CHAPTER 10

Designing a Production Process

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Creating successful multimedia applications with Director involves more than just a strong understanding of the program. A successful multimedia application contains timely, well-researched content, combined with a navigation scheme that's easy to use. All too often, we see multimedia applications with all kinds of cool graphics and animation, but which fail to meet the application's original objectives.

The best way to avoid having this happen to your multimedia applications is to spend time up front to determine the scope of the project. Then you can develop a well-defined production process to create the application. This chapter explores several tools and techniques to help you do the following: clearly define the goals and objectives of your projects; add more creativity to your projects; and streamline the production process.

Determining the Scope of the Project

You must consider many factors before building a multimedia application in Director. Some factors are more obvious than others, such as the computer platform and delivery medium on which the application is to play. Other factors are more obscure, such as determining whether there will be a secondary audience for the application — for example, building a game for students that has a tracking component for teachers to use. Developing a consistent approach to collecting this information not only makes for a better multimedia application, but also provides you with a basis for determining the cost and production time.

Using a project analysis form

The first step in determining the scope of a multimedia project is to ask the client the right questions. As the developer, you need to get the client to focus on the project's objectives, the intended audience, how often the project will need to be updated, and the delivery media. It can be very difficult to ask all the right questions in a room full of people whose attention is divided between looking at your latest cool project and showing you their latest PowerPoint presentation.

A useful tool to help you and your client answer these questions is a project analysis form that contains detailed questions about the objectives, audience, and any production considerations that need to be addressed in the project. If possible, ask the client to complete this form early in the project—ideally before your initial meeting. The information you gather on this form not only makes you appear more professional, but also enables you to walk into the room with solutions to problems. It also helps provide you with background information to answer the dreaded question: "How much do you think this is going to cost?"

Another useful aspect of a project analysis form is that you can get an early indication of just how organized a client is, as well as how much thought the client has given to the project. If most of your questions are answered with "Don't know," you'll know that you're going to have to spend a considerable amount of time before beginning the project to help the client answer the questions, and then adjust your production timeline and budget factors accordingly.

As mentioned earlier, your project analysis form should cover at least three main areas: objectives, audience, and production considerations. Let's dissect each of these topics and give you a series of basic questions for each topic area.

Objectives

Design questions about objectives so that they determine what the application needs to accomplish. The questions also give you a good starting point for researching the content for the application. Here are some sample questions:

1. Why do you want to produce a multimedia application?
2. What is the primary goal of the application? (Please select one.)
    - Inform
    - Motivate
    - Teach/Train
    - Sell
    - Other
3. What specific objectives do you want to accomplish with this multimedia application?

4. Are there any problems, misunderstandings, or misperceptions about the subject that need to be corrected?
5. Will the audience have access to other materials that deal with the same subject? If so, what are they?
6. In one sentence, recap the most important idea anyone using the multimedia application should get.

Note that question two allows the client to pick only one topic. This is a subtle way of educating the client that a multimedia application that focuses on one specific goal is much more effective than an application that tries to serve as a catchall for several different objectives. Question six reinforces this concept by asking a client to define the major goal in a single sentence.

Audience

Questions about the audience should make the client consider the target market and audience demographics for the multimedia application. The following questions help you determine the reading level of the content and the subject matter that should be emphasized or avoided in the project:

1. Who comprises the primary audience receiving this information? Describe by age, sex, educational level, and so on.
2. Who comprises the secondary audience?
3. What is the audience's major interest in the multimedia application? Why would they want to use it?
4. What does the audience already know about the subject?
5. What possible negative attitudes toward the subject does the audience have? Why?
6. Are there any taboos or political factors that must be taken into consideration?

Production considerations

Questions about production considerations help you determine the factors that affect the actual production of the project, such as the amount of time to complete the project, the delivery medium, and the budget. You should also include questions to help you create the look and feel of the project, and to help you choose the level of technology that you can employ.

