THE ROLE OF MULTIMEDIA IN THE PROCESSES OF DEVELOPMENT

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Since we belong to the time of massive changes, we may say that the education technologies progress along with the daily progress in all spheres of life. First of all, education has become necessary more than ever. In addition to classical education, there is a need of attaining new knowledge, both at school and university and then later at work. It is estimated that every worker must go through the process of attaining new knowledge and completely new skills at least twice during the professional career. This is the result of constant changes of technology and procedures at work. The introduction of computer technology in almost all fields of human life is an example that illustrates this best.

In this paper author seeks to present the importance of IT for education in development processes. In order to be accepted in the cyber world, as well as in real life, we must respect the basic ethical principles. The Internet is not, as many people think, an anarchic place – there are certain rules that must be respected.

The Internet with its fast computing infrastructure development has enabled people to connect and exchange data anytime, anywhere.

In the modern media culture, the audience gets more and more demanding and therefore it is obvious that multimedia is a reasonable response to this challenge. Same data, information and databases may be represented in different ways, by combining various media so that each of them affects appropriate sense. One thing that connects all of them is that they have been digitalized and represented as an organized structure of bits that can be further processed using software, be archived in computer memories, transferred via networks and displayed on the monitor. Thus, this common digital representation of media enables them to be combined and integrated in a whole that is called multimedia content (document). Multimedia content must be in the first place created and then transferred to the user in two ways: *online* (transfer via computer networks) and *offline* (via memory devices, most of all via portable compact discs, i.e., CD-ROMs and memory sticks).

Key words: IT, sport, multimedia, technology, education

Introduction

The information and communication technologies are combined into a single – Internet technology. This technology affects economic structures of specific national and international global systems in general. It also affects all dimensions of economy by keeping the standards that were developed during the era of industrial economy and at the same time by leaving space for individual, group and national differences to be more emphasized. It also comes to the so-called digital division to those who can take advantage of the competitive preferences of modern information and communication technologies on one side and those who cannot, on the other side. In terms of so-called "New economy", the center of manufacturing shifts from material sphere of providing services and thus, information becomes the basic business resource. [597]

We use term multimedia when we talk about pieces of information that have more than one meaning. For their perception we use several senses at the same time because they use different media to spread out and exist. Unlike text, the information in multimedia is represented by an image, sound or video. This way we get richer and better presentation of information.

The multimedia has begun when a piano was introduced to a silent movie. Since then, multimedia has been defined as a combination of different media: text and image (image, icon, animation, film), text and sound (music, speech), text, image and sound. The integration of media had been present long before first computers and TV shows appeared. However, complete integration of media took place with the appearance of computer technologies along with a huge step forward in terms of quality compared to its previous forms.

In the modern media culture, the audience gets more and more demanding and therefore it is obvious that multimedia is a reasonable response to this challenge. Same data, information and databases may be represented in different ways, by combining various media so that each of them affects appropriate sense. One thing that connects all of them is that they have been digitalized and represented as an organized structure of bits that can be further processed using software, be archived in computer memories, transferred via networks and displayed on the monitor. Thus, this common digital representation of media enables them to be combined and integrated in a whole that is called multimedia content (document). Multimedia content must be in the first place created and then transferred to the user in two ways: *online* (transfer via computer networks) and *offline* (via memory devices, most of all via portable CDs, i.e., CD-ROMs and memory sticks).

Modern technologies use visual and sound effects to interact with people. Just imagine if we could transmit information about touch and smell together with sound and video. It would certainly be a huge step in the development of human race. On the other hand, if we take a look at the knowledge about human brain that we have today, we may conclude that we won't wait long for that to happen.

Multimedia communication is simultaneous use of multiple media or different means of communication (combination of text and photo, i.e. image, graphics, etc.). It is about the conceptual integration of technical and software dimensions within a single digital information environment. They are parts of the global

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[597] Željko Panian,"Challenges of e-business", Narodne novine, Zagreb, 2002.

media culture, and this is how Francis Ball defines media as:

"*Technical equipment that enables people to communicate and transmit thoughts, no matter what their form or their final aim*". [598]

So, the term multimedia concerns any combination of two or more media in a digital form that are firmly combined and can be presented in the same interface and be controlled by a single computer program. Interactivity is one of the most important features that makes digital multimedia different from other forms of combined or multimedia content.

