Audiovisual and multimedia contents on the curriculum of Library an Information Science at the University of Leon (Spain)

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Abstract

The University of Leon, inside the Studies of Library an Information Science, lectures two subjects which contents are addressed to the knowledge of audiovisual and multimedia documentation.

The purpose of the subject Analysis of Documental Content is the treatment of the documental messages and how to retrieval them. The third session is focused on the representation and the retrieval of sound, visual, audiovisual and multimedia documents. Before approaching the documental analysis of the audiovisual document, it has to be exposed the peculiarities of the sound and iconic codes. Then, we introduce the students in the analysis of the audiovisual documents, as well as mixed image-sound, diachronic and non decodificable documents, directly through the senses. Finally, the peculiarities of the digital document are taught, where it is very important its characteristics of multimedia, text integrator, image and sound. The separation between content and support makes that these documents, besides mixed (different codes), be distributed (in many files) and be dynamic (easily modified). These characteristics involve new necessities of treatment that are outlined as corollary of this subject.

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The subject Multimedia Documentation has as a main goal to introduce the students in the elements of the multimedia documentation; that is, the analysis, treatment, conversion and management of sound, image and video documents, used as information transmitter or knowledge transmitter elements. In a first session, there's an introduction to the materials, to the associated hardware elements, and to the management and obtaining of the characteristics of the integrating elements in a multimedia environment. In a second session it is established the techniques of the model of multimedia documentation, where the student learns to integrate the different elements that he will employ in the practical development. The basic models that are used are the ones addressed to the interface, to the provisional characteristics and hyperlinks. Finally, multimedia applications are made, and they allow to prove what was done during the model process.

Introduction

The University of Leon, inside the Studies of Library an Information Science, lectures two subjects which contents are addressed to the knowledge of audiovisual and multimedia documentation.

The purpose of the subject Analysis of Documental Content (2nd course) is the treatment of the documental messages and how to retrieval them.

The subject Multimedia Documentation (3rd course) has as a main objective the introduction to the students in the physic elements that integrate the multimedia documentation, as well as the analysis, treatment, conversion and management of sound documents, image and video, used as information transmitter and knowledge transmitter elements.

Along with the teaching of the first cycle, the University of Leon has offered during this scholar year 2002-2003, a doctorate course named *Photographic Archives, graphic documentation centers and image banks. The representation and the retrieval of the photography*. Equally, there have been courses on university extension: *The images in the documental world* (march 2001).
We will focus the exposition on the contents and strategies used in the lecture of two subjects mentioned above. The appearance of the optical storage media, have generated books and multimedia material. On them, text, images, videos, voices and animations, are integrated in an interactive form, in order that the final user be able to move freely.

Professional people from information areas have to acquire responsibility in the representation of the messages, in different codes that create the multimedia documents, in order to retrieval them, and at the same time, it has to create contents on the web; contents that will be each time closer to multimedia. We are interested in studying the multimedia document, from both sides: from its documental treatment and from its management and composition.

2.- The subject Analysis of Documental Content
The subject Analysis of Documental Content (ADC) is meant to teach the students, the rudiments for the abstracting, as well as the foundation of the indexing. It is divided in three modules: The first one is about the theoretic parameters of the ADC; the second module is focused in the ADC of the bibliographical documents, starting with a block about the abstracting and following

another about indexing. The third module attends the ADC of the sound, visual, audiovisual and multimedia documents, specially those peculiarities that have an effect on its treatment.

The order of teaching the contents is not arbitrary. First, the theoretical parameters of the ADC are exposed, as well as its conception and relation with other Content Analysis. The latter topic is related to the Information and Documentation, and its relation to the Information Retrieval and Documental Languages.

In the second place, it is taught the ADC of the bibliographical documents for many reasons:

1. Because the students are more familiar to the verbal code of the textual document and its treatment; all of them have sometime realized any abstract or have underlined main ideas of a text.
2. Because the verbal code permits generate phrases from the text, and use them for the abstracting or the indexing. We have to identify the main concepts, because their formulation is already in the document. The indexing we elaborate in this subject, is indexing of concepts, free, with natural language.
3. In order that the students understand the relationship between indexing and retrieval, and the necessity of measuring its quality, it is easier to exemplify through bibliographical documents, because the students have been users of libraries, and they're trained to search these kinds of documents.

