

THE INTERACTIVE MULTIMEDIA DOCUMENTARY  
A PROPOSED ANALYSIS MODEL

**CHAPTER 4: INTERNET AND INTERACTIVE APPLICATIONS**

**4.1 Context and evolution of the Internet**

Before we fully focus on the new genre of the interactive multimedia documentary in Chapter 5, we must examine the evolution of the Internet and its many possibilities in terms of interactive applications. In this chapter, we will attempt to define the context behind this new interactive format, and to that end we will use an initial approach, from the early days of the Internet to the present, in which we will highlight technological convergence as a key factor. We will also examine the differences between what are considered online and offline educational interactive content, based on the key distinction of whether navigation takes place using the Internet or an external - and by extension offline - medium. To complete this contextualization, we will provide a list and a brief description of various online experiences.

The interactive multimedia documentary is a genre that uses **various media** for display and navigation: on one hand, offline media, and on the other, the online medium par excellence, the Internet. Towards the end of the last century in particular, the use of offline media such as CD-ROM or DVD-ROM almost ceased as the Internet incorporated some key factors that led offline media to be gradually abandoned and to a mass emigration to the Internet as a single medium. Some of these key factors were broadband connections, the flat rate and new programs enabling simultaneous animation and programming (such as Flash and Macromedia in the past and Adobe today.) This chapter considers the context in which the proposed analytical model is being developed, which is the modern Internet, and today's collaborative model or the Web 2.0.

The report entitled *Del Web 2.0 al Web 3.0: nous models de negoci i oportunitats empresarials en la Xarxa del futur* [From Web 2.0 to Web 3.0: new business models and business opportunities in the network of the future] (2009), produced by the Analysis and Forecasting Unit of the Centre for International Markets, suggests that the Internet has now become the most important means of accessing information and knowledge. Forecasts suggest that by 2017 there will be seven thousand million devices with Internet access and as the positive impact of the Internet throughout the economy makes itself felt in emerging economies, yet more users and services will be added. A division of the Internet into four stages or phases since its inception is listed below:

— *Internet 0*: is the **concept of the Internet as simply a communications infrastructure**, in order to **interconnect mainframe computers**. At its heart was the ARPANET network, which was created in 1969 at the express request of the United States Department of Defense, and developed by the Advanced Projects Research Agency (ARPA). At this stage, the Internet was an incipient, static and minority-based phenomenon. As can be deduced from the idea above, the Internet is the result of the combination of science (basic research) and research programs funded by the U.S. military. Although it was largely funded by the military, it has never had a military application.

— *Web 1.0*: coincides with the emergence of the Internet, beginning in 1993. The Internet became a vast store of information, the greatest that humanity has ever had at its disposal, a place where you can find anything, once you have overcome location problems (after the appearance of the first generation of large search engines.) **This phase is the consolidated Internet stage** and from the standpoint of its content, it involves procedures based on simple indexing or in other words, on linking pages based on an index and in relation to their content. Some experts believe that the concept was developed in the 1960s, with text only browsers, such as Elisa. After the subsequent advent of HTML, websites became easier on the eye, and the first browsers that could also represent images (IE, Netscape, etc.) appeared. Without a doubt, the development of the World Wide Web (www) by **Tim Berners-Lee, in 1989**, was the key factor that enabled this process to take place. The conception behind this revolutionary system for the exchange of information, capable of handling multimedia products with ease, opened up the possibility of paths such as searching for and publishing information, establishing conversations with other users, carrying out electronic transactions and a great deal more.

**Table 4.1 PRINCIPLES ASSOCIATED WITH WEB 1.0 and 2.0**

PRINCIPLES ASSOCIATED WITH WEB 1.0	PRINCIPLES ASSOCIATED WITH WEB 2.0
<ul style="list-style-type: none"> <li>* <i>HTML</i></li> <li>* <i>FLASH/JavaScript 1.0</i></li> <li>* <i>CGI</i></li> <li>* Page Design (frames, tables, hyperlinks)</li> <li>* Search Engines</li> <li>* Portals</li> <li>* Custom Pages</li> </ul>	<ul style="list-style-type: none"> <li>* <i>AJAX</i></li> <li>* <i>Wikis</i></li> <li>* <i>RSS</i></li> <li>* <i>XML, XHTML, DHTML</i></li> <li>* Blogs</li> <li>* Audio, Video</li> <li>* Web Standards 3WC</li> </ul>

<ul style="list-style-type: none"> <li>* Concepts such as <i>E-commerce</i>, <i>E-procurement</i> and <i>E-Learning</i></li> <li>* Discussion forums</li> <li>* IRC, Chats, online contacts</li> <li>* Email (<i>E-Mail</i>, <i>Web Mail</i>)</li> <li>* P2P (<i>peer to peer</i>, free downloads)</li> <li>* Newsgroups</li> </ul>	<ul style="list-style-type: none"> <li>* Smart Data <i>SEO</i></li> <li>* Mobility (Mobile, <i>PDA</i>)</li> <li>* Open Source <i>Projects</i> (<i>PHP</i>, <i>MySQL</i>, <i>Perl</i>, etc ...)</li> <li>* Style Sheets (<i>CSS</i>)</li> <li>* Div tag programming</li> <li>* <i>DOM</i>, <i>JAVA</i>, <i>JAVASCRIPT 2.0</i>, <i>APPLETS</i></li> <li>* <i>Google</i>, <i>Microsoft</i>, <i>Apple</i>, <i>Adobe environments</i>, etc.</li> </ul>
---	--