1. Multimedia
The basic criteria for multimedia are:
a) the data within the different media is integrated,
b) the computer processes and controls it,
c) the multimedia user is exposed to a multisensory experience; multiplied presentation of interpreted information,
d) the integration of a user and computer is of core essence when it comes to differing sequenced multiplied media from multimedia,
e) the information presented by multimedia is a symbolic form of symbolic knowledge that gets its importance with interpretive approach of a user and thus multimedia information triggers self-cognitive constructions.

In 1994, Gibbs and Tsichritzis classified these multimedia applications as follows:

- Interactive video disc,
- Video games,
- Hypermedia – browser,
- Multimedia presentation,
- Multimedia authoring systems,
- Multimedia mail system,
- Desktop video systems,
- Desktop conferencing systems,
- Multimedia services,
- Multimedia operating systems and
- Multimedia production tools.

Multimedia applications are classified according to their composition, synchronization, interaction and integration of database.

Multimedia content is classified into the following operating systems:
- Hardware components (video disc, Desktop Video, Desktop Conferencing),
- Functional content (games, presentations, Browser),
- Tools (authoring systems, Mail, Conferencing)
- Infrastructure output (Service 1.2 The educational functions of multimedia

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[598] [598] (Gone 1998, p. 15).

Multimedia has specific educational functions. These functions allow easier access to many sources and different types of information (data, texts, movies), time and money are saved compared to buying huge textbooks; richness of information leads to confrontation of different thoughts which can again stimulate creative thinking and intellectual involvement. These functions also supplement use of textbooks. They allow us to connect audio-visual content with text, interaction and individual approach (each student may use his own approach to studying, it is possible to be evaluated, go back to the points where student performed badly and focus on research of fields and concepts of advanced learning.

Picture 1. The elements of multimedia, Text, sound, i age, animation, video, interactivity.

The typical business applications are sales and marketing presentations, catalogues and presentations of products, staff training, direct marketing, retailing and information about the point of sale. The entertainment multimedia applications are a desired video, music, games, guides, home shopping, home entertainment, services via cable and phone.

Multimedia encourages purchasing so that the consumer uses multimedia applications while shopping. Multimedia is involved in the communication services and all thanks to the new generation of digitalized phones and cable systems which enable V-mail business systems (video mail), desktop video conferencing, networked multimedia and distance learning. Bodendorf (1990) classifies multimedia programs according to their interactivity methods within the following contents:
- Providing help (learning through instructions)
- Passive tutor or guide (self-study)
- Training (learning by practice)
- Active tutor (guided learning)
- Simulation (discovery learning)
- Game (learning by having fun)
- Problem solving (learning by doing) and
- Intelligent dialog (Socratic learning).

In the monograph "Mass media and education", Jacques Gonnet raises a dilemma of written word against the audio-visual and he defies the authors who identify AV civilization with the decadence of culture. He also defies "the experts who believe that the development of new technologies will solve all of our problems." (Ibid, p. 9)

2. E-learning and multimedia

The process of learning adapts to the digital age, so that e-learning is often called "learning for connected society". New trends in the development of communication indicate the beginning of mobile learning (m-learning). Psychologists, sociologists and pedagogues mark the generation of students that were born during the era of Internet as the Net generation. There is a huge variety of books of Anglo-American researchers about how this Net generation behaves and learns.

"*The students of Net generation prefer to learn by doing more than to be told what to do. They learn well through discovery learning, both individual or with their classmates. This research style trains them to accept information better and then use it in a creative, thoughtful manner.*"[599]

"*The new generation of students, so-called Net-generation, requires a new approach to learning. Modern trends are often represented in the "student-oriented" approach. Now it is more than just an adjustment to different styles of learning or allowing students to change font and background color; it is handing over the very control of learning to the students.*"[600]

