

FINAL REPORT - APPENDICES
***Ad hoc* TASK FORCE ON ELECTRONIC THESES AND DISSERTATIONS**
ARIZONA STATE UNIVERSITY

Submitted May 9th, 2001

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APPENDIX I
Report from ETD Sub-Committee
on Advantages and Disadvantages

(Craig Albers, Fernando Delgado, Pauline Kommenich, Debbie Losse, Ann MacEachron,
Moshe Raccach, Loriann Roberson, Richard Satterlie, Victoria Trotta)

A movement toward using multiple technologies for the production, dissemination, and storage of theses and dissertations has been in progress for several years. Such peer institutions as Ohio State University, Texas, Virginia, Oklahoma, Iowa, and Florida have adopted various forms of electronic formats and submitting procedures and are involved in pilot programs. Others, like UCLA, are looking in ETDs and observing how ASU is moving forward with a plan and pilot program.

As with any technological and media shift a learning curve is involved for students, staff, faculty, and administrators. Moreover, a movement toward electronic and digital forms may provoke a radical rethinking of what constitutes a dissertation. In practical terms, shifting toward ETDs may also imply a rethinking of how we collect and disseminate academic knowledge and creative products.

What follows is a perspective on the advantages and challenges of moving toward ETDs as they are considered generally and with particular focus at ASU.

Advantages

1. Library Storage and Retrieval

It appears clear that moving to ETDs will result in the saving of library space and will make access, when such ETDs are networked, easier to access by multiple and remote users. The “portability” of ETDs allows for greater dissemination of students’ work and for scholars at ASU (and beyond) to access any ETD simultaneously. Such remote and synchronous access, as opposed to having to order and/or wait for a hard copy to become available, can be a tremendous boon to the colleges and library and their missions.

The committee notes that advances in internet technology (DSL, cable, ISDN) have resulted in high-speed connections for many people who could easily connect to dedicated servers—administered by Information Technology or the Library--where dissertations on standardized formats (XML, HTML, image or text PDF files) could be stored. Indeed, the Networked Digital Library of Theses and Dissertations (NDLTD) argues that one distinct advantage of ETDs is ease of availability and ease of storage for both the library and the user.

Example: Timothy Watson of Ohio State University notes that the move to ETDs was inspired, in part, by the issues of web accessibility and storage. OSU had a ready-made submission and storage process through the State of Ohio library system’s OhioLink (www.ohiolink.edu).

2. Enhancing Creativity and Scholarship

Both Ohio State and Iowa, as well as Florida, have echoed the position of Virginia Tech regarding the intellectual benefits of ETDs. The University of Iowa notes that students can

push their creativity and scholarship in order to produce highly sophisticated and elaborate projects, including supplementary multimedia elements on CD ROMS (which may include links, streaming video, images, and sound), dynamic uses (and inclusion) of raw data, and animated and multidimensional models of concepts and theories. The benefits to students in music, art, performance, design, architecture, and various life and physical sciences could be quite profound.

A corollary benefit would be that moving to multimedia texts and electronic forms of publishing could foster student and faculty socialization into electronic publishing—a trend that is likely to continue and accelerate. The University of Florida suggests that preparing and submitting ETDs encourages students to “learn about electronic document preparation and about digital libraries. The skills will help prepare you for your future role in the Information Age, whether you teach, research, or use the research results of others” (Iowa also notes the possibility of elaborate “metadata” projects).

A third benefit is the ease of circulating the research in the dissertation to the academic community, locally and nationally. The author/creator can receive immediate feedback on the material in the dissertation.

3. Fostering Socialization

What may be a subset of #2 are the socialization benefits to faculty and students. Moving to ETDs accelerates the technological curve and encourages further integration of technology in instructional, research, and creativity activities. The Sub-Committee recognizes that faculty may be at different stages of technological sophistication, perhaps the result of disciplinary orientations or personal experience, but we note that ETDs can be a significant mechanism for faculty, staff, and students to develop proficiency with electronic hardware and software. The result may be further interdisciplinarity and a broadening of scholarship.

4. Institutional Benefits

The NDLTD argues that such shifts could reduce the handling costs of theses and dissertations by up to 75%. We have noted that the steps required in handling a dissertation, and the associated labor and time involved, will be reduced (likely resulting in indirect savings) and that students will have much faster turnaround times. The steps from submission to the Graduate College to cataloguing in the library could be much faster and more efficient. For example, following established formats (an important consideration as noted by Iowa, Ohio State, and Florida), templates from the graduate college could be used to assess simple text versions submitted on disks, CD-ROMs, or even emailed to editors and evaluators within the graduate college. Responses, whether they be editorial or formatting, to students could be overwritten on the submitted disk, CD, or document thus reducing time and paper usage.

A secondary and corollary benefit could be the result of the richness of multimedia texts which, when combined with portability, makes reaching out to constituents of the university—legislators, parents, community members—easier and could make theses far

more appealing and compelling for multiple audiences. Such peripheral advantages to the university should not be discounted as universities have struggled to translate and demonstrate what they do to the general public and stakeholders who may not be academics. We perceive that such opportunities can only enhance the profile and reputation of ASU.

While many peer institutions have entered into ETDs with bold, multimedia approaches (Texas, Florida, and Iowa) and others more tentatively (traditionally produced theses and dissertations simply formatted and submitted as PDF files—e.g., Ohio State University), other peers are somewhat more skeptical about ETDs. Maryland, for example, reports that ETDs were discussed “but the implementation costs to the university were deemed too great.” Kansas was similarly cautious about the cost issues and the technological parameters needed to ensure quality, access, and shelf life. Other institutions equally wary of ETDs are Minnesota, Utah, Missouri, and Colorado-Boulder.

This Sub-Committee is very supportive and intrigued by the move to ETDs but it is also aware that there are several thorny issues that have to be resolved and challenges that need to be met. We do have the experiences and models from those institutions that have gone before ASU as well as the NDLTD, which noted that governance and approval of digital formats; storage and longevity; training; availability and accessibility of ETDs; and property rights were are complicated issues that demand consideration prior to the adoption of ETDs. The NDLTD can help ASU effectively meet many of the challenges facing us. By moving forward in collaboration with our peer research universities we can find and share solutions to the challenges.

Challenges

1. Cost

If ASU moves to ETDs it is clear that cost must be a secondary consideration as the direct costs associated with the implementation of submission processes, storage and accessibility, and the support needed for faculty and staff will be substantial—at least in the short run. Iowa reported some concern with the cost burdens associated with managing and supporting the software platforms. Ohio State noted challenges with on-demand accessibility and the support for server space.

