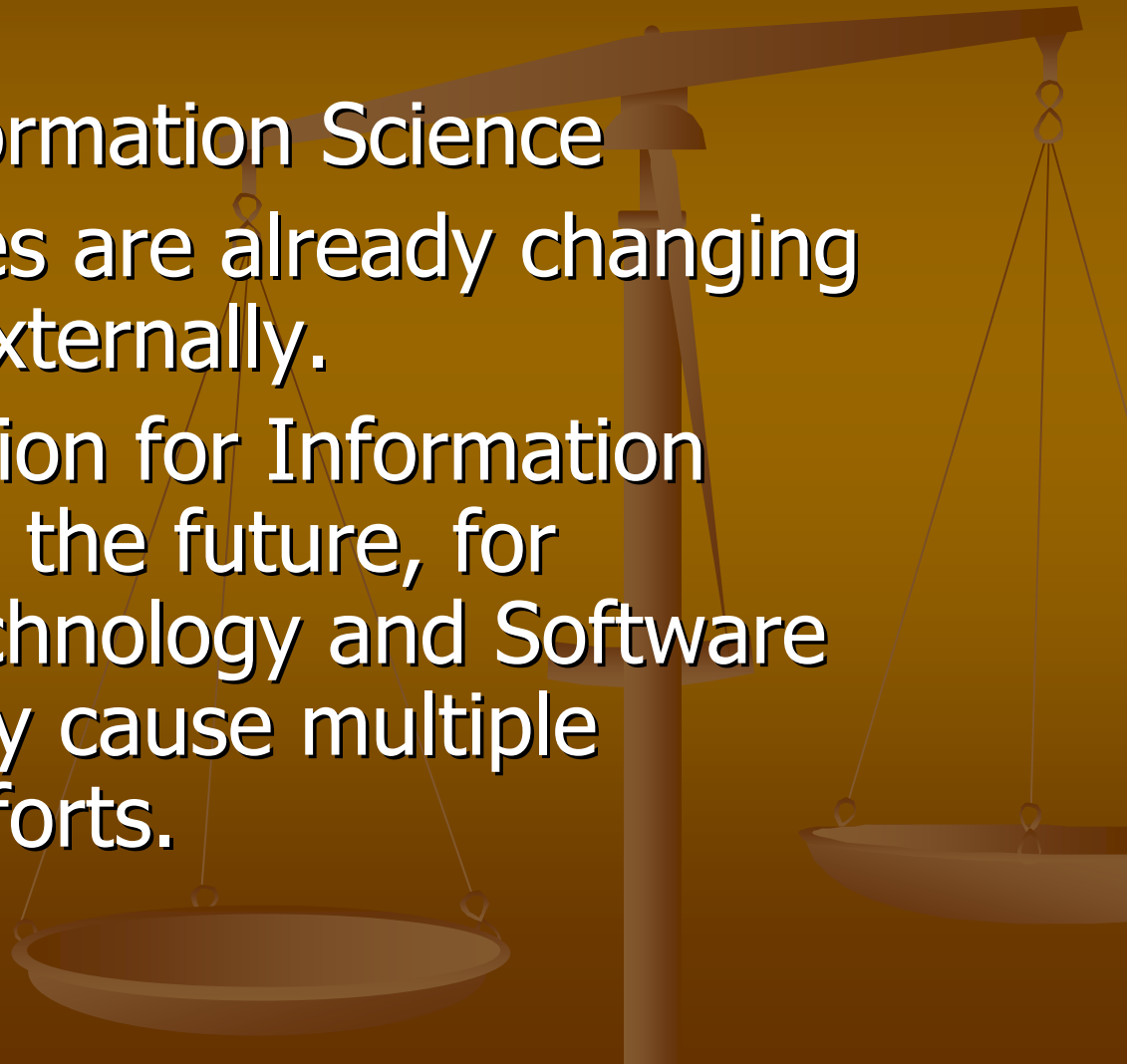
Information Schools: Traditions Growing, Morphing and Expanding

David Fenske

Standards and Traditions

- ALA standards
- Library and Information Science
- But these staples are already changing internally and externally.
- ABET accreditation for Information Systems and, in the future, for Information Technology and Software Engineering may cause multiple accreditation efforts.

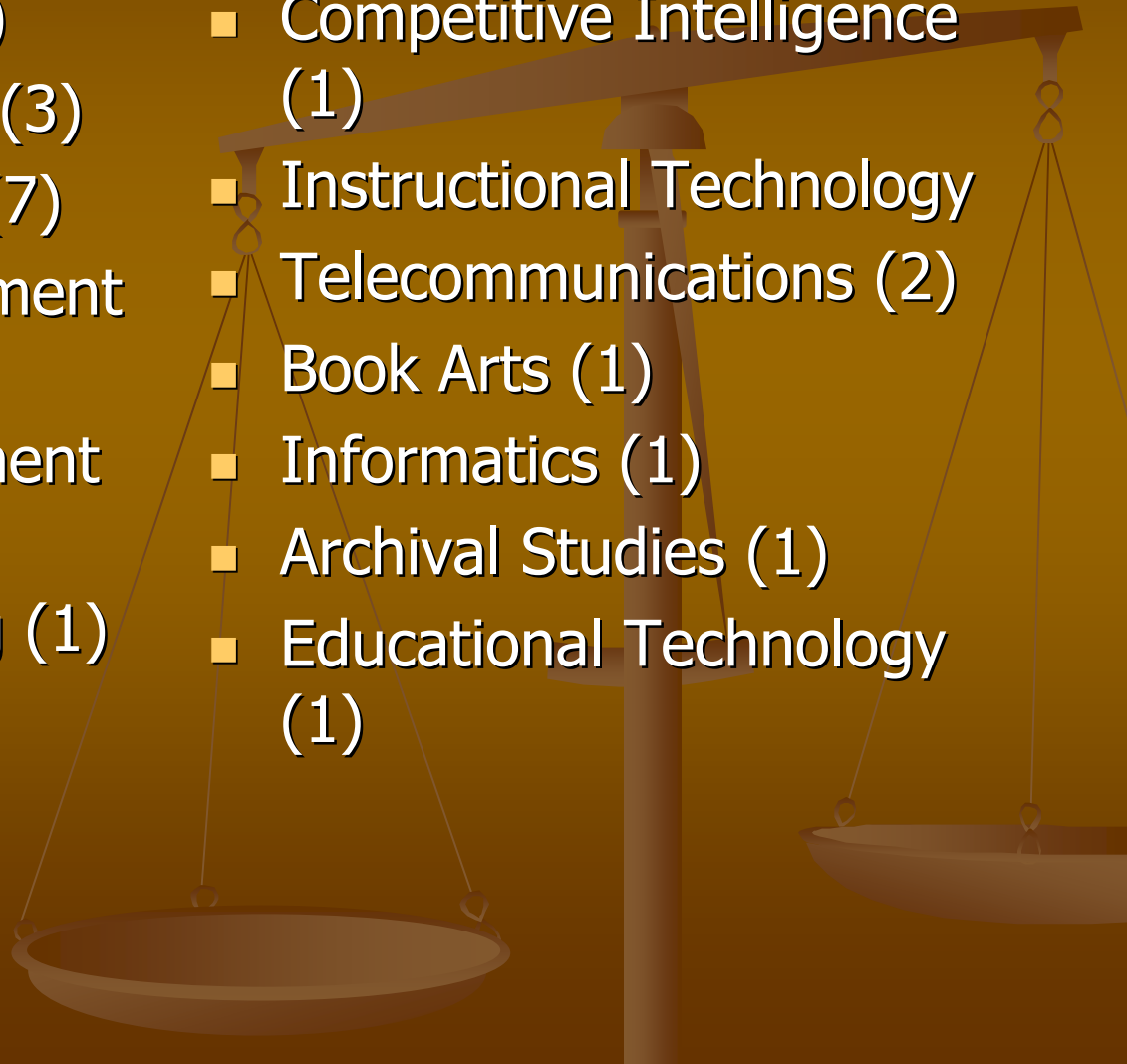


Degree Diversification with the ALA accredited schools

In addition to the traditional ALA accredited degree, the 54 or so ALA accredited programs offer 25 additional degrees

