see table 4). We also followed the classical recommendations for qualitative data analysis by implementing open coding and axial coding (Strauss and Corbin 1998). We started with open coding, which is the first step of content analysis. It helps to categorize the text by identifying relevant segments of texts that correspond to the research question and classifying them into codes. For all the interviews, the coding unit was the paragraph. We identified a first list of themes and codes. More precisely, the three main

themes that emerged corresponded to 1) visitors/the public of museums, 2) the museum institution/organization, and 3) the technologies. For each of these three themes, we also identified codes and subcategories (which led to tree of codes).

Themes	Codes (and sub-codes)
Museum	<i>The institution</i> <ul style="list-style-type: none"> ▪ Strategy ▪ Organization, processes ▪ Curators' skills
	<i>Decisions towards IT/IS</i> <ul style="list-style-type: none"> ▪ Decider ▪ Investment (nature/amount) ▪ Expertise
	<i>Missions</i> <ul style="list-style-type: none"> ▪ Mediation <ul style="list-style-type: none"> - Curator-oriented - Visitor-oriented
Visitor	<i>Profile</i> <ul style="list-style-type: none"> ▪ Characteristics ▪ Expectations
Technology	<i>Physical IT/IS</i> <ul style="list-style-type: none"> ▪ Characteristics - Entertaining features - Learning features
	<i>Web sites</i> <ul style="list-style-type: none"> ▪ Characteristics - Entertaining features - Learning features
	<i>Web sites</i> <ul style="list-style-type: none"> ▪ Characteristics - Entertaining features - Learning features

Table 3. List of codes

The axial coding helped us to identify relationships among the codes (Strauss and Corbin 1998). For instance, two codes can be related by a cause-effect relationship. In our data set, we were able to show that the importance given to ICT determines the level of equipment and the nature of usage of these technologies. As such, when ICT is perceived as a strategic resource, museums invest more in the technology. Similarly, museums' strategy in terms of exhibition determines the nature of ICT that they will implement. Museums that are visitor-oriented will invest much more in technologies that can convey entertainment. ICT also impacts museums' processes and curators' work. We provide more details on the relationship among our codes in Section 3.

We complemented our content analysis by examining the websites of the museums concerned in our study (Cliniffe, Kritou and Thudope 2001).

Theme	Investigated variable
ICT in your (*) museum	<ul style="list-style-type: none"> • Description of the ICT devices implemented and used • History and context of ICT implementation • Actors involved: financial (who pays for ICT, internal/external funds, public/private sector; sponsorship); technical (what are the roles of ICT developers and curators during the implementation project life?) • Impact within the museum's structural organization (roles, conflict management, shared/divergent values)
The museum's missions	<ul style="list-style-type: none"> • In your opinion, why do people visit museums (**)? (What are the principal roles of museums in our society?)
ICT in museums	<ul style="list-style-type: none"> • Does ICT support the museum's mission? • Does ICT change the museum's mission? • Does ICT have no place in museums?
<p>(*) For the interview conducted in the French Ministry of Culture, this question has been formulated as follows: "What ICT does the Ministry of Culture recommend for museums?"</p> <p>(**) If the respondent spontaneously talks about the museum's mission in terms of mediation, the interviewer asks the actor to define what this concept means for him/her.</p>	

Table 4. Interview Guide

How ICT Supports Cultural Mediation

In the following section, we briefly present the technologies available in the four museums investigated, before reporting the main findings of our exploratory interviews.

Tools available in the museums we studied

At the Louvre, the four interviewees listed an auditorium, a website, databases, audioguides and a museum lab (Louvre-DNP MuseumLab). This museum lab corresponds to a subsidiary of The Louvre which is implemented in Japan to provide visitors with a highly sensorial experience thanks to the use of multimedia technologies; it is a perfect example of an 'orchestrated experience' constructed by curators around a single work of art and fundamentally based on ICT features. At the Luxembourg museum, Interviewee #7 mentioned an electronic system for tickets, a website that offers online reservation, audioguides, and radio systems connected to the microphones of the guides. At the science museum, audioguides, websites, interactive kiosks and computers were mentioned. Finally, at the Chinese art museum in Paris, the website and the audioguides were the two main types of technology available.

How does ICT support the different aspects of mediation in a museum?

