



DIGITAL LIBRARIES
Curriculum Development

Further Development of a Digital Library Curriculum: Evaluation Approaches and New Tools

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Acknowledgements (Selected)

- Faculty / Staff / Others

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- Sponsor

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 - IIS-0535057 to VT
 - IIS-0535060 to UNC-CH



Overview

- Introduction
- DL curriculum framework
- Development lifecycle
- Future work
- Invitation

Introduction

- Interdisciplinary project
 - VT CS & UNC-CH SILS
- Goal
 - DL lesson modules → courses
 - Community

Introduction

■ Team

- VT: Dr. Edward A. Fox (PI), Seungwon Yang
- UNC-CH: Dr. Barbara M. Wildemuth (PI),
Dr. Jeffrey P. Pomerantz, Sanghee Oh

■ Advisory Board

- VT:10, UNC-CH:14, other:12

■ Term: Jan. 2006 - Dec. 2008

Foundations - 5S Framework -

- Theoretical foundation
- Necessary condition to be a Minimal DL

S's	Role in DL	Examples
Streams	Various types of content	text, video, audio
Structures	Organize information	catalog, metadata, hypertext
Spaces	Store and present information	interfaces, storage, vector space
Scenarios	Provide services	searching, browsing, recommending
Societies	Form a DL community of users and service managers	service managers, teachers, learners

Foundations

- Computing Curriculum 2001 (ACM & IEEE-CS)-

- CS Body of Knowledge
 - ← Information Management (IM.14)
 - ← **Digital Libraries**
- DL topics and learning objectives
- Suggestions for CC2001 update



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DL Curriculum Framework

- Current DL Module Framework
 - 10 core modules
 - 41 sub modules

DL Module Framework (1-5 of 10)

1	Overview
2	Digital Objects
3	Collection Development
4	Info/ Knowledge Organization
5	Architecture (agents, mediators)

1-a (10-c): Conceptual frameworks, theories, definitions

1-b: History of digital libraries and library automation

2-a: Text resources

2-b: Multimedia

2-c (8-c): File formats, transformation, migration

3-a: Collection development/ selection policies

3-b: Digitization

3-c: Harvesting
3-d: Information architecture (e.g., hypertext, hypermedia)
3-e: Document and publishing/ presentation markup
3-f: Metadata, cataloging, metadata markup

4-c: Ontologies, classification, categorization

4-d: Subject description, vocabulary control, thesauri, terminologies

5-a: Architecture overviews/models

5-b: Application software

5-c: Identifiers, handles, DOI, PURL

4-e: Object description and organization for a specific domain

5-d: Protocols

5-e: Interoperability

5-f: Security

DL Module Framework (6-10 of 10)

6	User Behavior/ Interactions	6-a: Info needs, relevance 6-b: Search strategy, info seeking behavior, user modeling
7	Services	7-a: Search engines, IR, indexing methods 7-b: Sharing, networking, interchange (e.g. Reference services) 7-c: Social 7-d: Recommendation systems 7-e: Interaction design, info summarization and visualization 7-f: Routing, community filtering 7-g: Web publishing (e.g. wiki, rss and 8-a: Approaches to archiving and repository development 8-b: Sustainability 8-c: Project management 8-d: File formats, transformation, migration 8-e: DL case studies 8-f: DL evaluation, user studies 8-g: Bibliometrics, Webometrics 8-h: Legal issues (e.g., copyright) 8-i: Cost/economic issues 8-j: Social issues 8-k: Future of DLs 8-l: Education for digital librarians 8-m: (1-a): Conceptual framework, theories, definitions 8-n: DL research initiatives
8	Preservation	8-a: Approaches to archiving and repository development 8-b: Sustainability 8-c: Project management 8-d: File formats, transformation, migration 8-e: DL case studies 8-f: DL evaluation, user studies 8-g: Bibliometrics, Webometrics 8-h: Legal issues (e.g., copyright) 8-i: Cost/economic issues 8-j: Social issues 8-k: Future of DLs 8-l: Education for digital librarians 8-m: (1-a): Conceptual framework, theories, definitions 8-n: DL research initiatives
9	Management and Evaluation	8-a: Approaches to archiving and repository development 8-b: Sustainability 8-c: Project management 8-d: File formats, transformation, migration 8-e: DL case studies 8-f: DL evaluation, user studies 8-g: Bibliometrics, Webometrics 8-h: Legal issues (e.g., copyright) 8-i: Cost/economic issues 8-j: Social issues 8-k: Future of DLs 8-l: Education for digital librarians 8-m: (1-a): Conceptual framework, theories, definitions 8-n: DL research initiatives
10	DL education and research	8-a: Approaches to archiving and repository development 8-b: Sustainability 8-c: Project management 8-d: File formats, transformation, migration 8-e: DL case studies 8-f: DL evaluation, user studies 8-g: Bibliometrics, Webometrics 8-h: Legal issues (e.g., copyright) 8-i: Cost/economic issues 8-j: Social issues 8-k: Future of DLs 8-l: Education for digital librarians 8-m: (1-a): Conceptual framework, theories, definitions 8-n: DL research initiatives