Once assimilated the fundamental concepts of the abstracting and indexing, it is due to teach the students the methodology they have to follow, about the representation and retrieval of the sound, visual, audiovisual and multimedia documents, that will conform the third module of the program.

The spoken speech of the sound documents is translated to the written language, without any problem, just the diachronic character, as well as the necessary mediation of reproducing equipment.

In respect to the image, of direct impact sometimes, we have to relate it with the main singularities that determine its treatment: its iconic code, its synchrony, and its polysemous character. This previous reflection is essential, before approaching the analysis of the audiovisual and multimedia documents.

The audiovisual, mixed and multimedia documents, are finally studied, once the treatment of the documents is analyzed, through a transmission code of the information.

2.1 The transmission media of the contents and its repercussion on the ADC
The systematization of the documents, in relation to the code used, is important in the Documentation, because the different codes and the different disposals of the messages in the supports, determine the treatment of the contents and its retrieval. The codes we mentioned above are the following (Rodríguez Bravo, 2002:112):

- In the case of the *writing*, we find out the textual documents or written documents, by now in paper mainly, and with that, they would be equivalent to bibliographic material or printed material. Nowadays, textual documents are put in appearance in digital documents.
- In the case of the *sound*, we find out the sound documents that include discs, cassettes and Audio-CD's, mainly.
- If it's the *image*, static or in movement, the photographies are grouped, as well as films, slides, etc.
- Finally, there are *mixed documents*, recently audiovisual, but the digital document allows the integration of the sound, visual and textual document, and even when the last one predominates, each time the multimedia tendency is bigger.

A decade ago, the main opposition used to be established among the documents in paper and the rest of the documents, that were a result of the technical advances of the XX Century. However, nowadays, the main opposition is the one between analogical and digital media, between atoms and bits. (Codina,2000:21-22).

Analogical media are characterized by the representation of information through a relationship of similarity or analogy. There's a certain similarity between the information and is codification, even when it's remote. On the other hand, in digital media where series of bits are use to represent the information, any similarity between the information and its representation is destroyed. The same for a text, a photography or a video; they're series of zeros and ones, for the computer; that is, they're represented the same way.

On the analogical media, however, each morphology or code, and each support of the information demands a proper way of codification. In fact, no analogical support results adequate for all the morphologies of the information at the same time. On the contrary, digital media can contain any morphology of the information and any combination among them.

In the presence of this new reality, we have proposed the next classification (Rodríguez Bravo, 2002:115):
1. *Analogical documents directly decoded*: we talk about the graphic and bibliographic documents that don't need mediating equipment in order to access to its message. Its support is the paper or similar, tangible support, and very stable.
2. *Analogical documents that aren't decoded* directly via the senses, but that need reading equipment: slides, videos, discs, etc. Its support is tangible and kind of stable.
3. *Digital documents which support is tangible* but not of great direct impact, that needs a computer and readers. They're the CD-ROM and the DVD. The stability of its support is also medium.
4. *Digital documents which supports is tangible,* the virtual document, that is not decoded directly, and also needs a computer and a connection to the net in this case. We talk about the documents that are spread on the Internet, and they're very stable.

We verify that these four types are also stages in the documental history. In it, it is observed the evolution of technology that the document has lived and lives, but it doesn't seem that the digital document is going to replace the others in a short term and, curiously, the book is the one that can reach more expectations of life, and it was not replaced by the audiovisual document, and neither

by the digital one. Its major ergonomics is very useful, along with the fact that the text is the main way of thought.

2.2 Some reflections about the teaching of the documental treatment in the image
Before talking about the ADC of the audiovisual and multimedia documents, we should have analyzed in depth the treatment of the codes that form them: the language –written and spoken- and the image. The image has singularities that have an effect on its treatment (Rodríguez Bravo: 2000):

The first one is its iconic code that obligates to do a translation into the verbal code, in the very moment that it's analyzed, with the previewed difficulties in the obligation of the translation of images, from concrete realities to concepts, which results frequently in the loss of signifier. The analysis of the images is always incomplete, because the step from one mean to another requires a selection into the many possibilities of the visual document.