Related to the technological costs are training costs. Support for students, faculty, and staff could produce substantial start-up costs. Staff and faculty must be trained to manage one or more electronic formats; library resources may be allocated to support and access (including on-site hardware), and additional costs may be added to instructional development and information technology units: UT-Austin established an on-line, web-based training course for students. Virginia Tech and the University of West Virginia have invested in a training for faculty and student users. Such costs are difficult to track as they are often indirect and diffuse. As of yet we have not received definitive cost numbers from other institutions initiating pilot programs similar to the one ASU is considering.

Iowa reported that technological support to develop electronic formats incurred considerable costs. Iowa chose to use XML and a highly structured format that gave control to the

Graduate College. As a result Iowa has expended much energy and many resources in the development of standards and style and a set of document type definitions (DTDs). Iowa notes that this has been a “nightmare” and part of the problem has been locating expertise at low cost to implement these parameters. It still leaves unresolved the issue of conversion and support and whether or not there is an accessible standard for all ETDs across the country. Iowa’s experience gives depth to institutions’ concern about implementation and maintenance costs.

2. Access

Interestingly, access remains an issue. Ohio State reported that they were concerned about copyright issues when dissertation materials were web-accessible, this led to concern regarding restrictions. One significant dimension of access relates to copyrights (and patents). While the value of ETDs is the ability to circulate research to wider publics there are compelling reasons to limit access to an ETD. The sub-committee recommends that ASU formulate policy consistent with present practices. Categories of open, restricted, and frozen access should be applied to ETDs. Patent pending material could continue to have a two-year total access restriction while copyrighted material might be placed on a one-year limited access restriction. The Graduate College of the Office of Research would need to formulate policy on this matter (in consultation with ASU Legal Counsel). An additional point of consultation would be censoring. ASU must establish guidelines for what might be censored on an ETD that is hosted by ASU. The broad circulation, potentially open access, and the possibilities of content presented in image, sound, and video form raise an additional concern for open and complete access.

A second consideration is technological. How does ASU support the software to make dissertations accessible on-campus and off-campus? If ASU moves to a highly multimedia format it may be difficult to remotely access such materials. A default could be to preserve dissertations as either text or image PDF files (there is considerable support for the text option). Still, if the point of going electronic is to support creativity, innovation, and multimedia presentation to audiences and users then ASU needs to consider these implications for preservation and access of truly multimedia dissertations.

Related to access is support. Support for those producing the ETDs and those attempting to access. Could ASU move to 24 hour support? Likely not, at least not in-house, such access support would likely be farmed out to outside vendors. Still, ASU would need input and guidance from both Information Technology and the Library? The cost of keeping up must be considered alongside the cost of maintaining the means to access previous versions and formats. This may be why retaining hard copy versions, using microfiche as backup, or even defaulting solely to PDF files may be viable alternatives.

Finally, ASU would need to create some sort of policy regarding restrictions. This policy might parallel the current university policy for paper dissertations but we must also recognize the evolving and broad implications of electronic dissemination on demand.

The issue of restriction could also bring to the conversation some issues of copyright and/or patents that could (and perhaps should) involve university counsel.

3. Technology and Longevity

Some discussion about the software formats needs to occur. Iowa and Florida have both voiced concerns about the long-term viability regarding certain platforms. As software evolves, ASU may find itself struggling to find (emulation) programs to read to new ETDs as well as old ones. Additionally, as written text and files are converted there may be some corruption and loss. ASU may want to signal what could acceptable losses in information. The development of truly multimedia dissertations—with on-line links or streaming video—also raise issues about technological longevity and long-term viability. Some of these concerns, particularly the use of material that may central to a thesis's argument should be left to a college, department, or thesis committee. Discussions locally and nationally suggest that faculty and students would support short-term accessibility to truly multimedia texts over more limited formats with a longer “shelf life.”

Still, ASU should set up guidelines for electronic elements in an ETD as well as standardizing formats and software (otherwise support, licenses, etc. could spiral cost and create greater demands on support staff). Opting for text-based PDF files seems safe and appropriate. Guidelines for formats of truly multimedia dissertations—perhaps involving images, sound, streaming video, internet links, etc.—would have to be established, articulated, and then supported.

Clearly, the issue of longevity remains an issue, although the NDLTD is collaborating with research libraries and universities on finding viable solutions for maintaining access to the ETDs. Regardless, the use of multiple formats and the development and utilization of migration software for future access of ETDs involves significant direct and indirect costs throughout the life of any ETD.

4. Training and Development

Clearly, ASU's commitment to ETDs would also necessitate some significant investment in student, staff, and faculty development. There are suggestions that instructional development, graduate college, library, and information technology may have to bear some or all of the costs and energies of training participants in the creation and management of ETDs. It is unknown how complex this process might be because the structure and scope of ASU'S ETD project is not yet known.

We are hopeful that the Graduate College, the Library, and Information Technology will collaborate with such entities as the Center for Teaching and Learning Excellence on delivering effective training.

5. Disability

ASU needs to be aware of legislation regarding access and support to disabled students (and potential impact on access). There is a sense that multimedia and web formats may actually facilitate some disabled users. Still, the implications of ADA on this environment is evolving and there is no strong indication that those who have gone before ASU on ETDs have really

hammered out these issues. ADA compliance complicates the develop of ETD policy and may further raise costs.

APPENDIX II
Arizona State University
Electronic Thesis and Dissertation Task Force
Subcommittee 2: Technical Issues

Submitted by Subcommittee 2 of the Electronic Theses and Dissertations Task Force
Lois Schneberger, Chair
April 9, 2001

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CONTENT OUTLINE:

- I. Acceptable Software and Media Formats
 - A. File Formats
 - B. Links to External Web Resources
 - C. Character Sets

- II. Submission Process – Technical
 - A. Process Flow
 - B. Data Required
 - C. Ongoing Review of Process
 - D. Forms and Fees Required

- III. Cataloging, Linking and Indexing
 - A. Cataloging Process and Standards
 - B. Access Restrictions
 - C. UMI and National Digital Library of Theses and Dissertations

- IV. Binding

- V. Long Term-Storage, Preservation, Migration and Access

- VI. Addenda:
 - A. Library-Supported Software Formats
 - B. Submission Process Flow Chart
 - C. Electronic Submission Form Data Requirements
 - D. Submission Form Development, ETD Storage and Migration Estimate
 - E. Cost Estimates and Flow Chart

I. ACCEPTABLE SOFTWARE AND MEDIA FORMATS

A. File formats

Recommendation: The University should require electronic submission of all theses and dissertations in accordance with standards to be established by the current Graduate College Thesis and Dissertation Format Committee. Membership on that committee should be expanded to include representation from the University Libraries and Information Technology. Exemptions will be granted only in exceptional cases. Theses and dissertations that surpass established electronic format standards, for example, artistic works such as musical compositions, structural models (architecture) among others, are invited to make proposals to the Graduate College Theses and Dissertation Format Committee.