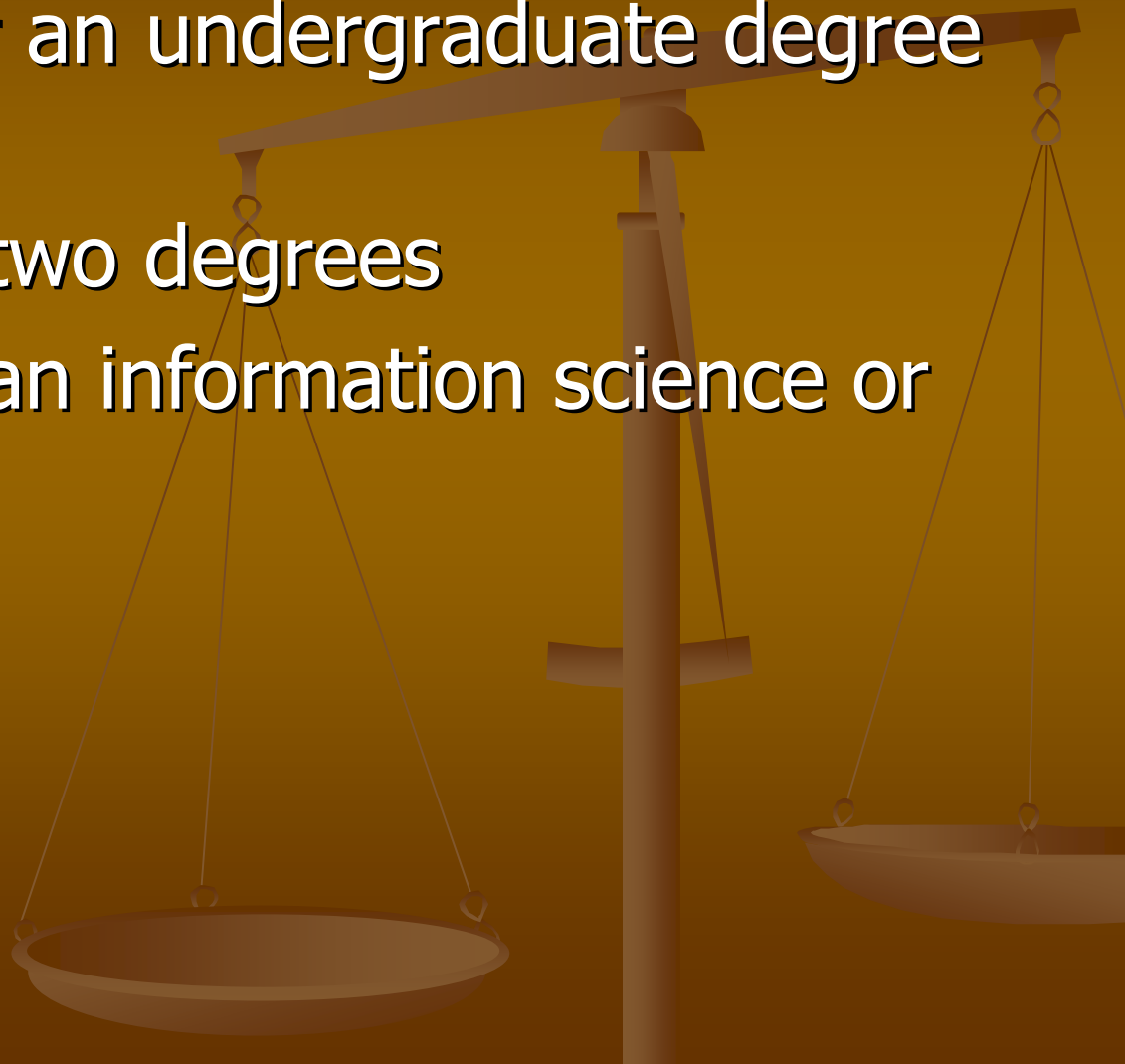
Masters

- Computer science (1)
- Information systems (3)
- Information science (7)
- Information management (3)
- Knowledge management (3)
- Software Engineering (1)
- Competitive Intelligence (1)
- Instructional Technology
- Telecommunications (2)
- Book Arts (1)
- Informatics (1)
- Archival Studies (1)
- Educational Technology (1)



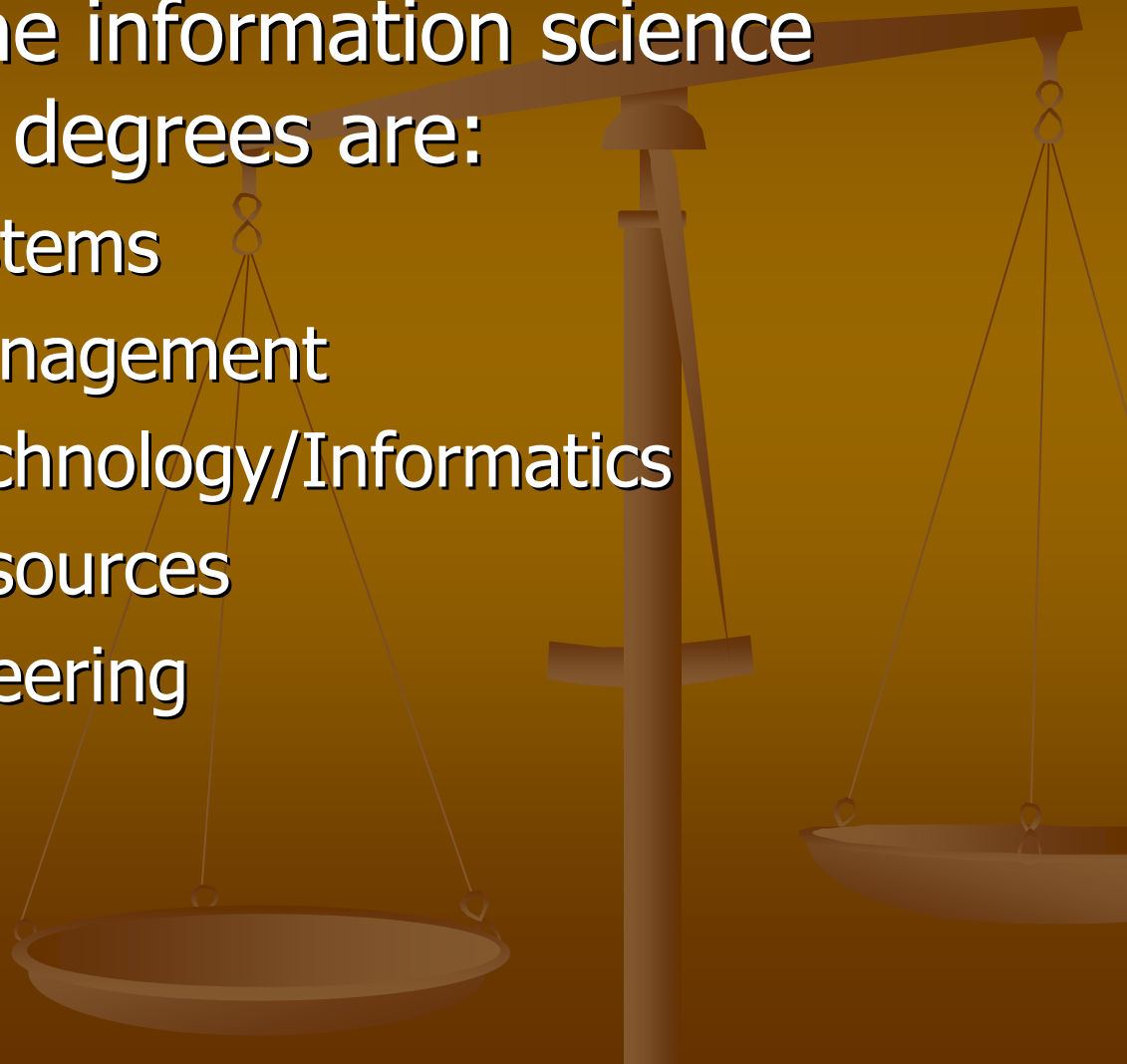
Undergraduate

- 14 schools offer an undergraduate degree of some kind
- 3 schools offer two degrees
- 7 schools offer an information science or variant degree



Degrees

- In addition to the information science variants, others degrees are:
  - Information systems
  - Information management
  - Information Technology/Informatics
  - Information Resources
  - Software Engineering



