

Part I. Multimedia Essentials

Chapter 1. Multimedia Production Basic Concepts

Chapter Objectives

After completing this chapter you should be able to:

- Define the concept of multimedia.
- Recognize different learning styles and how multimedia computer assisted communication can improve the user's retention of knowledge.
- Recognize the fundamental design criteria involved in the design of a multimedia presentation.
- Understand the development process of a multimedia application.

What is Multimedia?

Welcome to the exiting new world of effective interactive multimedia communication. Pretty sure you have heard the word multimedia several times. But, what is multimedia ?

The word "multimedia" on one level refers to the integration of multiple media, such as the visual imaginary, text, video, sound and animation, which together can multiply the impact of our message. On the other level, interactive multimedia refers to the ability to control these components and interact with them as needed.

The integration of multimedia technology into our communication environment has the potential to transform your audience from passive recipients of information to active participants in a media rich learning process.

Introduction of multimedia or any other computer based information technology is not intended to substitute a presenter. This new technology is intended to provide a powerful tool to the presenter to greatly enhance our communication. On the other hand, a multimedia information kiosk or Internet web site can be designed to provide information to users without human intervention.

Open your CD-ROM in Chapter 1 of the Interactive Guide to Multimedia to learn more about what is multimedia.

Why Multimedia?: Learning Styles

It is generally agreed that most that people retain knowledge of about 20 percent of what they hear; 40 percent of what they see and hear; and 75 percent of what they hear, see and do. As experienced communicators we know that our audience find little intrigue in rote memorization and exclusively text-based learning. Today, more than ever, communication must be stimulating and exiting as any of the barrage of media that pounds our society daily.

Why people retain knowledge differently? Is it because they learn in different ways?

Psychologists and educators tell us that there are different learning styles. There are graphic learners, auditory learners, and kinesthetic learners. This means that some of us learn by reading, others by listening, maybe by looking at pictures, or by touching objects. Ask yourself, how do I learn? What kind of books do you prefer? Books with text only? Books with lots of pictures and diagrams? Do I learn better by watching videos? Ask your classmates the same question. What is the result of your findings? Let's do a little research. With the support of your instructor ask your classmates the following question: How do you learn, by listening, through graphics or touching (kinesthetic). Record your survey results by completing the following table.

Learning Style	Number of Students	Percentage
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Auditory		
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Graphic		
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Kinesthetic		
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As you complete this survey you will recognize that in your classroom there are a variety of learning styles. Your colleagues learn and prefer to learn in different ways. Now think about this. Your classroom is a small sample of the overall population. If you extrapolate the results of the above survey to the entire population what will be the results? There are large segments of the population for each one of these learning styles.

But what is the use or applicability of the above to the planning and development of a multimedia application? It is very simple. If you need to communicate with a given audience your application design must incorporate different multimedia building blocks which will appeal to different learning styles. This translates into the effective and balanced incorporation of text, audio, graphics, animation's, digitized video and others into your application in such a way that by design your application will effectively communicate its message making sense to people with different learning styles.

Please refer to Chapter 1 in the Interactive Guide to Multimedia CD-ROM for an interactive presentation of this subject.

Communicating Information Using Multimedia

Let's start by defining what is communication. Communication is the exchange of ideas, messages or information. By definition, communication needs to be at least a two way street. With interactive multimedia technology you will be able to communicate with your audience by means of a presentation that becomes more than a message - it becomes an active, exiting experience in a multisensory environment. Using multimedia will allow you to communicate with your audience due to the fact that multimedia authoring applications provides the communicator the capacity to allow the audience to interact by design. This interaction takes place with the presenter or with the computer program itself.

From Application Planning to Product Delivery

Let's consider the following scenario, you or one of your clients have an idea about the need and desire to develop a multimedia application; the question is: what do you need to do next? There are a number of steps that you or your development team will need to go through in order to accomplish the delivery of the proposed multimedia application. These steps are summarized in figure 1.1.

