PART I

INTRODUCING MULTIMEDIA

PART OVERVIEW

Welcome to the wonderful and fascinating world of multimedia! With its numerous possibilities and applications literally carving out a new era in communications and the media world, multimedia has already made rapid strides in the recent past taken the information technology super highway by storm!

Part I, which contains only one chapter, introduces multimedia technology to a beginner and aims to develop a clear-cut and conceptual understanding of the same, by way of definitions and classifications.

Chapter 1

Components of Multimedia

CHAPTER OVERVIEW

This chapter begins with an introduction to the digital age in which we find ourselves today, followed by discussions on what is multimedia and what makes up multimedia. Next, we look at the mediums that are used to deliver multimedia contents and how they influence the nature of contents.

We also take a brief look at the exciting range of applications that have been made possible due to rapid advances in multimedia technology. In short, this chapter lays down the conceptual foundation for what we will be doing, throughout the rest of the book.

1.1   Dawn of the Digital Age

We are right in the midst of a digital age – heavily influenced by media.

Media bombards us from every conceivable arena – right from cinema theatres, televisions and various other audio equipments to computers and all the new generation electronic gadgets. We use media to communicate, collaborate and why, even co-exist!

Information has become much more powerful in the present century than ever before. The Internet has revolutionized the way the information was shared and accessed across the globe. Today, we literally – if not politically – stand as a single global entity, linked by a huge global network called World Wide Web.

Media is employed to delivering requisite information to the users, in required formats. Understood. So, what is multimedia?

The possibilities seem to be endless. Creatures of Jurassic age, even the time frame of which is unimaginable, come alive in the silver screen with their huge roars and fusses... military copters and jet fighters seem to fly right above our heads in the new CD games... professional quality music is stemming out of a serious business PC...

Now it's possible for the little tom to bring out some real jazz chillness in his own composition using computers – without even moving out of his drawing room! And 3D Software advertisements call to awaken the Spielberg in you...

Imagine the possibility of producing a movie – as good as Toy Story right from your PC! Amazing, isn't it?

Multimedia is no more a fantasy technology, exclusively meant for entertainment business – it has become a reality, a necessity and even mandatory under various contexts. It is the next generation blending of conventional media elements – to take advantage vice versa and deliver information in an emphatic and compelling manner.

While thinking about multimedia, it is virtually impossible to overlook the advancements in digital technology – that have made real life Multimedia applications, possible.

So, let us enter this wonderful and fascinating world of digital entertainment – not just as consumers, but also as potential producers!

1.2   What is Multimedia?

The term multimedia means many things to many people. To some, it is entertainment and educational CD-ROMs – like Microsoft Encarta and National geographic compendium. To others, it might be the latest 3D effect they see in a Hollywood movie or some fancy flash website they came across recently.

In reality, multimedia technology does include all of the above applications and many more.

So, what is multimedia? How can it be defined?

Multimedia can be defined as that technology which engages a variety of media - including text, audio, video, graphics and animation - either separately or in combination, using Computers, to communicate ideas or to disseminate information in a compelling manner.

If that is not enough, have a look at how the Interactive Multimedia Association of USA, defines Multimedia:

Multimedia is compelling communication, Education, Entertainment and Reference that appeals to all senses.

Perfect – Isn't it?

1.3   Scope of Multimedia – in this book

From the general definitions, it is clearly evident that multimedia encompasses a wide spectrum of applications and technology. However, in this book, we will limit ourselves to multimedia contents produced with the help of a computer.

This immediately implies that we will be dealing only with *digital media* – as only digital media is accessible via Computers. But this is not a serious restriction, as we will find that we can, after all, employ multiple mediums to deliver our media contents – like VCD / DVD Players, Electronic Audio Gadgets, Mobile Phones and TV / Cinema Films. In short, while we only use Computers to *produce* Multimedia – we may choose to *distribute* the contents thus produced via various other devices.

In a little while from now, we will clearly discuss the approach we will be taking – to master Multimedia technology.