Rationale: The Technical Issues Subcommittee believes that the instantaneous, global and multi-user access facilitated by electronic formats makes this recommendation the most appropriate choice in spite of the potential risk of content loss or corruption.

Recommendation: All students may produce their thesis in whatever format is necessary to facilitate review by their advisor and committee, however all students must complete the submission form (recommended below) and submit at least a title page and abstract in the portable document file (PDF) format.

- The entire body of textual theses should be submitted as a PDF file and the content and appearance of the document should conform to standards established by the Graduate College Theses and Dissertation Format Committee.
- Non-textual or multimedia theses must be submitted as separate files from the required title page and abstract, and may be submitted in any format. However, the University cannot guarantee continuing access to or survival of multimedia content produced in formats outside of the standard list produced by the Graduate College Theses and Dissertation Format Committee.
- The University should provide and support software, such as Adobe Acrobat Distiller, to produce PDF files at campus computing sites. The University should also provide training for the use of this software.

Rationale: Portable Document Format (PDF) file type has become the de facto standard for online publishing and although it is a proprietary format its code is relatively open and several freeware conversion programs are widely available. Given the large installed base we believe migration paths or emulation programs will be written to support this content. The University must be prepared to retain, make available and migrate materials submitted in PDF format.

Unfortunately this is not the case with multimedia software, which has very high non-interoperability, little backwards compatibility and a very short lifespan between software version

releases. Because this content is usually delivered in proprietary formats, access and continuing preservation of this content is largely driven by license agreements that must be concluded and paid for by the University. It makes sense to establish our multimedia standards around the software that can be licensed by the Libraries to facilitate accessibility and preservation. The Libraries will evaluate and consider requests for purchases of new software recommended by the Graduate College Theses and Dissertation Format Committee. The Libraries currently supports access to formats listed in Addendum A. This list of formats is reviewed and upgraded as necessary.

ASU does not want to preclude the possibility of access by local users that have the necessary software, or the future development of freeware emulation programs. As a result the Libraries is prepared to accept and make available multimedia content outside of the standards described above, but cannot make a commitment to future migration and accessibility in the absence of favorable license agreements. It is important to note that multimedia files outside of the permissible standard may not be readable in the University's system within 3-5 years of their production.

B. Links to external web resources

Recommendation: Links to external web resources will be permitted. However, faculty thesis and dissertation advisers are urged to treat the question of hyperlinks from the contents of a thesis or dissertation to a source external to the document itself and residing on a computer server with the greatest caution.

Rationale: It must be recognized that using an external source (as authority for scholarly work) that may not be available to others at a later date is a significant break with the standards for scholarship that have prevailed for over a century. Even when such links are permitted in theses and dissertations, the author should be urged to present as much of the information--through paraphrasing or condensing--as is feasible in the thesis or dissertation itself. The standard that should prevail is that the treatment of the resource, even when an external link is provided, should stand-alone in the event the external link becomes extinct.

C. Character Sets

Recommendation: The University will support standard character sets for Roman and non-Roman alphabets, as well as standard sets of phonetic, mathematical, scientific, or other special symbols in PDF files. After initial research, the Technical Issues subcommittee recommends further investigation of the UNICODE standard character set to facilitate error-free migrations from word processing production formats to PDF. The Graduate College Thesis and Dissertation Committee will determine these standards.

Rationale: Supporting standard character sets will reduce corrupted text or loss of characters when converting symbolic or graphical data into PDF format.

II. SUBMISSION PROCESS - TECHNICAL

A. Process flow

Recommendation: The University should require student submission of an electronic (web-based) form which will be accessed by the student, the Graduate College, Student Services, and the University Libraries to provide and process information about the thesis or dissertation. *See Addendum B for graphical representation of process flow.*

Rationale: By using a web-based form to submit information to a database, the University can simplify many of the processes involved in the submission of electronic theses and dissertations. Such a database will allow the departments involved in processing theses and dissertations to automate processes such as notification of fee payment by Student Services, notification of format approval by the Graduate College and notification of submission of content by the student.

B. Data required

Recommendation: The University should require submission of specific information to facilitate the processing of electronic theses and dissertations. *See Addendum C for the Technical Issues Subcommittee's recommendations for specific information required.*

Rationale: By using the electronic submission form to consolidate and organize data such as signature page information, Dublin Core metadata, and student information, the accuracy and efficiency of processing the content will be improved provided that effective training for students is available. Dublin Core metadata can also streamline some resource management tasks easier by allowing targeted searches on materials of a certain file type or that were produced on a certain date, etc.

C. Ongoing review of process

Recommendation: The University should undertake periodic review and evaluation of internal and external processes related to theses and dissertations. Of particular interest in these evaluations will be our continued involvement with UMI as well as our potential membership in the Networked Digital Library of Theses and Dissertations.

Rationale: Because of the dynamic nature of electronic media, the University should regularly review and evaluate the processes involved in producing and providing access to electronic theses and dissertations, particularly those which require membership in or payment to outside agencies for alternative forms of access.

D. Forms and fees required

1. Fee collection and invoice payment for UMI microfilming and copyright

Recommendation: The University should identify Student Services as a single collection point for all mandatory fees for theses and dissertations. Student Services will also manage payment of invoices to UMI for microfilming and copyright services.

Rationale: Because the subcommittee suggests a model that removes the binding of depository copies as an obligation, and because Student Services already collects a graduation fee from students, we believe that Student Services is the logical place for all required fee payments related to a thesis or dissertation to take place.

2. UMI Dissertation Agreement form

Recommendation: The University should identify Student Services as a single collection point for the UMI Dissertation Agreement forms.

Rationale: This model would provide the student with one place at which to submit forms and fees related to their thesis and dissertation, and would allow for centralized handling of the UMI processes.

