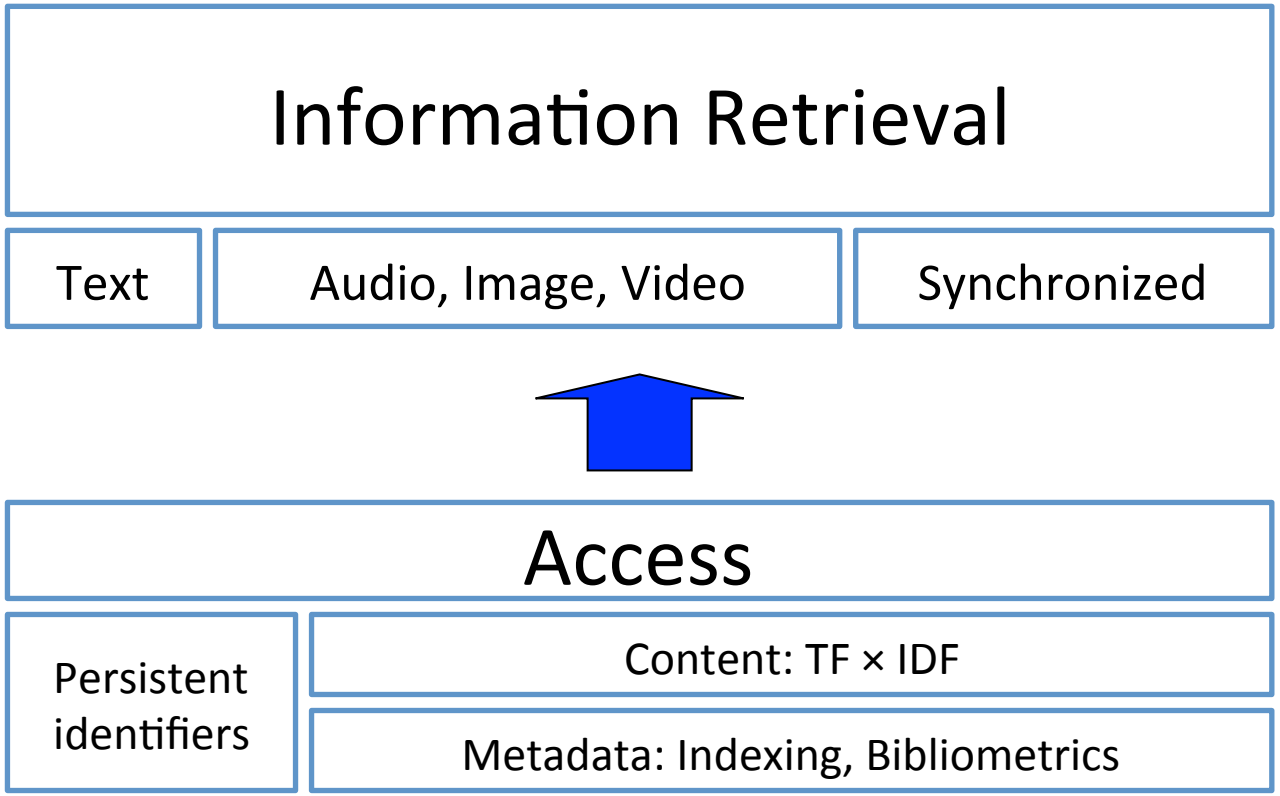
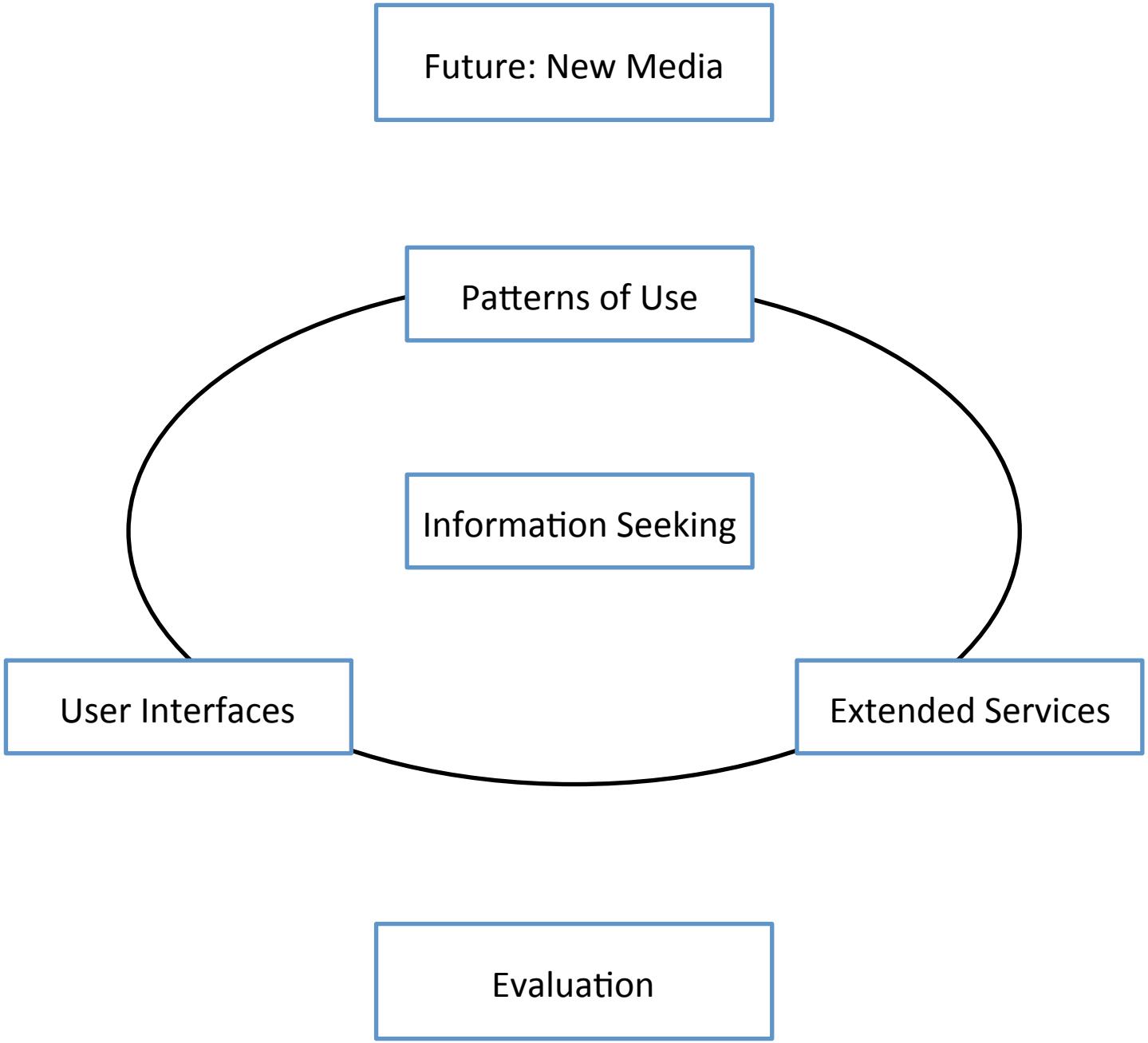
Digital Libraries