#### 4.1 Comparison between the principles associated with Web 1.0 and 2.0

— *Web 2.0*: without losing its functionality as a large store, the Internet becomes a macroagora, where surfers from around the world establish an ongoing dialogue and share their concerns, knowledge and experience. This phase is part of the **social read-write Web** and involves access known as manual semantic Web or syntactic Web. Internet experts now believe that the use of pages should be focused on interaction and creating social networks that can act as a receiver for exploiting the effects of creating interactive and dynamic websites. New websites are more like a meeting point or independent pages rather than static pages in the traditional sense of the word (which do not allow modification or interaction by the user in the broader sense - they are simply for reading). The term 2.0 has recently been coined to refer to these pages, which are capable of generating interaction in the broadest sense of the word, as part of considering them “more interactive than reactive” (Berenguer, 2004). The concept of Web 2.0 was **proposed in 2004 by Tim O'Reilly** of O'Reilly Media, to refer to a second generation of web pages based on communities of users and a special range of services such as blogs or wikis, which are capable of fostering collaboration and the flexible exchange of information between various users<sup>1</sup>. The infrastructure of Web 2.0 is complex and continuously evolving, but it includes server software, content syndication, messaging protocols, standards-based browsers and a suite of applications for clients. According to the main promoter of the concept, Tim O'Reilly, it has seven founding principles: the *World Wide Web* as a work platform, the harnessing of collective intelligence,

---

<sup>1</sup>The specific term was proposed by Dale Dougherty, of the company O'Reilly Media, in a joint brainstorming session with Craig Line of MediaLive to develop ideas for a conference. Dougherty suggested that the web was undergoing a renaissance, with changing rules and evolving business models. To put this proposal into practice, Dougherty signed up John Battelle to give him a business perspective. The combination of O'Reilly Media, Battelle, and MediaLive led to the first Web 2.0 conference, held in October 2004. The second conference took place a year later, in October 2005.

database management as a core competence, the end of the software update release cycle, lightweight programming models together with the quest for simplicity, software above the level of a single device and rich user experiences<sup>2</sup>.

In general, we use the term Web 2.0 to refer to a series of applications that are found in a type of website that uses a collective intelligence in order to provide networked interactive services, giving the user control over the flow of data. The first and most important development on the Web 2.0 is the recirculation of a website's content using standardized protocols that enable users to use the web content in other contexts, either on another website, in a desktop application or by means of a browser connection. According to Codina (2009), "Web 1.0 was more about reading and the pages were static, and in 2.0 they are about reading and writing, with dynamic pages with open content." Anyone can create content in Web 2.0, and as such it is obvious that the democratization of information in publishing is more apparent than in the previous web paradigm. There is some degree of social appropriation of the Internet in the version 2.0. Of all the standard web features mentioned above, such as access to content and information in different formats, its collection and storage, interconnection between websites (by hypertext), and the opportunity for creation, it is the latter that has been the most greatly enhanced. Although this feature was not completely excluded in Web 1.0, it was limited to certain areas. Content, information and creation flow more substantially in 2.0 formats, especially in terms of quantity, because in version 1.0 this content and its creation were largely determined by the willingness and desires of the website's administrators. In short, we participated in the Web 1.0 as consumers, while in Web 2.0 this initial trend is consolidated and the status of producers and creators is added. As Hugo Pardo says in his book *Planeta Web 2.0. Inteligencia colectiva o medios fast food* [Planet Web 2.0. Collective intelligence or fast food media] (2007):

"In this new Web the digital network is no longer a mere shop window of multimedia content, but is instead an open platform, built on an architecture based on user participation. A series of

---

<sup>2</sup>Since it was established in 2004, O'Reilly Media has organised several Web 2.0 conferences in California, USA. Web 2.0 Conference 2004: <http://www.web2con.com/web2con/>, Web 2.0 Conference 2005: <http://www.web2con.com/pub/w/40/coverage.html>. More information about the conferences and guest speakers is available at: <http://conferences.oreillynet.com/web2con/>. Hugo Pardo and Cristobal Cobo (2007) suggest a specific route for further consideration of aspects related to the concept of Web 2.0. The starting point is the article by O'Reilly mentioned above. The original version is available at <http://www.oreillynet.com/pub/a/oreilly/>. For more information, Wikipedia provides reasonable theoretical foundations, with links to related terms and players. Another possible avenue is the profile and interview with Tim O'Reilly, by Steven Lery in *Wired* magazine (October 05) available online at: <http://www.wired.com/wired/archive/13.10/oreilly.html>. This article mentions the architecture of participation, which is central to understanding the Web 2.0. Another possibility is to look at the Web 2.0 Conferences conducted by O'Reilly Media. This event is shaping up as as the conceptual and business driving force behind the "2.0 World," as well as the benchmark for new trends and applications. Also available is *IT Conversations*, a macroproject of podcasting files including a selection of speeches from the Web 2.0. conferences, at: <http://www.itconversations.com/series/web2.0-2005.html>.

satellites-terms which feed back into its development are based around the Web 2.0 concept. Social software, participation architecture, user generated content, rich internet applications, tags, social networking and content syndication are just a few of a long list of concepts which enrich this phenomenon” (Cobo & Pardo, 2007:15).

According to Cobo and Pardo (2007:15), the term Web 2.0 can be considered as one of many concepts in an environment characterized by a preplanned terminological obsolescence. According to these authors, its virtue is its ability to provide a precise description and summary of a kind of technology and its by-products. As regards the possible use of other terminologies, they say:

“When carrying out the practical exercise of seeking synonyms that cover the constituent principles of recent web applications, many have fallen by the wayside due to their failure to include all their properties. When we discuss “social networks” it is apparent that it is a larger set of web applications and that there are hundreds of them that do not comply with all the principles mentioned above (any intranet, for example). In fact, the Internet is the mother of all the online social networks and the Web 2.0 applications are only a small subset of this virtual world. Something similar is true of the idea of collaborative writing and the *content management system*: both characteristics are essential features, but do not represent all the constituent principles” (Cobo & Pardo, 2007:15).

In order to provide some theoretical basis for the new term and end the confusion that prevailed when it arose, in September 2005 Tim O'Reilly published what is to date the primary bibliographical reference for the concept, in an article is entitled *What Is Web 2.0. Design Patterns and Business Models for the Next Generation of Software*. In this article, O'Reilly presents a theoretical foundation consisting of the development of a series of ideas that had taken shape some years previously.