The analysis has, as a difficulty, the fact that having to recognize and to name what appears on the image, and this work is complicated because it tries to recognize, not the object itself, but the image given. The documentaliste is supported only in his knowledge and in his cultural references, in semantics topics pointed by Vilches (1987): iconographic, narrative, esthetics, encyclopedia, linguistics-communicative and competence. We try to enforce these skills in the alumni.

The second fundamental singularity is the polysemous character of the image, and its many signifiers. An image is useful for illustrating more contexts than a written document, because the image denotes and connotes. The image is very flexible.

The indexing will not limit to that that already exists in the image, concrete concepts, but new concepts will be extracted too, and they will represent the impressions or sensations that the image transmits.

It isn't convenient, however, to exceed in these subjective aspects, which vary in relation to the universe of reference, because the user –illustrator, graphic documentalist or a person who makes television- can give the image many meanings not previewed by the photographer, nor the person who indexes. It's better not to keep away from the image's context, given by the photo note, and it's not convenient to abuse in the use of complex words.

Besides, let's consider the risk that provokes the re-usage of the images in which people appear in other contexts, different from the original, because we could be in trouble, besides the publication can be discredit for giving false information.

Evidently anonymous people are only given for extra-thematic use, but anonymity is relative. Known people can only be represented by their names and by the dedication that make them public. The third important characteristic of the image is its synthetic character, as a result of the stopping of reality, seen through the photographic object. The still image presents all the information at the same time; it's a synchronic document, it's a synthesis, and the human eye and the brain can understand its significance in a moment.

This circumstance, along with the many significances and the re-usage of the image, allows making an indexing more deep, in comparison to the bibliographic documents, because the commotion generates a deep indexing, which contributes that the level of recall grows; it doesn't have any negative consequences, but the other way around, for two reasons:

- Because the images are selected more quickly than the bibliographic documents that are diachronic and have a verbal code.
- And because the image has a polysemous character, but it doesn't mean that the subjectivity of the analyst has to be identical to the user's.

It is convenient to offer the user, a first wide selection, in order that the user himself can select. According to Joanna Smit (1987) it has been proved that "30" is an appropriate number for the user to make an accurate selection. This is valid when it can be made directly from the pictures or the digital products. If the user has to decide through his representations in file cards of analysis, by reading the descriptions and characterizations made by the documentalist, the selection will be less expensive, less secure and it will take more time.

Now, the exhaustivity will have to depend, as the indexing in any moment, on the quantity of information in the visual document and the characteristics and necessities of the users of the center. Those bizarre, scarce and most beautiful images, will need more details in their description.

In fourth and last place, we think it's necessary to affect on the transcendence of the formals aspects of the contents, the technique and the composition of the image, for its improvement. What we mentioned before is for two reasons: the first one is that the way of taking pictures has influence in the interpretation, because it's not true the assumed objectivity of the visual document. For that reason, there are fundamental characteristics that help to discriminate the represented motives: the types of shots, the structure of the representation, the light and the atmospheric characteristics, the axis of the shot, etc. And the second because the bookbinding of books and newspapers limits the election, and then, it's important to care about aspects as format, technical quality, or if it's a picture in black and white colors. The demands of information from the users and their criteria to accept the results of the searching, is not based on the represented concepts in the document, because the way it's represented is more decisive when electing. The way the still image is employed, is also analyzed in books, magazines and newspapers, and some retrieval practices are made, in image banks, as *Corbis, Gettyimages, Comstock, Age Fotostock*, etc. Then, the student is taught about the characteristics of the Automated Systems of Retrieval of the Image (SARI), conceptual (concept-based indexing) and visual (content-based indexing).

2.3 The ADC of the audiovisual documents
In the third place, students are taught about the analysis of the audiovisual , mixed image-sound, diachronic and no decodificable documents, directly by the senses, that depend on the technological development.