Revision

Min-Yen Kan


Information Retrieval
Text
Audio, Image, Video
Synchronized
Access
Persistent identifiers
Content: TF × IDF
Metadata: Indexing, Bibliometrics


Future: New Media
Patterns of Use
Information Seeking
User Interfaces
Extended Services
Evaluation

Information Retrieval and Multimedia

- Traditional Information Retrieval
  - Lexicon and posting file construction and compression
  - Euclidean and cosine similarity

- Multimedia
  - Textual Images: CCITT, OCR sensitivities
  - Image: vector vs. raster graphics
  - Audio: perceptual coding for human limitations

  - Markup Languages
    - SGML to:
    - HTML and XML
    - XML variants: TEI, SMIL, SVG

Indexing and Metadata

- Dublin Core addresses all aspects of metadata
  - Administrative, structural, use, IP and descriptive
- Indexing as one part of descriptive metadata

- Tradeoff in specificity and exhaustiveness in indexing
- Controlled vocabulary
  - Objectives: distinctive terms, help bridge ASK
- Classification
  - Exhaustive, 1 to 1 mapping of possible subjects
  - Faceted indexing for faceted metadata

Identifiers

- Identifiers
  - Properties: persistent, unique, fast resolution, decentralized
  - Two systems: PURL, DOI
- OpenURL – solve appropriate copy problem

Bibliometrics

- Originated in social networks
  - Find power laws exponential distributions
  - Decay in citation rates, impact of time
  - Co-citation and bibliographic coupling
  - Centrality (undirected) and prestige (directed)
- Applying it to the web:
  - Pagerank: iterative prestige, rank only
  - HITS: hubs and authorities on a expanded base set

DL Policy

- Economics of the DL
  - Volume of knowledge vs. publishers' cost
  - Search engines acting as marketing;
    Websites act as publishing house
- Social Aspects
  - Self-archiving
  - Preservation: Digital Deposit, Internet Archives
- Digital Divide
  - Rich have access, get richer … poor get poorer
  - Bridge divide through access to resources and education

