

Interactive Multimedia Design and Production Process

Section Outline

Introduction

Multimedia Development Process

Funding

Planning

Designing

Producing

Testing

Marketing

Roles and Responsibilities

Introduction

Project Manager

Introduction

Responsibilities

Skills

Instructional Designer

Introduction

Responsibilities

Skills

Media Specialist & Programmers

Introduction

Skills

Tips and Techniques

Successful Projects

Development

Careers

Planning

Time Management

Personnel

Contacts

Reputation

Communication

Introduction

In an attempt to provide some useful and practical information on what the multimedia development process is we developed this web site. Our purpose is to inform students who wish to pursue a career in multimedia of the skills and knowledge needed.

Multimedia development encompasses many different aspects. Interactive multimedia is becoming increasingly popular in education, entertainment, and business. Because of the capability of incorporating various media, and of supporting interactivity and learner control, multimedia is often used in delivering instruction. Interactive multimedia technology has potential for enhancing learning. Furthermore, the World Wide Web technology with its interactive multimedia capability has been perceived to be one of the most promising technologies in the future. While there is a general consensus among educators that interactive multimedia has the potential for enhancing learning, educators also agree that having well-designed multimedia software is critical in order for

the technology to have any impact on learning. Literature on instructional design has detailed the process for developing instruction in general terms. There are numerous instructional design models and whether they are constructivist, behavioristic or cognitive, linear or non-linear, these models and approaches emphasize the importance of identifying objectives, selecting appropriate strategies, and conducting formative and summative evaluations.

The information in this section is based upon the research conducted with practitioners working in the multimedia field. The insights from these multimedia practitioners, the design models they have followed and the design strategies they have used, will provide valuable as well as practical information to students who intend to enter the field of interactive multimedia. This research is published at

Liu, Min, Jones, C., & Hemstreet, S. (1998). A Study of the Multimedia Design and Production Process by the Practitioners. *Journal of Research on Computing in Education*. 30(3), 254-280

www.edb.utexas.edu/coe/depts/ci/it/liu.html

The rest of this section will focus on the multimedia development process. It will help to identify the steps in the process as well as the roles people play. It will help to identify skills those desiring a career in the field will need to possess.

Multimedia Development Process

The multimedia development process consists of six main phases:

- (a) funding
- (b) planning
- (c) designing
- (d) producing
- (e) testing
- (f) marketing

Each phase has a number of activities associated with it and has its own characteristics. These phases represent the process from the inception of an idea to the finished product. Companies very often work on several projects simultaneously. The projects are at different phases for predetermined periods of time.

Funding

Obtaining funding is a critical phase for most multimedia companies. There are a number of ways they get funding:

- (a) writing proposals to get a grant from public or private sources
- (b) responding to "Request for Proposals" (RFP)
- (c) joining competitions
- (d) (4) obtaining contracts through personal contacts and/or referrals
- (e) creating a prototype and then finding a company interested in developing it.

For most companies their work is through a contract with a client obtained by one or more of the means mentioned above. The client can be a major publisher, a state or federal agency, or a company. The project managers, executive producers, or owners often spend a considerable amount of time writing proposals to respond to "Request for Proposals" and networking with other interested parties. A well-written proposal not only presents a match between the goal of a funding source and the developer, but also outlines a detailed plan and demonstrates a proven track record.

Important factors that could contribute to successful funding

- (a) Small businesses often engage in publicizing their capabilities to promote their business.
- (b) If a business finds a need for a particular product, it should take the initiative to contact relevant companies, museums, or agencies to promote their ideas and get potential clients interested.
- (c) You need to get the word out.
- (d) Get to know people in the business and let them know that you are interested if a project comes up.
- (e) Producing quality work helps to establish a reputation so that the client may return in the future, it is certainly advantageous when the product wins an award.

Planning

Once a contract is secured, a series of negotiations begins between the developer and the client.

- (a) It is very important to discuss the ownership of the content, the project schedule, and payment during the negotiation phase.
- (b) The negotiation phase clearly defines the roles of a client and a developer from initial contact.
- (c) Sometimes, the developer will receive the content from the client who owns the copyright of the materials and other times the developer has to generate new materials from scratch.
- (d) The developer and the client need to agree on the completion dates or milestones for various phases to ensure the feasibility of the intended amount of work. The budget is discussed at this point.
- (e) The ultimate goal of a contract is to help maintain a favorable working relationship between the client and the developer and to agree on roles and division of responsibilities.
- (f) Based upon what the client wants, the development team begins to brainstorm, outline the objectives, and decide on the presentation style, the delivery platform, and the approach to turn the content into an interactive multimedia product. Often, these ideas are implemented in a prototype, which is reviewed by the client to see if it satisfies its needs.

