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Prerequisites and Selection Criteria of Multimedia Authoring Tools (MAT)

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Abstract

The integration of audio, video, graphics and text on the desktop promises to fundamentally challenge the centuries old printed document as the basis of information exchange. Before this potential can be realized, however, systems must be devised that enable the production and presentation of complex, inter-related media objects. These systems are generically called multimedia-authoring tools. This article will discuss about different aspects of Multimedia Authoring Tools (MAT), its categorization, most common features and prerequisites. A special attention has been given to discuss the most common features of MAT and the best possible evaluation criteria of authoring packages. Lastly, three most popular MAT with their brief features are presented.

1   Introduction

In the present computer age the term multimedia has become a vogue. The etymological meaning of the word *'multimedia'* gives raise to -- *multi* ('much' or 'many') and *media* (from *medium* meaning '*means of communicating*'). With today's inexpensive, powerful personal computers and many easy-to-use-authoring languages, multimedia production is easily available and accessible.

The Multimedia Authoring Tools **(MAT)** are different from traditional media [1], and we can classify them in different types. All kinds of MAT have some common and general features. There should be some prerequisite knowledge, which is important to consider before multimedia production begins. Before selecting any MAT one should evaluate them on the basis of some evaluation criteria.

2   Definition

A MAT can be defined as:

2.1 A tool which provides the important framework for organizing and editing the elements of multimedia including graphics, sound, animation and video. The tool should help us in designing interactivity and user interface for presenting and assembling multimedia elements into a single cohesive project. [2]

2.2 A multimedia-authoring tool is the mean that allows multimedia presentation, which synthesizes content created by the text, graphics, video and audio editing tools into a single presentation. [3]

2.3 A MAT is a user application program that allows for the creation of courseware combining text, graphics, video and audio for playback and interaction in a training environment. [4]

3   Types of MAT

On the basis of the working methods, available MAT can be classified into four categories [2]:

3.1 Card or page based tools

Here, multimedia elements are organized as a page of a book or stack of cards. This is best used when bulk of content consists of elements viewed individually where hyperlinks enable users to browse in a non-linear way. For example, *HyperCard, SuperCard, MediaObjects, ToolBook* etc.

3.2 Icon based tools

Here multimedia elements and user interaction are organized as objects in a structural framework. These tools actually help in organizing the content by displaying a flow diagram of activities along with branching paths. The best examples are, *AuthorWare, IconAuthor, Quest* etc.

3.3 Time based tools

In this case, events and elements are organized along a timeline. These tools are best used when message or information must be provided within fixed time limit. An example of this kind is, *Macromedia Director*.

3.4 Object oriented tools

Here elements and events become objects that live in a hierarchical order -- parent and child relationships. This is particularly useful for games, which contain many components with many personalities. The best examples are *mTROPOLIS, Apple Media Tools, Media Forge* etc.

4   Features

Following are eight most common features [5].

4.1 Editing feature

The elements of multimedia need to be created, edited and converted to standard file formats and a MAT must support these tasks.

4.2 Organizing feature

The organization, design and production process of multimedia involve story boarding or flowcharting. *SuperEdit, AuthorWare, IconAuthor* etc. have this feature.

4.3 Programming feature

A MAT should offer one or more of the following programming features:

  4.3.1   Visual programming with cues, icons and objects;

  4.3.2   Programming with a scripting language;

  4.3.3   Programming with a traditional language like BASIC, C etc.

  4.3.4   Document development tool.

In the field of Library and Information Science this approach is very much important because a powerful document reference and delivery system are key components of many library services. MAT should offer direct importing of preformatted text, indexing facilities, complex text search mechanism and hyper-linking mechanism.

4.4 Interactive feature

A MAT should provide one or more of the following levels of interactivity

  4.4.1   Simple branching: ability to go to another section of the multimedia production.

  4.4.2   Conditional branching: ability to link on the basis of IF-THEN condition.

  4.4.3   Structured language: support for nested IF-THEN condition, subroutines, event tracking etc.

4.5 Performance tuning feature

MAT should offer the exact synchronization of events. It is good if it provides the custom programming facility to specify timing and sequence of events.

4.6 Playback feature

MAT should let one build a segment of presentation and then quickly test it as if the users were actually using it.

4.7 Delivery feature

It is better, if MAT provides a run-time version, which allows to play back without requiring the full authoring software and its tools and editors.

4.8 Cross platform feature

It is also important that a MAT should run under different operating platforms like Windows, Macintosh, UNIX etc.

