

# MULTIMEDIA : APPLICATIONS AND TRENDS

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*On discussing the meaning, elements and rise of multimedia, the paper describes briefly the various applications of multimedia and the associated emerging trends.*

## INTRODUCTION

The concept of multimedia is not new. The nature of human communication has always involved multimedia. We hear, speak, write, draw, make gestures, play music and act out our thoughts and feelings to one another. We have enjoyed multimedia presentations since our childhood through film, television and more recently, videotape and videodisc. These have all involved analog media. What makes recent developments in multimedia new and exciting is that we can now deal with the various media in a digital format.

The digital format allows manipulation, sharing and merging of data in ways that analog cannot. It can record and edit sounds to link with images or text, permitting the data types to serve multiple purposes with a minimum of reworking. Users can programme the computer to seek files randomly, and store these different files digitally, just as any computer file. They can edit this information, eliminating unnecessary parts or adding alternative data or special effects all without expensive part production.

Any one with the right kind of computer hardware and software can play, record and manipulate various types of media. The computer permits new ways of interacting with these media. Here, again, the

idea is not new. When we scan the newspaper and select articles we want to read and then decide on the order of interacting with the print media. When we tape a television programme for viewing at a later time, we interact with television. The computer, because it sorts, searches and catalogues large amount of information so well, gives us almost instant access to requested information. It appears on the screen in real time, cutting out any unwanted material. When we tape a television programme we still must tape it at the scheduled time of broadcast. We cannot interrupt broadcast to search for other related information. The computer, however, allows us to store information for viewing at any time. We can interrupt it, repeat it, and change or enhance it in a variety of ways.

## MEANING OF MULTIMEDIA

In the beginning of the 1990s, if professionals were asked what multimedia was, most had to admit their difficulty in giving a definition. Even professional journals recognized its fuzziness. "Multimedia is by definition undefined" or "if you ask ten different people for the definition of multimedia, you will certainly get at least ten different answers" according to Wichman (1991). Specific environments made the task of defining no easier. In the workstation

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world, its meaning is "nebulous at best" according to Speed (1991). When facing a difficulty in defining a term, a possible approach is to look at its etymology. The word 'multi' in Latin means much/many and 'medium' in Latin means middle — an intervening substance through which something is transmitted or carried on. Multimedia thus is a means of mass communication search through newspaper, magazine, or television (from American Heritage Electronic Dictionary, 1991). "Multimedia is any combination of text, graphic art, sound, animation and video delivered to you by computer or other electronic means" (Vaughan, 1994). Multimedia is, thus, an expression of communication realized as an interactive exchange of information where this exchange is conveyed in any of several different forms or in a combination of media formats simultaneously.

### **MULTIMEDIA : EVOLUTION OR REVOLUTION**

Multimedia may appear to be a revolution that occurred almost overnight. In actuality, it represents the evolution and synergistic integration of digital technology with various media. The important part of the story began with the popularization of low cost desktop computers in the early 1980s. While largely used for business tasks such as databases, spreadsheets, word processing, and accounting, the computer also became a controller for traditional analog media devices such as printers, slide projectors, video editors, and music synthesizers.

By the second half of the 1980s the graphic and print industries were revolutionized by desktop design and publishing. The video industry was partially transformed by desktop video and graphics, as well as the popularization of consumer VCRs and camcorders. And the music industry was

turned on its ear by personal and project studios using MIDI and desktop audio.

In tandem, personal computers and related components such as processors, memory and storage followed the oft-cited formula of "twice the power at half the price every two years". Given the proper software and input and output devices, the computers on our desks became capable of handling many of the tasks previously relegated to dedicated media tools. Medium to high resolution graphics became a given, and many users embraced internal sound (largely as a result of the game market). Overlaying graphics on an external video signal became inexpensive and software tools for integrating and navigating these media components became more refined.

As video, the most demanding medium, recently began finding its way directly into the computer, the final barriers to comprehensive media integration began to crumble. Further enabled by standards, smaller components, and the mass storage capabilities of today's hard drives and CD-Roms, multimedia is today a practical tool.

### **ELEMENTS OF MULTIMEDIA**

- (i) **Text** : Text plays a very important role and is considered as one of the most widely used multimedia components. In multimedia, text can be presented in different forms like full text, abstract form, bibliographic format, etc.
- (ii) **Still Images** : Still images are nothing but graphic images like photographs, drawings, graphs, etc.
- (iii) **Audio** : Audio is a major component of multimedia and is particularly important for presentations. By adding a sound card to a PC and using a

waveform audio digitizer board and a microphone one can record voice and link to a slide.

- (iv) **Digital Video** : It is possible to link direct video feeds but it faces a problem as it requires massive disk space and a fast processor.
- (v) **Animation** : Animation refers to moving picture or video and is widely used to prepare presentations.

## APPLICATIONS OF MULTIMEDIA

The rapid evolution and spread of Graphic User Interface (GUI) has made it possible to make multimedia application widely accessible to desktop users in home and office environment.