Information Seeking

- Types of Questions in RI
  - In contrast to the DL and Web
- Seeking as berry-picking
  - Finding and evaluating sources
  - Using others: collaborative filtering
    - Ask-A services and user-user recommender systems
- Aspects of seeking
  - Affective, accessibility and quality factors
- Information Chain
  - And its relationship to citations
  - Evaluating sources

User Interfaces

- HCI goals
  - Feedback, reduce memory load, scaffolding
- Different interfaces for different parts of the seeking process
  - Query specification, Results display, Relevance feedback
- Systems and their properties
  - VQuery, Filter/Flow, QBIC, Flamenco, Tilebars, Infocrystal, Superbook, Tablelens, Startree, Magic Lens

Patterns of Use

- DL, articles have distinct uses
  - Browsing, searching modes
  - Particular to user's role
- Web users have limited actions, too
  - Case study: the "back" button

In both cases, optimize UI to account for these specifics

Applications

Both applications can be structured as a machine learning problem

- Recommender Systems
  - Memory vs. Model
  - Shilling
- Authorship attribution
  - Non-content word patterns

- Duplicate detection
  - R-measure

Evaluation

- IR based metrics
  - P / R / Sn / Sp and compound metrics
- Library metrics
  - Use centered vs. materials centered
  - Micro vs. macro evaluation

Cyberinfrastructure

- Jim Gray's 4th paradigm
- How scholarship is changing
  - Elsevier's applications of linking data
  - Information Velocity
  - What's the endpoint look like? To you? To others?

Final Exam

- 1 ½ hours, 20% of final grade
  - Definitions
  - Calculation
  - **Critical essays**

Digital Libraries

Presentation Guidelines

Min-Yen Kan

Presentation format & timing

- 10 minutes of presentation (max 10 slides)
  - 2 minutes (1 slide) to introduce the problem
  - 2 minutes to define the problem
  - 2 minutes evaluation
  - 2 minutes conclusions
  - The rest is up to you.

- 5 minutes for questions
- Only one group member has to be present
- You should be prepared to ask questions of other projects
  - Not graded, but encouraged

Other details

- Will be the same grade for all students unless your team tells me otherwise
- Practice at least once
  - Otherwise, you'll probably run over time
  - Anticipate questions
- Send me your slides (.PDF or .PPT) to post to IVLE after your presentation
  - Think about publishing your slides, survey paper on the web to help others

Some presentation guidelines

- **Introduction:**
  - Involve your audience immediately and throughout the presentation
  - (1) Tell them what you're going to say, (2) say it, & (3) tell them what you said
- **Questions:**
  - Carefully listen to questions before answering
  - Acknowledge the validity of an appropriate question
  - Don't answer a question that you don't know
- **Visual aids:**
  - Use 1 figure per minute at most, & 1 figure per 2 minutes at best
  - Make every figure interesting
  - Simplify your figures, and then make them simpler.
  - Explain your figures in detail (including defining axes)
  - Use figures as a memory (numbers & words) crutch
  - Don't read from text figures (face audience & paraphrase).
  - Use a CONCLUSION or SUMMARY figure to show you're done

- From Russ Flegal's class notes

Overall grading metrics

- **Oral Presentation Skills**:
  - Correct use of English.
  - Logical presentation.
  - Conclusions demonstrate critical thinking.
  - Emphasize important points.
  - Good eye contact, do not read presentation.
  - Appropriate non-verbal communication

- **Slides:**
  - Make sure your slides are readable.
  - Use short phrases on slides, say full sentences.
  - Chose a high contrast color scheme and font (generally sans-serif).
  - Don't put too much text on a slide.
  - Make use of graphics but make sure the graphics do not distract.

Grading metrics

- **Organization**
  - State what his topic is?
  - Main point presented clearly?
  - Speech clearly organized into a few sections?
- **Scientific Presentation**
  - Cite scientific facts, statistics, statements from authorities?
  - Use scientific terms and define these terms for the class?
- **Analysis and Synthesis**
  - Synthesize and compare different articles?
- **Use of Visual Aids**
  - Visual aids add quality to the presentation?
- **Sources**
  - Give proper credit to people whose ideas he borrowed?
  - Figures properly attributed?
- **Questions**
  - Show respect for those who asked questions?
  - Understood question?
  - Answered question well?
- **Overall Quality**
  - Speaker prepared?
  - Present adequate information?
  - Interesting?
  - Understand the material?

That's all folks!

- Thanks very much!
- Hope it has been a fun and worthwhile course for you…