

One session in a science library: the need for conceptual schemes and scientific habits of a mind

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The thesis

- “The only justification for our concepts is that they serve to represent the complex of our experiences”
Einstein A. 1879-1955
- “The purpose of models is not to fit the data but to sharpen the questions”
Karlin S. 1923-

Thoughts of support

- “On the flag of contemporary science there should be written in capital letters the word – ORGANIZATON” Kapitsa P.L. 1894-1984
- “ It’s only when life appears that you begin to get organization on a larger scale” Huxley A. 1894-1963
- “They may say what they like; everything is organized matter” Napoleon 1. 1769-1821

Education in Science

- “ Science is the reduction of the bewildering diversity of unique events to manageable uniformity within one of a number of symbol systems. Scientific observation is always a viewing of things through the refracting medium of a symbol system. Education in science is essentially on the symbol level”

Huxley A. 1894-1963

Education of a scientific generalist

- Recapture the universalist spirit of the early natural philosophers
- Learn science not sciences
- Know in capsule form the dozen central concepts of each of the major sciences
- Learn the habits of mind of the chemist, psychologist and geologist
- Be exceptional in breadth of appreciation
- Be able in biological and medical science to suggest physical explanations or mathematical models for known or conjectured facts

Bode H.W. &.. (1949). Science,109, 553-8

Motivations

Chemistry + Information + Learning
as an international student -

curriculum, library

as a recent LIS graduate -

teaching, outreaching

as a new science librarian -

professional value

Scientific Method approach

Identification of a problem

Review of existing knowledge

Formulation of hypotheses how to solve

Manipulation of the independent variables

Collection and analysis of data

Conclusions about the validity

Criteria for implementation

Availability of:

- Core resources
- Faculty support
- Professionally trained instructors
- Instructional materials

Faculty support & librarian's credibility

Meeting -- leave the library walls:

liaisons, curriculum coordinator, faculty, frontiers

Outreaching – show interest in research:

library Newsletter, displays, grants

Learning -- gain knowledge constantly:

books, journals, web sites, listservs, workshops

Publishing, Presenting

Professionally trained Instructors

ARL's survey MS librarians in:

- Sciences 7%
- Social Sciences 43%
- Humanities 50%

In chemistry librarianship (Hooper-Lane, 1999):

43% had background in chemistry

23% BS

11% MS

9% Ph.D.

Library schools – ??

Sources of assistance

- **ACS/SLA Clearinghouse for Chemical Information Instructional Materials (200)**
 - www.indiana.edu/~cheminfo/ccimnro.html
- **ACS, CINF Educational committee – modules**
 - www-sul.stanford.edu/depts/swain/workshop
- **Biennial Conference on Chemical Education**
- **SLA, CE CHEM for non - chemistry librarians**
- **Journal of Chemical Education, Instructor column**
- **Training from vendors**

Learning is a cumulative process: librarian's approach

- Relate to the subject of a course
- State clear objectives
- Highlight principled grounds, conceptual schemes
- Involve in hands-on practice
- Create handouts
- Provide meaningful **ASSIGNMENTS**

Concepts: discipline

an individual is responsible for learning
search for information - lifetime activity

Scientific Information Flow

Research & Development

Notebooks

Nonformal & Preliminary communications

Correspondence, Letters to Editor, Letters Journal

**Invention
protection**

Patents

Conference

Preprints

Proceedings

Reprints

Journal article

Communications

Notes, Full papers

Reviews

Research report

Technical reports

Dissertations

Thesis

Indexes, Abstracts

Dictionaries, Encyclopedias

Handbooks, Tables

Monographs

Textbooks, Treatises

Bibliographies

Guides to the literature



Have a plan: know requirements, move from general to specific

- State your topic as a statement or question
- Identify the main concepts
 - Generate a list of synonyms for each concept
- Know the requirements of the assignment
 - types of resources specified
 - the approximate number of resources required
 - how much time do you have to complete the research
- Be familiar with a catalog, services and resources (print, online) available in the library
- Know techniques in online searching
 - Boolean search logic, relevancy terms, abbreviations