Our interviews revealed that ICT was perceived as a set of tools with two objectives. On the one hand, curators and experts from the cultural heritage sector pointed out that the mediation objective of ICT was primarily to transmit knowledge. On the other hand, ICT was also perceived as potentially playing a certain role to attract different categories of publics to museums thanks to its "customized and entertaining features".

Nevertheless, this role is not predominant and ICT is rarely considered as the one and only attraction within a cultural heritage institution. Some of our interviewees illustrate this idea by comparing ICT features to the Free Access policy to cultural institutions developed in France in the ten last years : "An important part of the beneficiaries of the free access days are not in fact new categories of visitors, but people used to enjoy our permanent collections" (Interviewee #3).

ICT to Support Curator-oriented Mediation

For this point, the databases implemented and accessed in museums and on museum websites represent useful tools for students, researchers and anyone who is seeking knowledge on art history (Interviewee #1) and science history (Interviewee #8). Additionally, the coordinator of the national digitalization program (Interviewee #5) highlighted that an increasing number of 'proprietary' museum databases are now connected to the Internet and, therefore, display free information about the collections owned by museums. The 'Closer look' application displayed on the Louvre website (<http://www.louvre.fr/>) is an excellent example of this role played by ICT, as it proposes "discovery of the secret behind the smile of the prestigious Mona Lisa of Leonardo da Vinci" and shows, through a virtual visit, many in-depth details of this painting which cannot be accessed via a simple 'physical' visit to the museum.

Interviewee #2 clarified why knowledge was so important in museums:

"A museum is, first of all, a college of curators [...] the first issue for curators is content, i.e., scientific research and creating exhibitions that will be diffused all over the world. This strong scientific culture explains the resistance to entertainment programs in museums."

From this perspective, learning is considered more important than entertainment. ICT, such as websites, on-site computers giving access to databases or audioguides, contribute to this scientific culture by providing visitors with dynamic content and learning opportunities. Asked about the mission of her museum website, Interviewee #1 clearly outlined its learning objective:

"The development of our website is not only work of art driven, it is also visitor driven. However, historically, the focus has always been on content [...]. Research-oriented and high-level content is displayed on the website [...] there is also practical information (access, opening hours), but this is not the primary added value of the site [...]. One of our new projects will consist of more diversified content which cannot be regarded as purely entertaining but is more focused on the imagination of the visitor" (Interviewee #1).

Another actor (the assistant head of the Auditorium of the Louvre) seemed to share this point of view and noticed that the primary role of a given ICT in any museum is to provide support for mediation "which cannot in any way be considered vulgarisation [...] we have great respect for our visitors [...] this is why our website is mainly educational and not entertaining".

ICT to Support Visitor-oriented Mediation

Entertaining seems to be another objective for the technology implemented in museums. ICT enhances the visitor-oriented mediation for both the 'Visual/Sensory' and 'Recreational' dimensions presented in the Kotler and Kotler (2000) model: to be in the presence of, face-to-face with prestigious works of art, or just inside a museum building which is often an architectural masterpiece, are enjoyable experiences for visitors.

At the Louvre-DNP MuseumLab, the Louvre subsidiary implemented in Japan, the equipment available to visitors includes 3D devices, virtual reality, and sensors which offer an immersive and interactive experience to the public. ICT is here clearly put forward, the art objects have never been so far exhibited without any technological support. However, this does not mean that ICT features are the principle "raison d'être" of those exhibitions. Whereas in the Louvre Paris the focus is more on traditional learning, as Interviewee #3 indicated, ICT at the Museum Lab is used to convey an experience that will be "new, impressive, surprising and memorable".

The entertaining aspect of the exhibition is more or less accentuated. When the accent is put on entertainment, the devices that are selected by commissioners tend to be more interactive and immersive, such as RFID (radio frequency identification), virtual reality and sensors. Conversely, for exhibitions that focus more on content and knowledge transfer, the role of ICT is more neutral and curators adopt more traditional tools. Overall, even if visitors rely on

ICT to discover an exhibition, the project manager of The Louvre-DNP MuseumLab explained that “visitors generally remember more of the artistic aspect than the technical one” (Interviewee #3). This is interesting for the designers of technology because it means that the technology was so well designed that the visitors ultimately forgot that they were using and interacting with a device. Generally, the main objective of museum technology is to facilitate immersion; as such, the technology should be invisible and convey an authentic feeling.