The documents of just one image, still, build up their messages exclusively in the space, stable in the time, that only uses the iconic code and the visual channel. The first liberation of the still image is gotten by the superposition of a sequence of the first ones, and the obtaining of images in movement. This is the basic ingredient of the audiovisual documents, among cinematography and television products (Pinto, García y Agustín, 2002:192).

Facing the textual discourse and the visual still document, the media created by mobile images and sound, pose problems in the analysis process, due to the mobile and transitory character of the emitted messages. The documentalist will be obligated to review, and the sequences will be defined and located through a chronometer. However, audiovisual documents represent a synthesis of the relation between the image and the word, because they support each other in order to solve the lack that each subsystem has.

Such as the picture needs the text of a cutline, to focus the significance of the image, here it's the sound what makes the function of contextualization of the image. Besides, the sequential superposition of images helps also to explain the messages. The audiovisual documents result more precise semantically, than the visual ones.

Because the audiovisual information is integrated by elements that belong to the image and sound sphere, its study has to be approached from a double dimension:
1.- Considering each one of the levels, separately.
2.- Considering the two levels together, observing the transformation that experience as a result of codes combination.

The analysis of the contents of the audiovisual documents is really complex due to the juxtaposition of codes, but also because of the diversity of documents considered: cinematography, video graphic and television genres. Besides, it's important considering the finality of the treatment of these documents:
- Unitary retrieval of videos, DVD's, etc. in libraries and other unities of information.
- Independent retrieval in informative micro-units (sequences, scenes, shots, etc.) of news, reportages, advertising spots, etc..

This reality implies that the item could be any thematic unit of information (film, video or program, reportage, sequence or shot).
The phases of the Analysis of Contents of the audiovisual documents would be, according to Pinto, García and Agustín (2002:265), the following:

1.- Vision: implies the knowledge of the specific characteristics of the audiovisual language.
2.- Determination of the structure of the contents and documental description: about the knowledge of the different audiovisual genres and its respective pragmatics.
3.- Exogenous documentation, interpretation and documental contextualization: it looks for documental supports in order to interpret the object-document of analysis.
4.- Synthesis of all the phases above.
5.- Representation of the documental contents: development of the different documental products.

For an accurate negotiation of resources, it is necessary to establish a level of analysis for each type of document. The level of analysis will be according to the posterior exploitation that this material can have. The contents of the documents with high possibilities of being re-used, will demand a description and indexing more detailed, in order to facilitate its retrieval for any concept. This will be the case of the informative and documental programs, and the original ones of filming (Conesa:2000).

In the case of a news program that contains many reportages, we will have to analyze, as an item, each one of the news or reportages, as we would do with the articles on a magazine.
The conceptual or semantic analysis of the reportage can be similar to the analysis of a textual document. If we compare the documental analysis of the same news, published on a newspaper, with the reportage aired on television, we will find out very similar elements of content description; but the audiovisual document is analyzed in a second level, describing and indexing the concrete images that it contains, which can or can't be directly linked with the global document (Conesa: 2000).

An average description has to include as a minimum, the description of the sequences more relevant, indicating the name of the personages, identifying places and describing the actions that can be developed in shots.

The difficulty in analyzing the audiovisual documents consists in having to make a difference in the theme of the documents or the reportage, frequently generic, and which is given by the oral discourse of the information, which contributes the different visual shots, always concrete of places, objects and actions.

The same with the still image, the shots are determined by big interpretative divergences, but it's necessary to describe them with the concrete concepts that exist on them by reference. The composition and technical aspects are important to indicate the type of sequence, useful or unuseful for the producer. The description of the images has to include: the type of shot, the movements of the camera and other formal aspects. In order to facilitate the localization of the images it is necessary to indicate the focus of the document (code of time) in which every shot or sequence is localized.

The automatic analysis of video images has to use the trans-codification from image to text, if it's developing six areas of researching: automatic recognition of images; temporal segmentation of sequences; analysis of camera movements; identification of values of framing; sound analysis, and automatic abstracting .

Practices of documental treatments are made, using many television programs, previously recorded –one informative, one documental and one entertainment program- and the formats of Spanish Television (TVE) for the analysis of the programs that will help to pick up all the important information. A cinematography film is indexed and resumed the same way. Besides, it has to access the main image and sound banks, as well as search engines on the www. That is the case of the *Footage.net*.