20 College/School/Department names

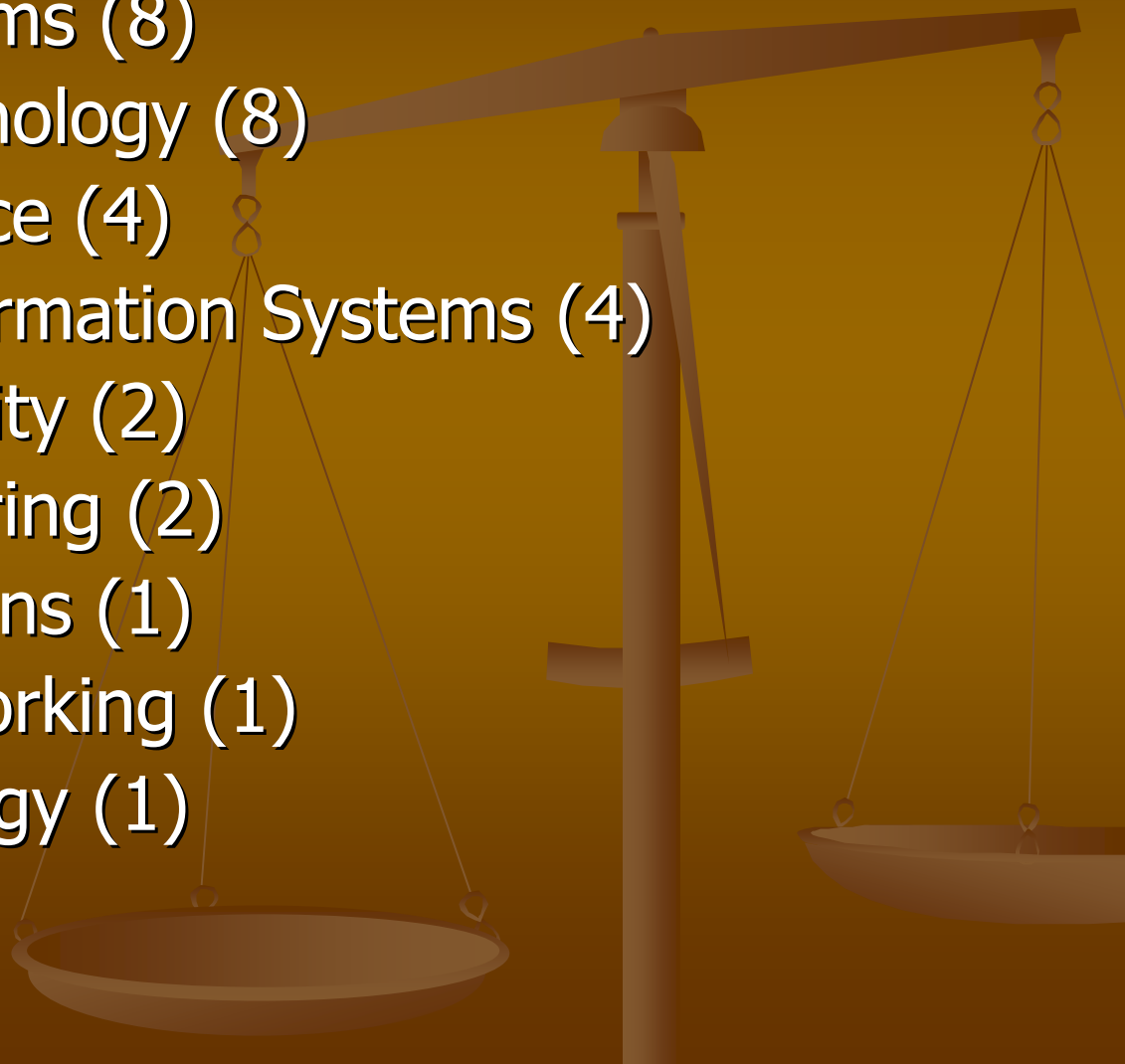
- Library and Information Science
- Library Science
- Library and Information Studies
- Information Science & Technology
- Library & Information Management
- Information Studies
- Information & Computer Science
- Information & Library Science
- Library & Information Studies
- Communication, Information, & Library Studies
- Information
- Information Science & Policy
- Informatics
- Information Resources and Library Science
- Library, Archival, & Information Studies
- Education & Information Studies
- Communications & Information Studies
- Information Science & Learning Technologies
- Information Sciences
- Information School

Computing Research Association—IT Deans

Graduate degrees in addition to Computer Science and excluding the ALA accredited schools and their degree variants

Degrees

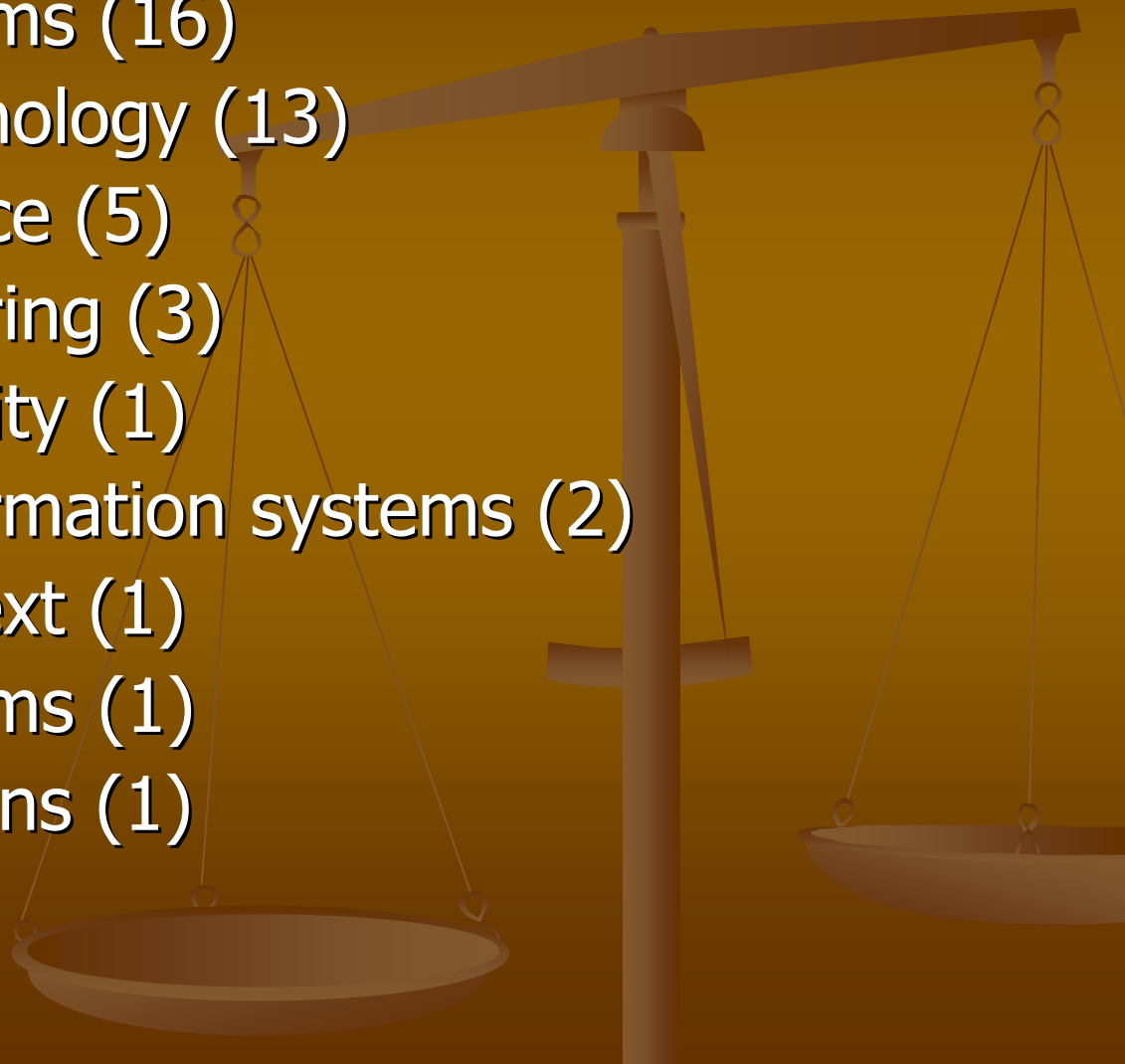
- Information systems (8)
- Information Technology (8)
- Information science (4)
- Management Information Systems (4)
- Information security (2)
- Software engineering (2)
- Telecommunications (1)
- Information networking (1)
- Internet Technology (1)



Bachelor degrees in addition to Computer Science and excluding the ALA accredited schools and their degree variants

Degrees

- Information systems (16)
- Information Technology (13)
- Information science (5)
- Software engineering (3)
- Information security (1)
- Management information systems (2)
- Information Context (1)
- Technology Systems (1)
- Telecommunications (1)



College/School/Department names

- Business School
- Engineering and Technology
- Physical & Mathematical Sciences
- Computing
- Computer Science
- Public Policy & Management
- Engineering
- Computing & Information Science
- Computer Science, Telecommunications, and Information Systems
- Science and Technology
- Information Technology
- Science and Technology
- Computing Sciences
- Computer and Information Science
- Applied Science and Technology
- Computer Science and Information Systems
- Information Sciences and Technology
- Science
- Computing and Software Engineering
- Information Science and Systems Engineering
- Information Management and Systems
- Information and Computer Science
- Engineering and Computer Science
- Business Administration
- Engineering and Applied Science
- Computer and Information Sciences

Conclusions

- A naming convention does not appear to be a strong characteristic of any of these fields and may reflect changes and diversification.
- Aside from Library Science or Computer Science as the name of graduate degree programs, there is nearly complete duplication between the ALA and the non-ALA groups, albeit different traditions.
- The study of information can occur in more than 5 basic types of colleges in a university.

