The Disciplinary Shaping of Information Landscapes

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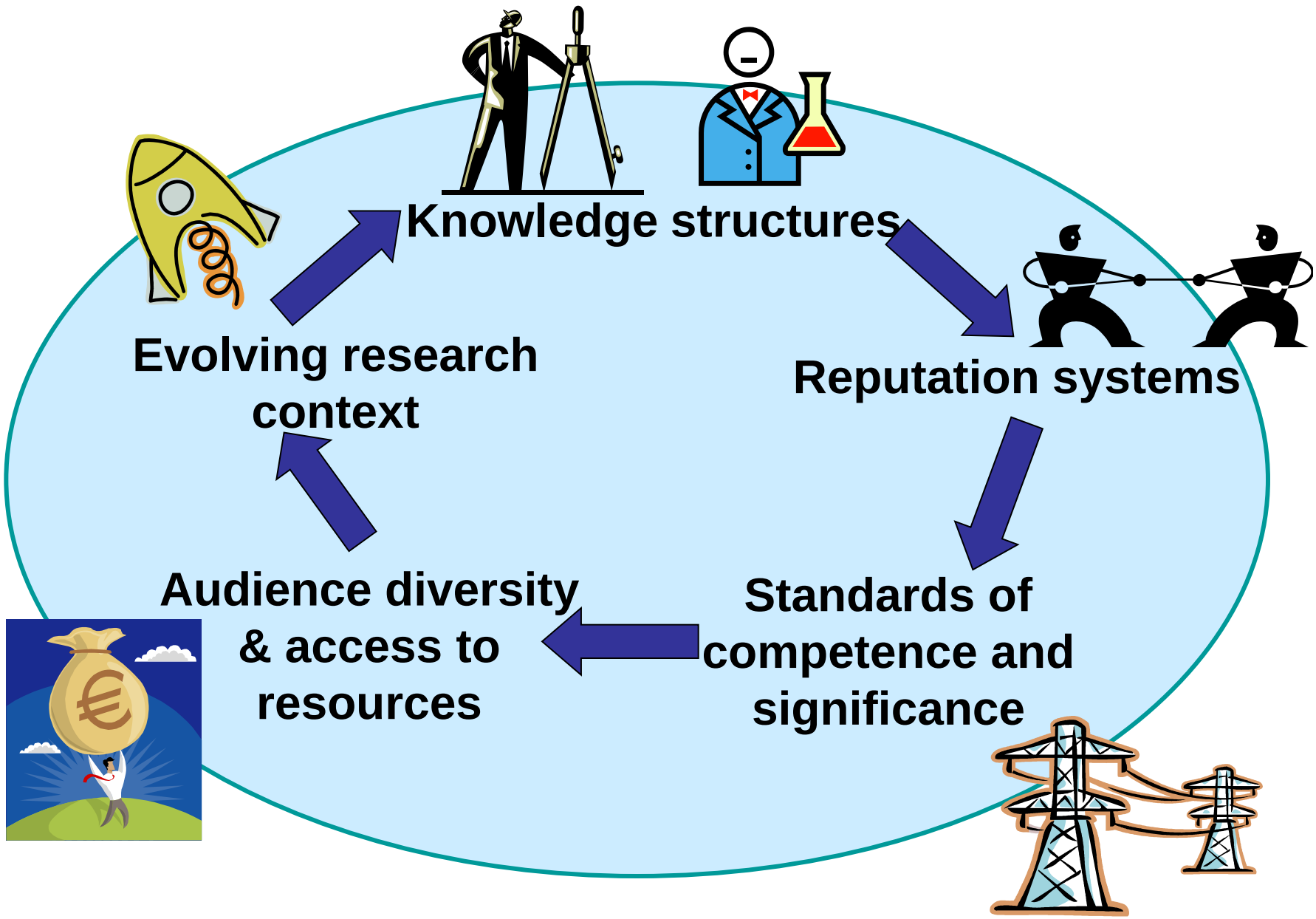
Knowledge structures
Reputation systems
Standards of competence and significance
Audience diversity & access to resources
Evolving research context

An explanatory framework

- Whitley (1984) argues that many of the major differences between disciplines (and specialist fields) can be characterized in terms of two interrelated concepts:

  1. degree of *mutual dependence* between researchers or fields in making competent and significant contributions to a body of knowledge
  2. degree of *task uncertainty* in producing contributions and evaluating knowledge claims

- Stratified into four analytic elements that relate to

  – reputational control, coordination of research strategies and intellectual priorities;
    - *strategic* dependence and *strategic* uncertainty.
  – the coordination of competence standards, research techniques and task outcomes;
    - *functional* dependence and t*echnical* uncertainty.

