Multimedia Authoring

Multimedia authoring is the process of creating a multimedia production, sometimes called "movies" or "presentation". It involves assembling or sequencing different media elements, adding interactivity, and then packaging the production for distribution to the end users. The end users are the target audience who will be viewing your final production.

Business presentations, advertising kiosks, games, and educational products are just a few examples of multimedia productions. These multimedia projects can be delivered to the end users over the internet (such as being played in a web browser) or as a standalone executable program suitable for distribution through CD-ROM and DVD-ROM, and for download from the internet.

Multimedia authoring programs allow you to combine text, images/graphics, audio, video, and animation into an interactive presentation. Many also have their own scripting language that lets you add interactivity to your production.

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Adobe Flash and Director are examples of commercial multimedia authoring programs. Flash has its scripting language called ActionScript and Director's scripting language is called Lingo. You can also develop a multimedia production by programming in languages that are not specific for multimedia authoring, for examples, C++, Visual Basics, JavaScript, or DHTML.

Multimedia Authoring Metaphors

The *authoring metaphor*, or *authoring paradigm*, is the methodology by which the authoring system accomplishes its task.

There are various metaphors:

• *Scripting Language Metaphor*: use a special language to enable interactivity (buttons, mouse, etc.), and to allow conditionals, jumps, loops, functions/macros etc. E.g., Lingo scripting language of Macromedia Director.

```
On exit frame
        go to frame 50
End
```

•*Slide Show Metaphor*: A linear presentation by default, although tools exist to perform jumps in slide shows.

•*Hierarchical Metaphor:* User-controllable elements are organized into a tree structure — often used in menu-driven applications.
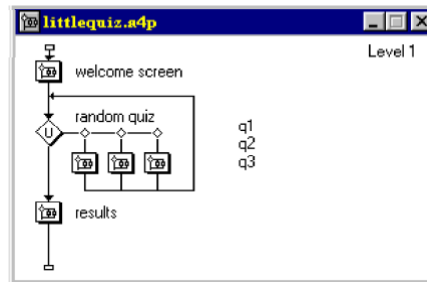
•*Iconic/Flow-control Metaphor:* Graphical icons are available in a toolbox, and authoring proceeds by creating a flow chart with icons attached.

- It tends to be the speediest in development time.

- best suited for rapid prototyping and short development time projects.

- Slowest runtime programs because of high interaction overheads.

- The core of this metaphor is the icon Palette, contains

- possible function/interaction of the program, and
- The flow line, which shows the actual links between the icons.

- Examples: *Authorware* and *Icon Author*

Authorware Flow Chart

- *Frames Metaphor*: Like Iconic/Flow-control Metaphor; however links between icons are more conceptual, rather than representing the actual flow of the program.

- *Card/Scripting Metaphor:* Uses a simple index-card structure — easy route to producing applications that use hypertext or hypermedia; used in schools.
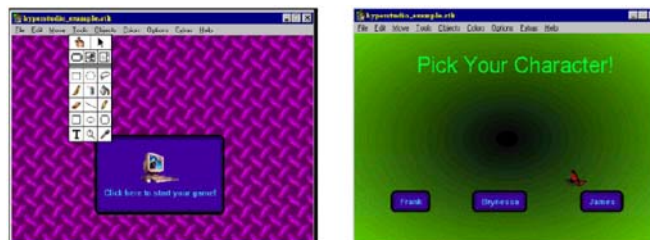
• *Cast/Score/Scripting Metaphor*:

-Time is shown horizontally; like a spreadsheet: rows, or tracks, represent instantiations of characters in a multimedia production.
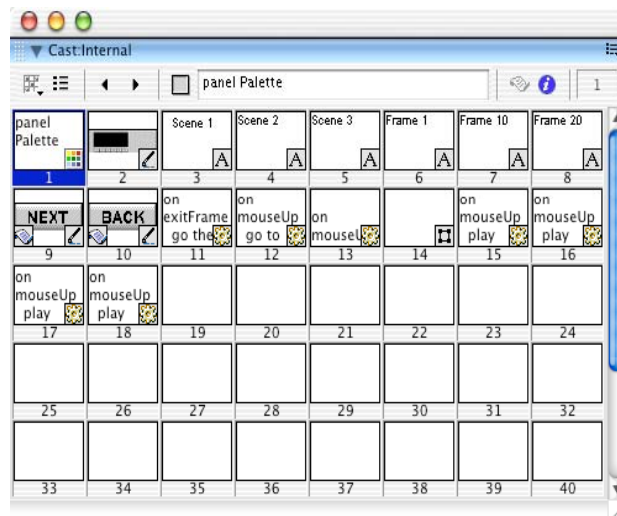
- Multimedia elements are drawn from a cast of characters, and scripts are basically event procedures or procedures that are triggered by timer events.