Figure 1.1 Simplified multimedia application development process flow chart.

The above is a summarized development process flow chart. This process is more complex than presented above, usually it involves a considerable number of additional steps. Figure 1.2 presents the development flow chart for a multimedia instructional application in the area of Humanities. This particular instructional module included the production of a laser disc.

Figure 1.2 Example of a production flow chart for an instructional multimedia presentation.

This chapter presents all the necessary steps to plan and implement the major phases of the production process of a multimedia application.

Multimedia Applications Design Considerations

Present and future technology will provide to the multimedia architect an almost unlimited number of resources and techniques that can be incorporated into a proposed multimedia application. Regardless of all technical tricks and gimmicks available, when developing and designing a multimedia program or presentation there are a number of essential elements or design criteria that need to be taken into consideration for developing a quality and successful multimedia application. These elements should be considered as critical parameters when planning the production of an interactive application. Among these criteria, this section will explore the following:

- Who is the target audience?
- What is the program objective(s)?
- Structure of the application: program content?
- What multimedia building blocks will be used to present the proposed content?
- What is the desired degree of interactivity between user and the computer?
- What is the expected level of users response?
- What will be needed to playback the proposed program?

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Stop guessing who is your audience and what are the goals of your multimedia applications,

Plan Ahead!

Defining the Target Audience

The definition of the program audience will be one of the most important design parameters for your program. For our purposes the audience will be define as the application users and/or the information recipients. There are significant differences between an educational program, a marketing program, a corporate presentation or an information kiosk application. It is advisable that before initiating the actual program design to perform some research about the target audience. Among the information that will help to define the program are:

- Age and educational level;
- Corporate culture;
- Audience needs and expectations;
- Logos and preferred colors;
- Audience ethnic, gender and cultural composition;
- Level of computer literacy, and
- Audience psychological profile.

The above can be simply summarized as follows:

Know your audience!!!

The success of the program or presentation will be greatly influenced by the audience background research (characterization and definition of your audience) and planning of your program.

Characterization of the program audience is very important but also you will need to consider other factors such as:

- Program objective;
- Mode of delivery (presentation, tutorial, kiosk, or Internet interactive page);
- User level of expertise, both subject matter and computer literacy level;
- Program interaction level (program complexity);
- Need for program documentation, manual or workbook.

Awareness of the above will help to define some of the specific design considerations of the proposed application.

Remember: the success of your multimedia application will greatly depend on your knowledge of your audience needs and expectations. Plan to fulfill the expectations of your audience,

Multimedia Application Goals and Objectives

During the initial planning stages of developing a multimedia application we must ask ourselves or our client a critical question.

- What is the purpose of the proposed application?
- What are we trying to accomplish?
- What is the expected result?

The answer to these questions must be clear and present throughout the planning and development phases of the program. Whatever we do in the program must be able to support the accomplishment of the purpose of the program.

Sometimes multimedia producers and programmers might tend to include as part of a presentation or an interactive application an exuberant animation which does not promote the development of the program objective. These additions to the program other than serving the ego of the developer, increase the cost, development time of the application, storage space, slows down the program among other implications.

Stick to the purpose of the program supported by those multimedia building blocks that will help to convey the intended message or information.

Program Content

Program content can be defined as the specific message, data, facts or information to be presented throughout the multimedia application. The program content is provided to the multimedia architect by the content specialist. As mentioned above, the production of a quality multimedia application is the product of the concerted efforts of a production team. The content specialist is

a member of the production team who will be responsible to perform all necessary research concerning the content of the proposed application.

It is the responsibility of the content specialist to provide to the multimedia architect the facts, data, figures, charts, graphics, and videos as accurate as possible.. He or she should prepare the narration, text, bullets, charts and tables that should be presented in the proposed program. The final form in which the information will be introduced and displayed in the program is the responsibility of the multimedia architect.

Once the content is delivered to the multimedia architect the key question is: How this information can be presented using the capabilities of multimedia technology?

