

How theories of information can contribute to the development of literature search methods for realist reviews

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Slide	Text
1	<p>My aim is to show that a theory of information can inform searching for information, i.e. literature searching.</p> <p>By “theory of information” I mean a general understanding of what information is, which can serve as a model for information in real world settings.</p>
2	<p>In part 1, I discuss how literature searching for realist reviews differs from literature searching for systematic reviews, with reference to Andrew Booth’s CLUSTER search method.</p> <p>In part 2, I summarise two theories of information.</p> <p>In part 3, I will attempt to show how what we’ve learnt in part 2 has implications for literature searching as discussed in part 1.</p>
3	Literature searching (part 1)
4	<p>Literature searching has traditionally focused on using bibliographic databases such as MEDLINE.</p> <p>Database searching is prioritised over other search methods, such as citation chasing, because it best meets the needs of systematic reviews.</p> <p>The benefits of databases are that they search a wide range of journals; and the search strategies can be transparently documented, facilitating peer review.</p>
5	<p>By contrast, realist reviews don’t just answer what works, but “what works for whom, in what contexts and why”.</p> <p>The emphasis is on identifying explanatory theories; and, as a realist review progresses, new avenues of research emerge which require further searches.</p> <p>Subsequently, bibliographic database searching is less appropriate – the focus is too much on identifying topical studies using keywords, and on labour intensive searching at the beginning of a review.</p>

6	<p>Andrew Booth's CLUSTER search method overcomes this problem (Booth et al., 2013). CLUSTER searching uses familiar search methods, explained in novel terms as to their unique value for realism.</p> <ol style="list-style-type: none"> 1. Footnote chasing (checking the references in a study/backwards citation chasing) 2. Citation searching (forward citation chasing) 3. Journal run (manual searching of key journals across a specified time period) 4. Area scanning (using the physical or online layout of a resource) 5. Subject searching in bibliographies (using subject specific bibliographies) 6. Author searching <p>These methods identify studies which are associated with a study of interest, rather than which just use the same terminology.</p>
7	<p>The potential for these methods to retrieve different studies to the standard approach was perhaps first outlined in a paper by Marcia Bates from 1989, which is cited by Booth (Bates, 1989).</p> <p>Bates describes this approach as "berrypicking". She considers that the standard model of a searcher with a pre-specified and clearly bounded information query is untrue to real life.</p> <p>Instead, Bates argues that information searchers develop a query, find information, then discover that that information leads to another avenue of interest.</p>
8	<p>She explains this iterative approach to searching in terms of the benefits conferred in an evolutionary sense.</p> <p>This connects Bates' approach to information searching with her theory of information, which is rooted in the natural sciences.</p>
9	<p>Theories of information in information science (part 2)</p>
10	<p>Bates' theory of information is encapsulated in this quotation from the communications researcher, Edwin Parker: "Information is the pattern of organization of matter and energy" (Bates 2006).</p> <p>Bates' definition takes its lead from physics and stresses the pervasiveness of information. Every physical piece of the universe is built from matter and energy according to or informed by a pattern.</p> <p>The theory posits a mind independent world, full of information existing independently of and unknown to observers.</p>
11	<p>The Danish information scientist Birger Hjørland is critical of Bates' work. In contrast to Bates' objective understanding of information, he proposes a subjective/situational understanding.</p> <p>He bases this on a competing definition of information attributed to the anthropologist, Gregory Bateson: "Information is a difference that makes a difference"</p>

	<p>Hjørland qualifies this definition by adding “...for somebody or for something or from a point of view” (Birger Hjørland, 2007).</p> <p>Hjørland argues that information cannot be conceptualised objectively, without also recognising that information is embedded in the viewpoints of communities with particular interests. He takes the example of DNA, stating that DNA “...may be “objective” in the way that different observers describe it in the same way....But this objectivity (or intersubjectivity) is dependent on a scientific consensus in biology” (Birger Hjørland, 2007).</p> <p>For Hjørland, information is not just interpreted by, but is constituted of, the discourse of communities with shared understandings. He argues that the best way to understand information is to “study the knowledge domains of discourse communities” (B. Hjørland, 1997).</p> <p>A knowledge domain is a field of study within which exists a community with particular types of knowledge organisation, relevance criteria, and language and communication forms.</p>
12	<p>Literature searching re-visited (part 3)</p> <p>In part 3, I will discuss whether Hjørland’s critique of Bates can help us view literature searching differently.</p> <p>Hjørland hasn’t discussed the practicalities of literature searching for realist reviews. He has, however, said that he considers Ray Pawson’s work on realism to be “the most fruitful basis for reviews” (Birger Hjørland, 2011).</p> <p>Realism recognises that complex interventions are dependent on the context in which they take place. Similarly, Hjørland argues that what constitutes as relevant information is dependent on context.</p>
13	<p>Hjørland has proposed domain analysis as a practical application of the subjective/situational theory of information. In his paper “Domain analysis in information science”, Hjørland presents the following types of analysis:</p> <ol style="list-style-type: none"> 1. Producing and evaluating literature guides and subject gateways, 2. Producing and evaluating special classifications and thesauri, 3. Research on and competencies in indexing and retrieving information in specialties, 4. Knowledge about empirical user studies in subject areas, 5. Producing and interpreting bibliometric studies, 6. Historical studies of information structures and services in domains, 7. Studies of documents and genres in knowledge domains, 8. Epistemological and critical studies of different paradigms, assumptions and interests in domains. 9. Knowledge about terminological studies, LSP (languages for special purposes) and discourse analysis in knowledge fields, 10. Knowledge about and studies of structures and institutions in scientific and professional communication in a domain. 11. Knowledge about methods and results from domain analytic studies about