1.4   Digital medias that make up Multimedia

Any one or more of the following media and / or a combination of these, are generally employed in all Multimedia projects:

1.   Digital Audio
2.   Digital Text
3.   Digital Graphics
4.   Digital Animation
5.   Digital Video

The extent, to which a particular kind of media is employed, is mainly determined by the nature and scope of the project.

For example, a Multimedia CD-ROM title on the great English music composer, Beethoven, may naturally feature a number of sound samples from his famous symphonies; whereas an Internet website on – say a 3D Special effects production house – will naturally feature rich graphics and many 3-Dimensional animation clips from various films it has handled in the past.
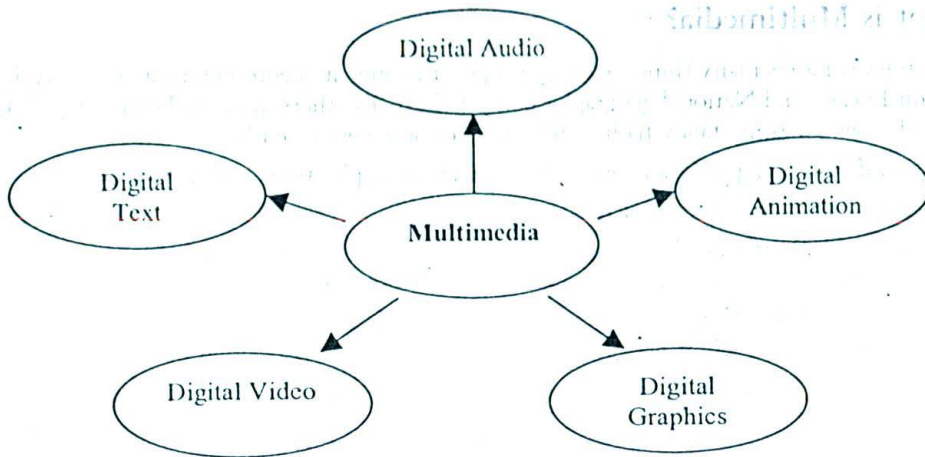
Figure 1: Multiple media elements that make up Multimedia

Let us take a high level look at what these different media elements are – as understood and implied in the Book.

☐   **Digital Audio**: Under this category, we can include digital music, recordings, speeches, natural sounds etc. Our aim and scope, in dealing with this medium, is two fold:

First, we will try to set-up our Multimedia audio system properly – so as to derive the best possible digital audio experience out of our computer.

Second, (which is likely to annoy our family members – if they are around) is to engage in various digital audio experiments, so that we can create some wonderful digital sounds and music for our own personal projects.

Part three of this book deals with almost all aspects of multimedia audio in great detail.

☐   **Digital Text**: The usual text – as seen in Websites and Multimedia CD-ROMs falls under this category of media. We will be discussing different aspects of presenting texts for various applications and mediums, with some focus on Website building – since Multimedia texts are most effective in media rich websites.

We will also be dealing with various animation effects that can be applied to Multimedia texts – so in certain sense, we also cover some ground on 2D and 3D animations.

All these discussions constitute part four titled 'Multimedia Texts'.

☐   **Digital Graphics**: Herein, we include all kinds of digital pictures - like photographic images, drawings and all other forms of art works. It's this media that makes up a visually engaging title or an attractive website; hence the extensive graphics that's bundled with almost all of the Multimedia CD-ROMs .The old adage " *A picture is worth a thousand words*", still seems to hold good in the digital age.

Our focus will be to produce digital graphics for various applications and projects. Since digital graphics is a very exhaustive subject by itself, we will have to restrict ourselves to some of the preliminary concepts and techniques.

Part five of this book is dedicated to multimedia graphics.

☐   **Digital Animation**: Digital animation is the art of producing movements to static objects. The artificial movements of texts or characters, created in virtual environments using specialised software packages – fall under this category.

To me, animations are the most interesting part of Multimedia computing ...but it comes with a hitch: It's extensively time consuming and demands tremendous artistic vision and capabilities on the part of the developer. There are two dimensional and three dimensional animations.

In part six of the book, we discuss multimedia technologies that enable us to create animations for various purposes.