- Power of this metaphor lies in the ability to script the behavior of each of the cast members.
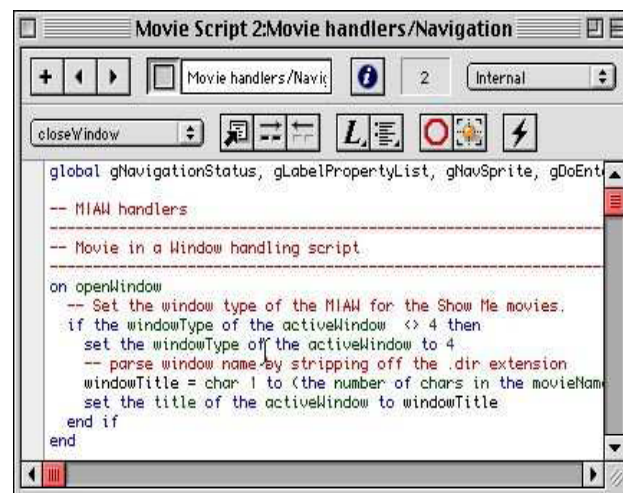
-Best suited for animation-intensive or synchronized media applications.
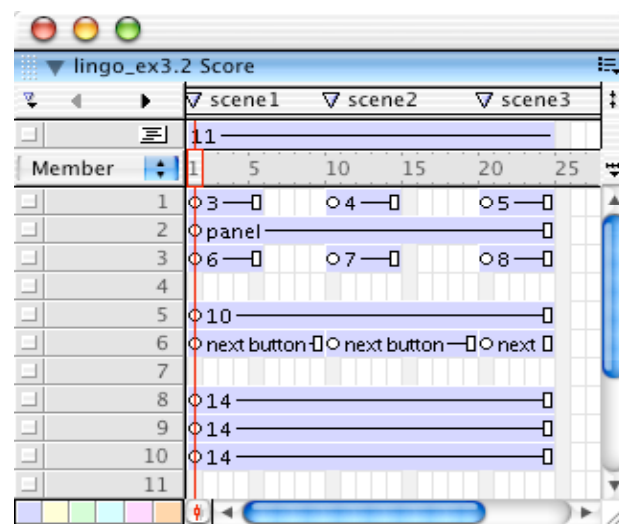
Macromedia Director Score window

Macromedia Director Cast window

Macromedia Director Script window

The Multimedia Production Process

Multimedia authoring refers to the assembly of media elements. The actual creation of the necessary media elements is a separate process. Digital images, video, and audio can be created with programs that are specialized for producing and editing these media.

For example, if you want to use video clips in your multimedia production project, you can shoot digital videos with a DV camera, transfer the video to a computer with a video editing program

such as Adobe Premiere Pro, with which you edit the video by adding transitions, adjusting durations, adding voice or music to the audio tracks, performing color correction, and adding special effects. Then, you export the video into a format, such as QuickTime, AVI, or a series of images, which you can import into your multimedia authoring program.

In the authoring process, you specify when your video will show up and how the video should interact with other media elements on screen when the multimedia production plays.

in this section discusses the basic steps of creating an interactive multimedia production to give you a big picture of the multimedia authoring process.

Step 1. Collect and assemble the media elements

Media elements include text, bitmap images, vector graphics, digital videos, digital audio, and animation. These elements are usually created outside of the multimedia authoring program using programs that are specific to the media type.

