

# Helen Barrett's Stages of Electronic Portfolio Development

- 1. Determine the purpose, audience, content**
- 2. Working Portfolio (Developing the Digital Archive) - Digitizing, Storing**
- 3. Reflective Portfolio (What? So What? Now What?)**
- 4. Connected Portfolio (Creating a hyperlinked document, adding multimedia, making connections)**
- 5. Presentation Portfolio (Publishing and Sharing)**

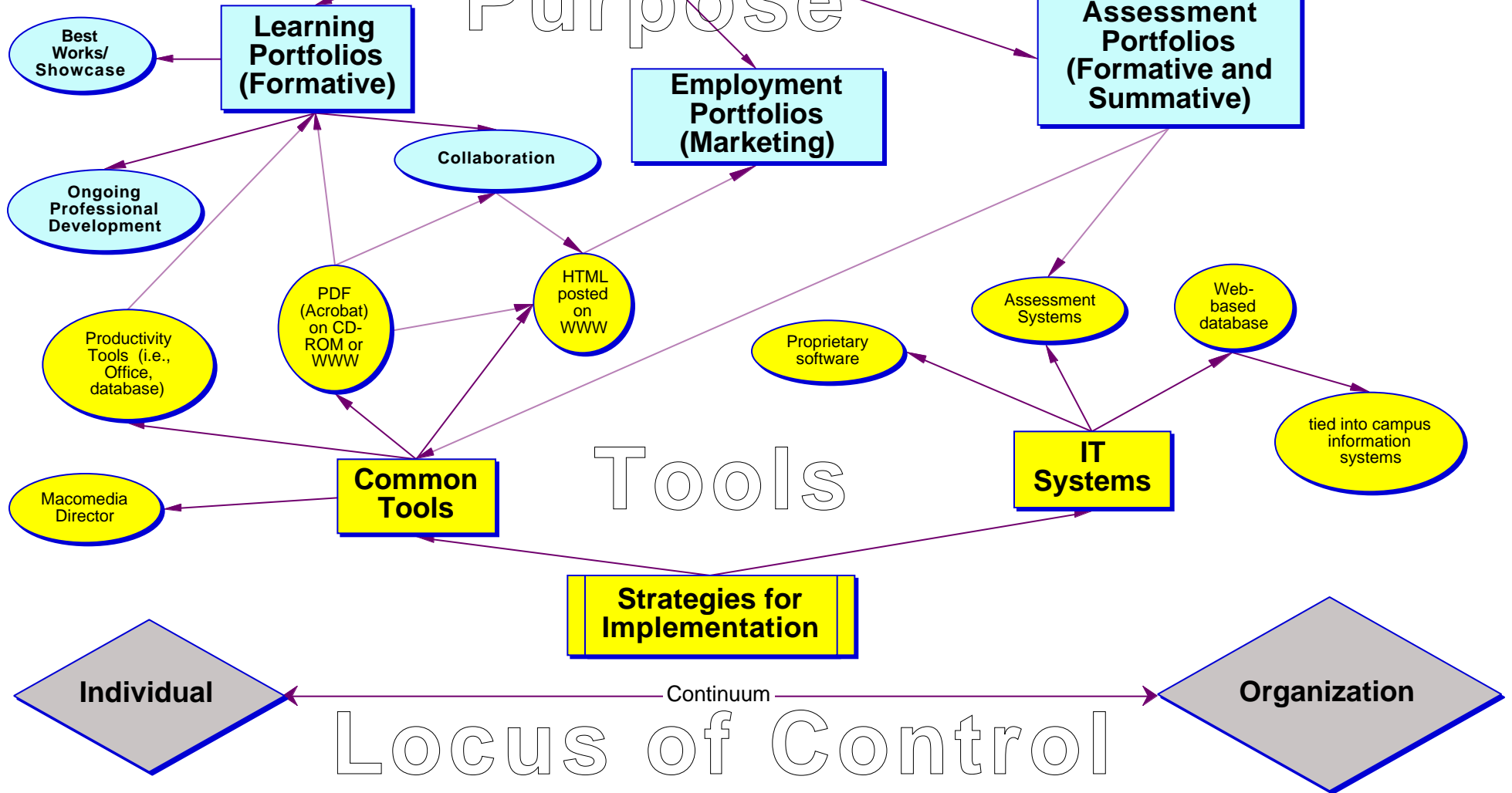


# Electronic Portfolios

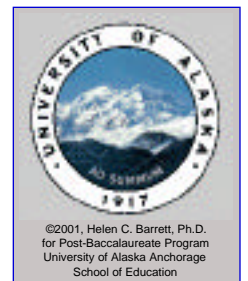
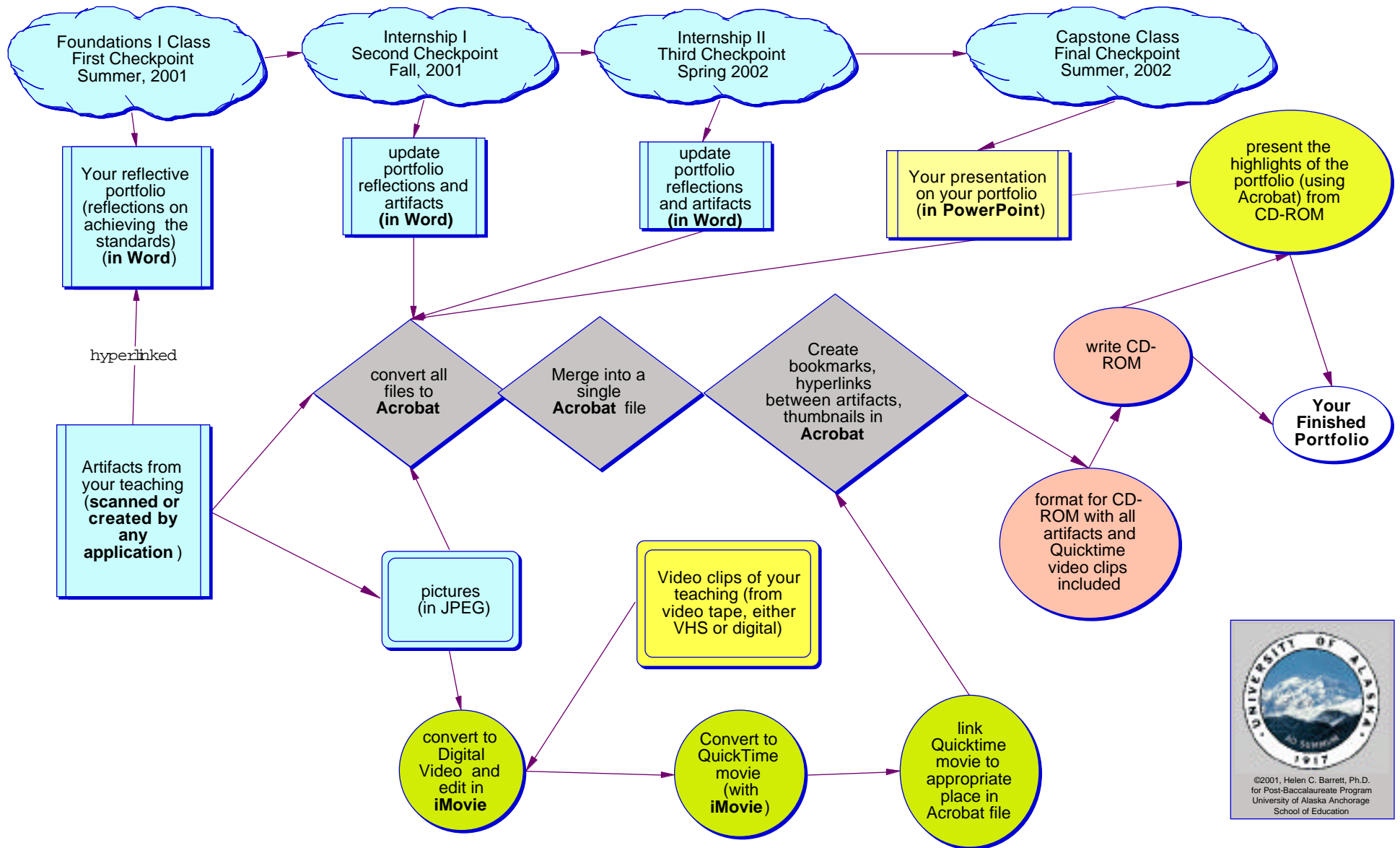
A conceptual framework  
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<http://electronicportfolios.com>

Purpose



# There is a quick overview of how we are putting the technology pieces of the electronic portfolio together over the four terms.