Designing

Based upon the client's feedback of the prototype, various specification documents are developed which provide detailed information on content, design, interface, and functions of the product. Terms such as design document, functional specifications, and content script are used to refer to different specification documents depending on the information and format provided by the document.

- (a) During the design phase, the objectives, presentation style, delivery platform, and the overall approach are finalized.
- (b) Details such as the design of each screen, the type of navigation to be used, and the interactive characteristics of the interface are worked out.
- (c) Flowcharts and storyboards are created to reflect these specifications.
- (d) Detailed timelines are created and major milestones are established for the critical phases of the project.
- (e) The work is then distributed among various roles such as designers, programmers, graphic artists, animators, videographers, audiographers, and permission specialists.

Producing

During the production phase instructional designers, graphic artists, animators, videographers, audiographers, and permission specialists begin to develop scripts, artwork, animation, video, audio, and interface. The production phase will run smoothly if the project manager has carefully selected the team members, distributed responsibilities, and created realistic milestones in the production schedule. Programmers begin to generate codes to put all the pieces together. Group discussions are more common and frequent during the planning and designing phases; whereas, in the production phase different roles will focus on their production tasks and meet only with the lead instructional designer and project manager to evaluate what has been created.

Testing

Unlike some traditional instructional design models in which evaluation occurs at the end of the process, the phase of testing is usually continuous and repetitive. Formative evaluation occurs at every phase and multiple times. The importance of having such continuous evaluation as a key factor for ensuring the quality of the product is often stressed. Evaluation takes on different forms.

- (a) Some forms used by developers include informal critiquing by members within and across the teams within the company, on-going evaluation by the clients, and using focus groups and surveys to get feedback from the end users.
- (b) Depending on the nature of the product and the type of audience, different forms are used. It is just invaluable to get feedback. Constant evaluation within the company and with the client occurs more often than with the end users.
- (c) Some companies use a four-step evaluation to measure major milestones for quality assurance: prototype, beta, alpha, and final testing.
- (d) Some clients tend to hire developers who know how to test for instructional value and who tend to build testing into their budget in response to a RFP.

Because multimedia development is a complex process involving many skills and people, on-going evaluation and revisions are critical steps that help ensure the success of the product. Although multiple cycles of formative evaluation are used, summative evaluation seldom occurs. A lack of funding and a lack of control over the product once delivered to the client are reasons given for an absence of summative evaluation.

Marketing

Marketing and support is important to the success of a product. The survival of a company depends on the product reaching the audience.

- (a) The elements of marketing include researching the industry, the audience, and the competition.
- (b) Marketing also includes the responsibility for determining the pricing and coordinating the advertising and public relations for the product.
- (c) Practices for marketing and distributing the products vary from company to company.
- (d) Most companies are not concerned with marketing because their clients usually hire them to develop a product. When the product is completed, they deliver the product to their clients, who are responsible for marketing and distributing the products. In such cases, the need for such a product is presumably established by the clients and the distribution channels for the product have been determined.

Roles and Responsibilities

Developing a multimedia product calls for many different skills and creative work from many different talents, such as

- project manager
- instructional designer
- authorer/programmer
- artist
- animator
- writer
- videographer
- audiographer
- subject matter expert
- permission specialist.

Throughout the creation and development of a multimedia project, the team members must be in constant communication to maintain a shared vision and achieve consistency in the design of the end product. The degree to which these different roles communicate and collaborate impacts the success of a finished product. During the planning phase, the different roles often provide their input into the vision of the project. Their input helps to ensure all roles have ownership in the vision and are motivated toward common goals. Expertise from the different talents is vital in determining whether certain design elements are feasible within the guidelines of the project.

Depending on the size of the company or the scope of a project, one person might play more than one role, or the roles might be expanded into departments. Roles from one company to another, or even from one project to another, may have different responsibilities. For many smaller companies, a project manager is also an instructional designer or an instructional designer is sometimes also a programmer. In other words, we all wear different hats at different times. Running a smaller and yet efficient company requires its employees to be flexible and to have multiple talents. Working in a small company may be advantageous because it is more able to respond and adapt to the rapid changes of multimedia technology and the demand of the market.