Implications for Search?

High degree of mutual dependence and low degree of task uncertainty	Low degree of mutual dependence and high degree of task uncertainty
Greater reliance on directed searching and greater likelihood of use of aggregated e-journal databases	Decreased reliance on directed searching and decreased likelihood of use of aggregated e-journal databases

Fry, J., and Talja, S. The Cultural Shaping of Scholarly Communication: Explaining e-journal Use within and across Academic Fields. *Proc. of the American Society for Information Science and Technology Annual Meeting.* Providence: RI, 13-18 Nov. 2004. pp.20-30.

FinElib

- Operated by the Finnish National Library
- Major supplier of digital resources to universities in Finland
- Annual user survey, 2004, included Whitley's theory
- 900 faculty members and PhD students responded
- Representative by disciplinary categories
  - (NB. Natural sciences and economics overrepresented; Engineering somewhat underrepresented)
- Data biased towards more active users of digital resources due to self-selection of sample

Talja, S., Vakkari, P., Fry, J., and Wouters, P. (2007) Impact of Research Cultures on the Use of Digital Library Resources. *Journal of the American Society for Information Science and Technology*. 58(11), pp.1674-1685.

Operationalizing Whitley (I)

Interdependence

(as an indicator of *functional dependence*)

Verbatim question "I conduct research"

a) mainly alone

b) in a loose-knit research group

c) in a tight-knit research group

Operationalizing Whitley (II)

Scatter (Bates, 2002)

(as an indicator of *strategic dependence*)

Verbatim question "I use publications in my work"

a) mainly from my own discipline

b) to some extent also from other disciplines

c) mainly from several disciplines

Operationalizing Whitley (III)

Maturity
(as an indicator of *task uncertainty*)

Verbatim question "My area is new and establishing its position within my discipline"

a) Yes
b) No
c) Cannot say

Use Indicators

- Number of databases used and importance to work as primary measure (dependent variable).
- Respondents selected those databases that they used from a list of resources provided by FinElib;
- They then rated the importance of each database to their work on a 4 point scale e.g. very important, not particularly important.

Interdependence by Discipline

Group membership	Hum	Econ	SocSci	Med/ heal	Bio/ Agri	Mat/ geo
Alone	**62%**	**52%**	**48%**	**5%**	**11%**	**13%**
Loose group	**32%**	**36%**	**40%**	**38%**	**48%**	**59%**
Tightly knit group	**6%**	**12%**	**12%**	**57%**	**41%**	**28%**
Total	100%	100%	100%	100%	100%	100%

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Interdependence & Maturity

Group membership	The degree of establishment of a field		
	Less established	Well-established	Total
Working alone	**3,8* (106)**	**3,4 (142)**	**3,6 (248)**
Loose group	**4,5 (136)**	**3,8 (190)**	**4,1 (326)**
Tightly knit group	**4,4 (98)**	**4,3 (110)**	**4,3 (208)**
Total	**4,2 (340)**	**3,8 (442)**	**4,0 (782)**

*Each figure in the cell indicates average number of databases used and in parentheses is the respective # of respondents

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Scatter by Discipline

Use of literature across fields	Hum	SocSci	Med/ heal	Bio/ agri	Mat/ geo	Chem
Own field	**11%**	**18%**	**53%**	**42%**	**38%**	**45%**
Some fields	**56%**	**43%**	**32%**	**44%**	**45%**	**44%**
Several fields	**33%**	**39%**	**15%**	**13%**	**17%**	**10%**
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Scatter and Maturity

I use publications in my work from	The degree of establishment of field of research		
	Less established	Well established	Total
Own field mainly	**3,5* (95)**	**3,9 (182)**	**3,8 (277)**
Other fields to some extent	**4,1 (131)**	**3,6 (194)**	**3,8 (325)**
Several fields	**4,9 (119)**	**4,2 (68)**	**4,6 (187)**
Total	**4,2 (345)**	**3,8 (444)**	**4,0 (789)**