What Issues are on Drexel's Agenda

COLLEGE OF
Information Science
& Technology

Empowering People and Organizations Through Their Use of Information

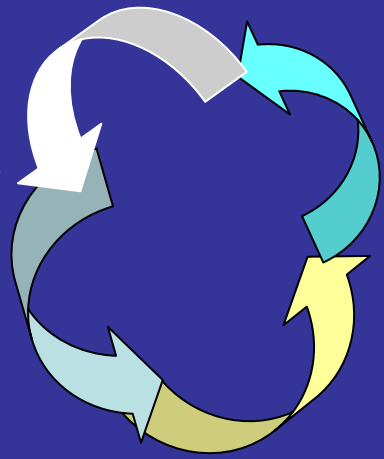
IST Research - Exploring, Transforming and Envisioning the World

IST Mission

The College of Information Science and Technology's educational and research programs integrate

Information Content

Information technology



Human Factors

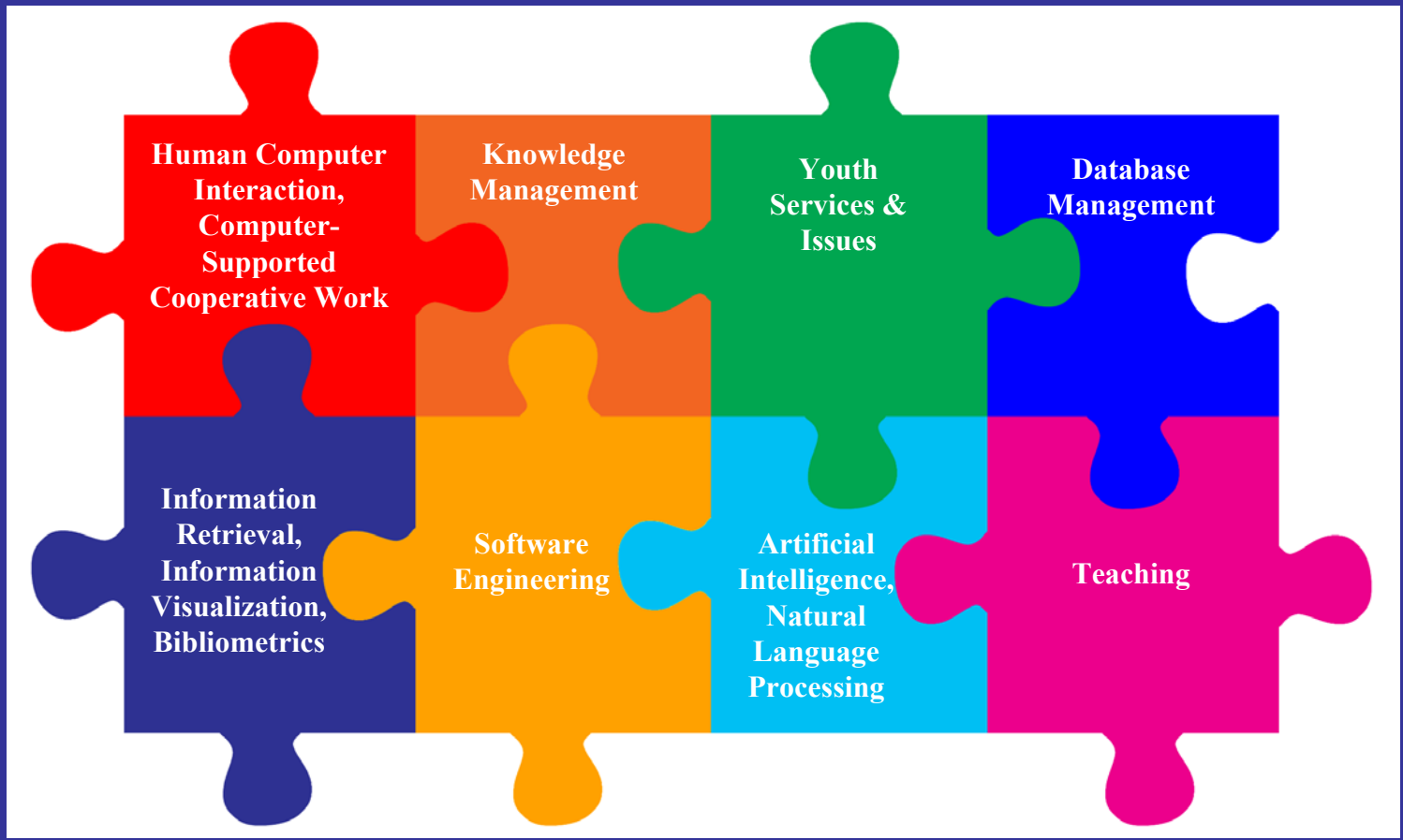
Organizational forces

Business Strategy

to advance 21st Century enterprises of all kinds.

Research Clusters

IST consists of 8 research clusters, which focus on different disciplines of information science and technology.



Human Computer Interaction, Computer-Supported Cooperative Learning

Research topics covered by the HCI Cluster include:

- Cultural effects on collaboration technologies
- Electronic communities and electronic governments
- Psychology of programming
- Group memory
- Digital libraries

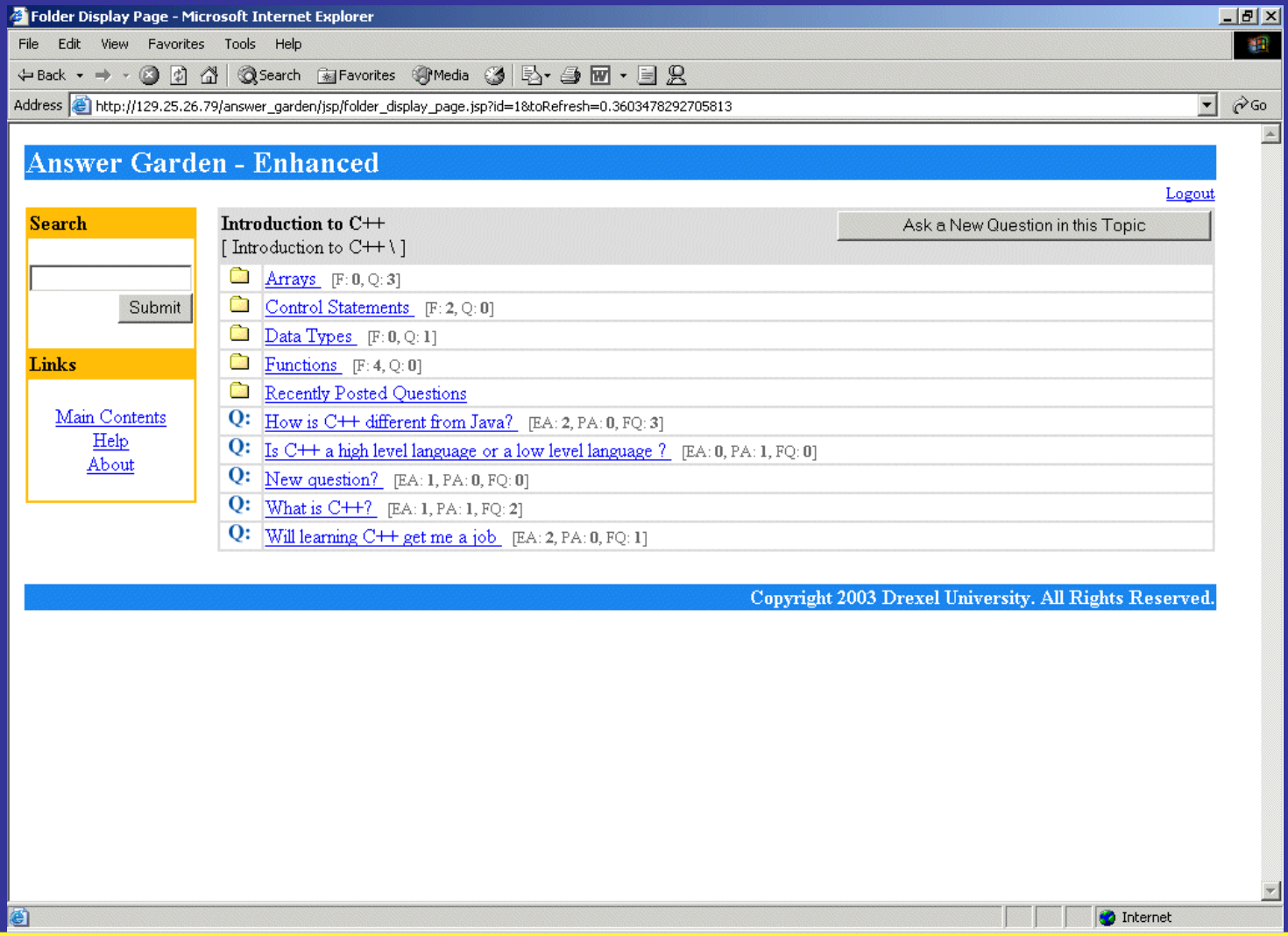
Answer Garden

The Answer garden system is a web-based prototype for providing help to students learning introductory C++ programming. The Answer Garden consists of a set of questions which are posted by students.

These questions can be seen by any student and can be answered by both faculty and other students. Answers are initially divided into “Peer Answers” and “Expert Answers.” However, if a student provides an answer deemed definitive by a faculty member, it can then be promoted to the “Expert Answers” category.