Moreover, museums generally welcome different types of public, from researchers and connoisseurs to neophytes. Therefore, offering different content to these publics appears to be one of the main issues for an appropriate mediation mission. As explained by Interviewee #1, “the main issue of mediation in museums is the transmission of knowledge in different ways and to different types of public”.

Some of the museum professionals already use the ICT equipment to appeal to their different targets. For instance, the Internet is commonly used to offer practical information and games to the general public but also to offer resources for researchers and students. Interviewee #1 also reported this advantage which is basically germane to the Internet:

“Websites have several advantages and one of them is the opportunity to reach different types of public. The Internet represents a way to ‘democratize’ highly scientific information. For instance, databases are professional tools and, at the same time, they offer user-friendly interfaces that can be used by the general public” (Interviewee #1, Louvre).

In fact, more and more people use ICT in their daily lives. Offering these devices to museum visitors is, therefore, a way of speaking the language of the general public, and making the works of art accessible to everyone, neophytes and experts alike. Interviewees #3 and #5 particularly highlighted this fact.

“We noticed that technology is part of the day-to-day life of our visitors; they are connected to the Internet, they are surrounded by screens at home, they have cell phones, PDAs and they are used to interacting with all this” (Interviewee #8).

Interviewee #5 provided the following definition of what he calls ‘cultural democratization’: “Cultural democratization is making art accessible to everybody, thanks to pricing policies, access facilities, and virtual visits via the Internet”. It appears that nowadays, for all the actors involved, the Internet is clearly perceived as a democratization facilitator in museums.

ICT can also help professionals in their cultural mission of visitor-oriented mediation when they provide a specific audience with immersive and applied learning (Kotler and Kotler 2000), beginning with those who need some ‘coaching’ through orchestrated visits, and the others: ‘the visitors on their own’, the neophytes or the experts who rely on their imagination, needs and knowledge to organize their visits and experiences in museums.

Actually, a first step towards the acceptance of cultural content by a larger public can be achieved with what our interviewees call ‘customization’. For instance, website visitors should be offered clearly separate sections and activities. Beginners’ guides, such as those proposed by the website of the National Gallery (London), can be helpful and give visitors a tutorial.

Interviewee #1 explained that the website of her museum is presenting the works of art with three different levels of information in order to meet visitor needs. The first level targets the general public, the second level aims to provide information for visitors who look for more specific information and the third level offers content to experts and connoisseurs. At the Louvre auditorium, Interviewee #2 also showed us how different types of content were proposed:

“At the auditorium, some of the conferences we organize are extremely technical and some are less ‘boring’, less scholarly for the general public” (Interviewee #2).

ICT impact in museums

We asked our interviewees whether ICT usage has changed the way that they work and perform their various tasks in their organizational environment. This issue is very important for Actor-Network theory-based research, in which researchers have to reconstruct the whole network of interactions. By analyzing the organizational contexts and the impact of ICT on the institution itself, we are better able to achieve such a research perspective.

It appears in our study that there is a visible impact of ICT in museums, whether these tools serve the curator-oriented or the visitor-oriented mediation mission. At an organizational level, this is exemplified by the merging of the ICT departments with other cultural departments. Furthermore, even though curators do not have any technical (computer engineering) background, they generally operate in the ICT department as well, and conduct ICT implementation projects within their departments. For instance, for the maintenance of museum websites, we notice that the technical updates are performed by a webmaster, but curators are requested to complete the website sections and provide updated content.

“The website is completed by the different stakeholders in different services of the museum” (Interviewee #1).

The general tendency is for curators to be increasingly invited to perform ICT-related tasks, whereas the reverse is not true; ICT professionals (computer science engineers, ICT consultants) are not asked to perform curatorial tasks. This practice is not welcomed by all curators: some of them consider that ICT should be disconnected from cultural tasks and that ICT is just a transparent tool to support mediation.

“In one of our departments in charge of the public and audiences, employees do not understand that it is their job to record the information onto the website; that it is not a technological service but part of their job” (Interviewee #2).

Technology also seems to facilitate the work of museum professionals. Interviewee #2 recognizes the importance of using ICT not only to communicate with the public, but also to perform her tasks. “Digital tools considerably lighten our workload in the auditorium”.

For Interviewee #7, the electronic ticketing system facilitates online reservation and the accounting of museum tickets which was subsequently outsourced. She also explained that guides rely on lapel microphones connected to visitor radio systems as a way to talk to their group without having to raise their voices.

