Methods to Integrate Media

- **Programming**
  - Languages specify how the media is presented and user interactions carried out.
  - Requires command of the language.
  - Is time consuming.

- **Authoring**
  - Applications specially designed to integrate and present media elements.
  - Developers can concentrate on design, interactivity, and functionality of the project.
Authoring Applications

- Software designed for creation of multimedia projects.
- Applications are used to:
  - Assemble media elements
  - Synchronize content
  - Design user interface
  - Provide user interactivity

Authoring Metaphors

- Authoring applications are grouped around three metaphors:
  - Card
  - Icon
  - Timeline
- Metaphors help orient developer to how the software organizes the media, sequences events, and presents final project.
Card Metaphor

- Media is organized in sequential order on a stack of cards or slides. (PowerPoint)
  - Appropriate for static media that is normally experienced in sequence.
- Cards have two layers:
  - Background layer contains shared elements.
  - Foreground layer contains content specific to that card or slide.

Benefits of Card Metaphor

- Benefits of card layers.
  - Background content is created once, which saves development time.
  - Common background layer provides consistent design.
  - File sizes are minimized by sharing background elements.
**Icon Metaphor**

- (Adobe Authorware)
- Icons define media and forms of interactivity.
- Icons are placed on a flowline to create the application structure.
  - Each icon has a dialog box with properties and parameters identified by the developer.
  - Flowlines let developers visualize and adjust the structure of the application.
- Branching routines add controls for user interaction.

**Icon Metaphor**

- **Flowline** is a graphical representation of the relationships between components of the application.
Timeline Metaphor

- Organizes media and interactivity as sequence of frames.
  - Each frame can have multiple layers.
  - Layers define the stacking order of the content to be displayed.
- Appropriate for dynamic media as the media can be synchronized precisely over time.

Timeline Metaphor

- Popular timeline-based applications include Director and Flash.
- Best used when animation or video is central to the application.
The Authoring Process

Application Design

- Create Flowchart and Storyboards
- Authoring software can establish the order of the content on playback.
- Basic navigation structures include:
  - Linear or sequential
  - Hierarchical
  - Networked
  - Conditional.
Importing Content

- Media is generally created in media-specific applications and imported into the authoring environment.
  - File formats for imported media are important.
  - Conversion utilities within the application are useful.

Create and Edit Content

- All authoring applications include some tools for creating and editing media content. For example:
  - Text adjustments to font size and color.
  - Paint tools to add shapes and edit image features.
  - Sound adjustment on volume, duration.
  - Animation changes to speed and direction.
Integrating, Synchronizing and Playback

- Techniques for integration are based on the metaphor (card, icon, timeline).
- Sounds, animations and transitions must be synchronized to present a unified flow of information.
- Playback of the content is often dependent on hardware factors. Timing controls can be established to ensure correct playback.

Programming

- Provides more flexibility and control.
  - For projects with extensive interactivity, custom features.
- Two programming methods.
  - **Script**: series of commands specifying properties or behavior of an element in the project.
    - Commands are interpreted as the project is executed.
  - **Icon**: dialog boxes allow the developer to specify parameters for icon's use.
    - Does not require programming knowledge but does limit commands to icon parameters.
Database Support

- Some projects may require access to a collection of related files to store and retrieve user input.
  - Tutorials have databases of related facts to test comprehension.
  - User stores answers for future reference and scoring.
- Authorware and Director applications offer an interface to a database.

Preview, Test, Debug

- Projects are created in the development mode.
- Necessary to preview the project as it will appear in the final product and test the components of the screen displays.
- Authoring applications often have a preview mode to test the assembled project during development.
- Debugger tools can identify errors in program code.
Project Delivery

- Projects are published so they play outside the authoring environment.

- Approaches to publishing:
  - Project requires a separate player program to present the multimedia content.
    - QuickTime, Flash, and MediaPlayer programs are free player downloads.
  - Project embeds the player in the multimedia project.
    - Larger files, but project is a stand-alone application.
  - Project plays at web browser

Choosing and Authoring Application

- No single authoring tool is suitable for all projects. To select the right application:
  - Consider the subject (static or dynamic media).
  - Consider the media (source file formats compatible).
  - Consider delivery (where used, means of distribution).
  - Consider maintenance (expertise needed to revise content, frequent update cycles).
Discussions

- Diskusikan keuntungan dan kerugian menggunakan authoring tools dalam membuat aplikasi pembelajaran.
- Diskusikan mengapa multimedia perlu diakomodasi dalam aplikasi pembelajaran.
- Diskusi diposting dalam forum diskusi Besmart. Tiap mahasiswa menanggapi 2 hal tsb.