# Two Directions in Electronic Portfolio Development

## Generic tools approach

- Using off-the-shelf software

## Customized systems approach

- Designing a networked system
- Buying a proprietary software package

# Generic tools approach

- Portfolios with reflections and artifacts that more closely emulate the traditional 3-ring binder
- Structure imposed by developer and/or software -- flexibility and creativity
- Low cost for infrastructure
- Higher cost for training
- Student can continue developing portfolio once out of the system

# Customized systems approach

- Record-keeping system that can be used to collect reflections and artifacts
- Highly structured using online database -- limited flexibility and creativity
- High cost for infrastructure
- May be a lower cost for training, depending on system design
- What happens to portfolio when students leave the system?

# Two Directions in Electronic Portfolio Development

## Generic tools approach

- Advantages
  - » Cost
  - » Use what is widely available
  - » Easy to get started
  - » Easy to maintain
- Disadvantages
  - » Ability to aggregate data
  - » May be difficult to share online with security

## Customized systems approach

- Advantages
  - » Ability to aggregate data
  - » Accessibility
  - » Security
- Disadvantages
  - » Cost
  - » Infrastructure requirements

# Authoring software

There are a variety of authoring software packages which allow the creation of

**hypertext links**

between goals, student work samples in multiple forms of media, rubrics, and assessment.



# Importance of Using Appropriate Software

The software used to create the electronic portfolio will control, restrict, or enhance the portfolio development process.

**Form should follow function,** and the electronic portfolio software selected should match the vision, style and skills of the portfolio developer, as well as the technology available.

# How do you decide what tools to use?

- **Level of Teacher Skill (Relative Ease of Use)**
- **Level of Technology Required**
- **Other factors**  
(Learning & Leading with Technology,  
October, 1998)

# **Pedagogical Requirements**

**Storage Space**

**Security**

**Linking and Grouping Artifacts**

**Reflection**

**Publishing**

**Portability**

# Storage Space

**To store digital artifacts (with meta-tags)**

**To store learner self-reflection and self-assessment on each artifact**

**To store feedback on each artifact from assessor(s) (independent validation)**

**To store details of the assignment with criteria for assessment (rubrics)**

# Technology - Storage

How much storage to make available  
per student?

–5 MB

–20-30 MB

–650 MB

–Unlimited

# Security

**Ability to restrict access, setting permissions to view:**

- **Artifact only**
- **Artifact with reflection**
- **Artifact with reflection and feedback**

**Ability to set permissions separately for faculty to view portfolio and provide feedback on work.**

# Linking and Grouping Artifacts

**Ability to organize portfolio in a variety of ways  
(flexibility in organization)**

- **By standards or learning outcomes**
- **By course**
- **By date (entered, last updated, etc.)**
- **By status of work (Work in progress, ready for assessment, ready for publication)**

**Ability to include:**

- **Goals for portfolio, Contents of portfolio**
- **Learning Goals or Standards**
- **Resume**

# Reflection

**Ability to reflect on a specific grouping of artifacts to make a particular case (i.e., how this collection demonstrates achievement of standards or learning goals)**

**Ability to set learning goals and future direction**



# Publishing

**Ability to create a variety of portfolios, depending on audience and purpose**

**Ability to individualize the portfolio, to allow creativity of expression in the presentation (how to avoid the “cookie cutter” effect or identical “look and feel” of a data-base or template-based portfolio)**