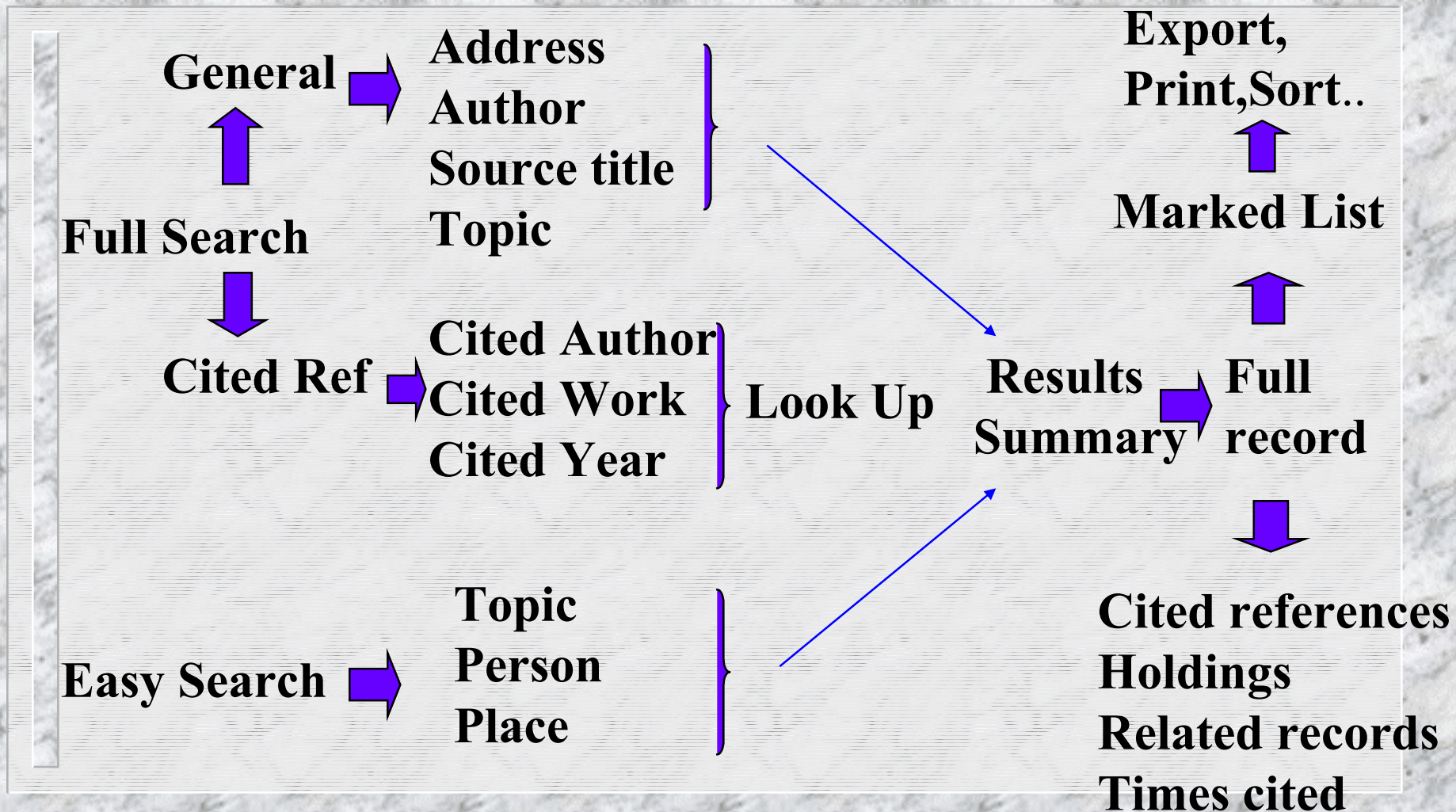
Information gathering: strategies

- Locate background information (reviews)
- Identify key researchers
- Complete a list of publications by an author
- Search how past research has been updated (citations)
- Be updated constantly
 - new books display, current periodicals, Alert services