The emergence of Napster in 1999, the launch of the first applications for blogging (*Blogge* appeared in the same year, and *Movable Type*, its main competitor, in early 2001), and the creation of Wikipedia in early 2001, were the paradigms in this transformation, and created the foundations for collaborative writing and other principles of Web 2.0. According to O'Reilly, the fall in the *NASDAQ* index in 2000 triggered the beginning of the transition from Web 1.0 technology to 2.0. With regard to the point of transition from one technology to another, Pardo says:

“However, semiotic debates aside, it is evident that today's *World Wide Web* is not the same as the Web that existed in 2000, and that applications of various types and capacity for tool-user relationships cohabit with one another to give the Web greater richness. At that time, few applications provided free open spaces for access, writing and production of added value content. The scope for participation in previous products was very limited: staff e-mails, contact forms and little else. Today there is a virtual environment with coexistence between standard applications with little interactivity and others with collaborative writing. However, the Web as a whole is beginning to outline a new scenario for content and meta-information during the transformation towards the early stages of Web 2.0” (Pardo, 2007:27).

In short, the concept of Web 2.0 refers to a **second generation of web pages** based on communities of users and a special range of services such as social networks, blogs, wikis, or

folksonomies, which foster collaboration and the flexible exchange of information between users, and in which the static nature of pages is transformed into a matrix for interaction between the user and the network, enabling them to input their information into the system. In general, when referring to Web 2.0, we are referring to a set of applications and websites that use collective intelligence to provide interactive networked services that give control of data to the user.

As argued by Wade Roush (2006), a journalist specializing in information technology and a member of the Technology Review of the MIT,<sup>3</sup> an organization considered an authority on the future of technology, the term 2.0 refers primarily to three factors:

- New mechanisms for interaction and communication between people, based on social networking technology (with services such as MySpace, YouTube, Digg or Wikipedia).
- The use of web standards for creating distributed services on the Internet (mashups, for example).
- The improvement in website interfaces to the point where they are almost a perfect imitation of the user's experience of the classic applications that run on their computer.

Paul Anderson's book *What is Web 2.0? Ideas, technologies and implications for education* (2007), which presents the ideas and key concepts for understanding what Web 2.0 represents, is very useful for learning about the global phenomenon called Web 2.0. The author sees it as a logical consequence of the first stage (Web 1.0), and not as a superior concept. He justifies his case by arguing that Tim Berners-Lee, the father of the World Wide Web, had considered surfing the Internet in terms of users being able to edit content, which is what would subsequently happen with the *Wiki* phenomenon, for example. Because of the speed and connection problems that it entailed, he rejected the idea, and it naturally became the great Internet revolution a few years later.

**TABLE 4.2 THE MAIN CHARACTERISTICS OF WEB 2.0**

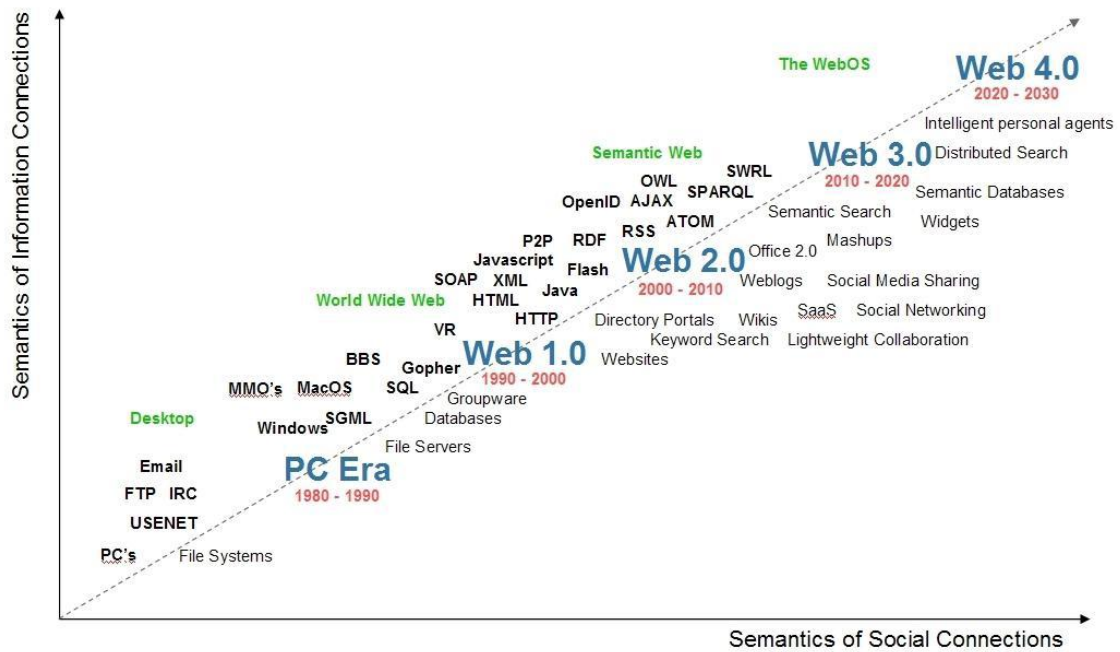
- Simplifies website usability
- Saves user time

<sup>3</sup>Article available online at: <http://www.technologyreview.com/web/16688/page2/>

-Standardizes languages for better use of code reuse
- Allows better interoperability between applications and between machines (software-hardware)
- Facilitates interactions
- Facilitates recognition or detection of shortcomings or new ways of using applications
- Facilitates the convergence between media and content
- Facilitates publishing, research and consultation of Web content
- Stimulates and leverages collective intelligence for the benefit of the network itself

#### 4.2 The main characteristics of Web 2.0

— *Web 3.0*: following on from the immediacy of the new version of the Web and in view of the cognitive inability to reflect on the new concepts created by it with sufficient calm, some authors have begun to refer to the third version, which is a new stage in the evolution of the Internet. This new stage coincides with the **global Internet considered in terms of a read-write media** and from the standpoint of access to content; it is the **automatic semantic web**. It is a **smart network**, with capabilities based on **the application of expert artificial intelligence systems** (Codina 2009).