# Portability

**Ability to archive work in a portable format such as:**

- CD-ROM**
- HTML or PDF Archive**
- DVD**

**Learners can take their portfolio to another school or maintain it on their own.**

## The "5-by-5" Model of Electronic Portfolio Development - Overview of Technology Options

© 2000, Helen C. Barrett	Stages of Electronic Portfolio Development				
Levels of Portfolio Development (based on level of difficulty)	<p style="text-align: center;"><b>1</b></p> <p style="text-align: center;"><b>Defining the Portfolio Context &amp; Goals</b></p>	<p style="text-align: center;"><b>2</b></p> <p style="text-align: center;"><b>The Working Portfolio</b></p>	<p style="text-align: center;"><b>3</b></p> <p style="text-align: center;"><b>The Reflective Portfolio</b></p>	<p style="text-align: center;"><b>4</b></p> <p style="text-align: center;"><b>The Connected Portfolio</b></p>	<p style="text-align: center;"><b>5</b></p> <p style="text-align: center;"><b>The Presentation Portfolio</b></p>
	<p>Identify: the portfolio's <b>purpose</b> and <b>audience</b>; the <b>standards</b> (goals) or organizing framework; the resources available (hardware, software, level of technology skills). Select the appropriate level/technology to begin.</p>	<p>Identify, <b>collect</b> and store portfolio artifacts based on purpose/audience/goals. <b>Interject</b> personality into the portfolio design by using appropriate multimedia to add style and individuality to the portfolio.</p>	<p><b>Select</b> the artifacts that represent achievement of standards/goals. <b>Reflect</b> on why artifacts were selected, indicating meaning and value to the portfolio. Project <b>learning goals</b> for the future (direction).</p>	<p><b>Organize the digital artifacts.</b> Create <b>hypermedia links</b> between goals, artifacts, reflections. <b>Identify patterns</b> through the "linking" process.</p>	<p><b>Record</b> the portfolio to an appropriate presentation and storage medium. <b>Share</b> the portfolio with an appropriate audience.</p>
<p><b>1 - Text only.</b> All documents are in digital file formats, using word processing or other commonly-used software, and stored in electronic folders on a hard drive, floppy diskette or LAN server.</p>	<p><i>Development Software:</i> Any Word Processor</p>	<p><i>Development Software:</i> Any Word Processor</p>	<p><i>Development Software:</i> Any Word Processor</p>	<p><i>Development Software:</i> Microsoft Word (linking to other Word documents) AppleWorks (linking to other Works documents)</p>	<p><i>Storage/Publishing Tools:</i> Zip Disk or Floppy Diskette or Hard Drive or Server</p>
<p><b>2a - With Graphics.</b> Portfolio data is entered into a structured format, such as a database or HyperStudio template or slide show (PowerPoint or AppleWorks) and stored on a hard drive, Zip, floppy diskette or LAN server. Video may be collected in analog form on video tape. Presentation portfolio may also be recorded on video tape.</p>	<p><i>Development Software:</i> Database PowerPoint or slide show HyperStudio  Inspiration (mind mapping software)</p>	<p><i>Development Software:</i> Graphics software Database PowerPoint or slide show HyperStudio  Digital still camera</p>	<p><i>Development Software:</i> Database PowerPoint or slide show HyperStudio</p>	<p><i>Development Software:</i> HyperStudio</p>	<p><i>Storage/Publishing Tools:</i> Videotape (digital-to-analog conversion)</p>
<p><b>2b - With Audio &amp; Video</b> Portfolio incorporates digitized audio and video artifacts linked to the portfolio, and stored on CD-ROM or server.</p>		<p>Audio capturing software  Video capturing software (analog-to-digital conversion)</p>	<p>Audio editing software  Video editing software</p>		<p><i>Storage/Publishing Tools:</i> CD-ROM</p>
<p><b>3 - With Navigational links</b> Documents are translated into Portable Document Format with "hyper-links" between standards, artifacts, and reflections using Adobe Acrobat Exchange and stored on a hard drive, Zip, Jaz, CD-R/W, or LAN server.</p>		<p><i>Conversion Software:</i> Adobe PDFWriter or PrintToPDF (Mac only) Acrobat Distiller</p>		<p><i>Development/Editing Software:</i> Adobe Acrobat Exchange</p>	<p><i>Storage/Publishing Tools:</i> CD-ROM</p>
<p><b>4 - With WWW links</b> Documents are translated into HTML, complete with "hyper-links" between standards, artifacts, and reflections, using a web authoring program (i.e., Netscape Composer, Adobe PageMill or CyberStudio, Macromedia Dreamweaver) and posted to a WWW server.</p>		<p><i>Development &amp; Publishing Software:</i> HTML authoring software</p>	<p><i>Development &amp; Publishing Software:</i> HTML authoring software</p>	<p><i>Development &amp; Publishing Software:</i> HTML authoring software  PowerPoint*</p>	<p><i>Storage/Publishing Tools:</i> WWW Server</p>
<p><b>5 - With Interactive Multimedia</b> Portfolio is organized with a multimedia authoring program, incorporating digital sound and video is converted to digital format and pressed to CD-R/W or posted to WWW in streaming format.</p>		<p><i>Development &amp; Publishing Software:</i> Macromedia Director</p>	<p><i>Development &amp; Publishing Software:</i> Macromedia Director</p>	<p><i>Development &amp; Publishing Software:</i> Macromedia Director</p>	<p><i>Storage/Publishing Tools:</i> Streaming Server</p>