2.4 The ADC of the digital/multimedia documents

Finally, the peculiarities of the digital document are approached, and its character multimedia, text, image and sound integrator.

Lately, we've experience a transcendental phenomenon: the immigration of textual and audiovisual systems to the new digital environments. Precisely the new category of "multimedia" documents appears from the combination of textual and audiovisual documents, created by the informatics environment. The digital documents combine the two transmitter channels (visual and acoustic) and the trilogy of available codes (textual, iconic and musical). The interactive CD-ROM represent the digital version of the traditional book, but the development of the Internet and the Web has given rise to an alliance between multimedia applications and the nets on line, which reach exceeds the last available documental forms.

The separation between contents and support makes that the digital documents, besides mixed (different codes), be distributed (in many files) and be dynamic (easily modified). From these characteristics, some new possibilities that it offers are drifted. Their strong points are their great capacity of storage, their virtuality and accessibility on distance and their actualization. Their weak points are the difficulty of conservation of their messages (the duration) and the major difficulty that it represents to guarantee its integrity and authenticity. The facility that the messages have to change support and its simple manipulation, is in the origin of its advantages, as well as its inconvenients.

Linda Schamber (1996:669) characterizes the digital document as the following: it's easily manipulable, it's linked internally and externally, it's quickly transformable, it's easily accessible, and it's instantaneously transportable and infinitely replicable. From these characteristics it is deduced that the first difference of digital documents, in respect to the analogical ones, is that in which the first ones produce a disassociation between the support and the content.

The peculiarities established by Schamber are referred to the contents; the supports have lost relevance, in fact, the messages that it contains are copied easily in the other support, which makes them transformable or manipulable and transportable. In the digital document, the spatial and temporal limitations have disappeared. Now, the preoccupation is oriented to localize them in the limited digital jungle, where the content is automated on a mosaic of elements which sense is built up freely by the user, thanks to the hypertext.

In this context appears the preoccupation for the auto-description and the concept of metadata, notion that includes the information over the content and the context of the digital documents. Nowadays, the major lack of the Internet is a universal system of a label process, representation and structure of the information that allows the searching and the automatic process more accurate, of any document on the web. It is introduced to the students, to the knowledge of the different models of metadata, with special attention to *Dublin Core Metadata*.
Only for the analysis of contents, it is useful to classify the digital documents into three types: (Pinto; García and Agustín, 2002:314-315):
1.- Digitized documents
2.- Softwares
3.- Multimedia documents

In the first group are considered those documents that require a simple translation to formats, supports and media of digital reproduction of messages, that are textual, sound or visual documents, and therefore, they require the analysis of the content, proper of its code, picking up the media, formats and digital support.

Softwares are tools for processing information, and they need to be identified and localized, but the lack of informative messages, and they don't require an analysis of content.
In respect to the multimedia documents, they are combining documents, under the interactive tools and different communicative elements: text, sound archives, digital video, etc. In the multimedia-interactive documents, the media modifies the message, which results in a type of document, different from the analysis of the content.

In the analysis of the content of the multimedia document, will have to consider, for one way, each one of the levels or communicative codes separately, attending its peculiarities; and on the other hand, the three levels together, observing the transformations that they experience, as a result of the combination of codes. Because of the instability of these documents, the products of the analysis of contents are integrated among metadata, which favor its localization.
There are practices of description of a multimedia CD ROM, of a database and a web page.

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Web Pages

Agefotostock [on line] http://www.agefotostock.com
Comstock [on line] <http://www.comstock.com>
Corbis Traditional [on line] <http://www.corbis.com>
Dublin Core Metadata Initiative. [on line] http://dublincore.org
Footage [on line] http://www.footage.net
Gettyimages [on line] <http://www.gettyimages.com>

3. The Multimedia Documentation subject

The Multimedia Documentation subject has, as a main goal, to introduce the students into the management, in the physic device and the logic elements of a multimedia document. Special importance is given to the integration and insertion of the multimedia documents into new documents, and into many other applications. It's about defining the concept of multimedia as the integration of the media, interactivity and digitization.