3. Signature sheet

Recommendation: The University should continue to require a paper signature sheet, to be collected by the Graduate College in the format and content review process in order to verify the approval of the thesis or dissertation advisory committee.

Rationale: Receipt of the signature sheet will provide the trigger for the Graduate College to indicate on the electronic submission form that the student is authorized to load the content of the thesis or dissertation onto the ETD server.

III. CATALOGING, LINKING AND INDEXING

A. Cataloging process and standards

Recommendation: The University Libraries' will retrieve the submission document with content and Dublin Core metadata embedded in (or linked to) it, and use the Cooperative Online Resource Catalog to harvest the metadata information from the submission page and create full level MARC records to download into the Libraries' catalog.

Rationale: The addition of Dublin Core metadata to the submission document will allow the University Libraries to use new cataloging resources and procedures that streamline the process and provide access to these materials quickly and efficiently. In addition, Dublin Core metadata will allow for more accurate resource discovery in web-based search engines. Full level MARC records

created for the Libraries' catalog collocate the ETD's into the balance of the library collections and provide more precise and more accurate searching than keyword web searching alone.

B. Access restrictions

Recommendation: The student may choose to restrict access to the content of the thesis or dissertation based upon guidelines set by the University. Theses and dissertations with restricted access will be fully cataloged and a link will be provided to a public version of the electronic submission form that presents author, title and other information about the ETD, as well as links to the ETD content itself.

Rationale: By using the submission document as the gateway to the content of each thesis or dissertation, users are given a consistent source of information about the level of access to the content. In addition, this method will minimize the amount of maintenance to the records in the Libraries' catalog. Access restrictions should be managed by security measures on the ETD server.

C. UMI and the National Digital Library of Theses and Dissertations (NDLTD)

Recommendation: ASU should continue to submit theses and dissertations to UMI and should consider membership in the NDLTD.

Rationale: UMI's *Dissertation Abstracts* continues to be the most comprehensive source of information about paper and electronic theses and dissertations, and also serves as an additional backup for ASU's ETD's. Membership in the NDLTD is currently free and establishes ASU as a leader in electronic scholarly publishing. As the NDLTD matures it may eventually replace *Dissertation Abstracts* as the most comprehensive source for recent theses and dissertations. The planned implementation of an NDLTD union catalog that supports Unicode will enable effective collocation of ASU ETD's with those from many other universities worldwide.

IV. BINDING

Recommendation: The University will no longer require submission of bound depository copies.

Rationale: The instant and global availability of thesis and dissertation content in electronic format eliminates the need to require paper copies. The Bookstore may continue to provide binding services for students' personal copies.

V. LONG-TERM STORAGE, PRESERVATION, MIGRATION AND ACCESS

ASU Information Technology and Library Instruction, Systems and Technology have collaborated on the following cost estimates for electronic submission page development, ETD storage and ETD migration. Given ASU's limited experience with costing these functions the estimates must be

considered preliminary and should be checked against the external market for completeness, accuracy and comparison to internal costs.

Recommendation: Refine specifications and issue a Request for Purchase (RFP) for the services required to develop and implement the electronic submission form (see submission process – technical, A), including forms, authentication, creation of database, and interfaces for searching and maintenance.

Recommendation: Refine specifications and issue a Request for Purchase (RFP) for providing digital storage space. RFP will address operational and maintenance services, required hardware installation, acquisition, installation, housing, software installation and maintenance, and 24/7 support.

Recommendation: Refine specifications and issue a Request for Purchase (RFP) to address the preservation and migration requirements and related services needed to maintain access over time.

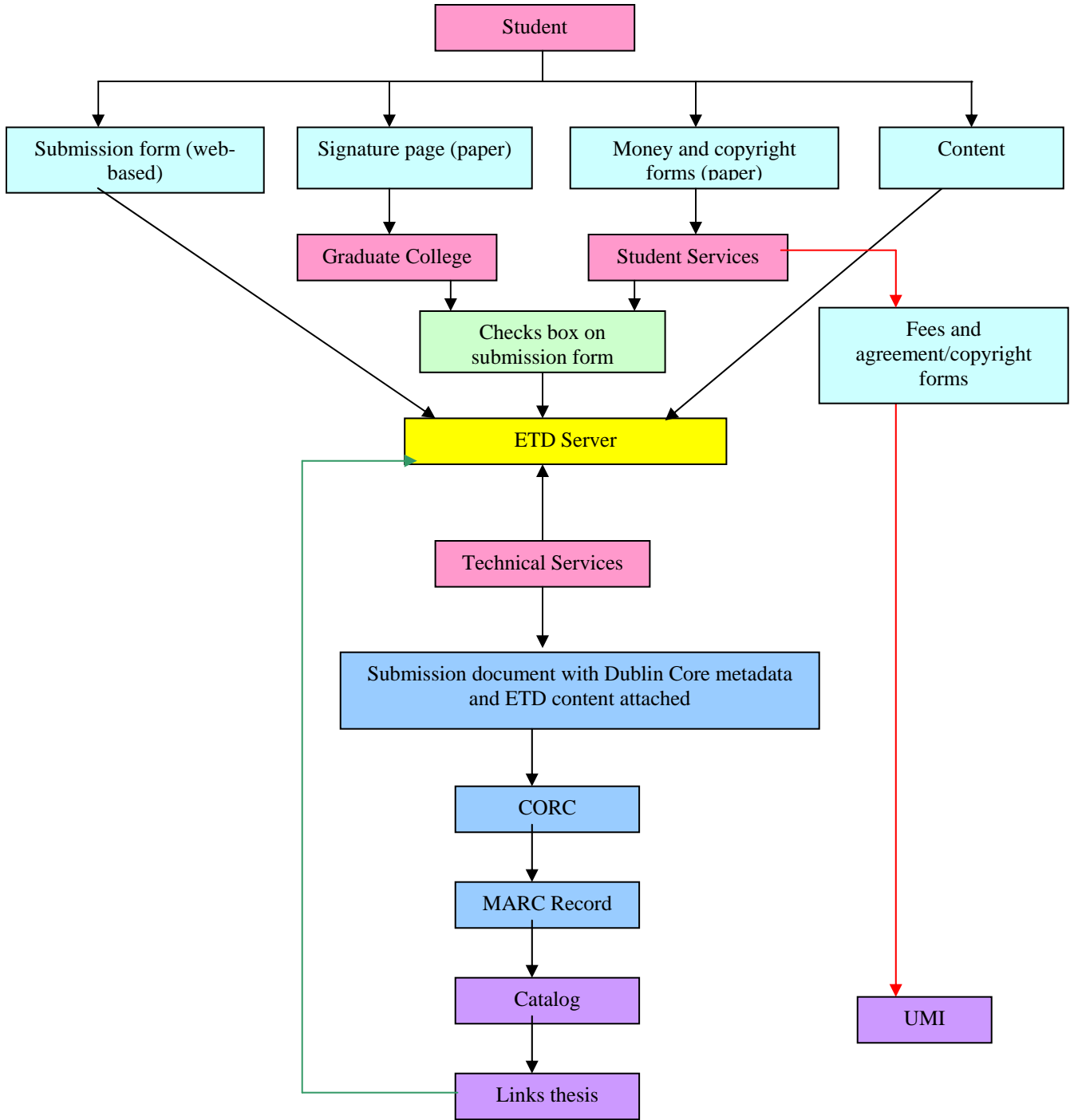
Rationale: The Technical Issues subcommittee recognizes that the resources required to produce and to provide continuing access to electronic theses and dissertations may be substantial. ASU Information Technology and Library Instruction, Systems and Technology have collaborated on the cost estimates presented in Addendum D. However the evolving technology and ASU's limited experience costing these functions requires additional research to substantiate these estimates and determine if outsourcing of some or all functions is cost-effective and warranted. Therefore while cost estimates are included in this document, the subcommittee recommends the RFP processes above to refine them.