# Comparison of Construction Tools

	<b>Relational data base</b>	<b>Hypermedia “card” file (including templates)</b>	<b>Multimedia authoring software</b>	<b>WWW Pages</b>	<b>Acrobat Reader</b>	<b>Proprietary software</b>
<b>Common development tools</b>	FileMaker Pro	HyperStudio Digital Chisel	Macromedia Authorware, Director	Adobe PageMill, Claris Home Page	Adobe Acrobat Exchange 3.01	Grady Profile Personna Plus
<b>Structure &amp; Links</b>	Structured fields/records/ files linked together by common fields	Electronic cards (screens) linked together by “buttons”	Icon-based or time-based multimedia authoring environment	WWW pages viewed with a Web Browser (Netscape or Explorer) using links created in HTML	Postscript-based pages that can be navigated sequentially, or using bookmarks, links, or buttons	Varied: Grady Profile has Hypercard base Personna Plus uses relational database engine
<b>Player available</b>	Yes	Yes	Self-contained	Browser (free)	Reader (free)	?
<b>Advantages</b>	Flexible reporting Network-friendly Web accessible Cross-platform	Widely accessible in classrooms Construction tools included	Most flexibility in development CD-ROM Cross-platform	Web-accessible Cross-platform	Web-accessible Cross-platform Create files from any application Ideal for CD-R	Pre-designed and structured
<b>Disadvantages</b>	Limitation of size of files Requires player	Not directly web-accessible View limited to screen size	Steep learning curve	Multimedia (video) not well integrated Complex authoring	Size of files Limited construction tools	Grady: not Web-accessible, Mac only, inflexible
<b>Ease of Use*</b>	4 to develop 2 to use	3 to develop	5	2 with editor 4 without	2	2 (Grady) ? (Personna)
<b>Technology Required</b>	3	3	5	4	4	2 4
<b>Cost (with Ed. discounts)</b>	\$49	\$39-\$199	\$150-\$1,000	\$49-\$79	\$49	Grady \$195 Personna ?

# Electronic Portfolio Development Tools

## Software environment

**Relational data base**

## Common Development Tools

Filemaker Pro, Microsoft Access

## Structure and links

Structured fields/records/files linked together by common fields

## Advantages

Flexible reporting - Network-friendly - Web-accessible - Cross Platform  
Most effective in tracking and reporting achievement of standards

## Disadvantages

Limitation on size of files - Requires player - Requires higher skill level to develop

**Ease of Use**

4 to develop  
2 to use

**Technology Required**

3

**Cost with ed. discounts**

\$49-\$199

**Player available**

Yes - free

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# Electronic Portfolio Development Tools

## Software environment

**Hypermedia “card” file (including templates)**

## Common Development Tools

HyperStudio, Digital Chisel, HyperCard, Toolbook

## Structure and links

Electronic cards (screens) linked together by “buttons”

## Advantages

Widely accessible in classroom. Construction and display tools available in one program.

## Disadvantages

Not directly web-accessible. View limited to screen size. Effort required to link standards and portfolio artifacts.

