Multimedia Authoring and Tools

2.1 What is Multimedia Authoring and Tool?

Authoring refers to the process of creating interactive multimedia content that combines text, images, audio, video, animations, and other elements into a cohesive project. An ***authoring system*** is a program which has pre-programmed elements for the development of interactive multimedia presentations.

Multimedia authoring is done through ***Authoring tools***, which provide an integrated environment for binding together the different elements of a Multimedia production. Multimedia Authoring Tools provide tools for making a complete multimedia presentation where users usually have a lot of interactive controls, are called *authoring* programs. Multimedia presentations can be created using: simple presentation packages such as PowerPoint

2.2 Why should you use an authoring system? (Benefits)

1. Ease of Use for Non-Technical Users
2. Efficient Multimedia Integration
3. Time and Cost Efficiency Faster Development, Reduced Development Costs)
4. Consistency and Standardization (Maintaining, Reusable Components)
5. Cross-Platform Compatibility
6. Can speed up programming i.e. content development and delivery
7. Time gains i.e. accelerated prototyping
8. The content creation (graphics, text, video, audio, animation) is not affected by choice of authoring system and Scalability for Large Projects

2.3 Characteristics of Authoring Tools

A good authoring tool ***should be able to***:

1. ***Integrate*** text, graphics, video, and audio to create a single multimedia presentation
2. ***Control*** interactivity by the use of menus, buttons, hotspots, hot objects etc.

3. ***Publish*** as a presentation or a self-running executable; on CD/DVD, Intranet, WWW
4. ***Be extended*** through the use of pre-built or externally supplied components, ***plug-ins***.
5. Let you ***create highly*** efficient, integrated workflow
6. Have a ***large user base***.

2.4 Multimedia Authoring Paradigms

The authoring paradigm, or authoring metaphor, is the methodology by which the authoring system accomplishes its task. There are various paradigms:

2.4.1 Scripting Language

1. Closest in form to traditional programming. The paradigm is that of a programming language, which specifies: multimedia elements, sequencing of media elements, hotspots (e.g. links to other pages), and Synchronization, etc.
2. Usually use a powerful, object-oriented scripting language
3. Multimedia elements and events become objects that live in a hierarchical order
4. In-program editing of elements (still graphics, video, audio, etc.) tends to be minimal or non-existent.
5. Most authoring tools provide visually programmable interface in addition to scripting language.
6. Media handling can vary widely

Examples:

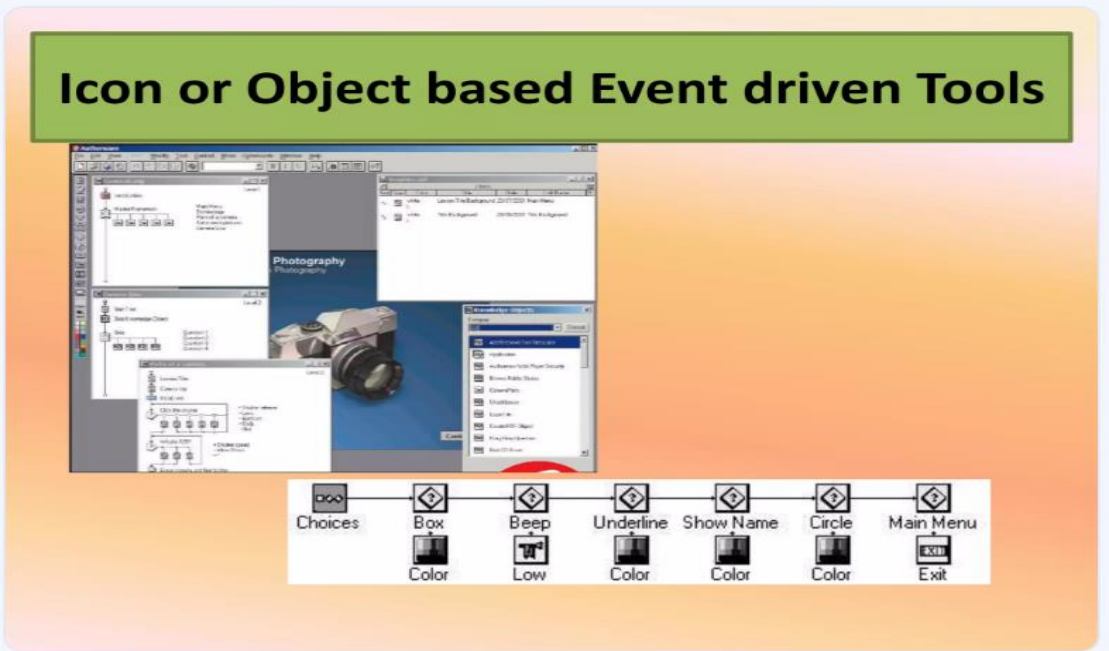
• The Apple's HyperTalk for HyperCard,
• Asymetrix's OpenScript for ToolBook and
• Lingo scripting language for Macromedia Director
• ActionScript for Macromedia Flash