The students are asked to have just a minimum of knowledge, in order to take this subject, such as the management of an informatic system on a user level. The students have knowledge of creation and using of web pages, and they know the techniques of information searching, that allows them localize resources on the web.

The concept of Multimedia can be considered under three points of view:

- Multimedia as integrator of hardware, that is, as the necessary equipment that permits the user introduce himself in this environment.

- Multimedia as integrator of software that permits exchange file cards and archives between them, generating codes, making up programs, etc.

- Multimedia as integrator of media, making reference to those efforts of the media for integrating their services along with the informatic platforms.

In respect to the contents of the subject Multimedia Documentation, it is structured in two blocks. In a first block, introduction to media, the students analyze, manage and describe the different elements that are integrated in a document multimedia, on hardware or software level.

In a second block, it is described the process of the multimedia development, as well as the techniques of analysis and model of the documentation, according to the focus or vision that

requires to be employed. Two multimedia applications are also managed, but the way it works is different.
On the practice development, the student uses different applications that allows him treat the different elements that are analyzed in the development of the class.

3.1 Elements that integrate the multimedia document

In the first block, the different ways of obtaining of the necessary resources are defined. We divide these resources in text, image, sound and video, and they are described with the peripheral employed in their acquisition.
In respect to the text element, it is defined and characterizes the different types of letters that a program can manage. They're classified and their mode of use is described, as well as its installation and its maintenance.

Into the elements of obtaining text, the dictation systems and the techniques OCR are important. The first ones are based on the sound, and it is described the philosophy of working of the recognition character systems, that consist on translating the data from a digitized image into characters, legible by any processor or application in text management. Such process is divided in three parts:

1.   Process of the image, that permits its obtaining
2.   Recognition of patterns where the OCR begins the detection phase of the character of the language, comparing the image with the letters of the alphabet.
3.   Interpretation of the image, where the visual element is translated into text.

The basic device to analyze is the scanner, as a system of digitization of information, which allow us make the introduction to the next element, the images.
In the analysis of the image, it is realized a distinction between the different types of images that we can generate, and this way, the bitmap images and vectorial images are described, then, we establish their main differences. We also describe the different formats that we can find, size of the picture, format, resolution, number of colors, etc. Some of the formats that we consider are: bmp, .pcx, .tiff, .gif, .jpeg, .eps; they're very common and easily integrated in other environments. The different forms of integrating the images in the application are analyzed, such as: the treatment of the text, the auto-edition applications, presentations and other HTML documents. They are described many treatments that can be made with the images, from many applications in image management. We are talking about *PhotoShop* y *PaintShopPro*. We make adjustments, selections, format conversions, layout management, filters, procedure automation and storage.

It is very important that the student knows how to obtain or extract information from the archives, as well as the characteristics of the archives that it can generate. In many cases, the level of information that is managed, is purely informatic, pointing out the extraction of the characteristics of versions, formats, conversions among different formats, records of actions, obtaining of a transparent background, insertion, creation of new elements and its configuration, etc. It is also obligated to point out the obtaining of the images from the screen, whole screen or those different objects that form a graphic environment (this permits the realization of multimedia manuals for final users). In the associated hardware section, we have to point out the

characteristics and the configuration of the graphic system of the computer; this computer is the union of the graphic card and the screen. Its configuration permits us improve the visualization and treatment of the images. Other peripherals analyzed are the digital cameras. In all of them, the procedure of acquisition and storage is defined.

Finished the description of the images, it is analyzed a superior level of animations, as well as its creation, typical formats and characteristics, description of its properties, addition of effects, insertion and control of time of execution.

Having made the image section, the analysis of the *sound* is started. The students create their own archives, from simple applications of recording, what permits to define the main properties of the generation of the sound.

The process of digitization is described, as well as the definition of the quality of the sound, the conversion between formats and definition of characteristics (number of channels, amplitude, frequency of sampling, number of bits per random sample, etc.). Then, the sound archives can be downloaded, taking parts from them, and then, insert them in many applications, such as text treatments, documents HTML, etc. The students extract or generate the archives, defines its duration, converts them into other formats and applies to them some effect.
On an associated hardware level, the sound system of the computer is described, pointing out the sound target, the megaphones and the microphone.