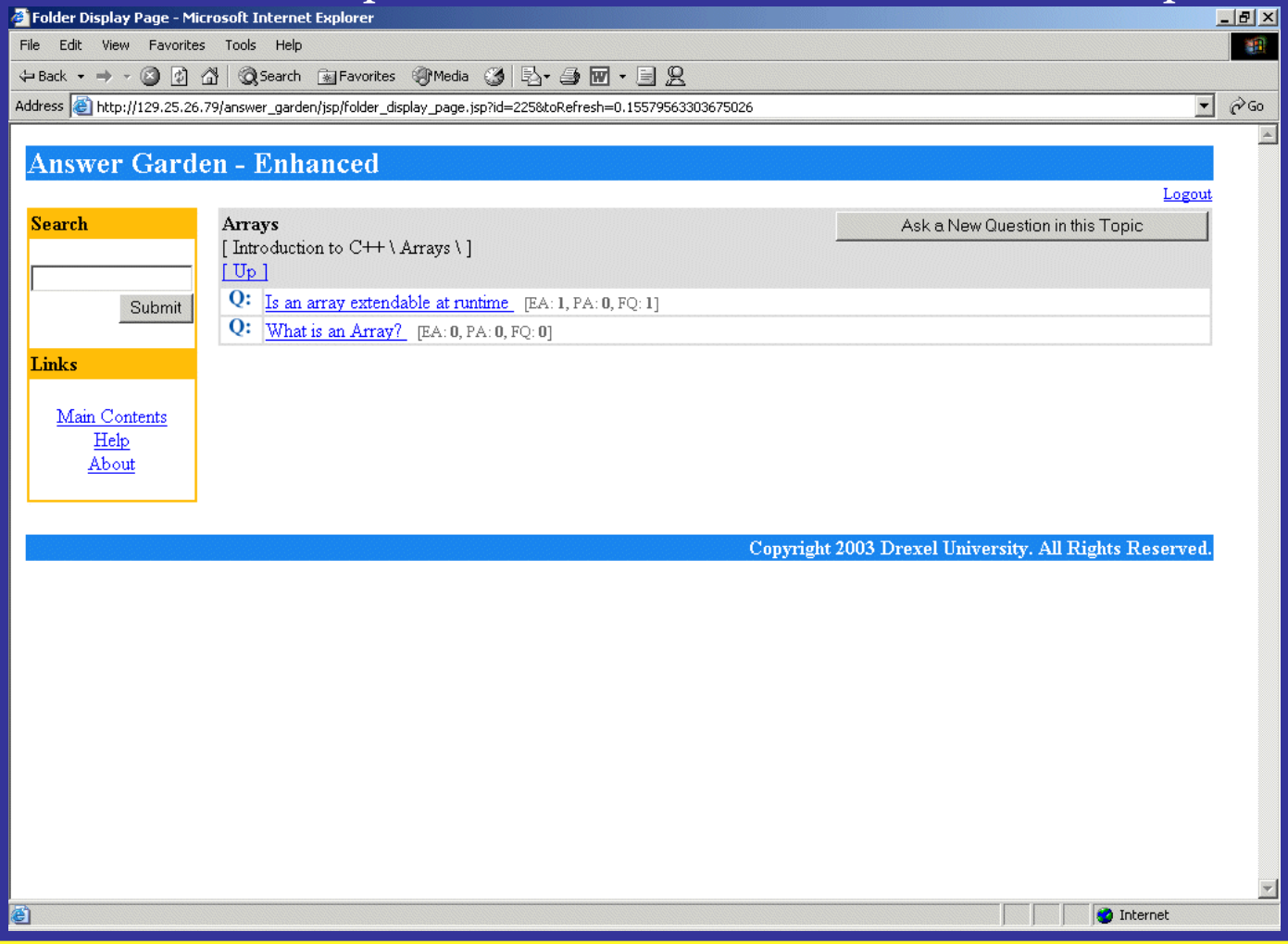
Answer Garden (cont'd)

On a successful login, a student can see the main system contents page. This shows the main topic (Intro to C++) sub topics such as "Arrays", a folder with any recently posted questions or questions posted directly into the main topic.



Answer Garden (cont'd)

By clicking on a topic area such as "Arrays," a student can see a short description of all questions asked in that topic. For each question, they can view any answers by students or faculty members, as well as follow-up questions. A student can examine a question in more detail or can ask a new question.

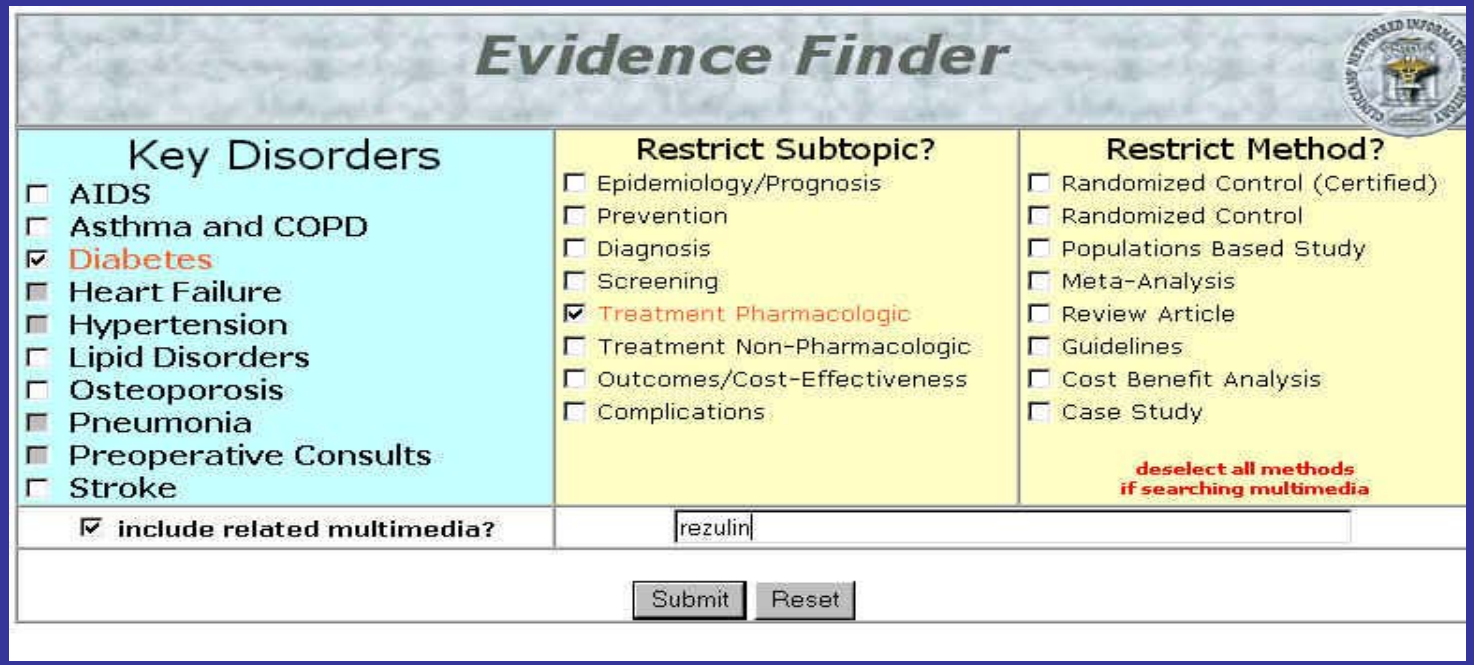


Knowledge Management

The KM cluster focuses on research topics encompassing the various aspects of knowledge management including the capture, understanding, evaluation, organization and deployment of knowledge using traditional, advanced, and intelligent information processing methodologies.

Evidence Finder

Four researchers working jointly between the College of IST, Drexel University and the School of Medicine at MCP Hahnemann University developed a digital information resource to support primary care physicians.



*Funded by National Institute of Standards & Technology

Evidence Finder (Cont'd)

- Evidence finder combined access to succinct clinically relevant information from the published literature, and access to relevant segments retrieved from video of primary grand rounds.

- Research included building physician-language-based query expansion ontologies to enhance retrieval of key clinical information from the database.

Your query **<thesaurus>rezulin AND (subtopic<MATCHES>Treatment Pharmacologic)** matched **4** out of **142** documents, shown below.

Find Again

Rank	Score	Title
1	1.00	Effect of troglitazone in insulin-treated patients with type II``diabetes mellitus.

Method: Randomized Control-Certified

Collection Searched: "Diabetes" Collection

Pearl *In patients with type 2 diabetes poorly controlled on insulin, the addition of troglitazone to insulin resulted in improved average glycemic control and a decrease in insulin requirements in a dose-related fashion, compared to no change in patients taking placebo with insulin. One patient (out of 116) in the troglitazone group taking 600 mg a day discontinued the drug because of clinical liver dysfunction, and several others on troglitazone developed elevations in transaminases.*

Database Management

Research topics covered by the Database Management cluster include:

- Data warehouse design and performance optimization
- Object-oriented approach to data warehousing
- Business intelligence and CRM
- Object-oriented analysis and design with UML
- Intrusion detection systems
- Data mining applications to bio-informatics
- Data mining to healthcare informatics
- Relational data mining
- Web data extraction
- XML Applications

Data Warehousing and Data Mining for Cybersecurity

Cybercrime

- Intrusion, damage or destruction by non-physical objects
- Includes:

  Financial fraud
  Sabotage of data/networks
  Theft of proprietary information
  Unauthorized system accesses
  Denial of service attacks
  Cyber stalking
  Identity theft
  Virus attacks
  Industrial espionage
  Interruption of International commerce or national security

Data Warehousing and Data Mining for Cybersecurity (cont'd)