1. What will be the primary delivery medium for the multimedia application? (Pick one.)
   - CD-ROM
   - Hard disk
   - Live on the Internet
   - Other
   - On the Internet via download

2. Will there be an alternate delivery medium for the application? If yes, what?
3. What will be the minimum system configuration on which the application will play?
4. If the project will be designed to play live over the Internet, what will be the minimum Web browser the application will have to support?
5. What style do you envision for the multimedia application (business-like, entertaining, documentary, cutting-edge, and so on)?
6. What existing resource materials (such as other multimedia applications, graphics, Web sites, brochures, and so on) could benefit this multimedia application?
7. How often do you anticipate updating this multimedia application?
8. Do you plan to expand this project in the future?
9. When is the target completion date for the project?
10. What is the budget for this project?
11. Is there anything else we should know in order to produce a successful multimedia application for your company?

In most cases, the client will choose not to fill in the budget amount for a project. For some reason, clients seem to take the same approach to buying multimedia content that they do toward purchasing a car, forcing you to walk a fine line between scaring them off with too high a price or undercharging just to get the work. Life will be much easier if you know how much the client is willing to spend on a project, and often this will not be an issue after you have developed a relationship with the client and they trust you. In the meantime, filling in as many blanks as possible on your project analysis form helps you create realistic budgets and timelines for your multimedia applications.

The Creative Process

After you've determined the scope of the multimedia application you're going to create, it's time to move on to the design phase of the project to begin capturing the concept's ideas that will be used in the project. Coming up with creative concepts can often be one of the most difficult parts of creating a multimedia application. You can start by creating an outline, but this approach can force you to think inside a very limited box of concepts. A better approach is to use a technique called *brainstorming*, which enables you think freely—"outside the box," so to speak. A very good tool to use for brainstorming is a program created by Inspiration Software called Inspiration (shown in Figure 10-1), which enables you to quickly capture ideas electronically. A good old-fashioned white board and sticky notes also work well for this process.

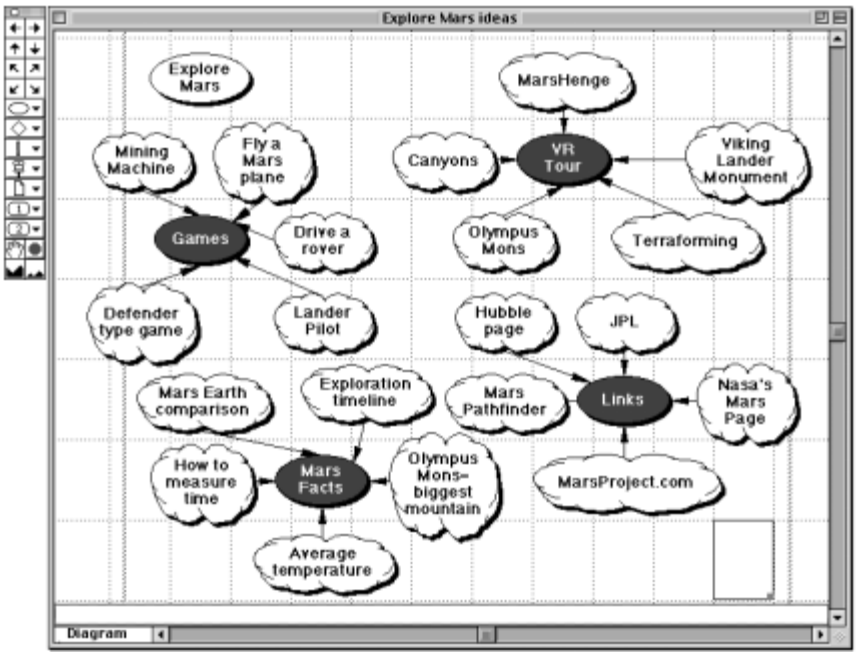


Figure 10-1: Inspiration is a very valuable brainstorming tool.