❑ **Digital Video:** Digitised video contents like VCDs, DVDs and mpegs fall under this grouping.

Our scope is to learn how to digitise and edit basic videos and how to create VCDs and DVDs – so that they can be played on various players that are compatible.

Part seven is dedicated to multimedia video technology.

Perhaps, the most difficult part of multimedia computing is that all these independent media elements have to be organised as single sequential stream of information and delivered. This may not only necessitate an in-depth understanding of the nature of every media and different ways of manipulating the same for a particular project, but also a capability to make use of the appropriate kind of media, in the appropriate place, at the appropriate time.

1.5   Our approach to understanding Multimedia

Since we have quite a large ground to uncover, it is safe to layout an approach to adopt – before we embark on our learning journey. Have a look at the figure.
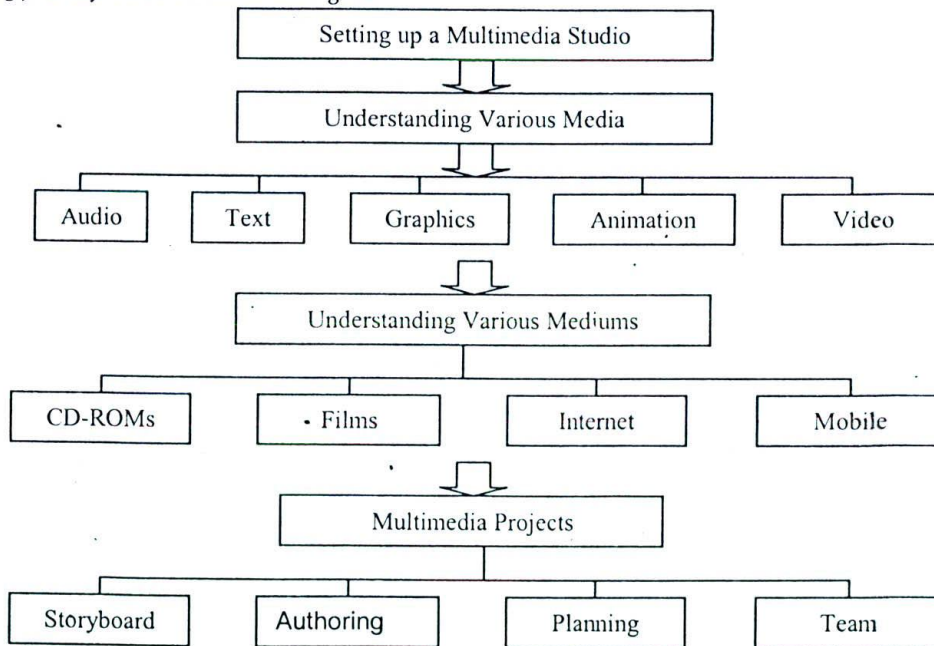

Figure 2: Our approach to understanding Multimedia

The figure should be self-explanatory.

We begin with setting up and tuning our Multimedia Hardware, so that we have a 'Multimedia Studio' – in which we can conduct our learning experiments. We then proceed with leaning each type of media – one by one, followed by various kinds of mediums available for delivering our Multimedia Contents.

In the end, we try to integrate various media elements using authoring tools to deliver some "compelling" contents. We also look at some of the project management concepts and teams that come to effect – in reasonably complex projects.

1.6 Mediums for Delivery

As indicated earlier, though our production station is going to be a Multimedia Computer, our delivery mediums can be different.

Let us try to list out some of the mediums available for us:

1. Multimedia CD-ROMs
2. Films, VCD / DVDs / other Digital Video Formats
3. Internet
4. Mobile
5. Other miscellaneous mediums

It will be interesting to analyse what kind of media can be delivered via these mediums – as it is obvious that not all kinds of media can be delivered via all of them.

You will be wondering why I've distinguished all media in Internet and Mobile mediums.