Step 2. Assemble the media elements

In Flash for example, you can create vector graphics using its pencil and brush tools. You can also import various types of media elements. These elements can be arranged on a timeline to control the order and timing of their appearance.

Step 3. Add interactivity

Interactivity can be added by programming, for example, in ActionScript in a Flash project or LingoScript in a Director Project.

Step 4. Package the movie for distribution to the end users

The two most common forms of distributing multimedia productions are *standalone executables* and *movies that play back in a web browser*. Publishing your multimedia project in any of these two formats allows others to view your finished project without the authoring environment. For example, they do not need to have a copy of Flash installed in order to view your Flash movies.

- The Web version of Flash movies is SWF file. It has a smaller size than the standalone executable and intended for the Web. It is playable on Windows, Macintosh, and Linux computers, as long as the Flash player or the browser plug-in is installed.

- Standalone executable does not require a plug-in to play. Standalone executables are usually created for distribution on CD-ROM or DVD-ROM. The file size for an executable is larger than a Web version, and you need to create separate executables for different operating systems.

Multimedia Authoring
Systems and Applications

An Authoring System is a program in which has pre-programmed elements for the developments of interactive multimedia software titles.

There is no such thing (at this time) as a completely point-and-click automated authoring system; some knowledge of heuristic thinking and algorithm design is necessary.

Whether you realize it or not, authoring is actually just a speeded-up form of programming; you don't need to know the intricacies of a programming language, or worse, an API, but you do need to understand how programs work.

Authoring systems vary widely in:
• Orientation,
• Capabilities, and
• Learning Curve.

Why should you use an authoring system

• can speed up programming possibly content development and delivery.

• the content creation (graphics, text, video, audio, animation, etc.) not affected by choice of authoring system.

• time gains – accelerated prototyping.

Authoring Vs Programming

❖ Authoring

   - assembly of Multimedia.

   - possibly high level graphical interface design.

   - some high level scripting.

❖ Programming

   - involves low level assembly of Multimedia.

   - construction and control of Multimedia.

   - involves real languages like C and Java.

Issues in Multimedia Application Design

There are various issues in Multimedia authoring.

Issued involved:
- **-** Content Design.
- **-** Technical Design.
- **-** Visual Design.

Content Design

Content design deals with:
- What to say, what vehicle to use.

In Multimedia , there are five ways to format and deliver your message, you can

- *write* it,
- *illustrate* it,
- *wiggle* it,
- *hear* it, and
- *interact* with it.

Scripting (*writing*)

Rules for good writing:

1. Understand your audience and correctly address them.

2. Keep your writing as simple as possible. (e.g., write out the full message(s) first, then shorten it.).

3. Make sure technologies used complement each other.

Graphics (*illustrating*)

• Make use of pictures to effectively deliver your message.
• Create your own (draw, scaner, photoCD, …), or keep copy files of art works.
Graphics Styles
• Fonts
• Colors
> - Pastels.
> - earth colors.
> - metallic
> - primary color
> - neon color

Animation (*wiggling*)

1- Types of Animation

• Character Animation - humanize an object.

<u>Factors in choosing a character</u>

- Emotion - Is it happy, sad, funny, sloppy, ...?

- Movement - Is it fast, slow, bumpy, ...?

- Visual style - Is its color/texture consistent with the rest?

- Copyright - "Don't use Mickey before checking with Walt."

- Adequacy - e.g., Does it provide various poses (can't make a broomstick sit!)

• Highlights and Sparkles

> e.g., to pop a word in/out of the screen, to sparkle a logo.

• Moving Text

> e.g., put up one character at a time like a typewriter.

> *Note*: Do not slowly move entire line of text, they are not readable.

• Video – live video or digitized video.

> e.g., put up one character at a time like a typewriter .

- Video – live video or digitized video.

  - Advantages:
    - more powerful than still images.
    - often easier to obtain than graphics animation .
- Disadvantages:
    - takes a lot of disk space.
    - sometimes needs special hardware.

2- When to Animate

  Only animate when it has a specific purpose,

  e.g., "A leaf doesn't flutter if the wind doesn't blow"

- Enhance emotional impact

e.g., air bag explosion + dummy movements -> car crash.