Here is an example lingo script to jump to a frame:

```
global gNavSprite
on exitFrame
go the frame
play sprite gNavSprite
end
```

2.4.2 Iconic/Flow Control Tools

In these authoring systems, multimedia elements and interaction events are providing visual programming approach to organizing and presenting multimedia.



1. The core of the paradigm is the icon palette. You build a structure and flowchart of events, tasks, and decisions by dragging appropriate icons from icon palette library. These icons are used to represent and include menu choice, graphic images, sounds, computations, video, etc.
2. The flow chart graphically depicts the project logic
3. Tends to be the speediest in development time. Because of this, they are best suited for rapid prototyping and short-development time projects.
4. These tools are useful for story boarding because you can change the sequence of objects, restructure interaction, add objects, by dragging and dropping icons.

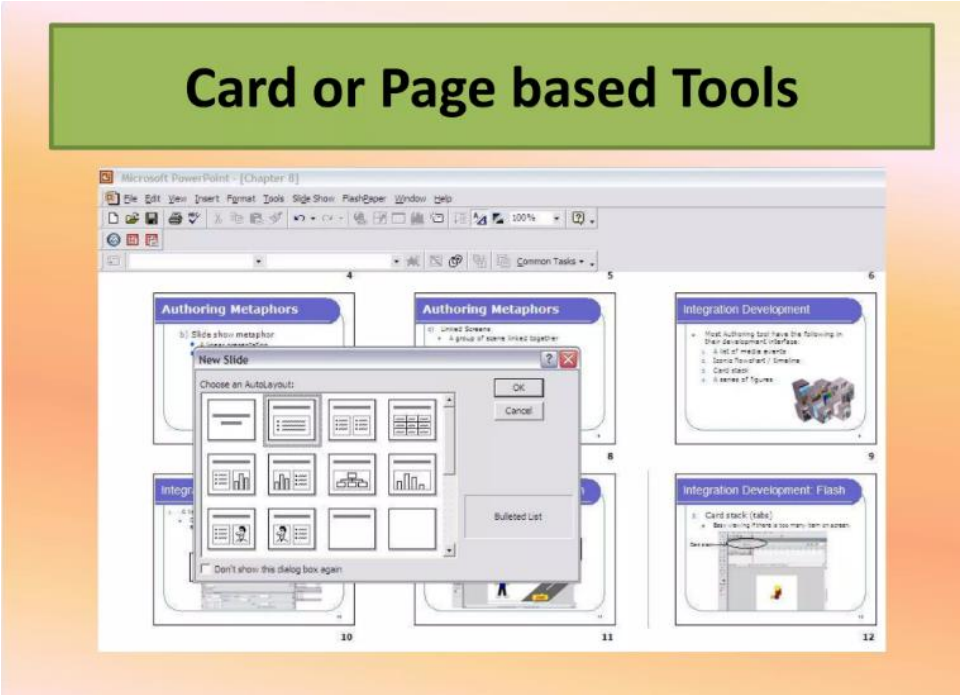
Examples:

- Authorware
- IconAuthor

2.4.3 Card and Page based Tools

They are multimedia authoring systems that organize content into discrete units, such as cards, slides, or pages. These tools allow users to present information in a structured, navigable format where each

card or page represents a section or segment of the content. They are especially useful for creating linear or non-linear presentations, e-learning modules, and interactive stories.