An important characteristic of all these roles is that they not only need to have a solid background in their respective fields, but also should be able to pick up new skills quickly for their new environment. Knowledge and experience of the responsibilities of other team members is also helpful. Each role is crucial to the design and development of effective interactive multimedia.

Project Manager

Introduction

The project manager has the primary responsibility of negotiating with the client and outlining the objectives, scope, schedule, and funding for the project. He or she coordinates the efforts of other roles and ensures all people involved in the project stay on task and complete their part by the specified deadline. A project manager, therefore, must not only be open-minded, but also be very efficient and effective. It is up to the project manager to establish regular and new procedures necessary for a project to be completed on time. During the planning phase, the different roles often provide their input into the vision of the project. Their input helps to ensure all roles have ownership in the vision and are motivated toward common goals. Expertise from the different talents is vital in determining whether certain design elements are feasible within the guidelines of the project. After the production phase, the project manager continues to oversee the project, communicate with the client, see the project to its completion, and deliver the product to its client.

Responsibilities

- Write proposals
- Oversees all aspects of the process
- Coordinates efforts of all other roles
- Interacts with clients
- Makes sure client's needs are met
- Make schedules
- Makes sure deadlines are met
- Resolves conflicts between a developer and a client
- Evaluates the work the team produced at every phase
- Keeps the project well organized
- Keeps the project on budget
- Generates tools to facilitate development process
- Resolves conflicts between team members
- Provides resolution for development and production problems
- Maintains the momentum and energy necessary for the team to complete a project

Skills

Help team members make decisions on priorities
Manage people and crises
Motivate people
Talk comfortably to different roles in the team using their languages (professional jargon)
Focus on ultimate objectives and have big picture in mind
Be detail-oriented
Be a good listener and problem-solver

Instructional Designer

Introduction

Instructional designers often assist the project manager in identifying clients' needs and establishing instructional objectives for the project. Once the client and project manager agree on the content and scope of the project, the instructional designers, in collaboration with the subject matter experts, outline the details of the content and design of the product. They select appropriate instructional strategies and media for delivering the content, devise test items, and then create storyboards or design specifications for communication during development of the project. Another important duty of an instructional designer is to compare what was created with the client's needs and outlined objectives. Many times instructional designers are also involved in production.

Responsibilities

Determines a client's needs
Analyzes what has been done on the topic in the past
Write instructional objectives
Interacts with clients
Determines how to test learners and creates test items
Designs learning environment
Selects appropriate delivery media
Selects appropriate strategies
Creates the master design document which details all the design decisions
Creates storyboards /flowcharts
Evaluates and ensures the design meets the clients' needs and objectives
Creates prototype
Supervises the production to ensure the design decisions are implemented
Consults with the client for any revision
Participates in the production process (writing scripts, titles, selecting images, video and audio sources etc.)

Skills

Have a good grasp of instructional design knowledge and be familiar with different design models
Have excellent communication skills and be able to relate to the client & other roles in the team
Talk comfortably to artists, videographers, audiographers, and programmers using their languages (professional jargon)
Understand what programmers, artists, etc need to develop the design
Be able to write clear, specific descriptions and directions.
Have a good eye for design
Listen intelligently
Be familiar with authoring tools
Break a project into manageable pieces
Be detail-oriented

Media Specialist & Programmers

As the production phase progress, the programmers begins to stitch together the elements of the project. When the production phase comes to a close, many of the roles remain on the project in order to revise the project based on client feedback, evaluations, alpha testing, and beta testing.

Responsibilities

- Locates audio/video resources
- Selects appropriate audio/video clips
- Casts characters and works with audio/video talents
- Creates audio/video clips
- Interacts with instructional designer and project manager
- Gets involved in the design process
- Is familiar with storyboard and uses it as a guideline
- Studies the problem and comes up with solutions and fixed bugs
- Writes clear, concise, understandable and reusable codes
- Communicates with designers

Skills

- Be creative
- Have good background in audio/video production
- Be detail-oriented
- Be able to communicate with other roles in the team
- Have good problem-solving skills and enjoy problem-solutions given the resources available
- Have a solid background in programming
- Be able to communicate with other roles in the team
- Should be detail-oriented

Tips and Techniques in Multimedia Development

Factors Contributing to Successful Multimedia Development

Several factors contribute to the success of a multimedia project. These factors are:

- (a) maintaining constant and clear communication among all people involved in the process
- (b) taking advantage of the individual developer's talents
- (c) utilizing continuous evaluation and feedback
- (d) keeping on task and on schedule.
- (e) Conduct team weekly meetings and hold regular informal conversations. Such constant communication among team members helps to keep everyone on track and prevents problems early on.
- (f) Use the technique of brainstorming to get creative ideas from all involved in the project. Try to get everyone's input because there are usually a lot of creative people on staff. You will be constantly amazed by the ideas that people come up with - things that you never thought of.
- (g) The testing process is not one stage occurring at the end of the development process, but a continuous process occurring at all phases.
- (h) The ability to deliver on time.