- Make a point

e.g., show insertion of a memory chip onto the motherboard (much better than a diagram).

- Improve information delivery

e.g., "pulsing" words (in and out of screen) adds emphasis

• Indicate passage of time

e.g., clock/hourglass -> program still running

• Provide a transition to next subsection
  ○ Wipes - e.g., L-to-R, T-D, B-U, diagonal, iris round,   center to edge, etc.
  ○ Dissolve - the current image distorts into an unrecognizable form before the next clear image appears,.
  ○ Fade - a metaphor for a complete change of scene
  ○ Cut - immediate change to next image.

Audio (*hearing*)

Types of Audio in Multimedia Applications:

1. Music – set the mood of the presentation, enhance the emotion, illustrate points.
2. Sound effects - to make specific points, e.g., squeaky doors, explosions, wind, etc.
3. Narration - most direct message, often effective

Interactivity (*interacting*)

- interactive multimedia systems.
- people remember 70% of what they interact with (according to late 1980s study).

Types of Interactive Multimedia Applications:

1. Menu driven programs/presentations
    - often a hierarchical structure (main menu, sub-menus)

2. Hypermedia
    - less structured, cross-links between subsections of the same subject, non-linear, quick access to information.
    - easier for introducing more multimedia features, e.g., more interesting "buttons"
    - could sometimes get lost in navigating the hypermedia.

3. Simulations / Performance-dependent Simulations
    - e.g., Games - SimCity, Flight Simulators.

Technical Design

Technical factors may limit the ambition of your multimedia presentation.

Technical parameters that affect the design and delivery of multimedia applications.

1. Video Mode and Computer Platform

   PC – Macintosh.

   There are many "*portable*", "*cross-platform*" software and "*run-time modules*", but many of them lose quality/performance during the translation.

Video Mode	Resolution	Color
CGA	320 x 200	4
EGA	640 x 350	16
VGA	640 x 480	256
S – VGA	1024 x 768	65536
S – VGA	1280 x 1024	16.7 million

2. Memory and Disk Space Requirement.

3. Delivery.

❖ Live Presentation

Short checking list for hardware/software requirements:

- ✓ type of graphics card
- ✓ video memory (1 MB, 2 MB, 4 MB, etc.)
- ✓ access time of hard disk (important for real-time video)
- ✓ type of sound card (support for General MIDI)
- ✓ audio-video software

❖ Delivery by CD-ROM

　　- Large capacity

　　- Access time of CD-ROM drives is longer than hard-disk drives

❖ Electronic Delivery (ftp, www, etc)

　　- depends on baud rate, network connection, and monthly bill

Visual Design

There are factors that should be considers in the visual design of a multimedia presentation:

1. Themes and Styles

- A multimedia presentation should have a consistent theme/style, it should not be disjointed and cluttered with multiple themes.

- The choice of theme/style depends on the styles and emotions of your audience.

❖ Some possible styles
- Cartoon theme
    + interesting / entertaining.
    - must be consistent with the character's personality.
- Traditional theme - straightforward
    + simple, often informative
    - not as interesting
- High tech theme - contemporary computer art work (morphing, texture mapping, metal texture, explosions, ...)
    + attractive, easy to animate

• Technical theme - include blueprints, 3D models of the product.

 e.g., start with a drawing, then transformed into a rendered image.

+ shows adequate technical information.

+ gives impression of solid design and construction.

2. Pace and Running Length

There are few guidelines:

• Allow a block of text to be slowly read twice.

• Transition time should be an indication of real-time.

- dissolve: time delay, scene change

- cut: two views of same scene at same time, or abrupt scene change.

• Running length

- self running presentation: 2-3 minutes

- limited interaction: 5-6 minutes

- complete analytical, hands-on demo: < 15 minutes

- with questions, discussions: > 30 minutes

3. Basic Layout

(a) Title

(b) Action area

(c) Narration

(d) Dialog

(e) Interactive controls

• make sure that the information delivery path in the layout is smooth, not irregular/jumpy

• use headlines/subtitles, additional shapes, buttons, fonts, backgrounds and textures to enhance the visual appearance.