1. Well suited for Hypertext applications, and especially suited for navigation intensive applications
2. They are best suited for applications where the bulk of the content consist of elements that can be viewed individually
3. All objects (including individual graphic elements) to be scripted; organized as objects in a structural framework.
4. Many entertainment applications are prototyped in a card/scripting system prior to compiled-language coding.
5. Each object may contain programming script that is activated when an event occurs.

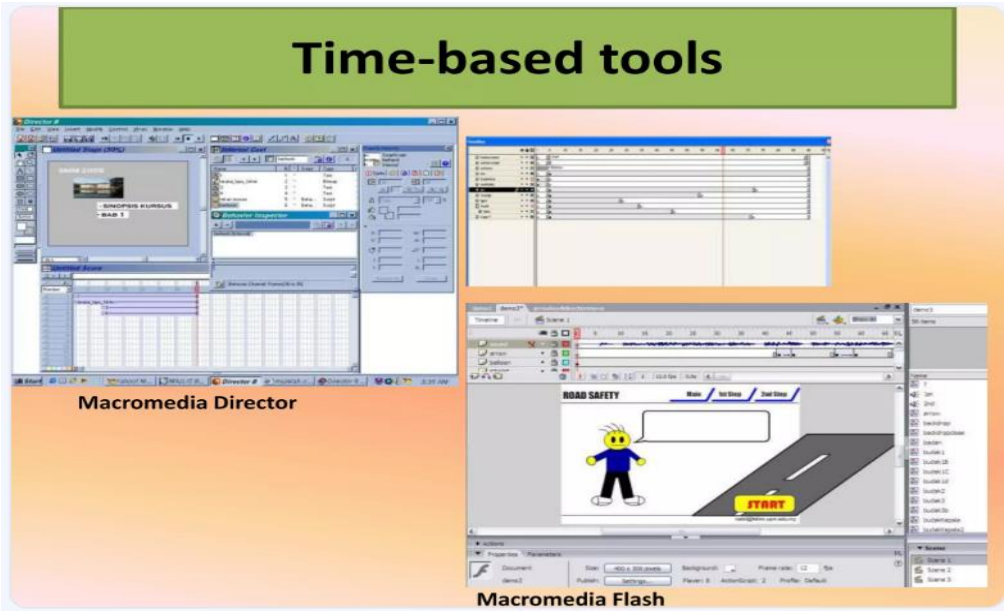
Examples:

- HyperCard (Macintosh)
- SuperCard(Macintosh)
- ToolBook (Windows), etc.

2.4.4 Time Based Authoring Tools

In these authoring systems elements are organized along a time line with resolutions as high as 1/30th second. Sequentially organized graphic frames are played back at a speed set by

developer. Other elements, such as audio events, can be triggered at a given time or location in the sequence of events.



1. Are the most popular multimedia authoring tool
2. They are best suited for applications that have a message with beginning and end, animation intensive pages, or synchronized media application.

Examples

1) Macromedia Director

It was a powerful and complex multimedia application authoring platform, primarily used to create interactive MM application like animations, presentations, and video games. It was known for its ability to integrate various media types like graphics, sound, and video, with scripting capabilities through its programming language, **Lingo**. You can assemble and sequence the elements of project using **cast** and **score**. Three important things that Director uses to arrange and synchronize media elements:

- **Cast**

Cast is **multimedia database** containing **any media type that is to be included in the project**. It imports wide range of data type and multimedia element formats directly into the

cast. You can also create elements from scratch and add to cast. To include multimedia elements in cast into the stages, you **drag and drop the media** on the stage.

- **Score**

This is where the elements in the cast are arranged. It is sequence for displaying, animating, and playing cast members. Score is made of frames and frames contain cast member. You can set frame ***rate*** per second.