The Net-generation is more comfortable in the environment of images than environment of text. Researchers predict that the Net generation students will refuse to read long texts, for example a long homework or a long instruction. They like to do something rather than just talk and think about it.
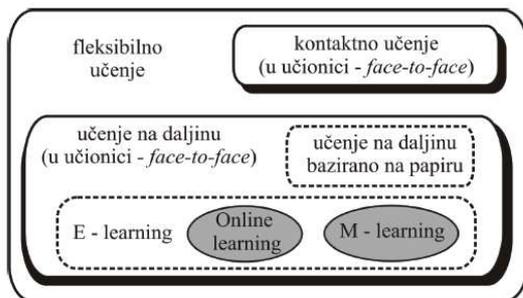
Picture 2. Flexible learning

E-learning has been present for more than fifteen years and it is seen as a flexible (mixed) style of learning. It is a kind of relief since all information and communication devices can be used (computer, CD-ROM, digital TV, mobile phones, etc.). The communication technology enables use of the Internet, email, forums and systems for collaborative learning. E-learning is also used for distance learning via Internet (online learning).

M-learning is a learning style when students use mobile devices such as mobile phones, laptops and pocket PCs. M-learning and online learning are the two subcategories of e-learning. All three of these categories belong to distance learning.

Unlike distance learning, face-to-face approach enables direct contact between a teacher and student and it is therefore called direct instruction. These styles of learning are all more or less combined with the face-to-face style to make a mixture called blended learning. LMS (Learning Management System) is the technology used to organize and deliver online courses. This type of software has become inevitable in the learning environment. Looking for new options to satisfy their needs and desires, students affected the Internet in the same way it affected them. Huge parts of the World Wide Web took over some features of communication networks and the very Web has transformed from what was called "The Read Web" to "Read-Write Web" whichin the end was the wish of its creator Tim Berners‑Lee. Members of this development Web often call it Web 2.0.

"At the end of the 90's of the 21st century, development of XML technology started changing the way web pages were created. *XML technology made it possible for content to be shared and transferred between different systems.*"[601]

This way the Web has been transformed from medium where you store, keep and download data to the platform where you can create, share, mix and transmit data. People today use the Internet not only to read books, listen to radio, watch TV but to have conversations, exchange pictures and other multimedia content. The world of blogging is the best example of this. A blog (shorten from website log, weblog) is a website that displays articles of one or more individuals in a chronological way. It usually focuses on a certain topic such as politics, professional topics, food, etc. It combines text, images and links with other blogs, websites and other media relevant to the specific topic. Blog has some attributes that make it different from a standard website. Designing and maintaining a blog or adding articles is called blogging. Blog articles are also called posts or entries. The person in charge of a blog is called a blogger. Blog is a medium that stretches between email and Web. It is a piece that communication chain has been missing. It is closest to the initial idea of the Web being a medium for reading and writing.

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[599] (Tapscot, 1998).
[600] (O'Neill & McMahon, 2005).
[601] McManus & Porter, 2005.

Picture 3. Multimedia content

There is also a medium called Wiki which allows all users who visit it to freely create and post a website (or download the existing page) using a Web browser. It is simple and easy to do using basic rules of organization. The term "wiki" was taken from the Hawaiian word *wiki*, meaning quick. Wiki is a simplified process of creating HTML pages combined with the system that keeps track of changes made so that it is possible to bring back the initial state of a page anytime. The first wiki was created in 1994 and published a year later by Ward Cunningham which called it *"Quick Collaboration Tool"*. Wikipedia is a huge, free to use and edit encyclopedia in many different languages. Its web address is http://wikipedia.org.

In addition, there is *podcasting* – distribution of audio and video program over the Internet using Web feed technology RSS or Atom for listening via mobile devices and PCs. Podcasting is a coined word of words *iPod* and *broadcasting*. Broadcasting is the term that concerns distribution of audio, video and programs to a large group of listeners or spectators. TV and radio stations are the ones who are involved with broadcasting. When this distribution happens via the Internet, we use the term *webcasting*. The term *iPod* stands for a portable music player. The *Pod* acronym stands for *Personal On Demand* which means that we can play our music whenever we want. Prefix *i* stands for individual use and for all the features required to connect to the Internet. The core of broadcasting is to create content (AV) whenever, wherever the audience wants to listen to it.