5   Multimedia prerequisites

Before going to develop a multimedia presentation or choosing a MAT one should think of the objectives of the project and the content of the presentation. Libraries and information centers especially in the era of digital libraries, may have all the content in various multimedia files. The MAT should not only support various file format, but should be able to used object-oriented multimedia data base back-ends.

This understanding guides us to choose proper tools in bringing one's work to life. Basically most of the MAT satisfies one of the following four [6] prerequisites; these are:

PREREQUISITE	SOFTWARE
Hypertext	*Multimedia Viewer, Winhelp, Guide, Multimedia Toolbook*
Presentation	*Aldus Persuasion, Astound, Authorware Professional, Forshow, Iconauthor, Imageq, Macromedia Director, Q/Media.*
Training	*Tourguide, Tie Authoring System*
Programming	*Mciwnd, Opengl, Wing, Wintool*

Table 1: MAT prerequisites

6   Evaluation criteria for multimedia authoring tools

There are several criteria [7], which must be considered when a tool is being selected for a multimedia preparation.

6.1 Authoring environment

The authoring environment is one of the most important areas of consideration. Basically authoring environments come in two varieties - (1) icon-based with drag-and-drop flowcharting, (2) object-oriented and require scripting.

6.2 Multi-platform support

The multimedia development tools should support all the computing platforms like DOS/Windows, Macintosh, and UNIX.

6.3 Price

The price of a multimedia authoring tool depends on its performance. In general, drag-and-drop packages are more expensive, while scripting-based tools cost less. Some multimedia productions require purchase of third party media editing and generation software and hardware to develop applications then cost will be more, as they involve hidden costs of third party software.

6.4 Support for text, graphics, animation, video, and sound

The authoring tools must be able to handle rich text, graphics, animation, video, and sound. Hypertext and equation editing capabilities may also be necessary. The development tool must be able to handle different file formats (see table-3) depending on the media being used in the application. The following table presents the media types and the various file formats the content may be stored.

MEDIA TYPES	COMMON FORMAT
Image	.BMO, .DIB, .PCX, .TGA, .GIF, .JPG, .TIF, .PICT
Sound	.WAV, .MID, .MP3, .SND
Animation	.FLI, .FLC, .MMM
Video	.MPG, .MOV, .TGA, .AVI

Table 2: Common media formats

6.5 Specific support for learning applications

The ease of use is an essential criteria in the selection of MAT. Some authoring tools, such as *AuthorWare Academic*, are designed specifically for educators and provide lesson templates, which facilitate course design.

6.6 Extensible architecture

It may be useful to integrate a multimedia application with an exis ting software application (e.g. database). The multimedia tool must have an extensible architecture to perform these tasks (such as **Dynamic Link Libraries** (DLE), **Dynamic Data Exchanges** (DDE), **Object Linking and Embedding** (OLE) in the Windows environment).

7   Three popular multimedia authoring tools and their features

7.1 Authorware Attain 5.2

Authorware Attain5.2 [8] is a leading visual rich-media-authoring tool for creating Web pages and online learning applications. It allows developers, instructional designers, and subject matter experts to develop trackable learning applications and deploy them across the Web, LANs, and CD-ROM.

Features

Navigating	Instructional	Versatile
Intuitive Flowline Built in interactivity	Knowledge Objects Assessment knowledge	Cross-platform Support Flexibility delivery
Powerful navigation	Hyperlinking	Streaming playback
Macromedia flash 5 support	Full text search and retrieval	Web player autoinstall
Quick time 4 support	External content	Low-bandwidth audio
Shockwave audio	Media management	Xtra extensions
Anti aliased text	Built in data tracking improvement	ActiveX support
Alpha channel	Knowledge track	Windows controls
Custom buttons		Scripting language
Show me files		Enhanced calculation editor

Table 3: Features of Authorware Attain 5.2

7.2 Director 8

Macromedia's Director 8 [9] is a powerful authoring tool for multimedia. Director enables users to import, integrate, and manipulate media objects to create high-impact interactive multimedia titles that can be delivered on Windows, Macintosh, and the Web.

Features

Developed features	Magnetic features	Destination features
Developed html Guided and distributed command Locked spirit	Developed magnetic html Runtime imaging Transition behavior	Publish command Loader movies Multi-user server2
Stage zooming	Precession sound control	Free player distribution
Image compression	Broadcast quality animation	High performance playback engine.
Robust scripting language	Rich text and shocked fonts	Integrate HTML content

Developed features	Magnetic features	Destination features
Broad media and file support	Real-time rotation and skewing	Stand alone applications
Unlimited cast	Multimedia hyperlink	Integrated web-safe palette

Table 4: Features of Director 8

7.3 Flash 5

Macromedia's Flash 5 [10] is useful in designing and delivering low-bandwidth animations, presentations, and Web sites. It offers scripting capabilities and server-side connectivity for creating attractive applicatio ns, Web interfaces, and training modules. It is very easy to create small & fast Shockwave multimedia, create animations or integrate existing graphics into your Web site, with no download lag.