**Ease of Use**

3 to develop

**Technology Required**

3

**Cost with ed. discounts**

\$39-\$199

**Player available**

Yes - free

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# Electronic Portfolio Development Tools

## Software environment

**Multimedia authoring software**

## Common Development Tools

Macromedia Authorware, Director

## Structure and links

Icon-based or time-based multimedia authoring environment

## Advantages

Most flexibility in developing for CD-ROM publishing. Cross-platform.

## Disadvantages

Steep learning curve. Effort required to link standards and portfolio artifacts.

**Ease of Use**

**5**

**Technology Required**

**5**

**Cost with ed. discounts**

**\$150-\$1000**

**Player available**

**Self-contained files**

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# Electronic Portfolio Development Tools

## Software environment

**World Wide Web Pages**

## Common Development Tools

Adobe PageMill, Claris Home Page, Microsoft Front Page, many more

## Structure and links

WWW pages viewed with a Web Browser (Netscape or Explorer) using links created in HTML

## Advantages

Web-accessible. Cross-platform.

## Disadvantages

Multimedia (video) not well integrated. Complex authoring environment.

**Ease of Use**

2 with editor  
4 without

**Technology Required**

4

**Cost with ed. discounts**

free - \$99

**Player available**

Web browser - free

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# Electronic Portfolio Development Tools

## Software environment

**Proprietary Software**

## Common Development Tools

Grady Profile, Persona Plus

## Structure and links

Varied: Grady Profile has HyperCard base. Persona Plus uses relational database engine.

## Advantages

Pre-designed and structured.

## Disadvantages

Grady: not web-accessible, Mac only, inflexible layout.  
Persona: ?

**Ease of Use**

2 (Grady Profile)  
? (Persona Plus)

**Technology Required**

**2-4**

**Cost with ed. discounts**

Grady \$195

**Player available**

?

# Electronic Portfolio Development Tools

## Software environment

### Multimedia Slide Shows

## Common Development Tools

PowerPoint, ClarisWorks Slide Show, Astound

## Structure and links

Electronic slides, most often shown in linear sequence.

## Advantages

Commonly-available tool.

## Disadvantages

Availability of hypertext links between standards and portfolio artifacts.

Ease of Use

3

Technology Required

4

Cost with ed. discounts

\$29+

Player available

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# Electronic Portfolio Development Tools

## Software environment

**Digital Video**

## Common Development Tools

Avid Cinema, Adobe Premiere, Movie Player Pro, Apple Video Player

## Structure and links

digitized video, usually in QuickTime or AVI format

## Advantages

www access, high interactivity. random access, editing

## Disadvantages

file size, storage, quality, bandwidth requirements, hardware requirements to digitize.

**Ease of Use**

5

**Technology Required**

5

**Cost with ed. discounts**

\$29+++

**Player available**

Yes - Free

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# Electronic Portfolio Development Tools

## Software environment

Analog Video

## Common Development Tools

video editors

## Structure and links

analog video on a variety of formats (i.e., VHS, 8mm)

## Advantages

ubiquitous access, cheap storage media, acceptable quality, relatively low cost hardware requirements

## Disadvantages

linear access, low interactivity, no www access, storage, editing

Ease of Use

4

Technology Required

1

Cost with ed. discounts

?

Player available

VCR

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# Electronic Portfolio Development Tools

## Software environment

**Adobe Acrobat Reader**

## Common Development Tools

Adobe Acrobat Exchange 3.01

## Structure and links

Postscript-based pages that can be navigated sequentially, or using bookmarks, links, or buttons

## Advantages

Web-accessible. Cross-platform. Create files from any application. Ideal for Compact-disc-recordable portfolios. Handles multimedia well.

## Disadvantages

Size of file. Limited built-in editing tools. Requires another program to create files.

**Ease of Use**

**2**

**Technology Required**

**4**

**Cost with ed. discounts**

**\$49**

**Player available**

**Acrobat Reader - free**

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# Adobe Acrobat PDF format

- John Warnock, Co-founder and CEO of Adobe Systems, Inc. defined the Adobe Acrobat Portable Document Format:
- “**PDF** is an extensible form of **paper**, a **hypermedia** that is device independent, platform independent, color consistent and it is the **best universal transmission media** for **creative and intellectual assets.**”

# What is PDF?

- PDF stands for Portable Document Format.
- It was developed by Adobe Corporation to allow efficient electronic distribution of large documents.