	<p>professional cognition, knowledge representation in computer science and artificial intelligence (Birger Hjørland, 2002).</p> <p>In conducting such analysis information professionals have made explicit the various types of knowledge organisation which are unique to different fields of study.</p>
14	<p>Two prominent components of CLUSTER searching are footnote chasing and forward citation chasing.</p> <p>These methods are also proposed as a domain analytic approach by Hjørland -- listed as “Producing and interpreting bibliometric studies”.</p>
15	<p>Hjørland considers citation analysis to be a strong domain analytic approach because it shows empirical connections between documents.</p> <p>However, a critical perspective, informed by a subjective/situational theory of information, warns us that:</p> <ul style="list-style-type: none"> - The results of citation analysis will depend on the database that is used. - Citation maps depend on the citation behaviour of authors writing the papers on which the maps are based. - Thirdly, it’s possible that some theories or authors may be in vogue and overrepresented relative to their scientific value.
16	<p>As a corrective to these shortcomings, Hjørland proposes historical studies and epistemological and critical studies. The former analyses the historical development of terminology within a field of study; the latter explores paradigms or schools of thought.</p> <p>Both these types of interpretative analysis compliment the more mechanistic citation analysis, providing a subjective/situational vantage point missing from citation analysis.</p>
17	<p>I want to suggest that the subjective/situational theory of information and its practical application in domain analysis provide a useful vantage point to critique CLUSTER searching; and, more generally, for developing literature search methods for realist reviews. In closing here are some thoughts:</p> <p>First, Booth proposes Google Scholar and Web of Science as databases for citation analysis, which are two popular options. Perhaps a more critical, domain analytic approach would consider the suitability of databases on a case-by-case basis, according to topic or methodological interest. This might include consideration of how disciplines are defined and represented within topical databases.</p> <p>Secondly, Booth writes that a strength of CLUSTER searching is that “theories are identified forensically from the actual evidence base rather being ‘magicked’ via external interpretation from the review team”. Perhaps Hjørland’s proposal to supplement citation analysis with historical and epistemological analysis can provide</p>

	<p>a theoretical basis for stepping outside an empirically connected network of literature, without resorting to “magicking” literature.</p> <p>Finally, there may be other types of domain analysis which can inform the development of literature searching. User studies seek to understand how researchers and practitioners who specialise in a field of study engage with the literature, which can offer insight not available to information professionals and researchers who tend to be methodological rather than subject specialists.</p> <p>In conclusion, domain analysis, informed by a subjective/situational theory of information, provides insight into how information is understood and used in specific contexts. This may be useful for information professionals and researchers when searching for information to resource realist reviews.</p>
	<p>References</p> <p>Bates, M. J. (1989). Design of browsing and berrypicking techniques for the online search interface. <i>On-line review</i>, 13(5), 407-424.</p> <p>Bates, M. J. (2006). Fundamental forms of information. <i>Journal of the American Society for Information Science and Technology</i>, 57(8), 1033-1045.</p> <p>Bates, M. J. (2007). What is browsing-really? A model drawing from behavioural science research. <i>Information Research</i>, 12(4).</p> <p>Booth, A., Harris, J., Croot, E., Springett, J., Campbell, F., & Wilkins, E. (2013). Towards a methodology for cluster searching to provide conceptual and contextual "richness" for systematic reviews of complex interventions: case study (CLUSTER). <i>BMC Medical Research Methodology</i>, 13, 118.</p> <p>Hjørland, B. (1997). <i>Information Seeking and Subject Representation: An Activity-theoretical Approach to Information Science</i>: Greenwood Press.</p> <p>Hjørland, B. (2002). Domain analysis in information science. <i>Journal of Documentation</i>, 58(4), 422-462.</p> <p>Hjørland, B. (2007). Information: Objective or subjective/situational? <i>Journal of the American Society for Information Science and Technology</i>, 58(10), 1448-1456.</p> <p>Hjørland, B. (2011). Evidence-based practice: An analysis based on the philosophy of science. <i>Journal of the American Society for Information Science and Technology</i>, 62(7), 1301-1310.</p> <p>Talja, S. & Maula, H. (2003). Reasons for the use and non-use of electronic journals and databases: a domain analytic study in four scholarly disciplines. <i>Journal of Documentation</i>, 59(6), 673-691.</p>

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