M-earning is e-learning where access to the study material is enabled via PDA devices and mobile phone. Typically, e-learning is described as learning anytime, anywhere but with the access to a computer and Internet connection. M-learning doesn't require this connection but a PDA device and a wireless network.

Strict oral presentation or presentation of study materials in a form of texts usually causes overload of information or creates difficulties when it comes to keeping students interested. Receiving information via a single communication channel hinders creating associations and connection of new information with the old one.

However, if we combine text, sound and video to present information, we will keep students interested longer and create higher possibility that students will correlate different forms of information.

Teaching materials of visual, audio, AV and multimedia content can be successfully used in education.

Visual content may be in the form of text, drawing, image, graphics, models, or scaled models, etc. Audio content is an oral presentation or speech, background music, various sounds, etc. AV content combines audio and visual content, often as a TV show, movie or video recording. Multimedia content combines text, image, sound, animation and video recording.

It is necessary to take care about the principles of efficient application of multimedia elements such as image and animation. The positive effects are:

- Attracting student's attention,
- Higher level of interest, motivation and satisfaction of students,
- Better comprehension of the content and more efficient memorizing of new terms,
- Retentive memory of the content and possibility to apply knowledge in new situations

3. Tele-teaching

Tele-teaching is the term used to describe transmission of a lecture from one classroom to another distant classroom.

There are two basic ways to do this. The first is video-on-demand. Lectures are stored on a server hard disc and divided into smaller parts. The user downloads and examines the lecture he wants. We are not able to carry out this learning style at home due to the inappropriate network infrastructure. However, this is possible where there is a fast Internet connection.

The second way is teleconferencing. This concerns two sides that are involved in a conversation at the same time but are distant. The interactivity goes through live streaming and sound. Often a lecture takes place at one spot but students from one or more distant places are involved.

Picture 4. Teleconferencing classroom

Teleconferencing requires expensive infrastructure. It is necessary to have a teleconferencing classroom available. It also requires a good sound system, high quality cameras, video projectors and computer assistance. This means a high price of equipment for a classroom of this type which further raises a question of

profitability. The outcome is essential since lectures can be transmitted from better universities and this is how we get better education.

Conclusion

Multimedia with its existence and development continually poses new challenges to technology. There is a need for faster signal sampling, more efficient ways of coding, better display, faster supplying, search, transfer and access to data. "*To be faster and have more*" are the most important requirements. Those are the main challenges. As long as it stays that way, there is tremendous development. The other way around is something we cannot comprehend today.

In a number of multimedia applications the user just sits by his computer and does not experience live communication with other people. This segment calls forth discussions about the social disconnection of distance learning students. People acquire their individual traits only in a face-to-face communication. It is almost impossible to acquire these traits using multimedia. This is why this concern has been a topic of various types of research. It has been proven that people who do not directly interact with other people have some difficulties when they speak to someone face to face. The problem occurs when a person doesn't have enough time to provide an answer. Moreover, face-to-face communication is more than just a communication. We complement communication with gestures, face expressions and subconscious movements. We're not aware of them but we know how to understand them when needed. This gives an advantage to teleconferencing compared to other ways of communication since it is closest to the genuine communication.

The Scientific revolution as a process of simultaneous and correlated changes in science and technology has started during the middle of 20th century. Human knowledge is in the core of this revolution which is further a precondition for scientific inventions and their application in life and at work. Without any doubt, knowledge has caused a true revolution in manufacturing but in life as well. Wide application of knowledge. Science is a generator of ideas. Technology is its material representation. [602]

The job of designers is to bring interactive semantics of a user and interactive software syntax onto the same level.[603] The so-called *Human-Computer Interface* is nothing more than a local and temporary organizational form of exchange for such syntactic elements. To consider a type of direct communication as a means of conversation or as a dialog is to reduce the terms communication and conversation to their technical or purpose meant and reasonable dimensions.

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[602] Radivoje Kulić, „Content of work and education", Andragoška biblioteka, Beograd, 1998.

[603] Prof. Dr Đorđe Nadrljanski, prof. Dr Dragan Soleša, prof. Dr Mila Nadrljanski, „Digital media – Educational Software" Sombor, 2008.

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