Characteristics of Multimedia Development

- (a) When a deal is obtained from a client, some companies will develop all pieces while others will contract out parts such as audio and video or artwork.
- (b) Many companies have only a few key personnel and maintain a large number of contractors. This enables them to stay flexible and more responsive to the changes of the field.
- (c) Some set up virtual offices where they communicate with their clients and contractors through telecommunication.
- (d) A few developers contract part of the project out. They often looked for people who could work at home.
- (e) Companies maintain a balance between using stock footage and creating their own. Many keep music and video libraries and have a working relationship with stock houses. More importantly, they all have the capability to create original media on their own.
- (f) The length of the projects varies with regard to the scope and content, yet most fall between six months and a year. Multimedia development is a time-consuming profession.
- (g) Many developers spend long hours, especially during the production phase. While some developers can spend as many as over 100 hours per week, others tend to spend between 40 and 50 hours each week.
- (h) Project managers often spend more hours than other personnel.
- (i) Regardless of the number of hours, working through the weekend is quite common.
- (j) Hard work is often rewarded by the creative nature of the field and the satisfaction of creating a product that can be enjoyed by others. Creating a useful product is very, very gratifying. No two days are exactly the same. There is always something new. These creative aspects attract many energetic and talented people to the multimedia field.

How to Prepare Oneself for A Multimedia Career

Being a multimedia developer is both a challenging and rewarding career. To be successful in this career, one should not only have some training and experience, but also possess some important characteristics. The following attributes are noted in a successful multimedia developer:

- Be very flexible
- Be willing to work hard and spend long hours
- Be willing to change what has been done to suit the needs of the client and changing technology
- Be open-minded to new ideas
- Be willing to learn
- Be willing to work with both creative and tedious parts of a project
- Be detailed-oriented
- Be able to work under various constraints (i.e. time, resources, and/or budget constraints) and be very creative given these constraints
- Have strong interpersonal and communication skills.

Education is certainly one way to gain entry into multimedia. Developers typically all start out in different fields, and move into multimedia. To many developers, however, education only opens the door.

- (a) Get on-the-job experience. You really have to get your hands wet. Get in the multimedia field and do some simple stuff and then build up your experience,
- (b) Read books, understand how to do it, and then stick your nose in front of the computer to do it
- (c) In addition to taking courses in multimedia offered by universities and colleges, and getting a degree, students should visit and be around people who are doing multimedia and get involved in a multimedia project so as to surround themselves with creative stimuli.
- (d) Students might also want to take advantage of more employment-oriented community colleges, which can give them a quick start.
- (e) Getting an internship or a temporary job is an excellent way to get involved and establish one's credentials.

To become a graphic artist, programmer, video producer, or audio producer, mastering some popular technical tools is essential.

- (a) Companies preferred hiring people who had computer experience and a good understanding of the limitations and capabilities of the tools they used.
- (b) People interested in building a career in multimedia should call the leading developers in the area, find out what everybody's using as far as authoring and spend the next six months learning that software.
- (c) Immerse yourself in as many diverse subjects as possible.
- (d) Be as varied as possible --writing, music, film, television, and creative arts. The experiences in these areas will help to produce a better product.
- (e) Read everything from futurist novels to old English history. You can get ideas from them.
- (f) Students should not only gain computer literacy on different platforms, but also study interface design.
- (g) For students interested in becoming project managers and instructional designers, it is very important to gain some hands-on knowledge of how different multimedia tools work and their capabilities and limitations.
- (h) Get as much hands-on experience as possible. Even though you may not be doing actual production, you can become aware of the issues that can come up. You can ask the right questions and do your job better.
- (i) The first-hand knowledge of how the tools work gives you more credibility.
- (j) Having knowledge of the multimedia tools and the experience of how the tools work is critical for being a successful manager.
- (k) To be good in multimedia, you just have to be as well-read and wide-read as possible in all areas.

Newcomers for this fast-paced and ever-changing endeavor must be prepared, both mentally and physically, for a steep learning curve of the production process and the software and hardware involved.