#### 4.3 The different stages of the web, the main concepts and their applications

Source: Van Oranje, C. *et al.* (2008), *The future of the Internet Economy: a discussion paper on critical issues*. Available at:

[http://www.futureinternet.eu/fileadmin/documents/netherlands/Netherlans\\_Future\\_Internet.pdf](http://www.futureinternet.eu/fileadmin/documents/netherlands/Netherlans_Future_Internet.pdf).

In Figure 1, van Oranje (2008) makes a distinction between the semantics of information and social semantics, and their interdependencies are related. The trend appears to be towards the higher phase, located in the timeframe of the decade 2020-2030 and the new phase called Web 4.0. The *Web 4.0* is beginning to be considered in terms of a **future reality**, in which **operating systems and local software** will no longer exist or will **coexist with server software**. If we consider the parameters of Moore's Law<sup>4</sup> the **speed of access** will be much faster, the **components will be much smaller** and personal digital gadgets will have **almost human intelligence**<sup>5</sup>.

<sup>4</sup>Moore's law states that the number of transistors on a computer doubles approximately every two years. This empirical law, formulated by Gordon E. Moore on April 19, 1965, in *Electronics Magazine*, has been fulfilled to date. The principles that this law entails are as follows: (1) the power doubles and the cost rises by 2% every 18 months; (2) there is a shift to another order of magnitude every 10 years; (3) the best computer today has 1% of the power that will be available in 20 years' time.

<sup>5</sup>Raymond Kurzweil (1999, 2005) considers different scenarios closely related to an intelligent web and a possible effective connection between human brains and computers (which he calls the "immortality of the soul"). The following files related to the author are available online: <http://www.neoteo.com/transcendent-man-el-documental-de-ray-15167.neo>; <http://www.redesparalaciencia.com/80/redes/redes-10-el-futuro-la-fusion-del-alma-y-la-tecnologia>



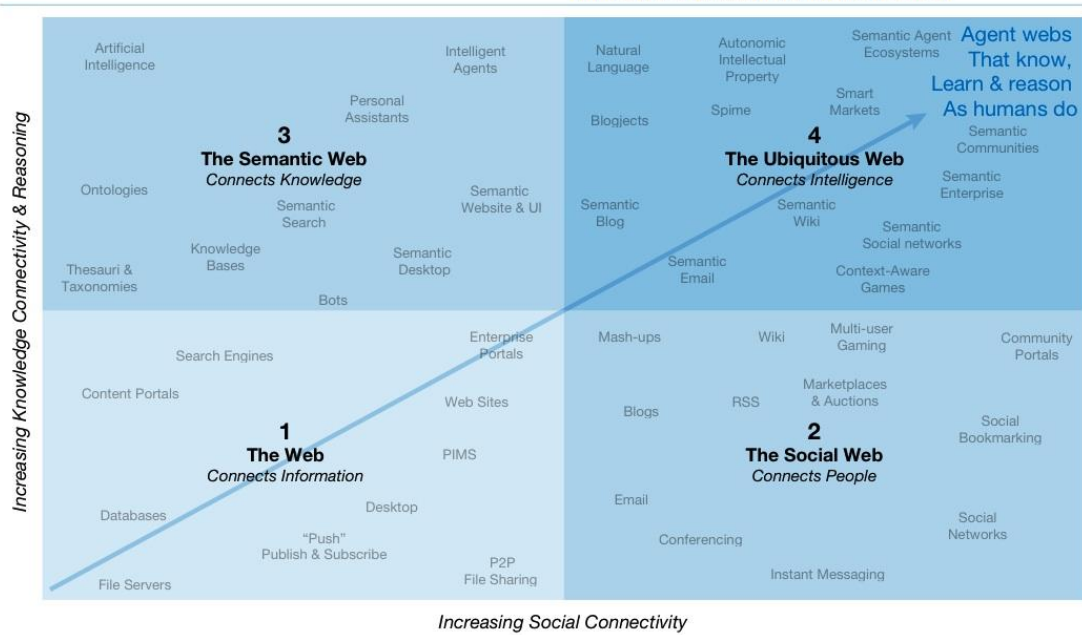
To complete this context, we present two schematic diagrams. The first summarizes the various types of web, the timeframe that they cover, and the associated technology and the characteristics of each type. The second shows a distribution divided into four quadrants, covering the evolution of the Internet until 2020 (web, social web, semantic web and ubiquitous Web).

**TABLE 4.3 SCHEMATIC DIAGRAM PRESENTING THE VARIOUS STAGES OF THE WEB**

	<b>TYPE OF WEB</b>	<b>TIMEFRAME</b>	<b>ASSOCIATED TECHNOLOGY</b>	<b>CHARACTERISTICS</b>
WEB 1.0	Static	1993-1997	<i>HTML, GIF</i>	Web pages are static documents that are rarely updated
WEB 1.5	Dynamic	1997-2003	<i>DHTML, ASP, CSS</i>	Web pages are constructed dynamically based on one or more databases
WEB 2.0	Collaborative	2003 - present	<i>Ajax, DHTML, XML, Soap</i>	Users become contributors. They publish information and make changes to data
WEB 3.0/4.0	Generative and cloud ( <i>cloud-tagging</i> )	present and future	<i>XML, semantic search, metasearch engines</i>	Everything happens online from virtual servers, searches are not syntactic but instead by meaning and everything planned using personal assistants

Table 4.3 Schematic diagram presenting the various types of web, the timeframe covered, the associated technology and characteristics of each type

Below:  
What is the Evolution of the Internet to 2020?