Draft Module Example

- 5-b: Application software



Overview

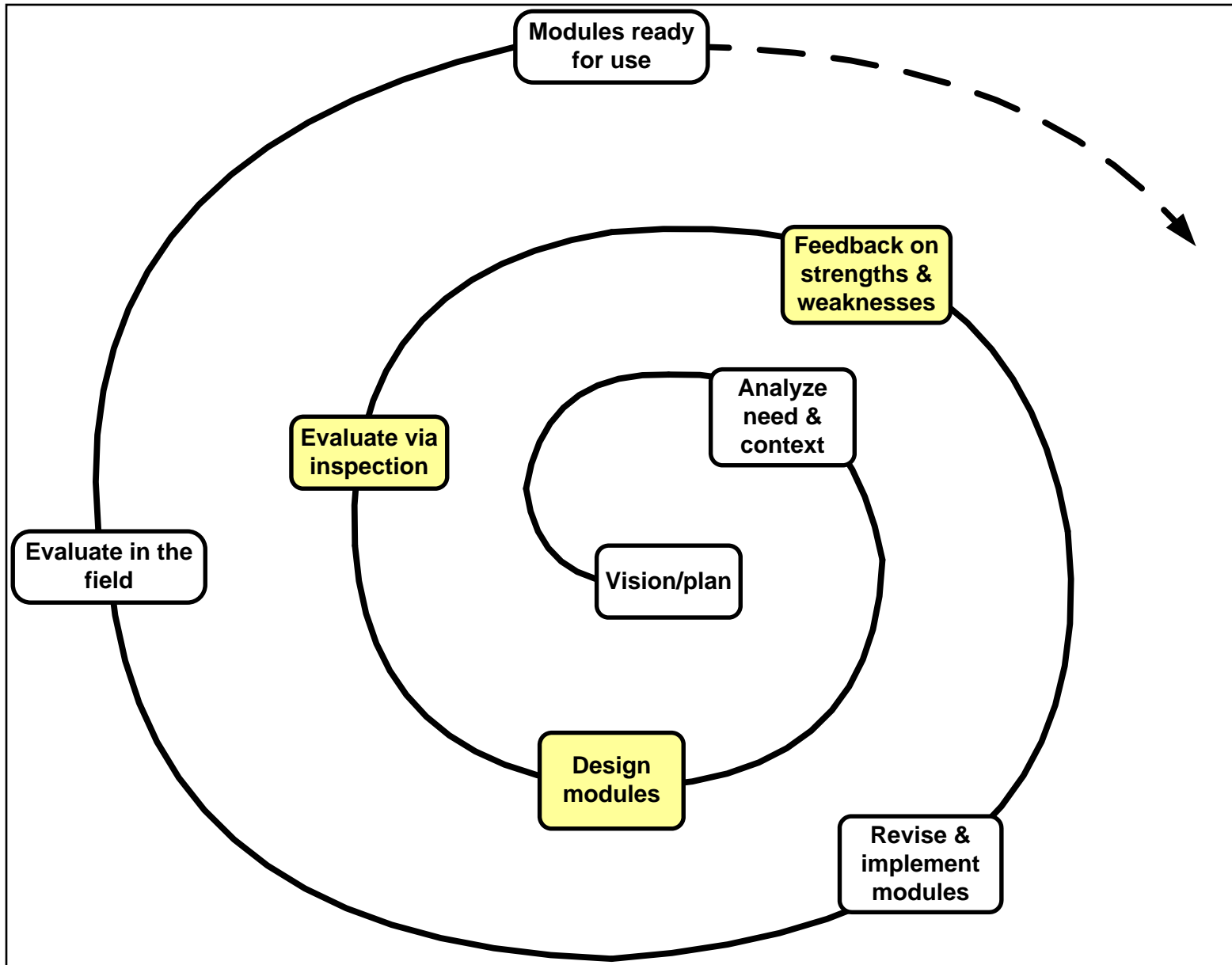
- Introduction
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- **Development lifecycle**
- Future work
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Development Lifecycle

- Diagram
- (Selected) six draft modules
- Pilot test for formative evaluation

Development Lifecycle Diagram



(Selected) Six Draft Modules

1st yellow box

■ High-priority areas first

- 1-b: History of digital libraries and library automation
- 5-b: Application software
- 6-a: Information needs, relevance
- 6-b: Search strategy, information seeking behavior, user modeling
- 7-b: Reference services
- 9-c: DL evaluation, user studies

Pilot Test for Module Evaluation

- Feedback –

Meeting during JCDDL'07

- Prioritize them
- Define the scope
- More consistent relationships
- International inputs in development
 - From **Asia**, Europe, Africa, Oceania,...