- **Lingo**

Lingo is a **full-featured object oriented scripting language** used in Director.

- ❖ It enables interactivity and programmed control of elements
- ❖ It enables to control external sound and video devices
- ❖ It also enables you to control operations of internet such as sending mail, reading documents, images, and building web pages.

2) Macromedia Flash

- ❖ Can accept both vector and bitmap graphics
- ❖ Uses a scripting language called ActionScript which gives greater capability to control the movie.
- ❖ Flash is commonly used to create animations, advertisements, to design web-page elements, to add video to web pages, and more recently, to develop Rich Internet Applications. Rich Internet Applications (RIA) are web applications that have the features and functionality of traditional desktop applications. RIA's uses a client side technology which can execute instructions on the client's computer (no need to send every data to the server).

Flash uses:

1) Library: a place where objects that are to be re-used are stored.
2) Timeline: used to organize and control a movie content over time.
3) Layer: helps to organize contents. Timeline is divided into layers.
4) ActionScript: enables interactivity and control of movies

2.4.5 Tagging Tool

Tags in text files (e.g. HTML) to:

1. link to pages,
2. provide interactivity, and
3. Integrate multimedia elements.
4. Most of them are displayed in web browsers using plug-ins or the browser itself can understand them.
5. This metaphor is the basis of WWW
6. It is limited but can be extended by the use of suitable multimedia tags.

Examples:

• SGML/HTML
• SMIL (Synchronized Media Integration Language)
• VRML
• 3DML

2.5 Selecting Authoring Tools

The multimedia project you are developing has its own underlying **structure and purpose**. When selecting tools for your project you need to consider that purpose. **Some of the features that you have to take into consideration when selecting authoring tools are:**

1) **Editing Feature**: editing feature for multimedia data especially image and text are often included in authoring tools. The more editors in your authoring system, the less specialized editing tools you need. The editors that come with authoring tools offer only subset of features found in dedicated in editing tool. If you need more capability, still you have to go to dedicated editing tools (e.g. sound editing tools for sound editing).
2) **Organizing feature**: the organization of media in your project involves navigation diagrams, or flow charts, etc. Some authoring tools provides a visual flowcharting facility. Such features help you for organizing the project. e.g IconAuthor, and AuthorWare use flowcharting and navigation diagram method to organize media.
3) **Programming feature**: there are different types of programming approach:

a) **Visual programming**: this is programming using events, icons, and objects. It is done using drag and drop. To include sound in your project, drag and drop it in stage. Advantage: the simplest and easiest authoring process. It is particularly useful for slide show and presentation.

b) **Programming with scripting language**: Some authoring tool provide very high level scripting language and interpreted scripting environment. This helps for navigation control and enabling user input.

c) **Programming with traditional language** such as Basic or C. Some authoring tools provide traditional programming tools like program written in C. We can call these programs to authoring tools.

d) **Document development tools**

4) **Interactivity feature**: interactivity offers to the end user of the project to control the content and flow of information. Some of interactivity levels:
   a. **Simple branching**: enables the user to go to any location in the presentation using key press, mouse click, etc.
   b. **Conditional branching**: branching based on if-then decisions
   c. **Structured branching**: support complex programming logic such as nested if-then sub- routines.
5) **Performance-tuning features**: accomplishing synchronization of multimedia is sometimes difficult because performance varies with different computers. In such cases you need to use authoring tools own scripting language to specify time and sequence on system.
6) **Playback feature**: easy testing of the project. Testing enables you to debug the system and find out how the user interacts with it.
7) **Delivery feature**: delivering your project needs building runtime version of the project using authoring tools.
8) **Cross platform feature**: multimedia projects should be compatible with different platform like Macintosh, Windows, etc.

Q1: What the different between authoring tools and authoring system?

Q2: For what plug-ins in software development is used?

Q3: What the different between vector and bitmap graphics

Q4: What the security concerns of the today Authoring Tools?

Q5: What the most common and used today of Multimedia Authoring tools?