Source: Nova Spivak, Radar Networks; John Breslin, DERI; & Mills Davis, Project10X

2007, 2008 Copyright MILLS\*DAVIS. All rights reserved

#### 4.2 Quadrant diagram showing the development of the Internet until 2020

#### 4.2 Interactivity technologies

The history of interactivity technologies has been extensively studied in the research by Ignasi Ribas (Ribas 2000), which we will summarize here. The first truly interactive audiovisual applications were produced within the **LaserVision optical videodisc** format during the 1980s. This system was developed by the company Philips, in the 1970s. It was an analogue format and difficult to manage, but connected people from different areas within interactive communication. Reginald T. Friebus had already patented a means of recording sound and images in color on a disc for optical systems in 1929, but it was not until the invention of the laser, with its extraordinary ability to concentrate a beam of light, that it became possible for one side of the disc to contain a reasonable amount of audio-visual programming (Ribas, 2000:29-30).

Of all the optical systems that competed with each other during the 1970s and 1980s (there were over 25 in 1976), the LaserVision prevailed due to its resistance and ease of use. Its **CLV format**, designed for watching films in a heavily linear way, never succeeded, as it competed with home VTRs in recordable and erasable tape. The CAV (Constant Angular Velocity) format<sup>6</sup> made the first interactive audiovisual applications possible. All the functions that the

<sup>6</sup>The secret of the CAV format lay in its positioning of a single image on every revolution of the disc. As a result, by turning at a constant speed of 25 revolutions per second in the PAL system, and while the

CAV format allowed could be remote controlled. This was level I of interactivity, or with an external computer, level III. As Ribas points out (2000:29-30), a program on this computer could add fragments of video and sound or video quality still images to its intrinsic interactive capabilities, albeit on a monitor other than that of the computer, as the image and sound stored in the LaserVision were still analogue<sup>7</sup>.

This technology was widely used in information outlets, catalogues of large companies, stores and in training applications for skills benefiting from the possibility of including realistic moving images: flight simulators, for dangerous or costly repairs, etc., especially in the U.S. market. It also had a very important market in education, once again in the United States, and this was the format in which were the first applications for cultural dissemination were produced. The role of the U.S. production company *Voyager* was especially important in the cultural dissemination market in general and that of art in particular, using the videodisc. As discussed by Ribas in his article “Integrating media within interactive discourse: the case of cultural dissemination” (2009), excellent products about artists such as Van Gogh or Muybridge, or about museums such as “The Art Institute of Chicago” and “The National Gallery of Art” in Washington, among others, were the first major conceptual change in the way that culture was disseminated. Also worthy of mention is the *Société ODA* in Paris, which produced excellent videodiscs about the Louvre and Orsay museums, which were the forerunners of today's vast wealth of French cultural interactive products.

The emergence in the early 1990s of **specific digital video formats**, initially requiring special hardware, such as the **Intel DVI**, and built in soon afterwards at the expense of quality that was initially at the permissible limits of the management of any powerful microprocessor, changed

---

laser reader head made a small movement in a radial direction during its revolution, it could play moving video images. However, it was also able to produce a perfect pause of unlimited duration, by simply stopping the head to reproduce the same image 25 times per second. It could also fast forward and rewind with the head's speed and direction control in the radial direction of the disk. And most importantly, all the images could be numbered from 1 to 54,000, on one side - with a digital code mixed with the image, and it could take the head to any image within a few tenths of a second. The combination of this random access and perfect and unlimited pause made the LaserVision CAV format the paradigm for the first interactive audiovisual applications. The 54,000 revolutions on one side could be used for the same number of different images, to provide 36 minutes of PAL video for any combination of still and moving image within these limits, with the addition of two commutable channels of sound (Ribas, 2000:30)

<sup>7</sup>The system was indeed huge, difficult to manage and its distribution among the general public was inconceivable: it required a computer with a monitor, a videodisc reader with a television and a connection between the two consisting of a special cable and software to manage it. Furthermore, if computer output to the video screen was required, a special synchronization card, which was expensive, difficult to manage and not standardized, was also needed. Another major problem was the incompatibility between the NTSC and PAL television systems, which prevented the videodisc from becoming widespread.

things dramatically. Hypertext generation systems gradually incorporated high quality still images, sounds, and even digital video, and became what we now call author languages.

The ability to **digitize** all the media around a multimedia application meant that the term took on a new meaning, guided by the shift from the concept of accumulation to that of integration, and this is what made all the multimedia and hypermedia interactive applications we have today possible<sup>8</sup>. In the late 1980s and early 1990s, when the multimedia digitization of the immediate future was becoming apparent, all the ideas and initiatives in the hypertext and interactive videodisc fields began to converge. It was the era of the first associations and conferences on the subject and the resurgence of the most important ideas on which the theory of interactive communication is based today (Ribas, 2000:33).

The adoption of storage devices is the reflection of a more widespread transfer of ideas on interactive, non-sequential ways of accessing information from the computer environment, which had begun some years previously in the audiovisual production field<sup>9</sup>.

#### **4.3 Offline informative interactive content**

Offline informative interactive content is defined here as a **set of interactive applications on an optical medium (CD-ROM or DVD-ROM), the aim of which is to transmit information and / or knowledge**. These applications may have different levels of interaction, but normally, based on the analysis set out in Chapter 2, and according to Xavier Berenguer (2004), there is a medium level of interaction, structured around an interactive language, which is ideal for achieving a good rate of assimilation and coordinating the rate of control-disclosure and enjoyment-difficulty.

---

<sup>8</sup>Digitization provides a number of fundamental advantages compared to the situation in the videodisc era: they all come from the uniform treatment of the various media within the digital environment, because all the information is stored in files that the system manages in the same way. This means that computerised integration is simple and uniform and the development languages of applications do not have to make basic distinctions based on the medium they are incorporating. Naturally, the hardware necessary has been simplified and has become a single computer with multimedia management capabilities, and in terms of applications, the content and its structure are now in a single digital medium (Ribas, 2000:32) .

<sup>9</sup>This seems to confirm the fact that in the early years after digital integration, when digital video compression algorithms were not as effective as they are today and the CD-ROM, the optical device par excellence was based on the low storage density of the old audio CD, no one thought of creating audiovisual interactive applications based on linear storage devices. The enormous potential of non-linearity, revealed by the videodisc and facilitated by digital media, meant that everyone preferred to work with very small and low quality moving images, or with special decoding hardware, rather than returning to the paradigm of linearity (Ribas, 2000:34).