Addendum A: Library –Supported Software Formats

The University Libraries currently supports the following software and file formats on public workstations. This list may expand as systems are upgraded.

- Netscape 4.08 (128-bit) with no mail or newsgroup capability.
- Adobe Acrobat Reader 4.05 with search (soon to be upgraded to include image rotation capability)
- AlternaTIFF image viewer for viewing tiff images from certain databases
- AT&T Deja Vu plug- in for viewing databases that require this plug in
- Microsoft Word Viewer
- Microsoft Excel Viewer
- Microsoft PowerPoint viewer
- JSTOR printing application (may be broken)
- WinSPIRS
- Proprietary Database viewing software launched from web system.

Addendum B: Submission Process Flow Chart



Addendum C: Electronic Submission Form Data Requirements

- **Publicly displayed information**
 - Title page/signatory information
 - Author
 - Title
 - Field of study
 - Names of all committee members
 - Departments of committee chair or co-chairs
 - Name of the Dean of the College, and the name of the College
 - Declaration page information
 - Student name
 - Graduation date
 - Degree type (Masters, Ph.D., etc.)
 - Date of defense
 - Access restriction/availability agreement
 - Formats of all files included
 - Acknowledgement of University policy regarding support of formats
 - Copyright statement acknowledgement
 - Abstract and keyword information
 - Abstract/summary
 - Keywords NOT included in abstract that may assist in retrieval

- **Information required for internal processing**
 - Student information
 - Name
 - ID number
 - Permanent address
 - Email address
 - Names of all files/directories loaded to the ETD server
 - Delivery mechanism

ADDENDUM D: Submission Form Development, ETD Storage and Migration Cost Estimates

TOTAL ONE-TIME COSTS: \$156,000

ANNUAL COSTS: \$ 50,000

ELECTRONIC SUBMISSION PAGE DEVELOPMENT [see also Addenda B & C]:

Programming: \$20,000
Design: \$ 6,000
Authentication: \$ 4,000

Total Estimate: \$30,000

ETD STORAGE:

Original estimates based on Virginia Tech average of 2.5mb/PDF submission, 750 ASU submissions per year, extrapolated for substantially increased multimedia content. 50 gigabytes of storage space expected to support 2-3 years of submissions.

50 gb AFS Space (purchase) \$41,000
Hardware \$20,000
Systems Administration time (10%) \$ 5,000/yr.

Total Estimate: \$66,000 plus \$5,000/year

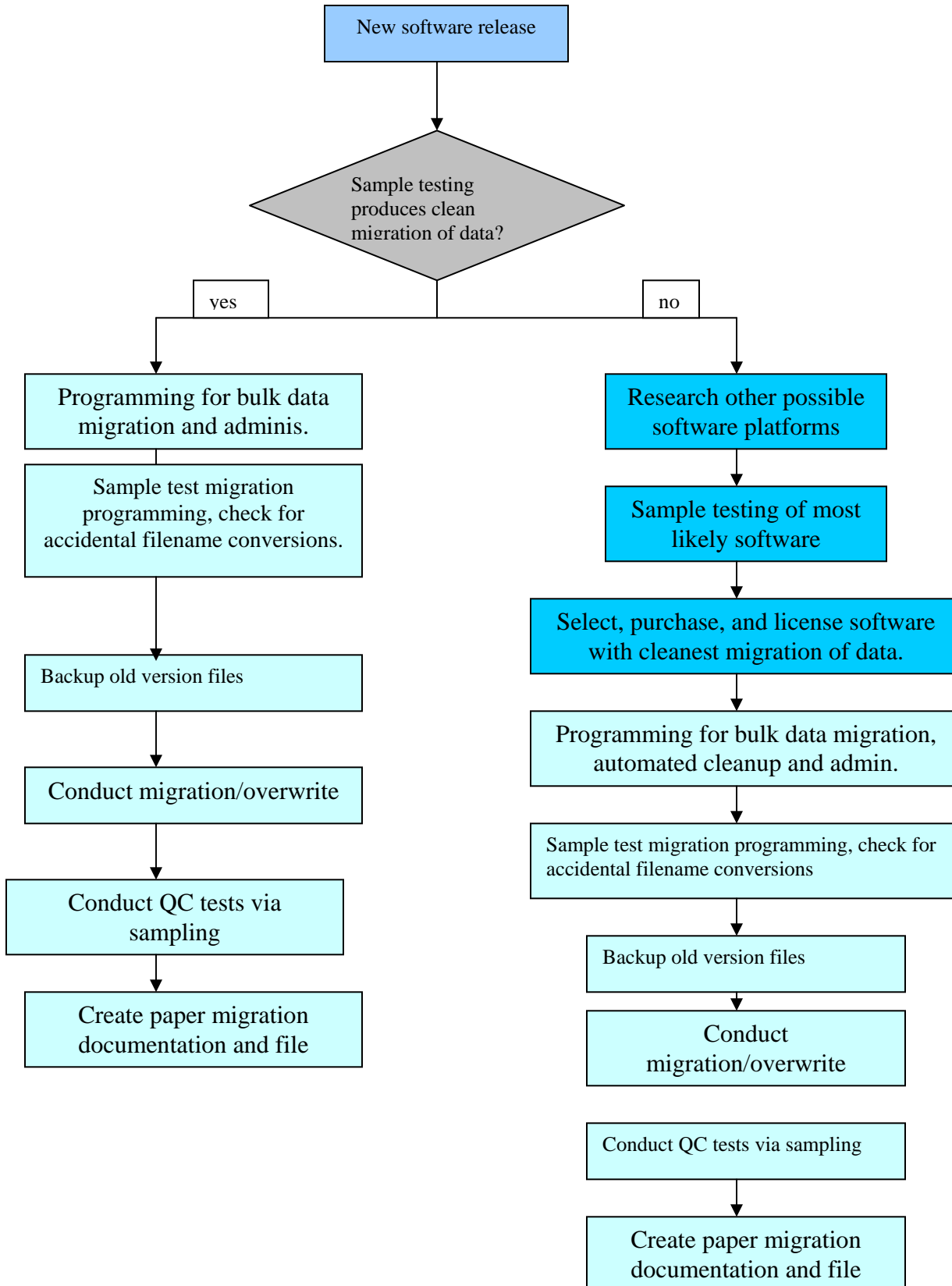
ETD MIGRATION (see flow chart next page):