Gather in a room all the people who will be working on the project, and assign a person in the group to be the facilitator, the person who is responsible for capturing the ideas as the group throws them out. At this stage of the process, you want to capture as many ideas as possible, no matter how improbable or ridiculous they may seem. One way to avoid the "We can't do that" syndrome is to arm everyone with a soft toy that they can use as a weapon to bombard anyone who criticizes an idea. This technique is lots of fun, and you'll be amazed at the number of really powerful concepts that you can generate in a very short amount of time.

After you've captured enough ideas, have the facilitator take a vote on each concept to narrow the ideas to those that are the most practical for the project. This gives everyone involved influence over the concepts.

Another advantage to using Inspiration is that the program automatically builds an outline of ideas in the diagram. Inspiration is also a very good tool to use for creating flow charts.

Tip Make sure to keep the ideas that the group has discarded; they could prove to be very valuable for some other project.

Avoiding creative block

One of the most difficult aspects of multimedia production is coming up with creative concepts to make your projects stand out from others. Here are several tips to spark your creativity and help you avoid the *Blank Page Syndrome* when it comes time to design your project.

Keep a scrapbook that includes clippings from cool magazine ads and illustrations that you run across. Flipping through the scrapbook is a great way to spark a creative idea. Of course, you don't want to steal another artist's concept, but a powerful image or layout can often inspire your own unique concept. Use this same approach for Web sites by keeping a set of bookmarks of Web sites that might inspire you.

Buy one of those magnetic poetry kits that contains individual words and use it to make random combinations of three to six words each. These word combinations can provoke a wonderful concept or idea.

Give yourself a Whack on the Head. A very creative fellow named Roger Von Oech created a book and a deck of cards called the *Creative Whack Pack*. These cards give you all kinds of suggestions and techniques that force you to think nonlinearly. You can find his book and cards in most bookstores, and a software version is available.

Creating a flow chart

One of the best ways to visualize the layout and navigation structure of your Director project is to create a flow chart. In Chapter 9, you used a simple flow chart to visualize the navigation components of your movie.

Another good use for a flow chart is to model the logic in your movies. Suppose that you will create a game composed of a series of questions that progress through several levels of difficulty. The user will have three chances to answer the question in each level correctly. If the user fails to answer the question correctly on the third try, the user is taken to a screen that gives him or her several hints. The user then is invited to try to answer again. The illustration in Figure 10-2 shows how modeling this process can make it much easier to visualize what screens you'll need to build in Director. The illustration is also a valuable tool for creating the Lingo scripting needed for the game.

This example shows that you need to create two screens for each question. One screen contains the question, and another screen contains the hint. The triangles (commonly referred to as *decision points*) help you identify what actions the Lingo script must perform. In this case, the script needs to detect whether the question is correct, how many times the question has been answered, and the proper screen to which the movie should advance. Because you need a script that has this functionality for each level, it might make sense to create a behavior that enables you to adjust the parameters for each question.