For some curators, technology is perceived as an opportunity to extend the reach of museum institutions. At the Louvre, the Internet presence and the auditorium help to enhance the museum image both on a national and international scale. As noted by Interviewee #1, the website is a way to communicate and reach people who cannot visit the museum.

Review of the Findings

In accordance with Kotler and Kotler’s framework, our research also reveals two principal types of mediation: mediation can be perceived and practiced as content-driven (the work of art is put forward and the curator’s view is dominant) or visitor-oriented (a customer-focused perspective). It should be pointed out that in all the museums that we studied, the “traditional” (curator-oriented) cultural mediation remains predominant. The Louvre is the only institution in our sample where the visitor-oriented perspective is also deployed. A visitor-oriented and highly customized mediation type is only clearly proposed in a spin-off of the Louvre located in Japan and is still presented (four years after its launch) as an experimental project. Similarly, the official Louvre website displays learning, recreational and social content, which clearly corresponds with the visitor-oriented perspective.

Although the Louvre example shows that ICT tends to support highly sensory experiences and is better aligned with visitor-oriented initiatives, we argue that ICT can be useful for the two mediation types. Among museum experts, there is still no complete agreement on the role

of ICT: some see it as a medium dedicated to entertainment, and others believe that it could also provide higher quality content.

For instance, the curator-oriented mediation type has also been strongly defended by the representatives of the French Ministry of Culture, who consider the Internet to be the most important way to offer easy and cheap access to culture. Museum curators are more skeptical and think that ICT will be more useful for encouraging repeated visits of a regular public than attracting new visitor categories. Numerous previous studies have particularly focused on the learning and educational role of museums and argued that ICT supports and enhances this role (Lefebvre and Lefebvre 1991). Nevertheless, ICT seems to play a secondary role and sometimes remains invisible to the visitor even though it has served as a support to display the works of art.

We think that ICT should not only be dedicated to one type of mediation. For instance, websites and online tools offer many opportunities to support both types of ICT-supported mediation identified in our study. For the past decade, the “Museums and the Web” conferences have outlined the potential for the use of the Internet for museum missions. The first generation of museum websites was clearly focused on publishing practical information, and was, to a certain extent, similar to a brochure website; however, with new applications such as Web 2.0 or immersive environments, learning and entertainment can both be enhanced. For instance, Di Blas et al. (2010) highlight the benefits of Rich Internet Applications for curatorial activity. Their research shows that online search engines and visualization tools effectively improve communication with the public. More precisely, in order to meet user needs, website design should offer visualization tools such as maps and interactive lists. These functionalities not only enhance educational results, but also provide better sensory and more engaging experiences. Internet tools can also be relevant for the work of museum experts. To illustrate this, more and more collaborative platforms are offered on the Internet to reinforce partnerships between cultural institutions (Incandela and Stein 2010). A more proactive role played by ICT is related to visitor-oriented mediation and is clearly identified in entertaining and customized mediations, in which several ICT devices appeal to the public’s intellect and senses while stimulating participation and interaction.

Museum technology is traditionally divided into two categories: on-site ICT (physically located in the museum) and online ICT (accessed via the Internet). A number of studies have focused on the interactions between these two types and have addressed issues such as: the user-friendliness of museum websites (Cliniffe, Kritou and Thudope 2001), the relationship between museums and their websites (Marty 2007) and best practices in creating online experiences for museum visitors (Soren 2005; Lin, Gregor and Huang 2008). Online technology seems to be more extensively studied than on-site technology, probably because it is more generally implemented within cultural institutions.

Concepts	How the concepts were addressed in our research
Actor	This research pays attention to both the human actor (museum professionals) and the technological actor (museum technology).
Actor-network	We analyzed the impact of ICT on the museum organization and work practices.
Translation	During the interviews, museum professionals frequently used the word “mediation”.The translation concept was also illustrated when our interviewees talked about the importance of understanding, making things easily accessible, explaining works of art, giving meaning.
Spokesmen and Inscription	We relied on a qualitative approach based on interviews with museum professionals. As such, we were able to elicit discourse and perceptions.
Controversy	Different points of view emerged in our research regarding the role of ICT for mediation.