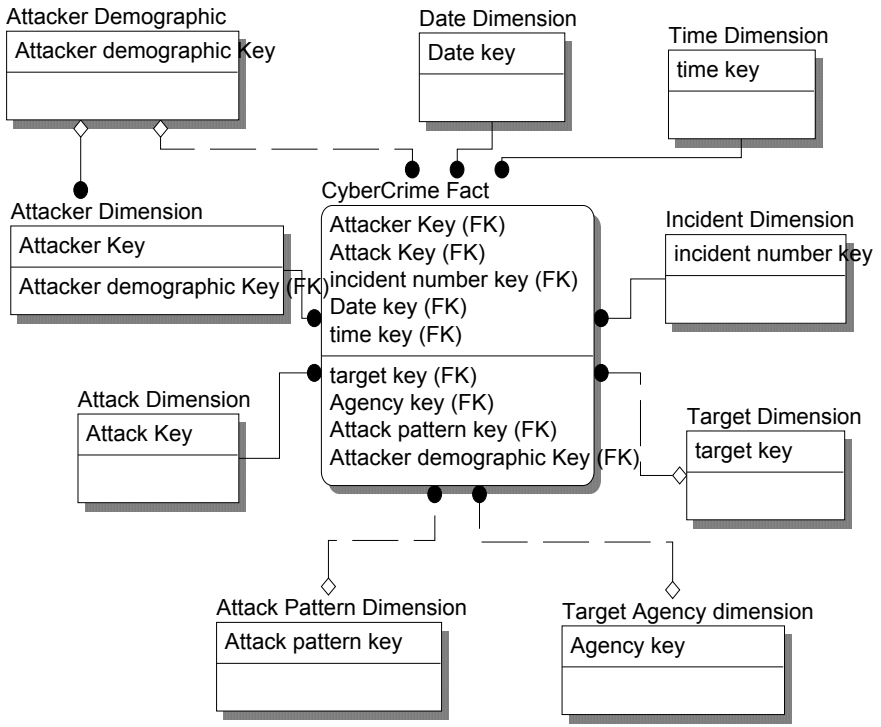
Data Warehouse Schema for Cybercrimes

Four Steps:

1. Select the BP
   - Investigation of Cybercrimes
2. Declare the Grain
   - An incident
3. Select the Dimensions
   - Attack
   - Attack Pattern
   - Attacker
   - Attacker Demographics
   - Incident
   - Date
   - Time
   - Target
   - Target Agency
4. Select Fact Table
   - Cybercrimefact

Data Warehousing and Data Mining for Cybersecurity (cont'd)

A Data Warehouse Schema for Cyber Security



Information Visualization, Information Retrieval, Bibliometrics

Research areas covered include:

Knowledge Domain Visualization

- -Mapping Scientific Frontiers
- -Tracing Scientific Revolutions and the Growth of Knowledge
- -Visualizing Knowledge Diffusion and Technology Transfer

Information Retrieval

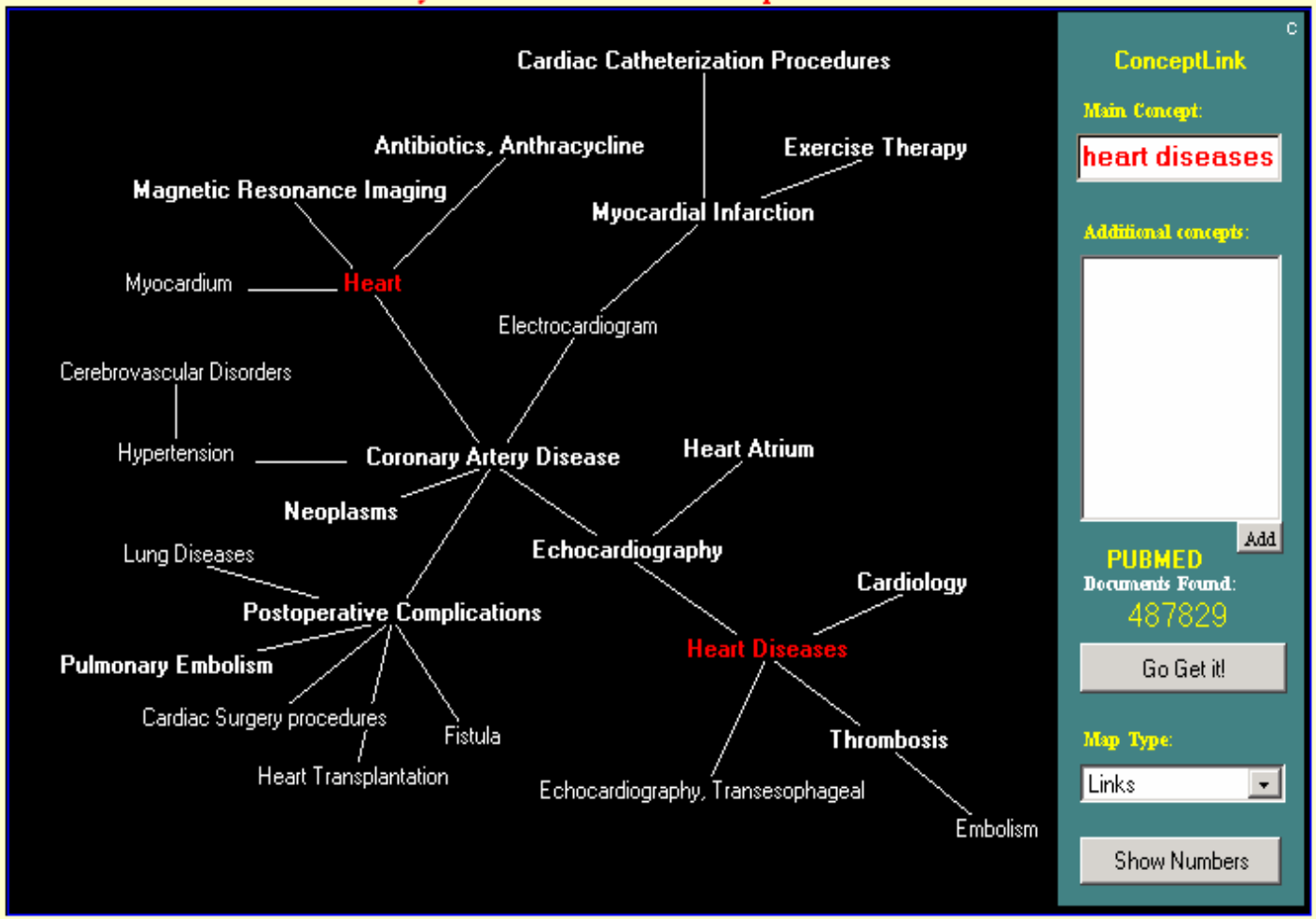
- -Visualizing Concept Structures for Information Access
- -Creating Knowledge Maps for Learning and Understanding