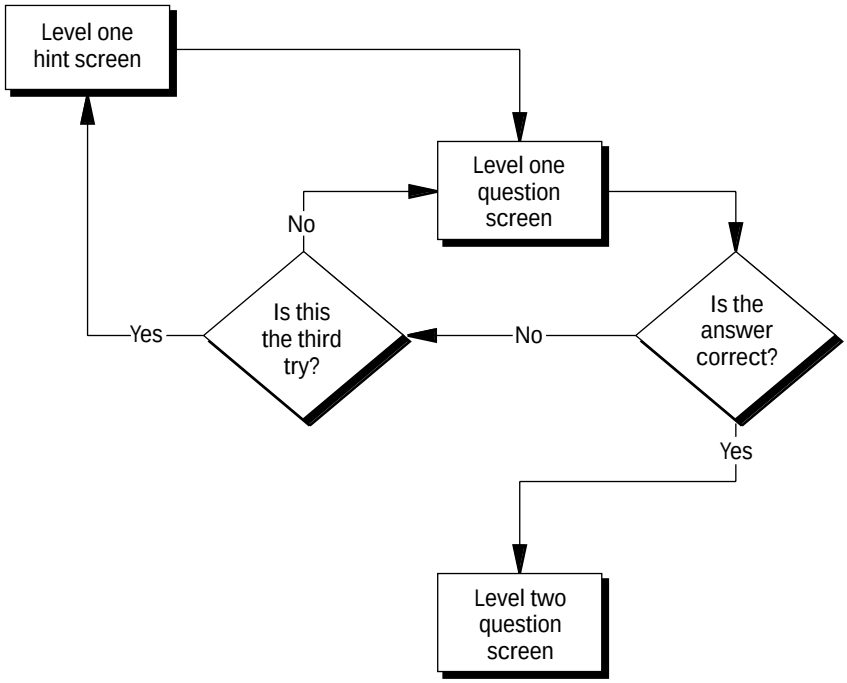


Figure 10-2: Use a flow chart to model the logic in your movies.

A shareware flow-charting program, SmartDraw for Windows, comes on the CD-ROM that accompanies this book. It is in the GOODIES:SMARTDRAW (GOODIES\SMARTDRAW) folder.

The value of storyboarding

In Chapter 2, we discussed the benefits of storyboarding your animation sequences. For a large Director project, you should consider creating a detailed storyboard of the entire Director movie to serve as a roadmap, clearly defining the entire scope of the project. This storyboard ensures that everyone involved — from the client who is paying for it, to the audio engineer who will be creating the voiceovers — understands their role in the project. When you create a storyboard, make sure you clearly define all the visuals, text, animation, and audio components that will be included in each scene. This helps you identify the elements that need to be produced for the project, and it gives you a basis on which to estimate the cost of the project.

A carefully detailed storyboard, like the one shown in Figure 10-3, is also the best way to make sure that both you and the client are in agreement about the content of the project. It's a good idea to have the client sign off on the storyboards, which — ideally — helps you avoid having to absorb the cost of additional changes to the

scope of the project later on. If the project is going to be a complex one, you might want to create a rough prototype in Director to have the client sign off on also.

There are several blank storyboards on the CD-ROM that you can use for your own projects. They are in PDF format and can be opened and printed on both the Macintosh and Windows platforms, using Adobe's Acrobat Reader software, which is also included on the CD-ROM. You can find the storyboards in the folder STORYBOARDS. You can find the Acrobat Reader in the GOODIES:ACROBAT READER (GOODIES\ACROBAT READER) folder.

Make sure that your storyboards include references to any factors that affect the cost and timely delivery of the project, such as:

- Digital video content that needs to be shot and edited before being included in the movie
- Complex animation sequences
- Special programming issues, such as connections to an online database, that might require outside assistance
- Any content requiring special permission or additional cost to acquire, such as stock photography, recordings of famous speeches, or a popular song

The level of detail to include in the storyboard should reflect the amount of trust between you and your client. If you're creating storyboards for a new client, you should include as much detail as possible to avoid confusion and to ensure that both you and the client have a clear understanding of the content that you're going to deliver.

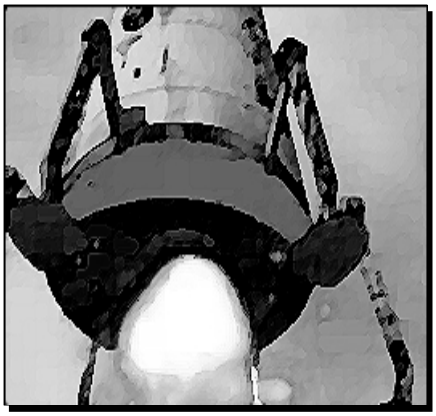
Generally, you should spend about one-third of the allocated production time on the creative process. Any less time might cause you to miss something that could greatly affect the cost or time needed to complete the project. If you spend any more time than this, our experience is that no additional benefit is gained from your efforts.