# Why create a digital portfolio in PDF rather than HTML?

- NO programming or coding files - easier to learn
- WYSIWYG - PDF files look exactly like the original document
- All one document, not fragmented files (graphics & text)
- Easier to integrate multimedia (sound and video)



# Why create a digital portfolio in PDF rather than HTML?

- Ideal format for CD-ROM
- Easily integrate documents created by a variety of different software packages
- A variety of ways to navigate a document:
  - Bookmarks
  - Links
  - Thumbnails
  - Toolbar

# HTML or PDF?

HTML Works Best	Both Work Well	PDF Works Best
HTML WYSIWYG editors	Word processing programs	Desktop publishing programs
Text editors	Spreadsheet programs	Illustration programs
Database programs	Documents yet to be created	Presentation software
Documents already tagged (SGML)	Document in RTF format	Documents already produced
e-mail	Basic specification sheets	Document exists on paper only
Memos	Graphs	Newletters
Basic letters	Order forms (information receipt)	Magazines
Simple reports	Links to URLs (WWW)	Posters
Various text-based documents	Mailto: links	Annual reports
Server side information (two-way)	CGIs (Image maps)	Books, brochures
Server-push information	Forms	URLs with links over text & graphics
Index service (search and retrieve)		Document-based security
Database connectivity		Movie and sound playback
Frames		High-resolution images
Java applets		Page numbers
		Text overlays

Source: Kent, G. Internet Publishing with Acrobat Adobe Press, San Jose, CA, 1996.

## Other References:

1. Adobe Acrobat Classroom in a Book (with CD-ROM). The official training workbook (Mac and Windows). Adobe Systems Incorporated, San Jose, CA, 1997.

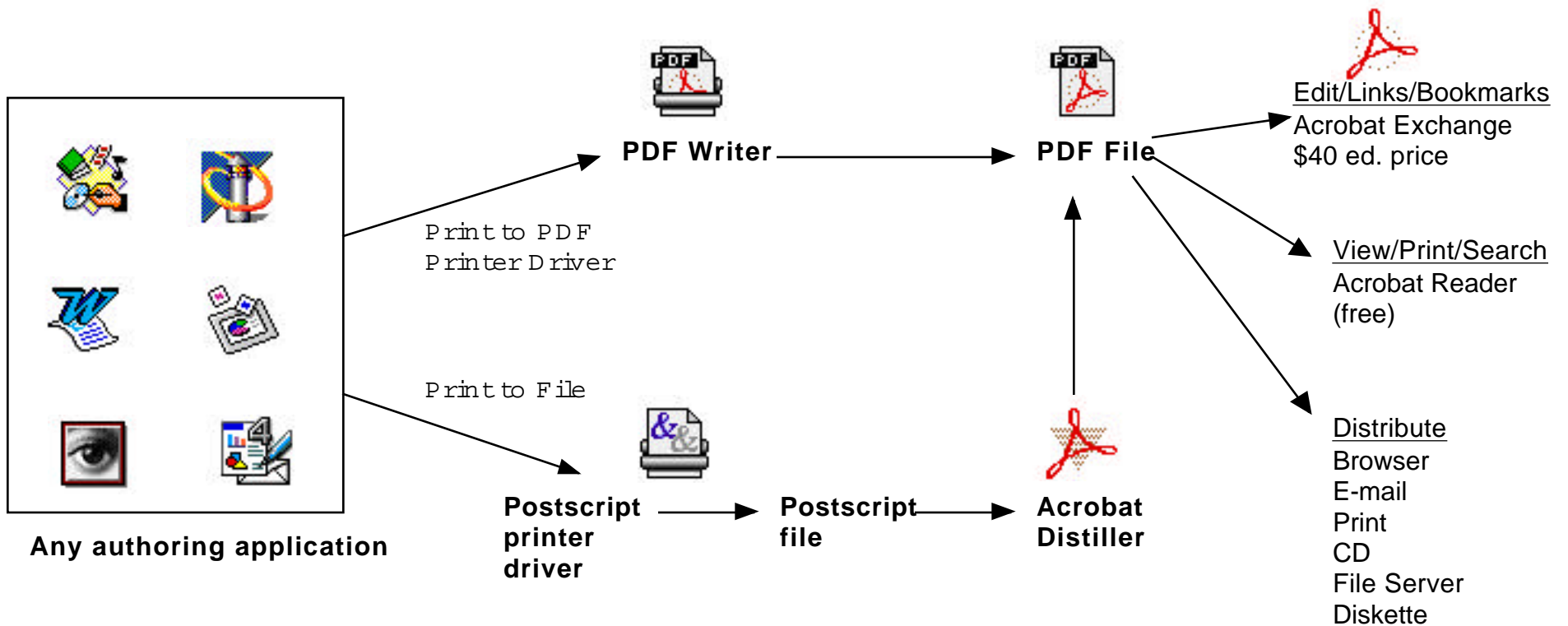
2. Abspach, Ted Acrobat for Macintosh and Windows Peachpit Press, Berkeley, CA, 1997