- (a) Be ready to learn constantly as new developments continue in this field.
- (b) Reading trade magazines and reviewing software was crucial to know the current state of the field, as well as being aware of the competition and trying to stay ahead.

Potential multimedia developers should learn to handle challenges from different perspectives.

- (a) A project manager and an instructional designer need to consider the client's needs, the end user's needs, the budget needs, and the programmer/artist's needs.
- (b) You've got to keep everybody's needs in mind and provide for their needs.
- (c) The ability to keep up with a lot of details, and be persistent.
- (d) Such characteristics cannot be developed overnight or learned easily from the books. Students interested should consciously develop it by becoming involved in multimedia production and working in a real-world situation.

Because multimedia development is often a group effort, companies look for people who can relate to other people in a team.

- (a) Being able to work collaboratively and having a positive attitude is more important than having some technical skills.
- (b) Some companies do not hire just for skills, but hire for attitude. It is possible to train people for the specific skills for the project, but it will be hard to train someone to be responsible.
- (c) If you are the sort of person who needs to work alone, find another business to get into.

Planning

Planning is the key to the success of most business endeavors, and this is certainly true in multimedia, where a lack of planning early in the process can be costly in terms of time later.

- (a) When a great deal of up-front planning is done with the client, it is easier to consider changes that the client request at a later time as change orders, for which the client is expected to pay an additional fee.
- (b) Carefully plan the amount of data that will be generated for graphics, text, audio, and video so that the final product will not exceed the 640 MB of disk space available on a CD-ROM.
- (c) Get everybody, including the project manager, lead instructional designer, art director, and video/audio director, involved early in the process to avoid pitfalls along the way and to understand the limitations of the process from their perspectives.
- (d) Early testing on target machines, i.e. the range of machines that are expected to run the final product, will help to guide the choice of media and activities designed for the product.

Time management

Skill in managing time in a multimedia environment is based on experience.

- (a) In creating the schedule, plan on unexpected problems to arise near the end of the project. There's a 9 to 10 rule. Supposedly when you have 10% left to do, you really have 90% of it - because that is when all the major stuff [problems] happens. So, try to stay ahead of your schedule.
- (b) Set milestones throughout the project. These milestones keep everyone working toward common goals and deadlines, and create motivation throughout the project.

Personnel

Multimedia businesses depend upon the talent of their employees.

- (a) Large companies may departmentalize, allowing employees to develop talents in one area only, but small companies should look for multi-talented people who can perform a variety of jobs.
- (b) In addition to the knowledge and skills particular to each position, companies seek out employees who are detail-oriented, have an eye for design, and can relate well to others.

Contacts

While multimedia companies can get work through grants and responses to RFPs (Request For Proposals), many companies get at least some of their work through contacts they had made in graduate school programs and professional organizations. It is important to establish connections with people one knows. It pays to remember people's names and where they are [in which company].

Reputation

In a field that is growing and changing as rapidly as multimedia, start-up companies will depend on the reputations they build in order to attract new customers and to get repeat business. A good reputation can also ease the production process.

- (a) Because of a company's good reputation, you may be able to negotiate for lower prices and get permission to alter some pieces of artwork.
- (b) You may be able to get away with a lot more with them than other people can get away with because a good reputation will let them know you are going to treat them well, you are not going to hurt the art and you are not going to misrepresent what the piece actually means.
- (c) Reputation could play a role in communicating with clients your competence in developing the technical specifics.
- (d) During the design phase, some clients may request a lot of changes while others are very hands-off. It depends on the trust level sometimes. If they [the clients] know your reputation, and know you're going to do a good job, sometimes they'll hand it over and let you go with it.

Communication with Clients

Since many clients lack a familiarity with multimedia, the importance of educating the client as to the design, capabilities, and costs involved in multimedia development is critical.

- (a) The most difficult thing to learn when working in this business is learning how to tell the client what they really need. Clients come in with schemes, plans, grandiose designs, and it's real difficult to get them to focus on what they want to accomplish.
- (b) Multimedia development is an educational experience for both the developer and the client. In case of disagreements with the client on issues of content and design, it is important to remain diplomatic, to attempt to convince the client of the reasons for a differing position, and to abide by the client's final decision.
- (c) In most cases, the clients have the final decision. If you disagree, that's too bad. You just have to bite your tongues and go ahead and do it, even though you feel that there is a better way to do it.
- (d) The client is the one who has to like the product, not the author.
- (e) Continuous communication with the client and keeping them informed of changes is important. The critical part is keeping the clients informed and making sure they have as much detail as possible so that nothing comes as a surprise.