One of the authors of this book had an unfortunate experience with a dishonest client. He invested more than a week of time creating a detailed concept and storyboards for a television commercial to be produced by his client. After he submitted the proposal, the client informed him that he had chosen another company to produce the commercial. What the client actually did was use the author's storyboards to have other production companies bid on the project until he found one that would produce the commercial for a lower cost. The commercial that aired was shot scene-for-scene from the author's storyboards.

If you are in a competitive bid situation in which you are asked to supply detailed storyboards for a project before a vendor is chosen, make sure that you either receive payment for the work up front, or have the client agree to compensate you for the time invested in creating the storyboards if they choose not to use you for the project. At the very least, include a copyright notice on each page. This may give you some kind of legal recourse if a client pulls a stunt similar to the one just described.

Project: Explore Mars
Client: LightBender Design
Job #: 990106
Date Created: 2/25/00
Revised:
Approved by: Date:

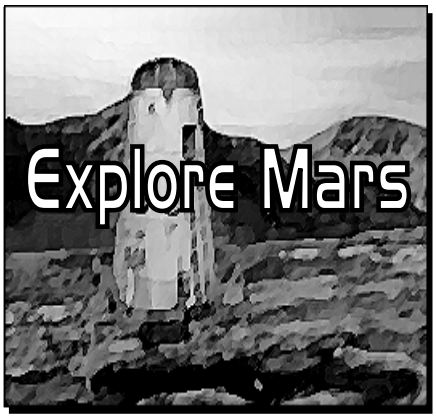
Screen: Open



Visual: The scene fades in from black , a small orange dot appears and grows to reveal the exaust flame from a rocket engine. As the flame grows larger the scene changes to a series of dramatic views as the rocket decends through the atmosphere then, finally changes to a side view as the ship touches down on the surface of Mars.

Audio: Radio chatter with ambient rocket engine noise.

Screen: Intronav



Visual: The title slowly dissovles on and holds for several seconds. The background slowly fades to black then the title moves to the upper left corner of the screen. Then the navigation bar elements slide into position from different corners of the screen.

Audio: Voice Over "Welcome to the Explore Mars interactive CD-ROM. Take an Interactive tour of the planet Mars, learn facts about the red planet and explore Web sites that are dedicated to the exploration of Mars."

Figure 10-3: A detailed storyboard used for a client review

Work Flow Considerations

Whatever the size of the project, deadlines for completion are usually very tight. When it comes time to begin the actual production, you need a system in place that enables the work to progress continually.

Many aspects of a multimedia project affect the deadline of your project, such as getting the client to approve the written content, or legal or copyright issues that need to be resolved. If you are creating a presentation for an event such as a trade show or sales meeting, where the deadline is written in stone, you'll be the one who has to make up all of the time lost at the beginning of the project.

Try to anticipate problems that could affect the deadline up front, such as delays in receiving content from the client (usually the biggest showstopper), and come up with an alternate plan, such as having your own writer standing by, just in case. Make sure that the client is aware of this alternative and has approved it up front so that you won't have to absorb the additional cost.

Another way to have more control over the production process is to structure the review cycles carefully. Try to discourage review by committee — the best approach is to ask your client to assign a small team that has the authority to sign off on the project, especially for reviews late in the process.

A good rule of thumb is to have two review cycles: the first near the beginning of the project, when the storyboards and project plan are presented, and a second near the end of the project. Reviews after the initial presentation of the storyboards and project plan are not the place to introduce sweeping changes, because they could affect the deadline. The best way to avoid this is to create detailed project plan storyboards and make sure that the client fully understands the work you intend to produce.