The research by Ribas (2000) contains a number of interesting parallels for this study, as what he calls **interactive offline essays** have a great deal in common with the online multimedia documentary. In a way, interactive multimedia documentaries could be considered a **natural evolution of the interactive essays described by Ribas**, despite the basic distinction that the former take place online and the latter on offline media. As can be deduced, both types fall with in what we might call interactive dissemination: they aim to convey a particular kind of knowledge or understanding (without the ultimate need for an idea of forced learning), and they are databases with linked information, created by one or more people, who Ribas calls authors.

The two major differences between offline and online applications are that the applications described by Ribas are located on hardware (while this paper focuses on the Internet, which is a virtual medium) and that in terms of the **transfer of control**, the essays are more inflexible than the interactive multimedia documentary (as they are part of a Web 1.0, using media in which contributions by the user are not possible, and the applications in this study do so in a network with attributes that are collaborative and generative for the interactor).

In the final part of his study, Ribas gives us one of his most interesting hypotheses, after studying and producing several interactive works meeting the criteria for his research:

“Our central hypothesis for future research is that there is a wide range of interactive media for cultural diffusion that are characterized by a treatment that closely integrates navigation through the information structure and navigation of content. We will call these interactive essays. We were struck by this idea after realizing that the essential characteristic of cognitive overload is in fact the effect of the competition between these two processes of the display of positions and content on the cognitive capacities of the reader. Integrating the two seemed the best and most appealing option. We believe that this solution has been adopted spontaneously by many designers and that it is specific enough to identify it and characterize it” (Ribas, 2000:104)

The **works** that Ribas analyses in his various articles, publications and in his research work include:

1. *Au cirque avec Seurat* (1996). Hyptique; Réunion des Musées Nationaux; Gallimard Jeunesse; France Telecom Multimedia. Paris.
2. *Dotze sentits* (1996). Pompeu Fabra University; Proa; Barcelona Provincial Council. Barcelona: Proa.
3. *Joan Miró. El color dels somnis* (1998). Joan Miró Foundation; Pompeu Fabra University; Club d'Investissement Media. Barcelona.
4. *Le Louvre* (1994). Montparnasse Multimedia; Réunion des Musées Nationaux; Index +. Paris: BMG Interactive.
5. *Le mystère Magritte* (1996).Virtuo. Brussels.

6. *Makers of the 20<sup>th</sup> Century* (1996). News Multimedia; Zappa Digital Arts. Leighton Buzzard (United Kingdom): News Multimedia.
7. *Microsoft. Art Gallery* (1994). Microsoft; National Gallery; Cognitive Applications Limited. London.
8. *Moi, Paul Cézanne* (1995). Index +; Télérama; Réunion des Musées Nationaux. Paris.
9. *Musée d'Orsay. Visite virtuelle* (1996). Montparnasse Multimedia; Réunion des Musées Nationaux; Le Lab: BMG Interactive.
10. *Operation Teddy Bear* (1996). Index +; Flammarion; Paris.

#### 4.4 Online informative interactive content

We will define interactive dissemination content as a **series of interactive applications that are located on the Internet**. These applications may present various levels of interaction, but as in the case above, there is normally a medium level of interaction, structured using an interactive language.

This interactive content presents a **clear desire for transmission of a specific type of reality or knowledge**, produced in the context of informal education, i.e. with a lack of explicit educational intention on the part of the author, a consequent lack of educational methodology in the process and an intention that is not extrinsically motivated in the receiver.

As we have seen, many qualities of the interactive genres of cultural diffusion detected by Ribas can be extrapolated and work in the same way in the online interactive dissemination genres:

“As the bandwidth of networks approaches that of modern local devices, all the possible creative uses of interaction using multimedia items must be able to be seamlessly transferred to become enhanced, as well as with the ability to update, delocation of content and the capability for shared authorship and participation and immediate specifics of networked interaction” (Ribas, 2000:9).

At this point, we can see how Ribas anticipates many of the key aspects that have been defined in the context of Web 2.0: simple updating of content, syndication and integration, participation and interaction in real time by the interactor or contributor (who Ribas calls the reader, etc.). Meanwhile, in his article *Integrating interactive media discourse: the case of cultural diffusion* (2009), he discusses the subject of the Internet from a perspective that is very interesting from the viewpoint of this study: while he acknowledges that it has contributed properties which were unimaginable in closed or offline systems, he is very critical regarding the limited expansion of multimedia applications have experienced as a result of its emergence:

“[...] there are many alternative ways to make different media converge in digital discourse. In fact, we believe that these different ways of integrating multi-modality and interaction are what best typifies the digital medium. At the end of the 1990s, some CD-ROMs already included

some of these possibilities, which were subsequently almost forgotten under the enormous weight of the internet and the games we now have. The strength of these two benchmark hypermedia (hyper in the discursive sense but particularly also in the financial and social sense) is probably the main reason for the virtual and, we hope, temporary disappearance of these pioneering experiments” (Ribas, 2009:43).

And on the advent of online genres, he continues:

“A quick tour around the web shows us that in the majority of sites, the only things exported from the paper medium are the least creative combinations of text and image, mere juxtapositions: an illustration next to a text to complement it, a text at the foot of an image or video, or as a title.... It’s true that the Internet explosion in the final years of the 20th century brought the experiments that were starting to be carried out in offline media to an abrupt halt” (Ribas, 2009:44).

In the following paragraph he discusses this unexpected setback for interactivity:

“This situation is the consequence of the major influence of characteristics inherent to the Internet itself, which encourage certain ways of engaging in discourse. The Internet’s great social appeal comes from the combination of its two key properties: first, its unlimited capacity to store and instantly return all kinds of content, much of which is pre-existing (ideally all pre-existing) and other specifically constructed content with radically heterogeneous criteria; second, its hyper-communicability, its egalitarian capacity for everyone to swap, with intrinsic ease, the role of receiver and producer. In neither case is the exploration of innovative forms of interaction and media integration particularly useful in achieving its objectives” (Ribas, 2009:44).