Preservation of ETD appearance and functionality requires retention in software-dependent formats until software-independent retention format standards can be developed. Given the increasing speed of evolution and obsolescence of software-dependent formats, ETD's must be actively managed throughout their life in order to maintain accessibility.

Technology Support Analyst: \$45,000/year
Hardware/Software: \$15,000

Total Estimate: \$60,000 plus \$45,000/year

ADDENDUM D, p.2: Migration Flow Chart
R. Spindler, April, 2001



APPENDIX III
Format and Outreach Subcommittee
Final Report (04/23/01)
ELECTRONIC THESIS AND DISSERTATION TASK FORCE

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The charge of the Subcommittee was to consider the following issues:

1. Format Review and submission process
2. Access and access restrictions
3. Training – Faculty and students
4. Communication/Press releases
5. Advising process/Content review
6. Copyright

The Subcommittee recommends the following consolidations:

1. Combine issues 1 and 5.
2. Consider Copyright (issue 6) as a part of the other issues and more of an educational item to be included in 3. Training – Faculty and students than a policy issue.

Following is the Subcommittee’s Summary of Issues & Plans.

SUMMARY OF ISSUES & PLANS

Format Review and submission process, Advising process/Content review:

Format

The Graduate College (GC) ensures that all theses and dissertations conform to requirements for format and institutional standards of style. Formatting considerations in relation to an ETD Initiative will include type of digital media used (e.g., PDF files, HTML, CD-ROM), as well as typographical/visual style aspects as presented in the *GC Format Manual*. Copyright/intellectual property issues will also need to be considered.

Regarding digital format options, our preliminary research indicates that PDF and HTML are the preferred standards. Some universities allow students to use alternate formats, such as XML, a variation of HTML. In these instances, the university library is responsible for submission guidelines, and it is the library, which approves such formats. The university specifies that each digital document, regardless of format, should be deposited on a server. It is recommended that a technical subcommittee be formed to explore the advantages and disadvantages of these matters.

The other formatting consideration centers on the *Format Manual*, which could be modified to apply to digital documents. One option is to devise a template for formatting that students can purchase and download, which could be developed using either Microsoft Word or LINUX.

The GC addresses appropriate copyright standards in the *Format Manual*; however, with electronic theses and dissertations, there are new implications for copyright and intellectual property. For example, digital documents may require a disclaimer. General Counsel could offer biannual workshops addressing copyright compliance and intellectual property issues.

Submission

Digital submission will necessarily affect policies and procedures, roles, training, and deadlines, but at this time, we will only consider those, which we are most qualified to address:

- We recommend that two other subcommittees be formed to address non-policy and procedural issues related to technical and training issues.
- Processes would be updated to reflect the characteristics of and opportunities for digital documents (i.e., technological feasibility of graphics use).
- Other considerations are evaluating current forms to determine which could be streamlined and automated. In addition, policy and procedural issues for evaluation include deadlines, web links, current UMI format specifications, and determining student eligibility.

Other Thoughts

Format

- Pdf
- Standardized electronic documentation citations, e.g. Columbia University Press model.
- Check for copyright compliance
- Review current requirements & rationales to determine which are print-specific/unnecessary.

- Xml...tags as standard feature. Also for disabled students (ADA)
- What is a "quality" electronic text? <http://www.ceth.rutgers.edu/intromat/faq/faq1.html>

As in their bibliographic research material, humanities scholars require an accurate, authoritative electronic text with known provenance. This implies all the scholarly apparatus, which is traditionally used to evaluate research and publications in the humanities, plus an appreciation of the electronic properties of the text. If the text is usable only with specific software, the functions of that software also determine the usefulness and "quality" of the text. Documentation is needed of any mark-up performed on the electronic text, with the logic and consistency of the mark-up explained clearly in the front matter, including a citation and address of the persons or company responsible for the input and/or mark-up. The Text Encoding Initiative has published the TEI Guidelines (TEI P3), a two-volume, 1300-page opus that helps scholars make a header with a standard format for the inclusion of all of this and more information in any electronic text.

Establishing standard mark-up schemes, such as the Standard Generalized Markup Language (SGML), and formats, such as the TEI (Text Encoding Initiative), is important to track the provenance of the text as well as to validate the authority of one text over another.

- Also our theses are images of works or papers with images. What facilities are there for students to scan their works and what expenses are incurred?

I think this could be attractive for students who want to use the web when they graduate to display their works, but it would be good if these things worked in tandem. But this also means good reproduction, high resolution should be guaranteed or the work will look poor and perhaps not represent the student or program properly.

Our Visual Resource Collection puts student works in the slide collection and until slides go the way of paper, they will probably still want them, but you should check with Lise on this issue, too.

- What expenses would there be in this, assuming that these documents are on ASU's server?

These issues are relevant to the topic of students withholding documents. I think a phasing in process would be best so students can choose paper or computer. (Julie Codell, School of Art)

Submission

- Possible to submit via pdf ONLY.
- Encouragement of non-text illustrations, other media.
- Who is responsible for review?
- Forms & permission from Advisor
- Student status check
- Deadlines

Advising Process/Content Review

- Web based check out sheet – Requirements & Modeling
- Feedback
- Content primarily focused on by committee members; Advising can come from committee & Graduate College.
- Works differently in different departments/disciplines
- Relevant variables – length, documentation

- Part of Training. Will T/D committees be responsible for reviewing “content” for online verification?