Managing the process

Keeping track of all of the elements that need to be produced for a project can be an overwhelming task. Even a small project can contain hundreds of different elements, such as artwork for buttons and animation sequences, audio, digital video, behaviors, and text content. Working on a large project that involves several people compounds the complexity, because you not only need to identify all of the elements and make sure they are produced in a timely manner, but you also need to ensure that the content coming from these various sources is consistent.

Here are some tips to help you better manage the production process and ensure consistency:

- Develop a standard naming convention for the elements, and make sure everyone sticks to it. A good technique is to develop a naming convention that identifies what the component is used for (for example, the main headers for

each section could use the prefix hdr followed by the name of the actual section name, such as hdrfacts.pct). This naming convention forces all the header elements to be grouped together in the folder, making it much easier to locate them. This convention applies to movie and Cast window names as well.

- Create a spreadsheet that contains a list of all of the elements that need to be created for each screen in the movie. This is a good point to determine the naming conventions. Then check off each element as it's created. This gives you a clear picture of the progress and helps you identify content that is taking more time to create than you had anticipated.
- Build templates in Director that contain elements, such as navigation buttons, that are used for the entire project. These templates should have all of the properties set, such as movie size, color space, and background color. Set the 16 favorite colors in the color palette to be the 16 common colors used in the project.
- Carefully design a set of rules that governs the placement of sprites in the Score; for example, the company logo is always in sprite channel 10, navigation buttons are always in sprite channels 3 through 8, and so on. This technique is especially important if several authors will be working on the project. Use guides to govern the position of key elements, such as titles and navigation components.
- Store common elements, such as behaviors, logos, and buttons that you use throughout the project, in the Library palette. Put these elements in an unlinked Cast window, and then drag the Cast window into the LIBS folder, which is in Director's application folder.
- Use the List View mode in the Property Inspector to track information about who created a particular cast member, as well as to find out the creation and modification dates.
- Create behaviors (Lingo scripts) that include parameters that give you as much flexibility as possible. For example, build a single behavior for the navigation buttons that contains every action that the various buttons in the movie will need to perform.

Developing a consistent approach to the way you build movies saves many hours of wasted time and identifies far in advance issues that can affect the deadline.

Using project management software

For large projects that involve a team, you should consider using project management software, such as Mac Flow or Microsoft Project. These programs enable you to track all the production aspects affecting the completion of the project. Project management software works by your plugging in each task, the number of people and percentage of their time devoted to the task, and the total amount of time needed to complete the task. This enables you to build a virtual model of the time

(called a *timeline*) involved in completing the project. With this model, you can easily identify tasks of the project that may affect the deadline, and then make any necessary adjustments, such as redefining the scope of the task or reassigning production resources.

Remember that a project timeline is only as accurate as the data plugged into it. It's also fairly time-consuming to maintain the timeline. If you're working with a small team, building and maintaining a project timeline is probably more of a hindrance than a help.

Working in a networked environment

There's nothing more frustrating than searching for an important file on someone's hard drive. The frustration is compounded if there are no standard naming conventions for the files. The best way to avoid this problem is to store the source files for a project in a carefully structured network environment. Although it's not a good idea to work directly on the files stored on the network — this can bring most networks to their knees and can even cause the server to crash — it's wise to have everyone update the files daily on the network that they are responsible for creating.

The structure of the network should mirror your production process. Structuring your network will vary greatly, depending on the needs of the project, but following are some general guidelines for most types of multimedia projects:

- Dedicate an area of the network for the "raw" content, which then serves as a repository for the source material being collected and created for the project, such as word processing documents, digitized video footage, Photoshop files, and scanned artwork.
- After this raw material is processed — the elements have been prepared so that they can be imported into Director — they should be stored in a separate area of the network that is accessible to the multimedia authors. This arrangement helps to avoid confusion on the author's part about which elements are ready to be imported into the movies and which are not. This could also be a good area for storing the working versions of the Director movies until they are finalized.
- As the movies begin to be finalized, you should store them in an area of the network dedicated to testing and debugging. After this stage is complete, move the finished movies to an area on the network where they are converted to projectors or are uploaded to a Web server as Shockwave and Java applets.