Storyboarding

The concept of storyboarding has been by animators and their like for many years.
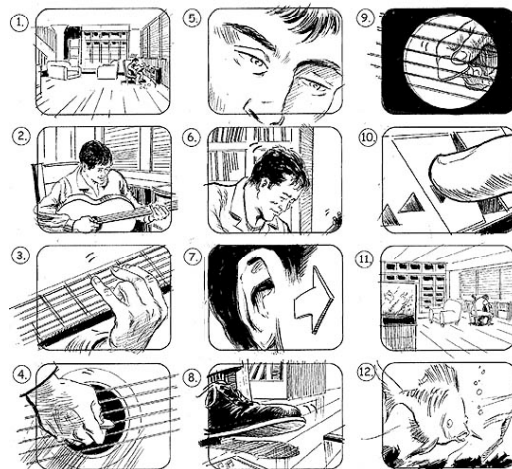
Storyboarding is used to help plan the general organization or content of a presentation by recording and organizing ideas on index cards, or placed on board/wall. The storyboard evolves as the media are collected and organized.

The Stages of Authoring

Authoring a multimedia piece generally follows the traditional development process of analysis, design, development, evaluation, and distribution.

1- Analysis

Before you start using the Authoring software, conduct an analysis to determine what the piece you're creating needs to do. The analysis you make will differ depending on the type of solution that you are providing. Who is the intended audience? What objectives must be met? How timely must the information be? What environment will users be in when they use the piece? If you're developing a kiosk that will be situated in a noisy shopping mall, you may decide against using sounds in your piece.

Next, think about how you'll distribute the piece and the kinds of computers that the target audience has.

2- Design

Before you develop the navigational structure of your piece, make a prototype of the screen design and identify all of the content elements for your piece.

❖ **Create storyboards and prototypes**

Create storyboards for the project and design a few sample screens to work out in detail exactly what you want to achieve. Authorware is ideal for creating prototypes. You can draw basic shapes to represent elements on the screen and later import finished graphics into the piece. A prototype should convey the idea of how a piece will work. Be careful not to spend too much time on visual details for the prototype: If the design needs to change later, you will have created graphics that won't be used.

❖ **Identify and gather content**

When professional developers identify and gather their content, they create what's known as an asset list, a list of every sound, graphic, movie, and object used in a piece. You should do the same. Authorware excels at integrating text, graphics, sound, and digital movies. Although you can create some text and graphics with Authorware tools, you'll get the best results with applications designed specifically for creating the type of media you want to include. For example, use Macromedia Flash for digital movies and animations.

Use the Authorware media libraries and external content features as much as possible. They let you store content externally and reuse and reference the icons, saving disk space and making it easier to update applications. Be sure that your computer and all end users' computers have the equipment needed to play sound and movies.

3- Development

Now you're ready to build full functionality into the piece, which is best done module by module. You'll need to import content, apply transition and motion effects, create navigation structures and interactions, and develop data variables.

Look for ways to set up logic so you can save it as a model and reuse it. Remember that you can switch from Authorware to external applications, for example, to let the user enter numbers in a real spreadsheet or save results in a text file. Run and test the piece regularly as you build it.

4- Evaluation

When you think your application works the way you want it to, test it just as software companies test applications - on real users.

❖ **Testing and fine-tuning**

Run the files and make adjustments to the content and the interactions. You might need to modify the files to obtain the best performance on slower computers. It's important to allow ample time for this stage; designing interactions is considerably more complicated than creating a linear presentation.

❖ **Review**

In this stage of testing, you make sure the project works as designed. You might need to go back to the development stage, or you might simply need to fine-tune some details.

5- Distribution

When you're ready to distribute your piece, package it. You can use one-button publishing to package it in multiple formats at the same time. If you're developing commercial applications, make sure your distribution is in accordance with the license agreement. The packaged file doesn't contain all the information needed to change the application, so be sure to archive the original file.

If you're developing a piece for the Internet or for a corporate intranet, you can use one-button publishing to create the HTML page where you want to embed the piece, and then put all the files on your web server. Run at least one test with each browser that will be used to view the piece, such as Netscape Navigator or Microsoft Internet Explorer, to make sure the piece downloads and runs properly.