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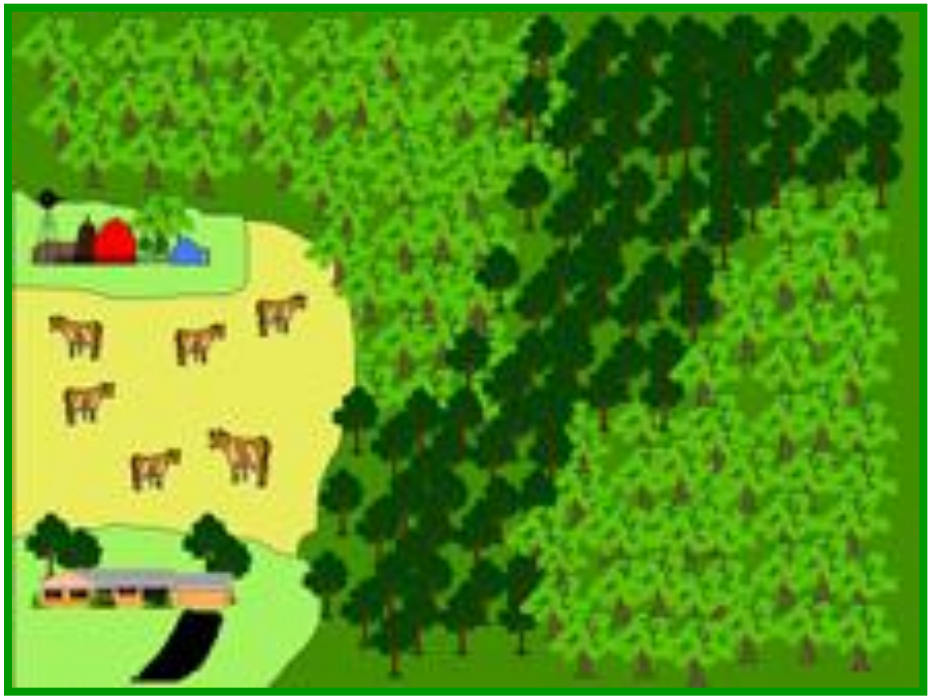
Networked information landscapes

Complex matrix of gatekeepers

Fragmented

Centralized



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Emergent gatekeepers

Networked information landscapes

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Emergent gatekeepers

Traditional gatekeepers

Networked information landscapes

Complex matrix of gatekeepers

Fragmented

Based on choice of theory and discourse communities; contributions to a variety of goals without need to systematically embed specific results & ideas in existing literature in the field

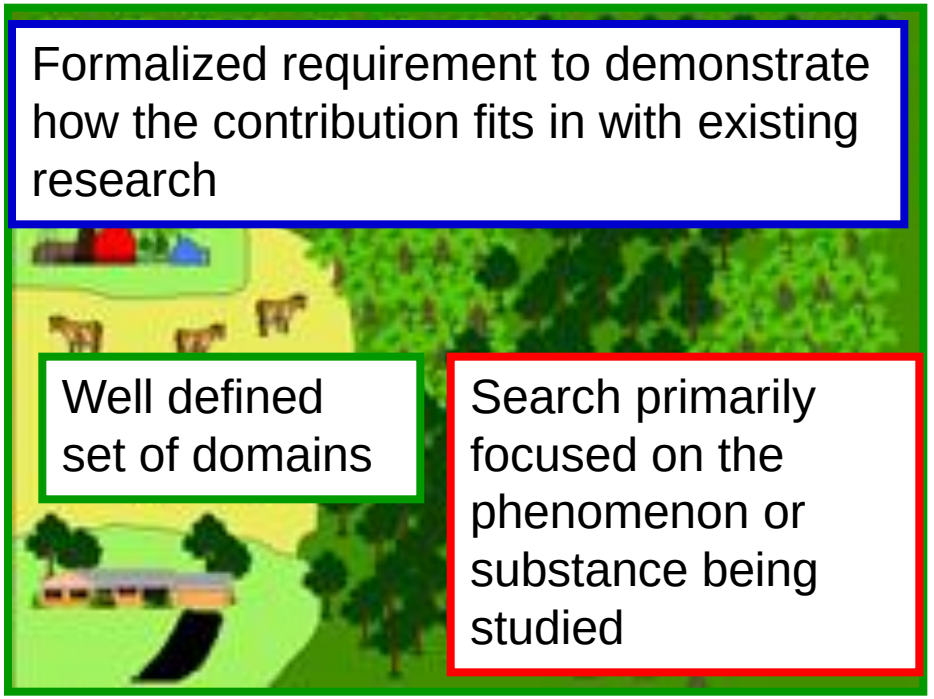
Need for translation & boundary crossing

Search oriented to particular conversations or paradigms

Emergent gatekeepers

Centralized

Formalized requirement to demonstrate how the contribution fits in with existing research



Well defined set of domains

Search primarily focused on the phenomenon or substance being studied

Traditional gatekeepers