Table 5. Application of the ANT Concepts to our Research

Conclusion

The purpose of this paper was to identify if and how ICT supports the mediation mission in museums. Our interviewees told us that ICT facilitates the transfer of knowledge to visitors, and that it also offers them a more entertaining experience. ICT also appears to have the potential to reach different types of public thanks to its customized features. ICT is used by museum professionals in their daily tasks and may help them, at some point and in certain contexts, to be more efficient. This research offers both practical and theoretical contributions. From a practical viewpoint, professionals who are still skeptical about ICT implementation in their institutions can identify the numerous benefits of using ICT for mediation. Pareto and Snis (2007) in particular highlight how important it is to provide professionals with evidence of ICT capabilities to enhance user experience. From a theoretical perspective, this study delineates different types of ICT-supported mediation — curator-oriented and visitor-oriented — applying an ANT view to the concept of mediation.

Our findings echo and confirm previous works. Paterno and Mancini (2000) examined the effects of ICT customization in museums and their study stressed the importance of offering different ICT interfaces to different types of public. The contributions of ICT to learning and entertainment have been stressed by Lin, Gregor and Huang (2008) who focused on museum website environments. Their study indicates that websites represent a different, suitable tool for mediation.

The limitations of this study are related to the small number of interviews conducted, which may render the generalization of the results problematic. We have also exclusively investigated the point of view of museum professionals and need to investigate visitors' points of view. In this exploratory study, our aim was not to provide a yes or no response to our research question, but to focus on an ANT vision of ICT roles within museums. We have thus contributed to the construction of the different components of the controversy around the role of ICT within the mediation interaction process in which museums, publics and governments are involved. Future research is worthwhile to highlight visitors' perceptions of the technology within this process and will be addressed in the second stage of our research study which is currently being conducted. We are absolutely convinced that a wide range of studies using qualitative and quantitative research approaches are needed to improve our understanding of this research area.

References

- A. Carugati, E. A. Hadziliadis and N. Demoulin. 2005. Setting the Framework for Developing E-Government Services on Cultural Heritage. Paper presented at 13th European Conference on Information Systems (ECIS), 26-28 May, in Regensburg, Germany.
- M. A. Fopp. 1997. The Implications of Emerging Technologies for Museums and Galleries. *Museum Management and Curatorship*, 16, 2, 143-153.
- P. F. Marty. 2006. Meeting User Needs in the Modern Museum: Profiles of the New Museum Information Professional. *Library & Information Science Research*, 28, 128-144.
- I. Caillet. 1994. L'ambiguïté de la médiation culturelle: entre savoir et présence. *Publics et Musées* 6, 53-73.
- F. Tilden. 1957. *Interpreting our Heritage*. North Carolina: University of North Carolina Press.
- J.-M. Lafortune. 2008. De la médiation à la médiatisation : le double jeu du pouvoir culturel en animation. *Lien Social et Politiques*, 60, 49-60.
- L. Fleury. 2008. L'influence des dispositifs de médiation dans la structuration des pratiques culturelles. Le cas des correspondants du Centre Pompidou *Lien social et Politiques*, 60, 13-24.
- M. Callon. 1986. Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay. In *Power, Action and Belief: A New Sociology of Knowledge*, J. Law. London: Routledge & Kegan Paul