The reason is that while Text and Graphics mainly dominate the present day Internet and Mobile mediums, we already have technologies to deliver true multimedia contents via the same. For example, Macromedia's Flash technology can be used to deliver compelling Multimedia contents via the Web – but not all websites feature Flash, as on date. Similarly, Multimedia Messaging Service (MMS) is making headway in the Mobile market and will soon hit the mainstream.
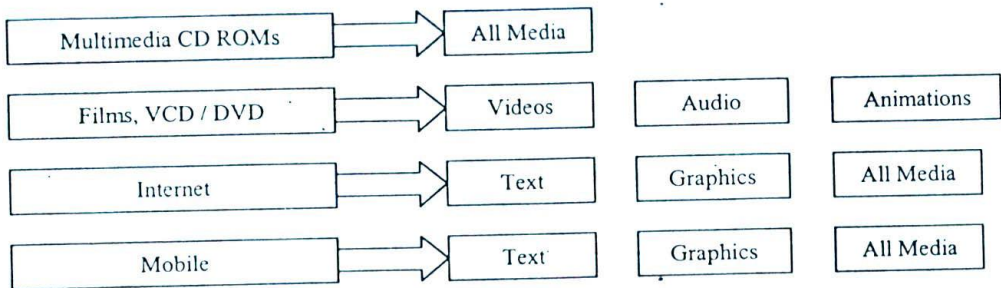
Multimedia CD ROMs	→	All Media		
Films, VCD / DVD	→	Videos	Audio	Animations
Internet	→	Text	Graphics	All Media
Mobile	→	Text	Graphics	All Media

Figure 3: Mediums and Media

While the mediums exercise their influence on the types of media that can be accommodated, what influences our choice of mediums?

The target audience and our business model, of course!

1.7 Various types of Multimedia Applications

Our discussions will not be complete, without listing various applications that make use of Multimedia technologies today. While doing this exercise, we will also try to include what sorts of mediums are used to deliver the same.

1.7.1 Interactive Applications

1. Multimedia Games (CD-ROM & Internet)
2. Computer based training and tutorials (CD-ROM & Internet)
3. Edutainment Titles (CD-ROM)
4. Encyclopaedias / Knowledge Banks (CD-ROM & Internet)
5. Multimedia Websites (Internet)
6. Mobile Games (Mobile Phones)

1.7.2 Non-Interactive Applications

1. Corporate Presentations (CD-ROM & Internet)
2. 2D / 3D Animations (Films, VCD/DVD and CD-ROMs)
3. Digital Videos (VCD/DVD and CD-ROMs)

As you can see, this listing is just indicative and by no means, comprehensive.

Having classified the applications as interactive and non-interactive, it becomes essential to discuss what we mean by interactivity.

1.8 Interactive multimedia and non-interactive multimedia

Most CD-ROM titles and games are of interactive nature - i.e. the user participates in every stage of the proceedings, as the title advances... and that's what makes the Multimedia titles all the more interesting!

Of course, the extent of interactivity may vary depending upon the titles, but the general tendency is to keep the same as high as possible, so that the user enjoys greater participation in the show.

But in a corporate presentation or a multimedia demo, the audience just watch the show as it proceeds from the beginning to the end in a sequential manner. These are examples for non-interactive multimedia.

1.9 Summary

Multimedia is an amalgamation of various conventional and non-conventional media put together. Digital multimedia is the order of the day, employing various kinds of mediums and devices for its all-pervasive usage.

Depending upon the nature of application and target audience, appropriate media is chosen. The type of delivery medium selected, influences the nature of multimedia contents.

Multimedia is being used for a variety of applications. They can be broadly classified as interactive and non-interactive multimedia.

1.10 Keywords

❑ **Multimedia:** A technology that employs different kinds of media like text, audio, video, graphics and animation, either separately or in combination - using computers, to communicate ideas or to disseminate information.

❑ **Interactive Multimedia:** A multimedia application, which allows the user to interact with the ongoing proceedings, in some way or other.

❑ **Edutainment:** A methodology of teaching academic curriculum, in an interesting and entertaining manner.

The CD drive, used for reading CD-ROMs, can be external or internal drive, and can have either an IDE or SCSI interface. The two main parameters that ultimately govern the performance of CD drives are data transfer rate and seek time.