### Education

The benefits of multimedia are well documented by Professor James Kuelik and his associates at the University of Michigan. During the past twenty years, they have analyzed hundreds of controlled experiments on the effectiveness of computer based learning, the findings of which indicate that when multimedia is used effectively, average learning time reduces significantly (sometimes by as much as 80 per cent). Multimedia gives teachers instant access to thousands of slides, videos, sound tracks and lesson plans they ever wrote. Teachers are using multimedia to bring into their class rooms real-life examples to provide the contextual framework, important for learning. Otherwise, skills and knowledge are too often taught out of context, as ends in themselves.

### Medical Application

An individual's medical records (including X-Ray and CAT scan images) will be sent to a consulting physician located miles away. Tele medicine services address

elderly, sick or disabled people who cannot consult their doctor and get medical information and other administrative health information. Multimedia tele-surgery allows one to consult a specialist on demand for crucial and difficult operations performed through remote camera control with conforming capabilities.

### Multimedia Conferencing

The time has come when one may interact face to face, across the table, with many persons situated at different locations all over the world. Meetings are very difficult to be arranged and expensive especially when long distance travel is involved. Multimedia conferencing systems enable a number of participants to exchange information in real time using various media via voice and data network. Each participant has a multimedia workstation linked to the other over high-speed networks permitting him/her to send or receive video, audio and data. The multimedia conference uses the concept of the 'shared virtual workplace', which describes the part of the display replicated at every workstation. The advantage of multimedia conferencing is getting down to business without getting down there, and at the same enjoying all the benefits of personal meeting.

### Business and Industry

Multimedia provides business with powerful new ways to reach and service customers. Interactive multimedia merchandising is replacing store fronts with point of sale kiosks and home shopping network that have increased sales dramatically. Video conferencing permits face to face meetings without the need to travel. Multimedia teaching systems provide just in time training wherever and whenever needed, significantly reducing corporate training costs. Global networking makes these services available any time any where.

### Entertainment

Much of the innovation in multimedia sound and graphics originates in the entertainment industry. Virtual reality entertainment, location-based entertainment, motion-based simulations, large-screen film and games (based on interactive audio-visual support) are applications that use multimedia for entertainment and bring a different and more involved entertainment experience than what is available with a standard TV or movie theatre.

### Government

Government officials are turning increasingly to multimedia for solutions to problems inherent in government. Multimedia kiosks make services more widely available and enable municipalities to respond more quickly to emergencies and disasters. Video conferencing and electronic town meetings provide ways for politicians to reach, canvass and brood about their constituencies. Governments are using the superhighways to find out more about what is happening around the world.

### Publishing

Multimedia can be used for publishing greeting cards, posters, etc.

### Virtual Reality

The aspect of multimedia that has generated most commenting is virtual reality, also known as cyberspace. This uses the modelling capabilities of the computer to create a digital world which can be seen and touched. Viewing is by a small pair of LDC screens mounted in front of the user's eyes. The images supplied by the computer to each of these give rise to a three dimensional view. Adding a pair of headphones supplies 3D sound and special feedback gloves allow physical interaction.

### Multimedia CD-ROM

A wealth of encyclopedic resources is available on multimedia CD-ROMs and online via networks on the information superhighway. CD-ROMs provide the convenience of owning the resource, ability to use it on any multimedia PC network, and accessing much more and up to date information.

### Emerging Trends

The following are the trends in multimedia applications(Gaurav,1994).

- (a) Applications are going from re-engineering of existing applications to establishing new application domains. The new application may require re-engineering of user interfaces,new integration techniques, etc. The problem is that the multimedia application designers and developers do not always know what will be the future applications.
- (b) Multimedia applications are moving from a single PC user environment to either a multi user environment or to a personalized user environment using power books and other personalized tools.
- (c) Multimedia applications are designed less and less for local environments only and more and more for distributed environments.
- (d) The solutions of current application are often platform specific and system dependent. The trend is going towards open solutions, so that applications are portable across various platforms.
- (e) Media consumption is going from a passive mode of user computer interaction to an active mode of interaction

although not every user is comfortable with this change.

- (f) Media communication services are going from unidirectional to bidirectional flows. Interactive TV is the best example.
- (g) Technical improvements and changes in multimedia applications improve productivity through better collaboration opportunities, visualization of different manufacturing processes, etc.

### CONCLUSION

The growth of multimedia technology has given a new dimension to human life. There have been ongoing attempts to improve productivity of knowledge workers. Reducing paper flow has been an important area where electronic mail and groupware technology are beginning to have some impact. Meetings, whether planned, group meetings or unplanned one-to-one discussions, are another major area where productivity can be enhanced. While there is no gain saying the need for visual contact, such visual contact can be achieved without physical face to face contact.

The conferencing software always allows users to share and simultaneously edit a variety of documents across LAN or WAN. A key benefit of this technology is that it is

a lot easier to jointly review and make decision on important issues of concern in any field of life, like health, business, education, security, etc.

The technologies at the care of computing revolution have reached a point where one can envision a computing system composed of a number of elements strung together by various communications methodologies, all striving to serve the user in semi-intelligent manner.

The multimedia technology is so pervasive that a wide range of applications are under development. A unique aspect of multimedia applications is that for the first time, business applications and user video game technologies are converging towards a common set of technologies.

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