Another element to analyze in this first block is the video. Different formats and characteristics of it are described, as well as the conversion among different formats and its treatment. We have to point out the elements that permit the creation of the compression and decompression formats of video (the codecs: description and installation). The definition of the standards of video is given, as well as the obtaining methods for digital video, its configuration and its definition. The formats are: MPEG, AVI, etc.

In the hardware of acquisition we point out the characteristics of: cards of video capturing, WebCam and digital video cameras.

The last element to tackle is the definition and creation of hyperlinks, both in a single document or among other documents. Many applications are employed: text treatments, web documents, presentation documents, etc.

To finish this block, and having on mind the size of the file cards generated, there is the necessity of the storage systems of more capacity; among them, we point out the optic systems of recording information, and the most representative technologies of them. We also describe the many different types in the technology: CD and DVD; determining the types of data that can be stored and its structure. We also define the removable storage systems, as well as the backup systems

3.2   Process of a multimedia development

In a second block we describe a description of the phases of a multimedia development. The students analyze, define and describe formats of distribution of contents, as well as the way of doing the integration of the multimedia elements.

We try to introduce the students in the employment of a methodology or a software engineering that allows to organize and distribute the information.

The analysis is focused in the description of many techniques employed in a model of multimedia and hypermedia documents. We describe many diagrams that permit model all the characteristics and elements of the documents, such as:

- The presentation of the contents to the users, what we call interface with the user.
- The synchronization among its components (specially audio with image) that describes the temporal distribution of each one of the elements that integrate the application.
- Finally, the possibilities of hypermedia navigating.

All that permits the definition of different scenes or blocks in which we divide or structure the content of the application.

The definition of the interconnections among the different areas of contents is made by outlines or structures of graphs, that define both the form and the structure of navigation that is meant to be employed. Among them we can point out many models, starting with the most simple, the linear, and increasing its level of complexity with the hierarchical (no linear and compound).

The analysis of the description of the presentation of the content to the users, is an equipment oriented to the interface with the user, and in it, it is described the distribution of the contents and the different elements that integrate it; for each interface with the user, it is developed a model of blocks and each one of the elements is described: localization of buttons or groups of buttons, localization of image zones, text and video zones, etc. In many cases we can make a major description of them, such as: font size, image size, etc. and from other documental data, as obtaining sources, treatments, etc.

The temporal analysis describes the development in the time of the execution of the application, that is, it is defined as the sequence of appearance or execution of the different elements that are contained in the application; we call it the temporal synchronization diagram. This type of scheme is applicable generally in audio, video and animation format. It's needed a graphic in a bar form that describe in the horizontal axis, the duration of each one of the elements that are presented in the vertical axis.

The base of development of the subject of multimedia documentation consists in pointing out the previous process of the analysis and conceptual design of the different aspects, mentioned above: the ones oriented to the navigation, the ones oriented to the interface and the temporal development of the contents.

The practical part allows, on the other hand, knowing the characteristics and management of the many types of applications for the multimedia development. This part is linked to the implementation, and allows the student to know a developing tool and the characteristics, and that can help the student improve the description of the analysis. Among all the author tools that we have nowadays, we only analyze two of them, because they have a different developing context.

One of the tools employed is the *Authorware* of Macromedia, oriented to the navigation, which is based on the discharge hierarchical diagram, where the user takes the icons to a discharge line, and defines its contents, composes pages and links the different elements, permits a sequential development, as interactive, where the user makes decisions.

Other tool employed is Flash of Macromedia, based on the definition of scenarios and in the temporal description of the different elements or layouts. Both applications have a programming language that extend its action camp.

The development of the subject is a practical element. Much of the theoretical contents are taught through seminars, and the student makes the development of an application, from the analysis level, employing the many techniques of model, seen in the course. The practices are developed in three groups of 2 or 3 people and they have to present at the end of the descriptive document, where they define the different elements employed and the formats of acquisition, as well as the documentation of the fonts where they have acquired the resources, along with model diagrams. Later, the student makes the implementation with the applications seen in class.

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