Formative Evaluation

- Evaluate 5 sections + 2
 - Objectives
 - Body of knowledge
 - Readings
 - Learning activities
 - Level of effort and prerequisites

- Overall structure
- Additional comments

Example: Guiding + Specific Questions

Body of knowledge:

- Guiding question: Does the module **address all areas of the topic** that need to be addressed?
- Specific questions:
 - Will the body of knowledge enable students to **achieve the objectives**?
 - Are there any topics that you think are critical to **add to** the body of knowledge?
 - Are there any topics that you would **remove from** the body of knowledge?



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Future work

– Resource presentation in a module –

- **S**uperimposed **I**nformation (SI) Technology
 - Sub-document level granularity presentation
 - “Marks”: references to selected regions within base (original) information

SI Technology

The image shows two side-by-side screenshots. The left screenshot, labeled 'A', is a document page with a table of contents. It lists sections like 'Introduction, and implementation' with a URL, and 'About DSpace', 'Technologies', and 'Implementation'. A yellow arrow points from the 'Introduction, and implementation' link to the right screenshot. The right screenshot, labeled 'B', is a web browser window titled 'DSpace: An Open Source Dynamic Digital Repository - Windows Internet Explorer'. The address bar shows 'http://www.dlib.org/dlib/january03/smith/01smith.htm'. The main content area contains a paragraph about DSpace's development by HP and MIT in 2000. A yellow highlight is placed over a paragraph starting with 'So what is DSpace? It is an attempt to address a problem that MIT faculty have been expressing to the Libraries for the past few years...'.

A

2. Introduction, and implementation
<http://www.dlib.org/dlib/january03/smith/01smith.html>
o [About DSpace](#)
o [Technologies](#)
o [Implementation](#)

3. Conception of the idea, chronology, case study in MIT at
<http://dspace.org/implement/case-study.pdf>

4. DSpace news at <http://wiki.dspace.org/index.php//Dspace/>

B

DSpace: An Open Source Dynamic Digital Repository - Windows Internet Explorer
http://www.dlib.org/dlib/january03/smith/01smith.htm

In March 2000, Hewlett-Packard Company (HP) awarded \$1.8 million to the MIT Libraries for an 18-month collaboration to build DSpace™, a dynamic repository for the intellectual output in digital formats of multi-disciplinary research organizations. HP Labs and MIT Libraries released the system worldwide on November 4, 2002, under the terms of the BSD open source license [1], one month after its introduction as a new service of the MIT Libraries. As an open source system, DSpace is now freely available to other institutions to run as-is, or to modify and extend as they require to meet local needs. From the outset, HP and MIT designed the system to be run by institutions other than MIT, and to support federation among its adopters, in both the technical and the social sense. The DSpace Federation will be explored in a later section.

So what is DSpace? It is an attempt to address a problem that MIT faculty have been expressing to the Libraries for the past few years. As faculty and other researchers develop research materials and scholarly publications in increasingly complex digital formats, there is a need to collect, preserve, index and distribute them: a time-consuming and expensive chore for individual faculty and their departments, labs, and centers to manage themselves. The DSpace system provides a way to manage these research materials and publications in a professionally maintained repository to give them greater visibility and accessibility over time.

DSpace was built breadth-first: it supports every function that a research organization needs to run a production digital repository service, but as simply as possible. The project focus was on building a production quality system. It complements and was influenced by previous research in

A) Mark used in a module; B) Mark highlighting the desired selection that describes DSpace in an article