Bibliometrics and Scientometrics

- -Exploring Intellectual Structures of Literature through Citation Analysis

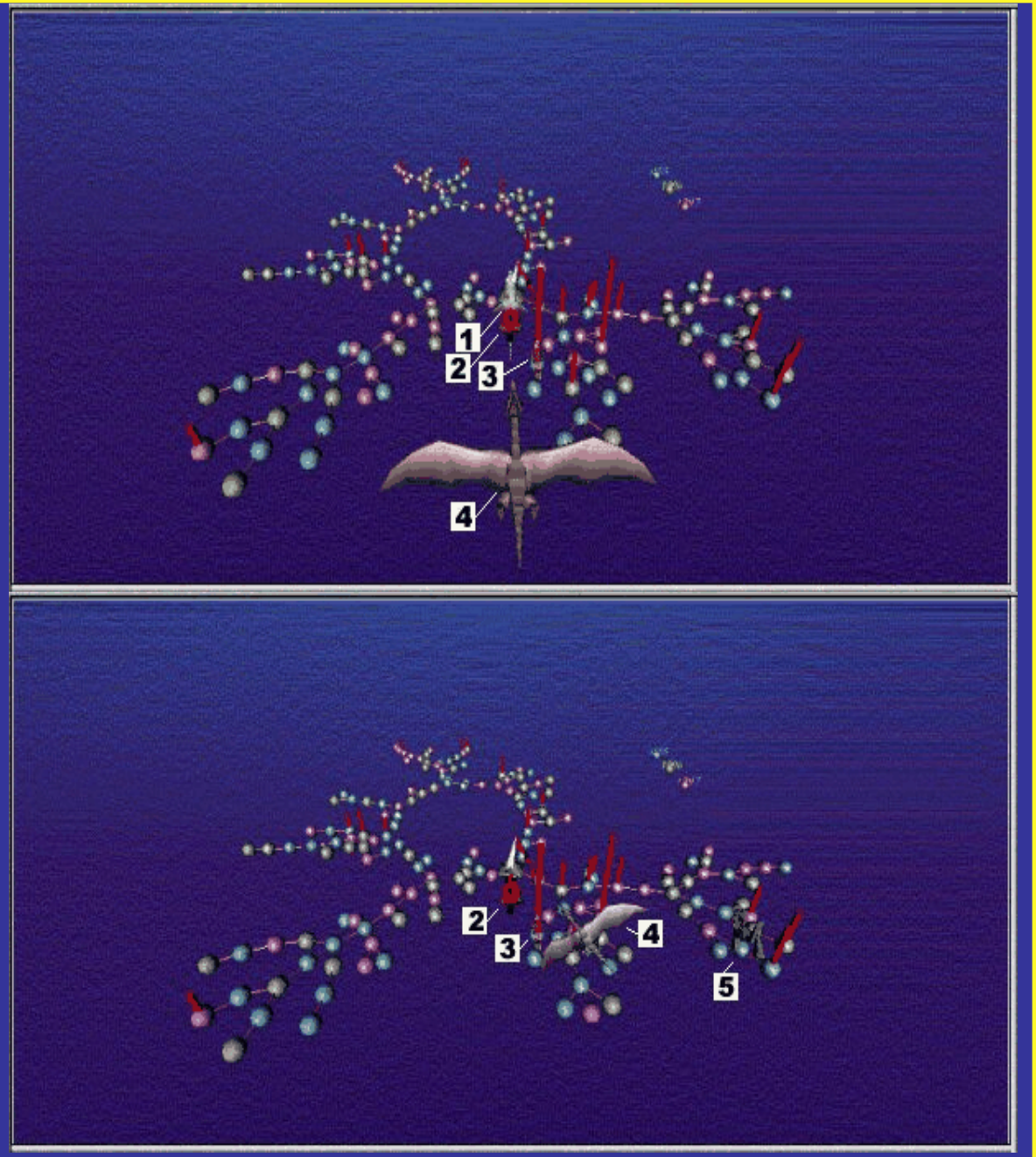
Concept Map

Automatic generation of concept relationships from the literature



StarWalker and Social Navigation

Semantics and Cyber-footprints



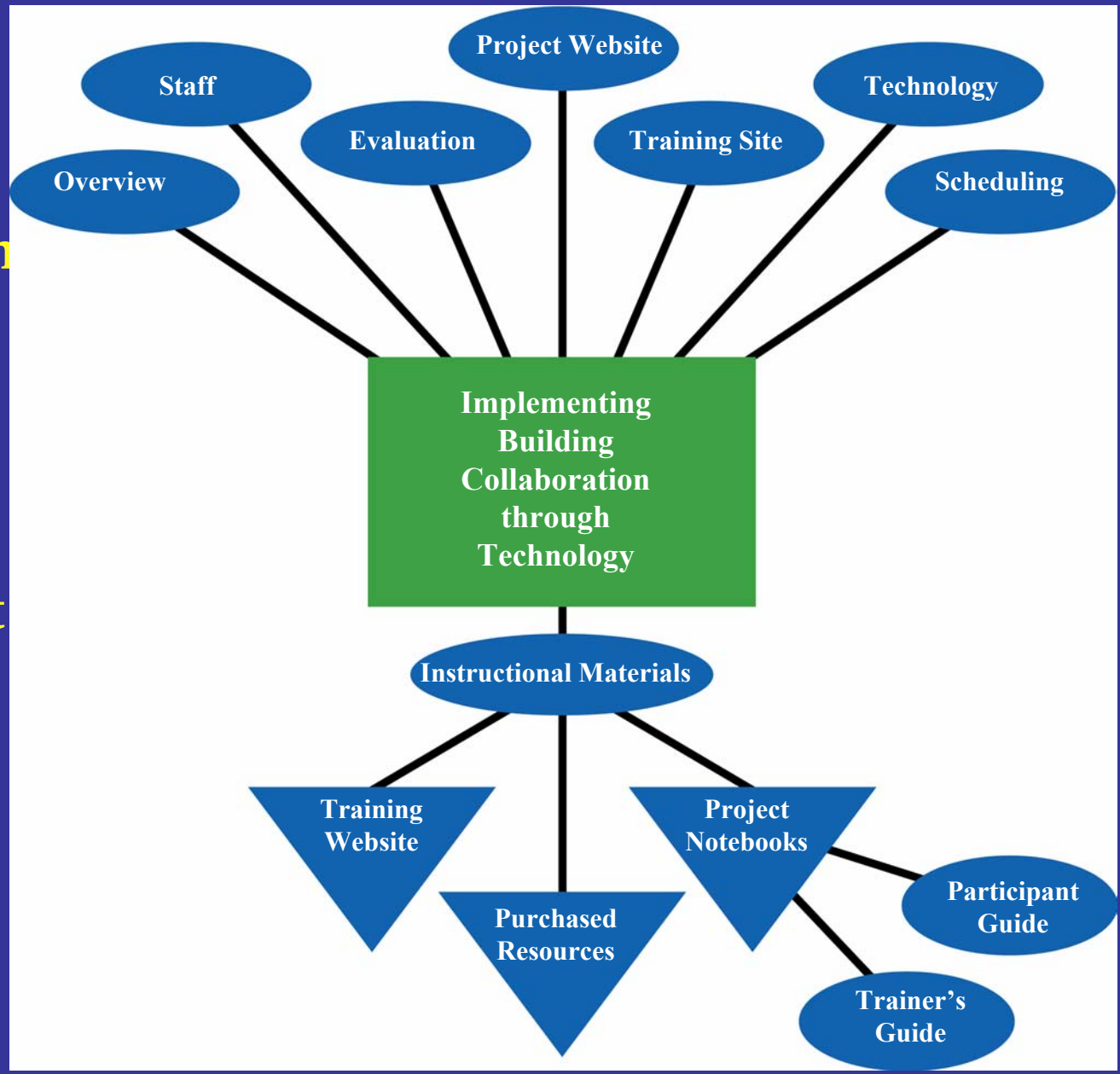
Youth Services & Issues

Research activity in this cluster includes identifying and evaluating the information needs and behaviors of specific communities in order to better serve them via libraries, as well as through technology.

Featured is a project focused on using technological tools to enable schools and librarians to meet community interests through creation of a collaborative web site.

Building Collaboration through Technology:

A Professional Development Model for School and Public Librarians



Building Collaboration through Technology (cont'd)

Project Goals:

- To increase collaboration among school and public librarians serving youth
- To teach school and public librarians new tools, skills and knowledge needed to locate and use electronic databases and internet resources, in particular web development with children, youth and their families.

Target Audiences:

- School and public librarians serving youth
- Public library directors
- School district superintendents
- State library personnel
- Library professional organizations

Artificial Intelligence, Natural Language Processing

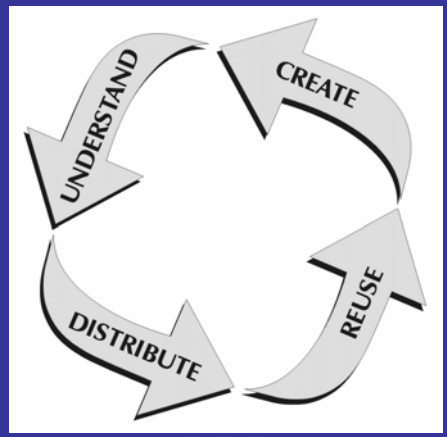
The AI & NLP cluster is comprised of faculty who are actively involved with artificial intelligence and natural language processing research, application and teaching. The cluster focuses on specific methodologies including case-based reasoning, expert systems, data mining and logic-based methods.

Case-based Reasoning and Software Testing

Designing Testing Processes with CBR

- End-user inputs a description of a software program
- System designs a testing strategy
- System should embed and manage experiential knowledge without restrictions
- System should learn

How to Achieve These Goals?