In designing how to deliver the presentation content keep in mind that your audience has different learning styles. Use a variety of media to express an idea such as narration, a related background picture, an animation, text bullets, etc. The integration of a variety of elements will help your audience to retain and comprehend the information.

Multimedia Building Blocks

As mentioned above a multimedia presentation is composed of a number of elements such as text, graphics, digitized video, video played in a video window, sound, computer animation's and others that are coordinated by the authoring program. Authoring programs such as Macromedia Director, Authorware Professional, Astound, and Asymmetric ToolBook among others are use to assembly the multimedia application.

These multimedia building blocks are usually produced using a variety of software applications and then they are either imported into the multimedia application or use as external resources to be retrieved by the authoring application and played when necessary. The production of these elements will be topic of discussion in the chapters in Part II of this book.

From the perspective of planning the multimedia presentation in respect to the use and integration of the multimedia building blocks, you must consider the following:

- Which elements should you use to illustrate or present the proposed information?
- What was provided to you by the content specialist?
- What are the expectations of your client?
- How should these elements be used and integrated in such way that the presentation appeals to members of the audience with different learning styles?
- How much time do you have to develop and deliver the presentation?
- What is the budget (financial resources) assigned to the program (project)?
- Do you have the expertise and resources to effectively develop these elements?
- How is the proposed presentation will be distributed?
- How much storage space (ROM) will be available in the distribution media to be utilized (a floppy, a CD-ROM, on-line, an optical drive) and how does this affect the selection of the multimedia building blocks?

The answer to the above questions will definitely affect the planning and production of your presentation. Assuming that you have the answers to the above questions, when planning the composition of each one of the screens and integrating these elements into the screen there are other aspects that should be taken into consideration.

- What is the application or presentation intended use?
- How many information layers or screens associated with the active screen will be available?
- How much interactivity between user and machine is necessary?
- Do you need to provide the user with feed back?

This will be discussed in the following section.

Application Intended Use

From the early stages of planning of you presentation or multimedia application you must have clear how is this application will be used. Is the intended use a presentation to a group, who are the members of the group, are they students, clients, a board of directors. Or the proposed multimedia application will be used by a single user in an instructional setting, a kiosk, a TV, or an individual using a desktop computer in an office environment? All of these have implications in the planning and design of your application. Lets explore the differences and implications of each one of intended uses scenarios.

Individual Use

The planning of a multimedia application thought to be use on a one to one basis (user-computer) allow for the incorporation of the following elements:

- Extensive text - can be incorporated due to the fact that the application will be used by one or two users in a single machine, the size of the fonts and the amount of text is not affected by the effect of distance from the machine.
- Scrolling text fields can be incorporated (this will be discussed in Chapter 3).
- Audio - the quantity and length of narrations, music and sound effects can be considerably larger than in a large group presentation. It is suggested to plan the use of low sound level (volume) or the selection of playback hardware with headphone connection capabilities (mini connector).
- Interactivity - in interactive applications the user can interact with the machine by means of using several devices such as keyboard, numeric key pad, mouse, tracking ball, touch screen, pen based mouse, infra red pointer among others.

Please refer to Chapter 1 in the Interactive Guide to Multimedia CD-ROM for an interactive presentation of this subject.

Group Presentations

When planning a multimedia presentation intended to be use or presented to a large group you must consider the following:

1. Text - it is recommended to use bullets and short paragraphs. The size of the fonts should be no smaller than 20 points such that text will be legible from distance. Text scrolling fields

should not be use.

2. Audio - it is recommended not to use narrations unless these are testimonials necessary for the accomplishment of the application goals. Music and sound effects can incorporated. Quality of sound will be dependent upon the quality and capability of the sound amplifying system. Keep in mind that the better the quality of the sound the larger the file, and the larger memory requirements.