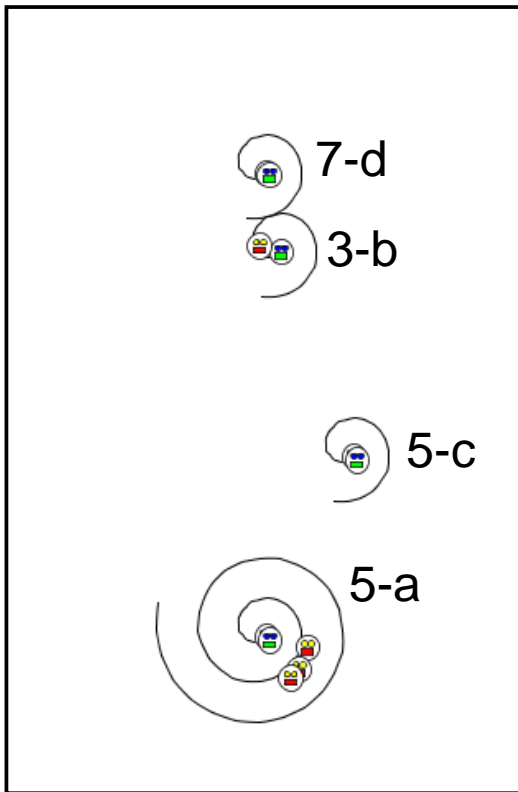


Future work

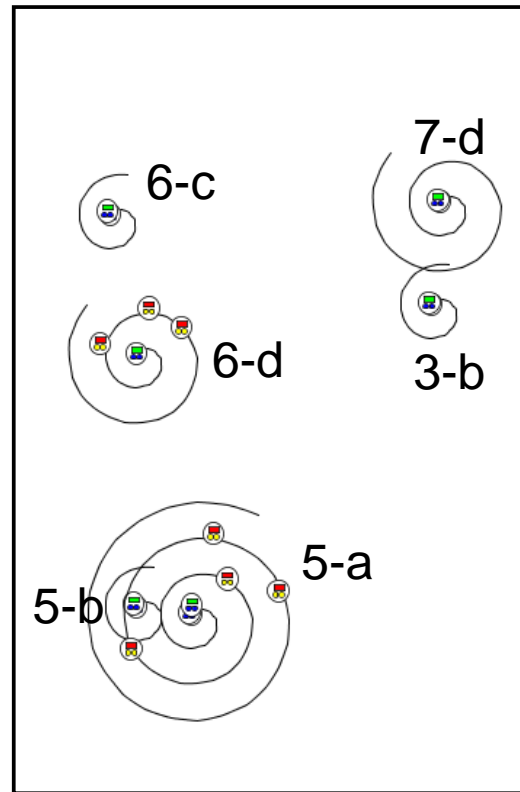
– Understanding the community's use of module –

- Visual User model Data Mining (VUDM) Tool

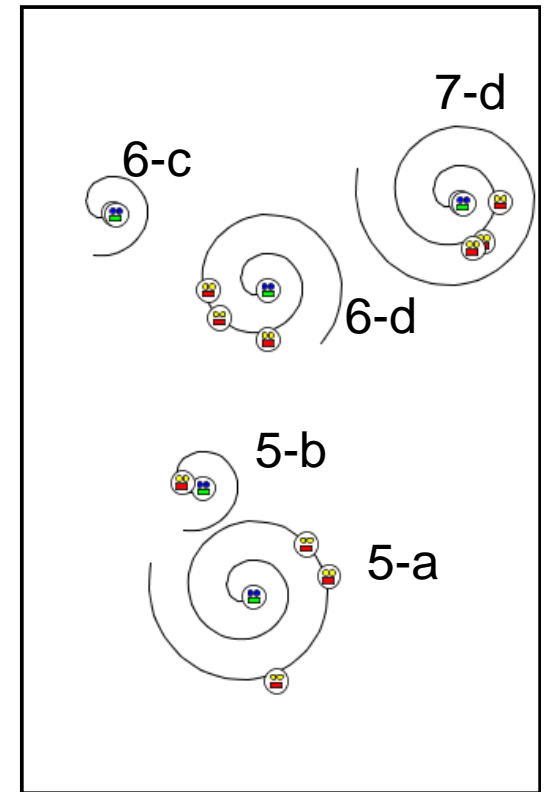
VUDM



Week 1



Week 2



Week 3

Visualization of DL module usage trends for three weeks

Future work

– Plans for module distribution –

■ Using wikis

- Wikiversity: distribute modules, set up a DL community
- Wikibooks: DL booklet

■ Using Second Life (secondlife.com)

- 3D virtual environment
- Supports collaborative, distance learning
- Collaborator in SJSU: Dr. Lili Luo

New Media Consortium Campus



From http://b2e.nitle.org/media/Howard_beforethemob.jpg



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Would you like to join us?

- Your contribution – two ways
 - Module development
 - (e.g., based on your teaching experiences/classes)
 - Module evaluation

- Contacts for PIs
 - VT: Edward A. Fox (fox@vt.edu)
 - UNC-CH: Barbara M. Wildemuth (wildem@ils.unc.edu)

More Information

- Project homepage: <http://curric.dlib.vt.edu>
- Module evaluation: <http://curric.dlib.vt.edu/wiki>
- Project diary:
<http://tuppence.dlib.vt.edu/blogs/index.php?blog=2>



Thank you!

Questions and comments?