Reference Sources: evaluation

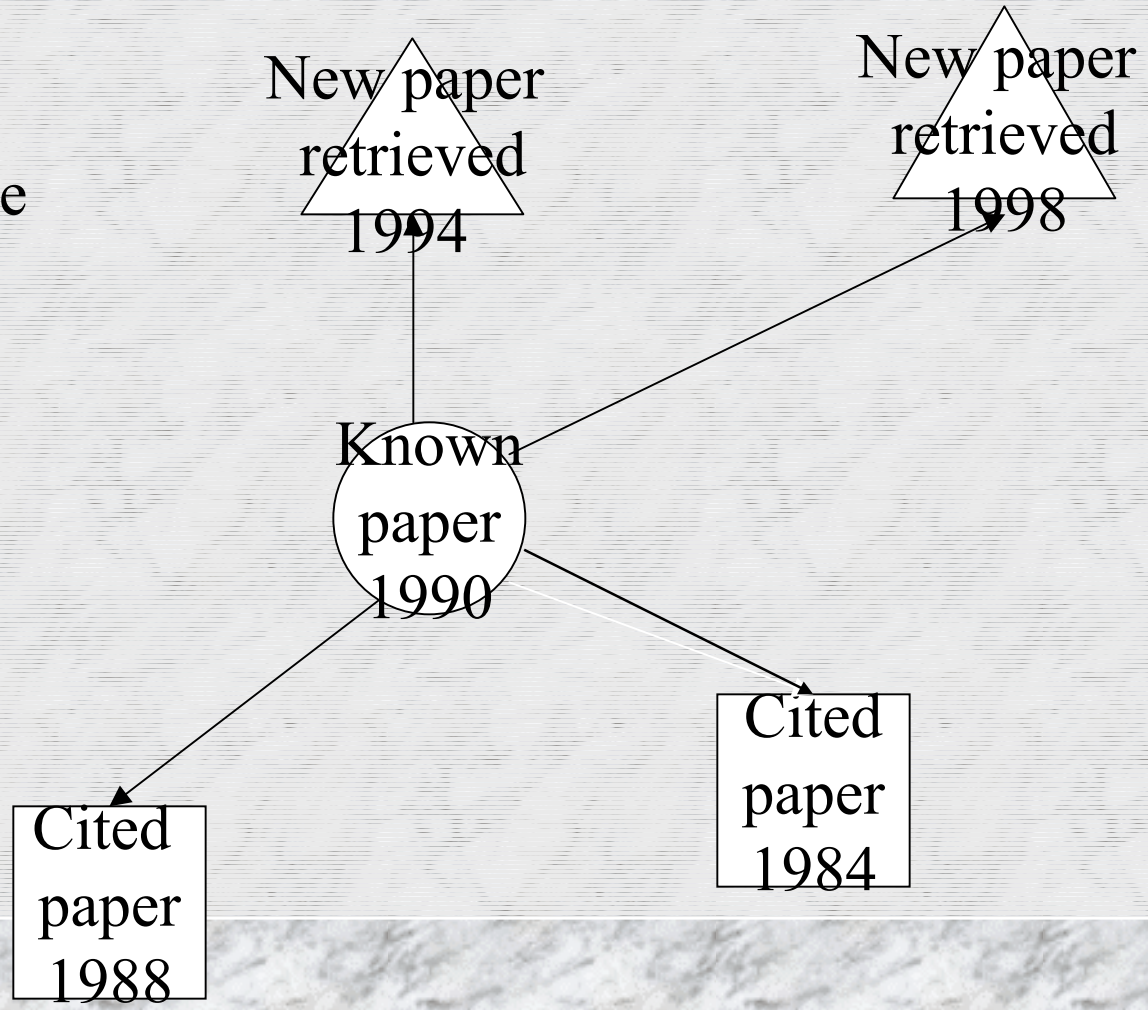
- Scope (interdisciplinary, specialized)
- Subject coverage
- Comprehensiveness (type and how many sources)
- Chronological coverage (time period)
- Updates (how frequently)
- Features for a search, links to other resources
- Indexing policies (style, abbreviations)
- Quality (authoritativeness)
- Availability (location, simultaneous usage)