Access and Access Restrictions:

--Next generation mark up languages such as SGML (standard generalized markup language) or XML (a "super" standard considered a subset of SGML) may be more "accessible" by virtue of the tags one can embed in the coding of the document to enable disabled users to access the document. (HTML does not have this capability). (from Rutgers Electronic Center) XML is being used by University of Iowa (from document distributed by Kristen).

--My informal poll surfaced issue of "choice" on part of student--choice of paper vs. electronic, choice of level access (local ASU vs. world-wide-web).

--Yahoo just started indexing .pdf documents in a systematic fashion. They currently have thousands of .pdf documents on line.

--Levels of access to ETD archive could be as follows: 1. World; 2. ASU only; 3. ASU only encrypted; 4. No access [with the possibilities of various combinations of extensions]. (This adapted from WVU document entitled “signature form.”)

--At VT, 47% of authors allow for unrestricted access; 20% are inaccessible; 30% are available to VT users only.

--At VT, 50% users are from Education; 33% from commercial sources/business.

--VT reports “remarkable increase in exposure to grad student research” as result of making available in .pdf format on line.

1. To what degree/percentage should students withhold documents? How will that be facilitated; tied into copyright?

If the students want to put the information on their own website, would they be restricted? Who owns the contents of their work once it's on the web? ASU or the student? These are typical intellectual property issues and should of course be spelled out in whatever document your committee comes up with. (Julie Codell, director, SOA)

2. Responsibility for contacts...should it rest with students?

ASU should take responsibility for the contacts for the first time period or two and then the student is responsible. (Julie Codell, director, SOA).

3. What confidentiality agreements need to be in place? (Our current ASU policy can be read at <http://www.asu.edu/graduate/formatmanual/index.html> choose "confidential status") [full text copied below]

I think confidentiality should be maintained as it is in our current policy, but wonder what problems there are maintaining this on the web. Also does that mean that individuals must have an ASUrite ID or a pin? How could alums view the sites then? Or the community members like our board members? (Julie Codell, Director, School of Art)

4. What ADA considerations would/should obtain?

... a .pdf file is not accessible. This is a very large area and there are federal guidelines for web accessibility. If you would like some more information about web accessibility, please let me know. (Richard Jones, Disabilities Resources)

I found an excellent resource on ADA recommendations at:
<http://www.usdoj.gov:80/crt/508/report/web.htm>

Here's a small sample:

Different communities of people with disabilities experience different barriers to access when using federal agencies' Web pages:

- * People who are blind and who use screen readers may require that all non-text items (such as pictures, charts, and graphic elements) have text alternatives.
- * Users with cognitive disabilities and those who have visually-induced seizure disorders may require content without flashing or distracting elements.

Generally, removal of barriers on federal agencies' Web sites is simply a matter of good design. It also benefits others, such as those who use low-end technology with lower modem speeds and people who use wireless Internet connections.

5. What should the policy be with respect to evidence of plagiarism?

Notes from a very thoughtful article on how to make students aware of copyright and plagiarism issues.

How do we determine when we have fairly adapted a work and when we have plagiarized or violated a copyright? An exploration of Internet resources will provide the answers and generate good discussion along the way. Below are five useful sites that explain copyright, dispel myths, offer suggestions for avoiding plagiarism, and provide instructions for obtaining permission to use another's work.

<http://www.centerforlearning.org/tips3.html>

Tips from a webmaster of a popular Internet Dance website:

How can you avoid it?

- * If you're creating your own web pages, don't look at someone's web page if it has the same purpose as your own. Once you see someone else's writing, it's hard not to use their phrasing because it's easier than coming up with your own original text. This concept was used as a sub-plot in Tom Clancy's novel, *Patriot Games*. I avoid looking at another Boston swing website, [Total Swing](#), so I can't accidentally use something that they created (that's why DanceNet never had everything that was listed in the BSDS' newsletter after I left that organization).
- * If you're creating a link to a web page, just get the URL of that website and create your own text around it. The URL is public-knowledge; no one can fault you for using it. Just don't take anything else from the site. However, don't take all the links off someone else's website to save your own research time.
- * Change the formatting and colors. I use Picture Publisher to create the two-dimensional color banners on each of my pages (it's on my laptop so I can create new web pages when I travel). I then use a calculator to figure out the numbers for the colors I want to use for my backgrounds and tables. That means none of my colors are standard; they're all individually chosen. Be smart enough to use your own colors.
- * Don't copy someone else's mistakes. Who knows, they might have put them in there on purpose to catch plagiarizers. Verify your information and if you do that, you won't need to copy someone else's information anyway.
- * Everyone has a different writing style. Mine is very obvious to see when I type in every HTML code to format my pages. Don't copy someone letter-for-letter.
- * If you ask for information and someone sends you HTML code, ask where he or she got it so you can ask the data originator if it's okay to use it. Don't let these volunteers hurt your reputation.
- * Consider citing your sources and dating them (or documenting them somewhere). While Eric and I tend not to do that to protect the privacy of our sources, some volunteers appreciate getting thanked for providing new information (particularly if the source is another website). If nothing else, it adds credibility to the information.
- * Give full credit to the creator of the web information if you use it on your web page. And don't forget to ask for permission first, even if you don't need to.
- * Link to other websites. There's nothing wrong with not having everything in your website. It's ridiculous to try to list everything in other cities when someone else is working constantly to update the information for that location. Let them get the credit for their work and just link to their site. Let Eric take care of Northern California, Margie has southern California. Michael has Toronto. I've got Boston (well, most of it). DanceNet will list specific items when I visit that location personally, get flyers, or if someone specifically asks to be listed. There's no point in raiding all the locations from someone's website because that information will be obsolete five minutes later.