#### 4.4.1 Examples of online experiences

In order to evaluate the broad scope of interactive applications on the internet, we have prepared the following table, which shows a number of interesting experiences, many of which are applicable to the subject under discussion here. The interactive multimedia documentary takes the best from each experience described below: virtual education, online resources, online virtual browsing, networks and television, networked communities, mobile web and mobile devices and digital books.

**Table 4.4 EXAMPLES OF DIFFERENT ONLINE EXPERIENCES**

<p><b>VIRTUAL EDUCATION</b></p> <p>The virtual universities campuses and model are examples of communities that transmit knowledge (formal or informal) and use specific techniques to do so (these can also be called modes of knowledge transmission or didactic modes).</p>	<p>National University of Distance Education (UNED)</p> <p>Open University of Catalonia (UOC)</p> <p>Distance University of Madrid (UDIMA)</p> <p>International University of Andalucia (UNIA)</p>
--	--

<p>Core or optional subjects can be considered as a modular system, as they are grouped in sets (or specific modules) depending on the type of course that students select.</p> <p>From this perspective, the objectives of interactive multimedia documentaries are very similar (the transmission of knowledge from the perspective of informal education and from a modular standpoint).</p>	<p>International University of la Rioja (UNIR)</p>	
<p><b>ONLINE RESOURCES</b></p> <p>The various online resources are becoming the classic paradigm of category-based hypertextual information transmission. The information is usually structured in knowledge areas.</p> <p>Many of the resources use Web 2.0-associated technologies and concepts, which can also be extrapolated to the interactive multimedia documentary (favorite video channels, providing information in the same way as in wikis and educational blogs, online searchable and downloadable theoretical documents, etc.) Normally, one of the interaction systems in an online documentary has its own internal resources and a section with recommended or suggested external links.</p> <p>The interactive multimedia documentary is in this case the inspiration for detecting patterns of classification and categorization derived from it (to order the discourse or educational subject).</p>	<p>University Networks</p>	<p>OTRI Network (Research Results Transfer Office) Universia</p>
	<p>OpenCourseWare Courses</p>	<p><i>OpenCourseWare</i> <i>OCW Finder</i></p>
	<p>Educational video channels</p>	<p><i>YouTubeEDU</i> <i>ArteHistoria</i> <i>Smart Planet</i></p>
	<p>Wikis and social networks</p>	<p>Wikipedia Wikilearning EstudioWiki Wikiversidad</p>
	<p>Resource Pages</p>	<p>E-learning Social Edukativos Educaweb Educasites</p>
	<p>Educational blogs</p>	<p>Aulablog El Tinglado EduCAP-TIC</p>
	<p>Encyclopedias</p>	<p>Enciclonet Enciclopèdia Catalana</p>
	<p>Electronic libraries</p>	<p>Miguel de Cervantes Virtual Library Public Libraries La Biblio CSIS Libraries Network</p>
	<p>Online notes and tutorials</p>	<p>Apuntesuniversidad Apuntes gratis Apuntesyexamenes El Rincón del vago</p>
	<p>Mobility and exchanges</p>	<p>Movilitat Academica Internacional Erasmus Erasmus Mundus</p>



	I-TunesU
<p><b>ONLINE VIRTUAL NAVIGATION</b></p> <p>Guided tours and documentary games are an entirely virtual aesthetic which can in a way be considered modes of navigation (space and time) that are ideal in their respective fields.</p> <p>In specific terms, a virtual tour or a game emotionally involving the interactor can be independent or related modes in an interactive multimedia documentary.</p>	<p>The Picasso Museum in Barcelona</p> <p>Virtual Montserrat</p> <p>Virtual visit to the <i>Guggenheim Museum</i> in Bilbao</p> <p>Visit to the <i>Louvre</i> museum</p> <p>Virtual Tour of the Museum of Natural History</p> <p>Smithsonian National Museum of Natural History</p> <p>Thyssen-Bornemisza Art Museum</p> <p>Virtual Tour of the <i>Saint Patrick Center</i></p> <p><i>JFK Reloaded</i></p> <p><i>America's Army</i></p>
<p><b>WEBSITES AND TELEVISION. CONTENT ON DEMAND</b></p> <p>Web television platforms are offering critical aspects in the audiovisual treatment of information and new high definition imaging technologies.</p>	<p>TV3 on Demand (Channel Website)</p> <p>CCRTV Interactiva (Corporació Catalana de Ràdio i Televisió Interactiva)</p> <p>TV3 in high definition (Web channel)</p>
<p><b>NETWORKED COMMUNITIES</b></p> <p>Networked communities are the models to be taken into account in some respects for interactive multimedia documentaries: the various possibilities of interaction that they offer have been studied in depth by some interactive documentary authors.</p> <p>We can use a study and analysis of their users' behavior, to consider a similar model and apply it to the genre described.</p>	<p>Second Life</p>
<p><b>MOBILE WEB AND MOBILE DEVICES</b></p>	

Communication using mobile devices is now an established fact. The interactive multimedia documentary should consider this new type of technology and gradually adapt to it. In the future, this genre may end up working on a multiple platform made up of computers, television and mobile devices. Each platform is configured with its own parameter types and users.

Synthesis of Web 2.0 model

CampusMovilnet

**ELECTRONIC BOOKS (e-BOOKS)**

The e-book is also a very innovative format from which it is possible to learn a great deal. In this area, it is very interesting to consider devices such as touch screens and how the interactive multimedia documentary can be adapted to achieve a more immersive navigation.