# A crobat vs. HTML

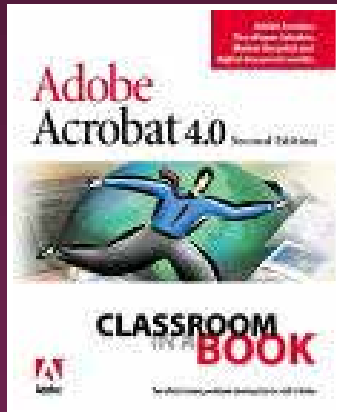
- PDF based on a **page description model**
  - » The absolute style and layout imposed upon a document is preserved in electronic publication and distribution.
- HTML based on a **page markup model**
  - » Web browsers' interpretation of the HTML code, along with users' font size and style preferences, have a significant impact on the final visual result.

# Why use PDF for ePortfolios?

- Power and simplicity for both portfolio authors and end-users viewing the portfolio
- Instant Publishing of Existing Documents
- Unlimited Document Control
- Using Familiar Tools
- Combine documents from multiple applications
- No need for end-users to have original programs

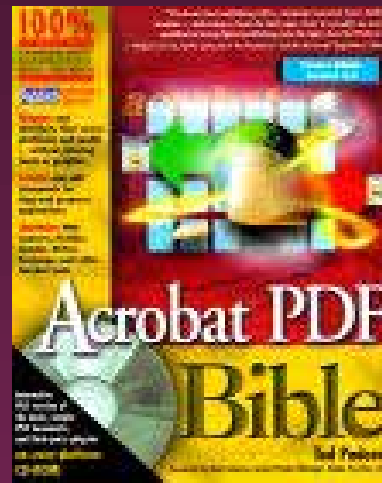


# Learn about Acrobat



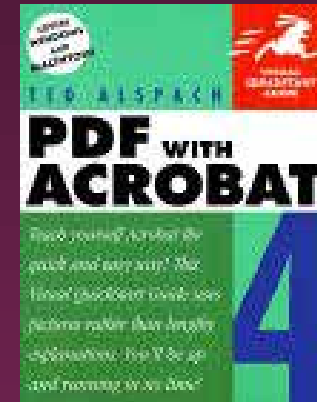
Adobe Press  
ISBN: 0201702843  
\$31.50 (Amazon)

A great tutorial



IDG Books Worldwide  
ISBN: 0764532421  
\$31.99 (Amazon)

A great reference



Peachpit Press  
ISBN: 0201354616  
\$14.39 (Amazon)

A “quick&dirty” guide

# Planning Documents

<http://electronicportfolios.org/EPDirections.pdf>  
outlines issues between generic tools and computer systems approaches

<http://electronicportfolios.org/EPpedissues.pdf>  
a list of pedagogical issues to address when planning for electronic portfolios.

<http://electronicportfolios.org/ali/>  
a set of “at-a-glance” guides that address three issues:

1. Digitizing & Storing Artifacts
2. Construction Tools
3. Publishing Formats