Web of Science Functionality

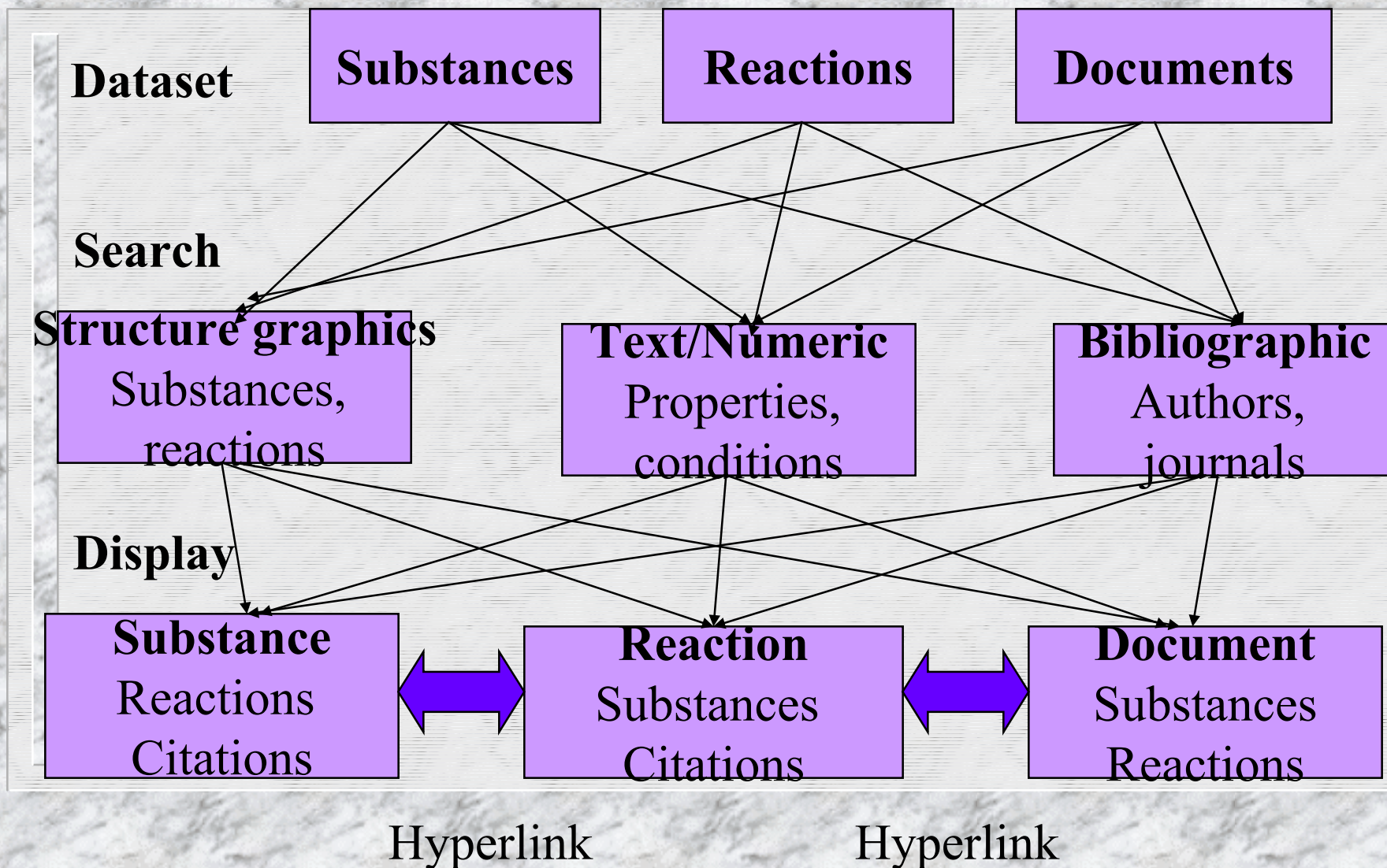


Web of Science

Cited Reference
Searching:



CrossFire: relationship



The Current Awareness



Specialized:

Alert services,
Letters journals

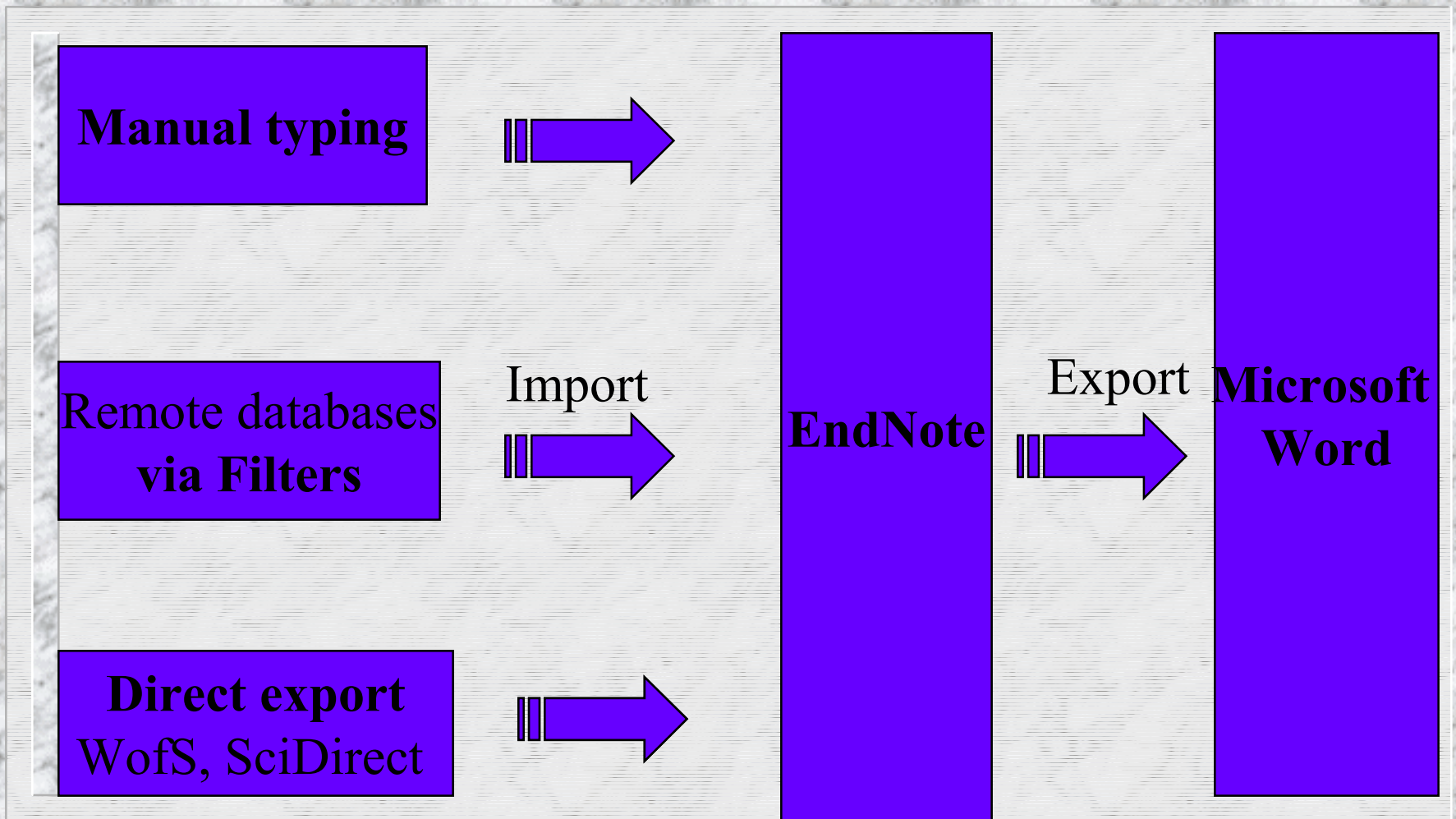
General research:

Angewandte Chemie Int.Ed.,
Science, ACS journals, AIChE

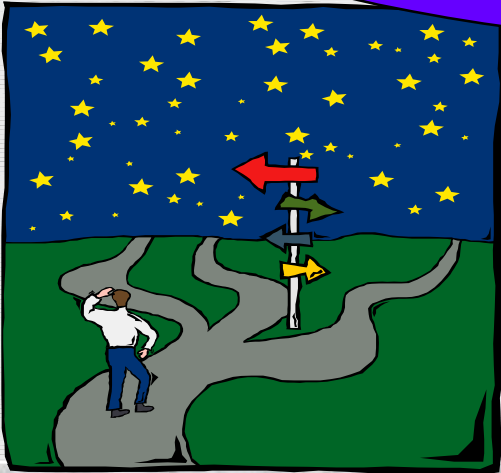
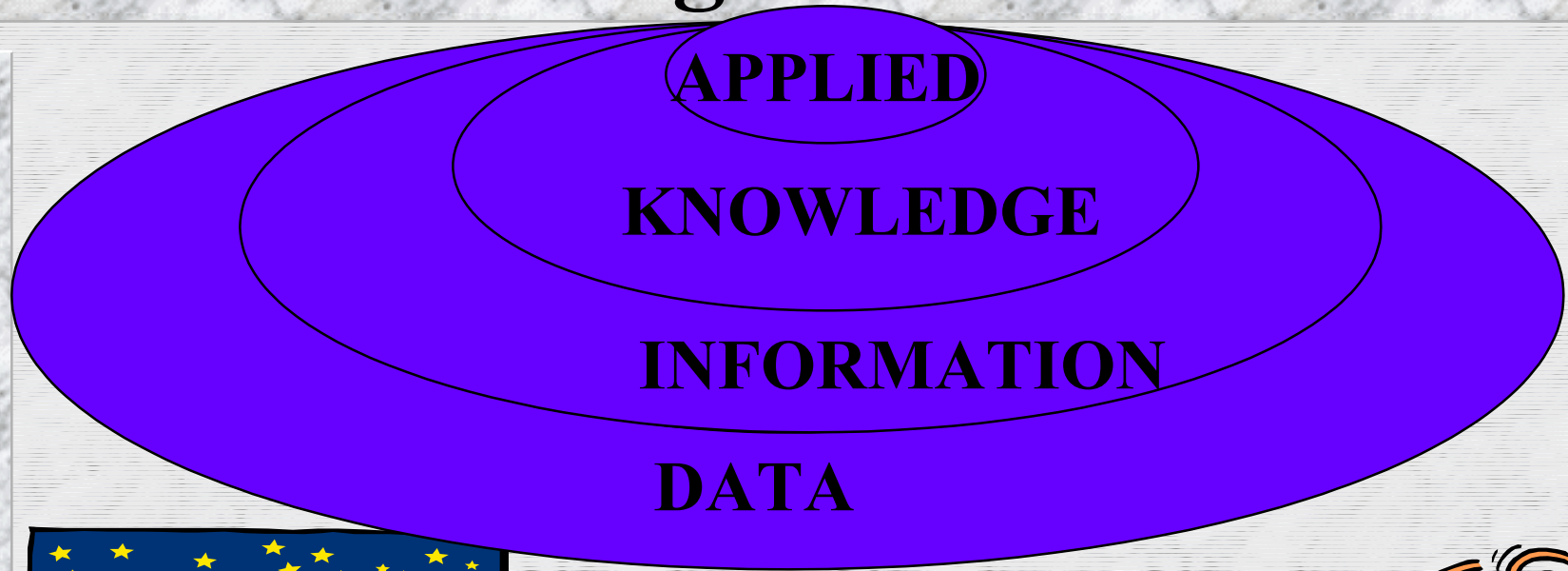
News Magazines:

Chemical & Engineering News, Chemical Week,
Chemistry and Industry, Chemical Engineering

Reference manager



Query+Information = Knowledge extension



“FLUENCY OF TIME”

a librarian -- **think Deep**

- Build professional identity
- Take initiative
- Attack a “library paradox”:
 - “Not to be told, but to find out”
 - Gain knowledge constantly

“A little learning is a dangerous thing...”

“Thinking outside the box...”