Other Thoughts

- To what degree/percentage should students withhold documents? How will that be facilitated; tied into copyright
- Responsibility for contacts – rests with students?
- See current policy for confidentiality – attached
- ADA
- Plagiarism

- Good additional references on Accessibility:

--Good site on dissemination and accessibility of pages using search engines:

<http://www.wwwmetrics.com/>

--Dublin Core. The Dublin Core: A Simple Content Description Model for Electronic Resources (1999); <http://purl.oclc.org/dc/>

--Requirements for Federal web pages:

<http://www.usdoj.gov:80/crt/508/report/web.htm>

Training – Faculty and Students:

The Center for Learning and Teaching Excellence (CLTE) will collaborate with appropriate ASU units to provide professional-development activities (workshops, on-line support, etc) to prepare faculty and graduate students for submitting electronic theses and dissertations. We imagine that CLTE will sponsor/co-sponsor and arrange for the following kinds of activities:

- 1) Leading-edge faculty—panels and/or individuals from all three state universities—could conduct how-to workshops for other faculty, especially those in disciplines similar to their own.
- 2) Preparing Future Faculty (PFF) or Preparing Future Professionals (PFP) participants could conduct how-to workshops for other graduate students. These could be projects for second-year participants.
- 3) Instruction Support/Information Technology staff could offer face-to-face workshops and web-based support, including courses, for both faculty and graduate students. The web-based support might be made available to all three state universities.
- 4) Library personnel could offer workshops and web-based support for both faculty and graduate students.
- 5) One or both of the associate deans in the Graduate College could conduct workshops for university chairs and directors to encourage participation and to address concerns. Janice Reeb and Cassandra Hamblin orchestrate such events for chairs and directors.
- 6) One or both of the associate deans in the Graduate College could conduct workshops for graduate directors to encourage participation and to address concerns.
- 7) CLTE and Instruction Support could offer weeklong courses in ASU's Summer Institute on College Teaching to help faculty and graduate students learn cutting-edge digital applications. These currently focus on technology for teaching and learning, but some of that technology may also apply to dissertations and theses.
- 8) ASU might offer travel funding for leading-edge faculty to do presentations at national cross-disciplinary conferences such as AAHE.

Other Thoughts

- Computing Commons staffers & (Sam DiGangi)
- Format Advisors
- T/D Workshop – Both fall & spring (also summer, winter sessions)
- Online classes
- Faculty may be extremely resistant

- Orientations to ETD's; new process for ETD submitted
- Part of Extended Ed. Across all campuses
- Joint programs with U of A & NAU and beyond
- Who – Students, faculty, staff from Grad. College & elsewhere

Communication/Press Releases:

Publicity Strategy:

To Promote acceptance of an ETD Recommendation through multiple communications explaining the rationale, targeting each stakeholder groups, the university, and the State of Arizona should defuse resistance to change and promote a smooth transition. Stakeholder groups identified include: graduate students, faculty, administrators, ABOR, technology and information consumers, business community, and citizens of Arizona.

Faculty:

- An initial announcement of the ETD taskforce to faculty has been made in the Academic Senate Newsletter.
- Clarify that most scholarly journals have relaxed pre-publication restrictions.
- Explain that the ETD format requirement is something that happens separately from the defense; that ETD does not change the work of the supervisory committee, interfere with the preparation, or alter the defense of the thesis.
- Explain that ETD provides a potential for creating multimedia dissertations that capture the essence of many creative processes better than the traditional textual style thesis or dissertation.
- Point out that ETD is consistent with on-line defenses that remove the constraints of space and time, which sometimes limit or frustrate committee selection, supervision and defense.

Students:

- Communications need to emphasize that conversion to a digital format (.pdf*) is easy, doesn't require additional time, may reduce the cost to the student, and speeds dissemination and recognition for scholarly work.
- Clarify that the student has control and may choose to delay release of material to allow pursuit of patent, or publication rights.
- Point out that electronic journals are becoming an important outlet for scholarship and publication and becoming comfortable with new media may enhance marketability and career development.
- Clarify that dissertations are currently scanned and microfilmed.

Administrators:

- Communications should emphasize promoting the national reputation of the unit or program at a very low cost.
- Point out that there may be significant cost savings that will not require libraries to divert resources that may support serials or other services
- Clarify that on-line access may facilitate assessment and program reviews.

- Argue that on-line ETD may help build partnerships with industry, help students obtain jobs, and help units in development and fund raising activities.

Public:

- Press releases from ABOR, and ASU need to announce that ASU is an early ETD adopter and point out that the rapid dissemination of new knowledge is a key to achieving Arizona's New Economy Goals.
- That by adopting ETD, ASU is putting in place procedures to insure the realization of widespread benefits stemming from Prop. 301 and the creation of new knowledge.
- Announce that rapid dissemination for new knowledge created and opportunities for Arizona, enhances the development new economy business environment, and increases Arizona's reputation as an environment nurturing flourishing new knowledge companies and industries.

To do: Develop communication vehicles and tools including:

- Newsletter announcements
- E-mail announcements
- Letter from Task Force/Deans
- Press releases/Insight/Arizona Republic/Tribune
- Horizon Program produced by Channel 8
- Web page with streaming video
- How to video tutorials describing requirement and process. (seek support from Adobe).
- Handout materials for seminars and workshops
- ETD Book mark to acquaint new graduate students
- Checklist for ETD
- ETD Issues to discuss with your Committee Chair or Thesis Director.

Other Thoughts

- Insight notice
- A change management plan will be crucial in getting faculty & students, & administrators on board.
- E-mail notice to faculty for comments at various points
- I would pass through Deans and Directors and encourage departments to discuss policy in context of faculty meetings. (Collins)
- Faculty/staff likely to get on board with ETD's if seen from the standpoint of Continuous improvement and Univ. taking leadership role - - - and encouraged that there is the money/resources for this investment in training
- Work with pilot group; apply for continuous improvement award.
- Get publicity.
- Committee suggestions for effective ways of keeping faculty abreast of ETD issues/activity on a grassroots level include the following:
- Department Chairs could present salient issues at department meetings. The information could be disseminated via a presentation at the next ACDC meeting. Links on a website could be established; Dr. Roen might be consulted re: an ETD site off the Center for Learning and Teaching Excellence website that would list 4-5 burning issues for faculty to consider.

- Dennis Durband, an editor in the Graduate College, could write an article bulleting excerpts from interviews with experts.

Copyright:

Faculty and students need to understand copyright rights and permissions. Including the following topics in professional development activities (see Training – Faculty and Students) is essential.

- Use of materials owned by others
 - Fair use
 - Permissions
 - Assignments
- Ownership of material
 - Individual, institution, co-authors
 - Graduate students
 - Assignments
 - Permissions
- Protection

Other Thoughts

- Use current item labeling technology?
- Combine this topic with Access & access restrictions
- Does this change status of thesis/dissertations re: permissions