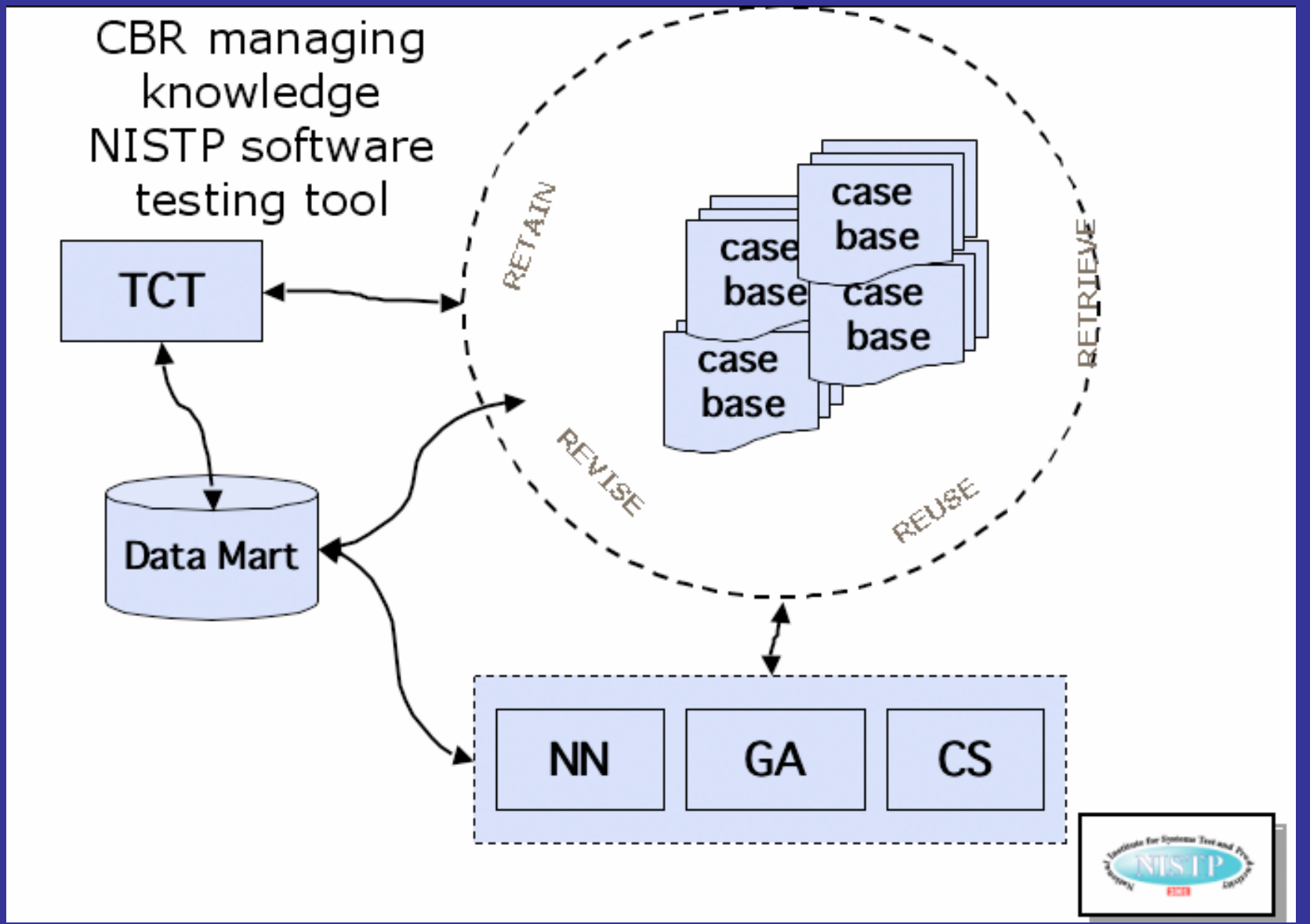
Adopting a Knowledge Management Framework

Case-based Reasoning and Software Testing (cont'd)

Main Steps

- User enters software to be tested
  - First step is to assess the level of testing required (e.g., analysis, design, units, black, white box)
  - CBR retrieves, reuses adequate testing strategy (includes guidelines to generate test cases) and incorporates lessons learned
  - TCT generates test cases (NN, GA, CS)
  - CBR revises the solution (assess quality)
  - Results of each use is learned (e.g., case is retained, adaptation knowledge, feedback from revision, lessons learned are incorporated)

Case-based Reasoning and Software Testing (cont'd)



Curriculum Development

- Increase degree diversity from a shared core curriculum.
- Add (2004) a BS in Information Technology and in Information Science to existing ones in Information Systems and Software Engineering
- Add (2005) an MS in Knowledge Management to existing ones in Library and Information Science, Information Systems and Software Engineering.

Online Degrees

- Master of Science in Information Systems
- MS in Library and Information Science
  - Management of Digital Information Specialization
  - Information/Library Services Specialization (under development

Online Certificates

- Competitive Intelligence
- Database Technology
- Digital Information
- Healthcare Informatics
- Human-Computer Interaction
- Information Retrieval
- Internet Information Systems
- Management of Shared Information
- Software Engineering
- System Analysis and Design

Online LIS programs

- There are 54 ALA-accredited programs in library and information science
- 5 programs have a masters degree entirely online
- 8 more programs have a combination of online and some residency requirement
- 21 programs (including the above) offer some online courses.

What do “I” Schools hope to accomplish

Building "I" Schools

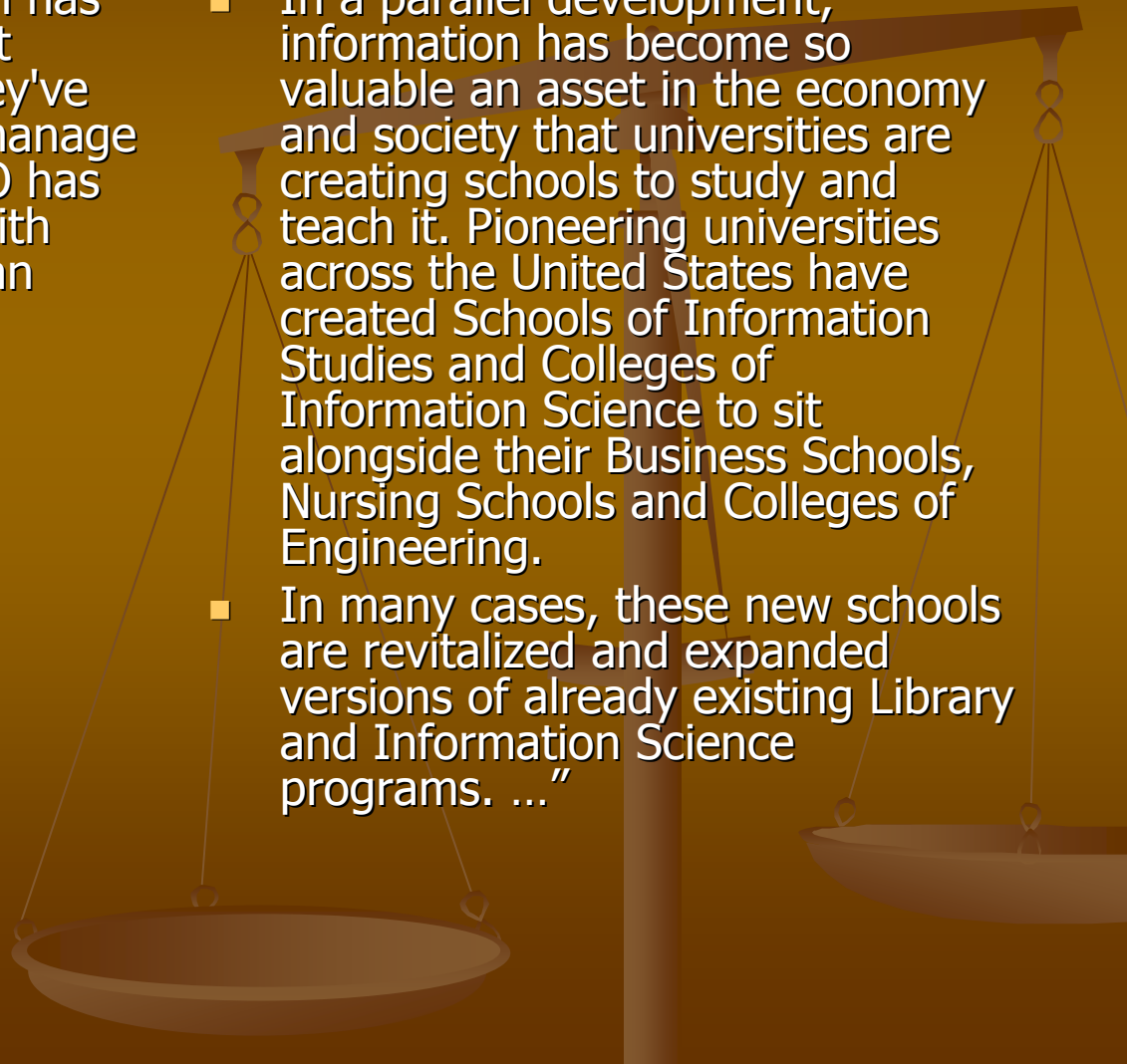
by Bob Boiko and Corinne Kator

Monday, December 02, 2002

Knowledge Management, destinationKM.com

Excerpts

- "In recent years, information has become so valuable an asset within organizations that they've appointed chief officers to manage it. The appointment of a CIO has placed information on par with finances and operations as an integral part of most any organization.
- In a parallel development, information has become so valuable an asset in the economy and society that universities are creating schools to study and teach it. Pioneering universities across the United States have created Schools of Information Studies and Colleges of Information Science to sit alongside their Business Schools, Nursing Schools and Colleges of Engineering.
- In many cases, these new schools are revitalized and expanded versions of already existing Library and Information Science programs. …"



Excerpts Cont'd

- "When they were first introduced, library schools were, in effect, trade schools, with practical skills taught by practicing librarians. As library schools matured, they developed theories and observed best practices, constructing a discipline of librarianship to complement the practice of librarianship. Information schools are beginning the same process for knowledge and information work. University information schools do not wish to simply be IT schools where practitioners train others in a practical skill. These schools are creating a body of knowledge to better inform practice. Researchers at information schools are studying knowledge workers and attempting to identify best practices. They are developing new theories and techniques for organizing and managing information. As researchers collaborate with one another, they are developing a common vocabulary for the field. Many information school professors are experts in business, library science, law, computer science and psychology and are helping to apply contributions from all these disciplines to new information contexts. "

Excerpts Cont'd

- "The curriculum at information schools is a mix of the technical and the social sciences as well as a mixture of theory and practice. Most information schools offer technical courses in network administration and web development alongside courses like Behavior of Information Users that are grounded in the social sciences. A class in interface design melds the technical and the social, teaching the use of design tools as well as psychological principles of human-computer interaction. Likewise, a class in the organization of information melds theory and practice by teaching classification theory and then offering opportunities to apply that theory to real problems."

The End