- B. Latour. 1987. *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge Mass. USA.: Harvard University Press.
- M. Akrich. 1993. Les formes de la médiation technique. *Réseaux*, 60, juillet-août, 87-98.
- G. Walsham. 1997. Actor-Network Theory and IS Research: Current Status and Future Prospects. In *Information Systems and Qualitative Research*, A. S. Lee, J. Liebenau and D. J. London: Chapman and Hall
- H. Amblard, P. Bernoux, G. Herreros and Y.-F. Livian. 1996. *Les nouvelles approches sociologiques des organisations*. Paris: Le Seuil.
- M. Callon and B. Latour. 1991. *La science telle qu'elle se fait*. Anthologie de la sociologie des sciences de langue anglaise. Paris: La Découverte.
- R. Silverstone and E. Hirsch. 1992. *Consuming Technologies*. London: Routledge.
- R. Silverstone. 1994. *Television and Everyday Life*. London: Routledge.
- E. Gomert and A. Hennion. 1999. A Sociology of Attachment: Music amateurs, Drug Users. In *Actor Network Theory and After*, J. Law and J. Hassard. Oxford: Blackwell
- L. Fleury. 2006. *Sociologie de la Culture et des Pratiques Culturelles*. Paris: Armand Colin.
- J.-P. Simon. 1993. Médiations et histoire sociale de l'art. *Réseaux*, 60, juillet-août, 101-129.
- C. Ginzburg. 1980. *Le fromage et les vers : l'univers d'un meunier du XVIème siècle*. Paris: Flammarion.
- A. Hennion. 1993. L'histoire de l'art : leçons sur la médiation. *Réseaux*, 60, 123-141.
- L. Winner. 1993. Upon opening the black box and finding it empty: social constructivism and the philosophy of technology. *Science, Technology and Human Values*, 18, 3, 362-378.
- M. Reed. 1997. In praise of duality and dualism: Rethinking agency and structure in organizational analysis. *Organization Studies*, 18, 1, 21-42.
- N. Postman. 1993. *Technopoly: The Surrender of Culture to Technology*. New York: Alfred A. Knopf.
- W. Bijker, T. P. Hughes and T. Pinch. 1987. *The Social Construction of Technological Systems: New directions in the Sociology and History of Technology*. Cambridge: MIT Press.
- L. D. Inrona and F. M. Ilharco. 2004. The Ontological Screening of Contemporary Life: a Phenomenological Analysis of Screens. *European Journal of Information Systems*, 13, 221-234.
- M. Heidegger. 1977. *The Question Concerning Technology and Other Essays*. New York: Harper Torchbooks.
- C. Tilley. 1993. *Interpretive Archaeology*. Oxford: Berg.
- J. Thomas. 2000. *Interpretive Archaeology: A Reader*. Leicester: Leicester Press University.
- E. Monod, H. H. Klein, O. Missikoff and D. Isari. 2006. Cultural Heritage Systems Evaluation and Design : The Virtual Heritage Center of the city of Rome. Paper presented at Proceedings of the AMerica Conference on Information Systems, August 4-6, in Acapulco, Mexico.
- E. Monod and H. K. Klein. 2005. A Phenomenological Evaluation Framework for Cultural Heritage Interpretation: from e-HS to Heidegger's Historicity. Paper presented at Proceedings of the Eleventh AMerica Conference on Information Systems, August 11th-14th 2005, in Omaha, USA.
- N. Kotler and P. Kotler. 2000. Can Museums Be All Thing to All People?: Missions, Goals, and Marketing's Role. *Museum and Curatorship*, 18, 3, 271-287.
- B. Latour. 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory* Oxford: Oxford University Press.
- A. Strauss and J. Corbin. 1998. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. California: Sage, 2nd edition.
- D. Cliniffe, E. Kritou and D. Thudope. 2001. Usability Evaluation of Museum Websites. *Museum Management and Curatorship*, 19, 3, 229-252.
- B. Lefebvre and H. Lefebvre. 1991. Le visiteur, le guide et l'éducation. *Revue Canadienne de l'Éducation*, 16, 3, 331-337.
- N. Di Blas, S. De Caro and L. Spagnolo. 2010. In Search of Novel Ways to Design Large Cultural Heritage Websites. Paper presented at Museums and the Web 2010: Proceedings Archives & Museum Informatics, in Toronto, Canada.
- D. Incandela and R. Stein. 2010. ArtBabble: A Year's Worth of Lessons Learned and Thoughts about Collaborative Content Platforms. Paper presented at Museums and the Web 2010: Proceedings. Archives & Museum Informatics., in Toronto, Canada.

- P. F. Marty. 2007. Museum Websites and Museum visitors: Before and After the Museum Visit. *Museum Management and Curatorship*, 22, 4, 337-360.
- B. J. Soren. 2005. Best Practices in Creating Quality Online Experiences for Museum Users. *Museum Management and Curatorship* 20, 131-148.
- A. C. H. Lin, S. Gregor and J. C. C. Huang. 2008. The Hedonic Experience of Enjoyment and Its Relationship to Informal Learning: A Study of Museum Websites. *Proceedings of the International Conference on Information Systems (ICIS)*.
- L. Pareto and U. L. Snis. 2007. Design Experience from Experience Design: Towards Strategies for Enhancements. Paper presented at Proceedings of the Fifteenth European Conference on Information Systems, June 7-9, in St. Gallen, Switzerland.
- F. Paterno and C. Mancini. 2000. Effective Levels of Adaptation to Different Types of Users in Interactive Museum Systems. *Journal of the American Society for Information Science*, 51, 1, 5-13.