*Google Books*

*The Apple Ipad*

*Alice for the Ipad*

The shift from current to future technologies is only a stage in the direction that has been signposted in recent years: we gradually stop using the mouse and keyboard and we will incorporate more natural actions when interacting with the system, using the hands, words or sight (*eye tracking* systems). Virtual books allow manipulation by the hands and tactile devices, and the new Apple device - *the iPad* - goes even further (augmented/virtual reality, etc.).

4.4 Examples of different online experiences

**4.5 Technological convergence and digital mobility**

Technological convergence is an expression that describes the **convergence between telecommunications, the media and information technologies**. The first obvious phenomenon of global convergence between sectors occurred in the mid-1990s, when the **three worlds consisting of digital infrastructure and technologies, some operators, a market and some consumers, began to meet the same demand: the consumption of multimedia information consisting of audio, video and data.**

Technological convergence can be defined in two different ways: one refers to the ability of different network platforms to carry services or similar signals, and the other focuses on the ability to receive various services using a single device, such as a telephone, television or personal computer.

Consideration of the convergence of media dates from before the current explosion of digital technologies, Internet and the networked age in which we live. This is because in recent years, there has been a gradual convergence of the various media and languages of communication. This phenomenon was described in the mid-1990s as **“multimediality,” and is today known as “convergence”** and assumes new connotations. The boundaries between media become blurred with the onset of digitization. Rather than competing with each other, the different platforms tend to complement each other. Any medium must have an information presence on the World Wide Web or create divisions that produce content in various languages and formats. As regards content, digital technology is used mainly to produce the same products as ever (Pons, 2008:13).

In his essay entitled “Convergencia de medios” [*Media Convergence*] (2003), Ramon Salaverría reflects on the process of technological convergence in the news sector, and argues that we must consider four essential dimensions when dealing with multimedia convergence: the business, technological, professional and communication aspects (Salaverría, 2003:32). The level of evolution of these four areas is not uniform. Some aspects - business and technology in particular – are at an advanced stage of development, because they were the first to start a couple of decades ago, and because the most has been invested in them. However, the professional aspect, and the communication aspect in particular, which only have a few years of effective development, are still in an embryonic stage (Salaverría, 2003:35).

According to Salaverría (2003:34), the traditional media - newspapers, radio and television - are consumed by only two bodily senses: sight and hearing. The newspaper is an exclusively visual product, which provides information using text and static images. Radio, meanwhile, is a purely sonic medium. Finally, television includes visual elements (static and dynamic) and sound. The Internet is a major breakthrough in the integration of communicative codes and the creation of a new multimedia language, as it is a medium that has added new possibilities to the sensory potential provided by the three traditional media, such as those involving touch (automatic transcription services to Braille for the blind, 3D virtual reality systems, etc.) and smell (devices for digital aroma synthesis, etc.). Indeed, the ability to create multimedia content that includes images, sound, tactile and olfactory sensations is today presented as mere science fiction, but technological developments mean that we can envisage a future in which the composition of such messages will be possible. However, today's Internet has yet to reach that point, mainly for

technical reasons (limited bandwidth, restrictions on networking protocols, poor multimedia features in many of today's computers, etc. ).

In his article “Mitjans de masses, la gran extinció?”, [*Mass media - the great extinction?*], Carlos Scolari (2009) considers the aspect highlighted by Salaverría in his article, the appearance of “a new species, the *World Wide Web*.” According to Scolari (2009:15), the emergence of this new medium “led to a crisis in the entire media ecosystem, and even threatened a few historic media specimens with extinction.” **Since the advent of a new medium in an ecosystem, the rules have changed and the old species must adapt and survive.** At the end of the article, Scolari also refers to the appearance and emergence of a new *New Media*: mobile devices. By joining the digital network, mobile devices have become a medium which can be used to watch television, listen to music and read the latest news, among other possibilities. According to Scolari, for scholars of communication, this event, coupled with the Internet, is very important, because two new types of media have appeared in just fifteen years.

In short, **a new medium, the digital medium, is playing a role throughout this complex ecosystem and the related process of convergence. As a clear example of this medium, the Internet is becoming the leading medium.** Some experiences are beginning to combine television and the Internet, and all this is taking place thanks to a series of factors that are converging, such as digital literacy, generous bandwidth, which provides enough speed for comfortable surfing of the web, the technologies offered by Web 2.0 and the fact derived from this that the user becomes a broadcaster of content and that authorship is no longer singular, but instead shared or plural.

With regard to technological convergence and the highly necessary process of digitization, Ribas quotes Emilio Prado:

“The fact that all the media in a multimedia application are digital files that are uniformly manageable by the computer system that contains them is what gave real meaning to hypermedia applications. Technological convergence naturally implies the possibility, or the inevitability of the use of all types of media: ... (technological) convergence would be unfeasible without digitization that enables the unique manipulation of all kinds of information sources, i.e. no matter whether the information is originally audio, video, graphics or data as thanks to digitization, it is all bits” (Prado, 2003: 3).

As can be deduced from the paragraph above, the key factors in the real implementation of this technological convergence are the digitization of the various media (data, voice and image), and the transformation necessary in order to standardize transmission.

According to Salaverría (2003:39), digitization and the advent of interactive networks have been the main destabilizing factor in the media, and have become a challenge to which the media

must respond. This is because lifestyles and the consumption of information by the public in particular are changing rapidly as a result of driven by the digital revolution. Multimedia convergence calls for new languages and ways of producing information and it is to be anticipated that as these coordinated information strategies are consolidated, the interactive digital media become will more prominent due to their adaptability and flexibility.

Meanwhile, digitization is a phenomenon that is affecting the processes of production and distribution of information (Pons, 2008:12). This process is characterized by the appearance of:

- Textual media based on binary code (which unlike traditional media, enables endless manipulation and reproductions of the text, with no loss of information).
- Devices for the production and distribution of information based on binary code (computer-assisted publishing, non-linear video editing, etc.).
- Exchanges of information through networks based on data packet transmission (the conceptual and technological foundation for the Internet).
- New ways of organizing production (company-network) and new logics for the creation and transmission of information (point to point networks, open source code, etc.).
- Convergence of languages, media and businesses.