Create a directory structure that matches the one used to deliver the content. This approach ensures that any linked media in your movies function correctly.

A media cataloging tool, such as Extensis Portfolio, is another valuable tool for managing the various media assets used for large productions. These types of software enable you to create keywords for the elements and create a catalog that

knows the location of the element, making it very easy to find it in the future. This is especially useful if you will be revising and enhancing the projects and will need to use those assets many times.

Understanding Copyright Issues

Copyright is a form of protection that is provided by the United States (and most foreign governments) to the author of an original work. For example, an author can be an architect, artist, composer, photographer, publisher, singer, or writer. The copyright holder (that is, the author of a work) holds the exclusive right, according to the copyright law, to do the following:

- ✦ Reproduce the work
- ✦ Create derivative works based on the original
- ✦ Display the work in public
- ✦ Perform the work in public
- ✦ Distribute and sell copies of the original work

These rights must be specifically assigned, in writing, to you before you can duplicate a copyrighted image, sound, or text passage in any interactive media production.

A copyright notice is not required to assert the author's legal rights to original material. It is prudent, however, to always include a notice of copyright, for example: *Copyright © 2000 by Robert Martin, John R. Nyquist, and IDG Books, Inc. All rights reserved.*

Ownership or possession of a work (book, fine-art painting, limited-edition print, magazine, manuscript, photograph, sound recording, or video recording) does not give you permission to copy an item. If you purchase a limited-edition print, for example, you do not have the right to scan the image and place it in an interactive media project. If you purchase a book from a bookstore, you do not have the right to use images and text in a multimedia project. In both cases, you must seek permission from the copyright holder.

What can be protected by copyright?

Works that can be copyrighted include:

- ✦ Architectural drawings (blueprints, schematics)
- ✦ Audiovisual works (films, videotapes, DVDs)
- ✦ Dramatic works (pantomimes, musicals, plays, screenplays)
- ✦ Graphic images (cartoons, drawings, maps, paintings, photographs)

- ✦ Literature (articles, novels, poems, reports, short stories)
- ✦ Multimedia works (computer games, choreographic works, other products based on mixed-media types)
- ✦ Music and lyrics
- ✦ Publications (books, journals, magazines)
- ✦ Sound recordings (cassette tapes, compact discs, phonograph records)

As a general rule publications written by United States government agencies cannot be copyrighted and therefore are considered to be in the public domain; you can use these works without seeking copyright permission. This group does *not* include works belonging to the U.S. Postal Service, however. The Postal Service is an incorporated business, and as such it is entitled to copyright protection for the designs of its postage stamps.

Be extremely careful that you have not consciously or inadvertently included any information in your interactive media project that is the property of some other copyright holder. Obtain the required permissions if you want to use excerpts from textbooks, newspaper or magazine articles, material from other multimedia works, photographs, graphics, or other forms of media. The same restrictions and obligations that govern the use of print materials also apply in multimedia.

Copyright protection under U.S. copyright law is for a limited period, based on when the work was created. One of the following two formulas apply when determining the life of a copyright:

- ✦ If the work was created on or after January 1, 1978, it is protected from the moment of its creation until 50 years after the author's death.
- ✦ If the work was created prior to January 1, 1978, the life of the copyright is 28 years, and the author has the option to renew the copyright for an additional 47 years. Therefore, the maximum life span of the copyright is 75 years.

These are general guidelines to creating copyrighted material. Before publishing any copyrighted material, you should consult a qualified copyright attorney.

Fair use for educational purposes

Many colleges and universities have departments that produce multimedia classroom materials for instructional purposes. In this regard, the following information describes guidelines for fair use of copyrighted materials in such productions.