Features

Approachable	Creative	Standard
New user interface Macromedia free hand import	Bezier pen tools Shared symbol libraries	Movie explorer Support macromedia Flash Player
Generator developer edition support	Intuitive drawing tools	Web-native printing
Improved document and learning aids	Vector effects	Quick time and Real Player support
Intuitive timeline	Bitmap support	Action Script development tools
Asset management	Advanced button and menu	Smart clips
Publish command	MP3 streaming audio	XML transfer and HTML text support

Table 5: Features of Flash 5

8   A comparative study between three MAT

Comparison	Authorware	Director	Flash
Overview	Authorware is the industry-leading program for creating interactive, rich media learning applications.	Director is the standard for creating and delivering powerful multimedia	Flash is the standard for producing high impact web experience
Main use	*Computer based training; *Web based training	*Web based multimedia *Demos, presentations	*Web based interface; *Narrative animations
Primary users	*Training Developers; *Subject matter expert.	*Web developers; *Multimedia Professionals; *Corporate presentation specialists.	*Web designers; *Web developers; *Animators.
Skill level of user	*60% of projects require very little technical proficiency; *30% of projects require medium, technical proficiency; *10% of projects require high level technical proficiency;	*25% of projects require very little technical proficiency; *25% of projects require medium level technical proficiency; 50% of projects require high level technical proficiency;	*60% of projects require very little technical proficiency; *30% of projects require medium technical proficiency; *10% of projects require very high technical proficiency;
User interface	Icon on a flow line	Frame based using a score, powerful scripting language.	Timeline –based, graphical editing tools and scripting language.

Comparison	Authorware		Director		Flash	
	Import	*Create*	*Import*	*Create*	*Import*	*Create*
Media support	Text	Text	Text	Text	graphics	Text
	graphics	shapes	graphics	Shapes	Audio	shapes
	Animat-ion	Basic animati-on	Animat-ion	Sophistic-ated animation		Sophisticated animation
	Audio		Audio			
	Video		Video			
Media control	Provides some synchronization of graphics, animation, sound and video creates hyperlink between any media types		Provides tight synchronization and extensive control of media elements.		Provides tight synchronization and control of media elements	
Interactivity	Support rich interactivity. Nearly all interactivity is created through smart icons and easy to use menus.		Support rich interactivity through behaviors and scripting language called Lingo		Support good interactivity through Smart Clips, a scripting language called Action Script, as well as pre built learning interactions.	
Updating applications over time	Easy to change applications over time such as updating information, changing media content or interactions. Provides simple ways to create re-usable templates.		Primarily used for creating high impact, one-time productions. Developers can create re-usable code through behaviors.		Primarily used for create one time productions. Can be combined with macromedia generator to dynamically create graphics that include real time data	

Comparison	Authorware	Director	Flash
Student tracking	*Built in data tracking; *Automatic books to a learning management system.	Possible to return detailed data to a LMS with programming.	Possible to exchange date with a LMS through programming
Data connectivity	ODBC database access	*ODBC database access; *Parses XML	*Parses and exports; *Flash templates work with Macro media Generator server-side software to deliver dynamic, data driven content.
Delivery platform	*Web and intranet; *Hybrid (CD-ROM and Web); *LANs; *CD/DVD-ROM	*Web and intranet; *Hybrid (CD-ROM and Web); *LANs; *CD/DVD-ROM	*Web and intranet; *LANs; *CD/DVD-ROM
Extensibility	*3.0 and above browser; *Authorware Web Player; *Windows and Macintosh	*3.0 and above browser; *Shockwave; *Windows and Macintosh	*3.0 and above browser; *Flash Player; *Windows Mac and selected Unix platform

Table 6: Comperative study of AuthorWare, Director and Flash

9   Conclusion

The success of multimedia presentation package depends on MAT. It may include hardware components like soundcard, speaker, headphone, digital camera, microphone, digital video cards etc. A lot of authoring packages are available in the market have been classified into four categories. Though they have maximum common features but some features are unique. From comparative study [11] of

these MAT, it can be said that Authorware is good for multimedia based computer aided teaching packages. Macromedia Flash is good for special web application. Authorware and Flash require less technical skill whereas Director requires higher technical skill. The potential of multimedia in libraries is still not fully exploited. It has enough scope specially in rural public libraries and at the same time in special scientific R&D centers.

10   Reference

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