3. Interactivity - in interactive applications the presenter will be the only one interacting with the machine. This interaction will be also by means of using several devices such as keyboard, numeric key pad, mouse, tracking ball, touch screen, pen based mouse, infra red pointer among others. The audience can interact with the use of keypads probably responding to questions or numeric inputs. Usually audience inputs is use to know their opinions or reactions to what is presented on the screen.

4. Colors - when presenting to a large group a projection or playback device will be necessary. These devices can be an LCD panel with a high intensity overhead projector, a three beam gun projector, a one gun LCD projector, a large screen TV or other device. It is important to know the capacity of such device in terms of how many colors can it display. For example if you presentation was developed using millions of colors (24 bits) but the projector is capable of only displaying 16 colors the presentation will look terrible.

Please refer to Chapter 1 in the Interactive Guide to Multimedia CD-ROM for an interactive presentation of this subject.

Navigation: Linear or Branching?

Video productions are said to be linear, the viewer normally don't have any other option than watch what will be presented screen after screen. Multimedia technology allows to design applications with several layers of information, each accessible by means of navigational tools (buttons) and each containing several different multimedia building blocks on each one of them.

In the developing of a multimedia application there are four basic navigational structures (connections and links among various sections of the application content), these are: linear, hierarchical, nonlinear and composite.

These navigational structures are defined and further presented in Chapter 1 of the Interactive Guide to Multimedia CD-ROM. We can define them as follows :

- Linear: the user or presenter navigates through the application in a sequential basis, from one screen to the next;
- Hierarchical: the user or presenter navigates through a branching structure defined by the application content logic flow;
- Nonlinear: the user or presenter navigates through the application content without a prescribed or determined path;
- Composite: the user or presenter navigates through the application freely, but in certain locations a prescribed sequence, usually linear (a digital video or a sequence of critical information), is imposed over the user.

The following diagram (figure 1.3) illustrates the logic flow for each one of these navigational structures.

Figure 1.3 Multimedia application navigational structures.

Suggestion: Limit the number of information layers to three, otherwise returning to the screen of departure will be very difficult. If you follow this suggestion you will be able to market your product indicating:

“Only three clicks away from anywhere!!”
The Grollier Multimedia Encyclopedia.

Degree of Interactivity

In the process of planning your multimedia application it is critical to determine the level of interactivity (user-machine) needed in order to accomplish the program goals. This is of particular importance in training or educational applications and in direct sales applications. You need to determine if you need the user to respond to question presented by the computer and if it will be necessary feedback of the program based upon the user response. For example in an educational application you can use multiple choice questions, the user can select an alternative and if programmed the machine can provide feedback to the user such as:

- Congratulations!!! That is the correct answer.
- Sorry, that was not the correct answer, please try again.

Remember: If you plan to provide feedback to the user, always make it positive and encouraging, never use negative or derogatory feedback.

When requesting response from the audience by means of keypads it will be important to provide the audience with the results of the survey. To be able to accomplish this, it will be necessary to consider in the design of the application to include statistical analysis capability and the capability of producing and displaying charts with the survey results. In order to accomplish this, your application must have built -in this capability or to have the capacity to call other computer application capable of performing this function.

Exercise: Creating Your First Interactive Multimedia Application - The Planning Phase

As mentioned in the introduction of the book, the best way to learn how to develop a multimedia application is by authoring one. The purpose of this exercise is to develop the application in a sequential process using the concepts and skills learned in each one of the chapters. The first step into the development of the application is to plan how it will be structured.

In this exercise you will have to develop an interactive multimedia presentation for an imaginary client. As part of the process of planning the application you must define the design criteria. With the support of you instructor answer the following questions. At the end of this process you will have initiated the planning of you first multimedia application. It is recommended to have available a three ring binder to keep and organize all documents regarding the development of your presentation.

- What type of multimedia presentation are you planning (educational, marketing, a

business report, direct sales, etc.)

- What is the goal of the proposed application?
- What will be its content?
- What are the expectations of your client?
- How interactive will be?
- How is the proposed presentation will be distributed?