The fair use provision of the Copyrights Act is found in Section 107. It states that the use of copyrighted materials for "criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright." This provision was established at a time when the newest medium for copyrighted materials was the phonograph record. Further, the

law predates the introduction of personal computer applications, including multimedia. Still, legal precedence suggests that the fair use doctrine (as a means whereby copyrighted works may be used for noncommercial, not-for-profit educational purposes) also applies to multimedia applications. As we stated previously, these are general guidelines. If you have any concerns about the content that you intend to use, consult a qualified copyright attorney.

If you intend to sell your work, read no further. Fair use guidelines *do not* apply to your application!

Although few written standards exist to cover the fair use of copyrighted nonprint media, most legal experts and students of copyright suggest that when you use materials to prepare multimedia courseware for instruction or classroom presentations, you should apply the same criteria as prescribed for the fair use of copyrighted print materials. The criteria include these characteristics:

- **Spontaneity:** The decision to use copyrighted material must be a spontaneous decision. For example, an instructor cannot use the same copyrighted material spontaneously for several semesters. The decision to use the material must be the instructor's, and the decision must not be dictated by management or administration (as a cost-saving measure, for instance).
- **Brevity:** When discussing print media, guidelines are very specific, even to the point of specifying the maximum length of an excerpt from poetry or prose. The clear intent is to limit the use of copyrighted material to a small portion of the original work.
- **Cumulative Effect:** The fair use doctrine limits the copying or use of the copyrighted work in order to preserve the commercial or monetary value of the work to the author. Guidelines for copying print media limit the amount of information that can be used, based on the fair use doctrine. For instance, the law restricts the educator from copying more than one short poem, article, story, or essay from the same author, or two excerpts from the same author in the same collective work or periodical. The limitation applies to using the material during any one class term. There are different considerations for integrated media; in principle, however, the cumulative effect of any copying should not diminish the financial viability or rewards to the author.

As a developer, you can only claim fair use if the use of copyrighted material meets all three tests (spontaneity, brevity, and cumulative effect). In all other cases, you must obtain a copyright release for the materials that you use.

The strongest argument for fair use involves use of the material in these activities:

- The noncommercial use of copyrighted material for instructional purposes
- "Scholarly pursuits" (research and literary criticism)
- Copying modest portions of the copyrighted work for educational use

Copyright concerns for the developer

First, when working with material that you have not personally created, maintain a record of each item used in your project. Include the following information:

- The source of the asset (name of the book, magazine, publication, video, and so on)
- The author's name (artist, writer, cartoonist, illustrator, photographer, and so forth)
- The copyright holder and any pertinent copyright information (address, phone number, year of copyright notice, and so on)

Be aware that the author of a work may not be the copyright holder. Many authors create "works for hire" that belong to the publisher or to the creator's employer. Furthermore, the copyright may be held jointly by two or more individuals, in which case permission must be sought from all owners.

Second, as soon as you know you plan to use a copyrighted work, seek permission from the copyright owner.

Finally, don't forget to protect your *own* creative works. Although not required, it is still wise to include a copyright notice in a prominent location on your work.

Under the Berne Convention, any work you create is automatically protected, even without the addition of the copyright notice. If your work is reproduced inappropriately, however, your legal case is strengthened if the notice appears on your work.

Summary

Defining the scope of a project, developing a standard production process, and developing a standard naming convention will go a long way toward ensuring that your Director projects are more creative and will be delivered on time and on budget. Keep the following points in mind before beginning your next Director project:

- Use a project analysis form to determine the scope of the project.
- Develop detailed storyboards to ensure that everyone involved in the project understands what will be delivered.
- Use flow charts to model logic problems and programming issues that can arise in your projects.
- Use solid naming conventions and consistent production procedures.
- Be aware of copyright issues when using content from other sources.

Chapter 11 discusses the fundamentals of programming in Lingo.

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