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## **A Metaphorical Study of Information Seeking using Q methodology**

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### Abstract

This brief paper examines a metaphorical perspective for information science. Metaphorical understanding, like learning itself, is a fundamental component in the movement from the known to the unknown. Adopting this perspective has the potential to inform and further advance the study of characteristics of information and how it relates to emerging knowledge. This will be demonstrated by an examination of the metaphors used by theorists to describe how users approach information.

### Keywords

seeking, information, metaphorical, study, methodology, q

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The following paper outlines post graduate research that is being undertaken in the Faculty of Education, in the School of Educational Psychology, Measurement and Technology, at the University of Sydney, Australia. The outcome of this research into the metaphorical nature of information and information seeking will advance information science by enhancing understanding of the information retrieval process, information, and information systems.

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### **A Metaphorical Study of Information Seeking using Q Methodology**

This brief paper examines a metaphorical perspective for information science.

Metaphorical understanding, like learning itself, is a fundamental component in the movement from the known to the unknown. Adopting this perspective has the potential to inform and further advance the study of characteristics of information and how it relates to emerging knowledge. This will be demonstrated by an examination of the metaphors used by theorists to describe how users approach information.

Metaphors are viewed here as essential structuring components of the conceptual system that information seekers use in seeking and making sense of new information. Lakoff and Johnson, (1980) in their work, "*Metaphors We Live By*" suggest that our conceptual system, which we are not normally aware of, plays a central role in defining our everyday realities and that this system itself is largely metaphorical. So what we experience everyday is very much a matter of metaphor. (Lakeoff, Johnson, 1980).

When seeking to understand how metaphor is related to the information seeking process there is a need to examine the premise, which underlies this perspective. Information itself is viewed as largely cognitive, with information seeking being a process that is guided and

experienced through metaphoric lenses that shape our awareness of “reality”. It is also suggested that as information seeking needs to be understood from the information seekers’ personal perspective, it is essential to investigate and identify the way (metaphorically) information seekers’ experience information, and their need for information. Researchers have frequently used metaphors to understand and describe individual approaches to information seeking and learning, for example, Marton uses a metaphorical approach to make a useful distinction between “deep” and “surface” approaches to learning. (Marton 1988).

A review of the information literature finds that contemporary theorists, such as Ingwersen in his 1992 work *Information Retrieval Interaction*, have found that information retrieval is moving from a traditional system based approach, towards a user based approach which recognises the cognitive processes of individuals, (Ingwersen, 1992) and Kuhlthau, in her 1994 work, *Seeking Meaning*: focuses on the process model for information seeking. This process model of information retrieval is among the most current of a series of developments in information retrieval theory that sees the individual as actively involved in finding meaning that “fits” in with what he or she already knows. (Kuhlthau 1993, p.3). Importance is now being placed on **the way** information seekers conceptualise their information needs in the circumstances of their learning. How information seekers determine that something is meaningful and that it “fits” with their need and expectations can be understood metaphorically. This has been demonstrated by a variety of writers who have used metaphors to describe information seeking processes: *A Maze*, (Fogg, 1994), gaining access to information as being aided by a *Key*, (Meloche,

1994), Filters, (Taylor, 1968), and most recently as a *Targeting* process, (Meloche, 1996).

A further examination of the literature demonstrates how this approach has developed. Kelly (1963), the founder of Personal Construct Theory, used the “**metaphor**” of constructs to describe and understand how individuals process new information and experiences. He proposed that constructs are built of a person’s experiences and these allow individuals to anticipate future events. These constructed frames of reference which are developed from our social, historical and cultural experience begin to frame and to help determine the choices or meanings one makes of new or previously unknown information. Learning, then, which is necessarily personal and subjective takes place as each individual develops by the forming of new constructs and the re-constructing of old ones.

The basic postulate of Kelly’s Personal Construct Theory, is that, “A person’s processes are psychologically channelized by the ways in which he anticipates event[s]” (George Kelly, 1963, p.46) This postulate implicitly demonstrates the importance of a metaphorical analysis of Kelly’s work, as to **understand**, “channelized” is to accept it as a directing and focusing metaphor. It can be seen that Kelly’s statement the “way an individual anticipates events” is dependent upon a metaphorical basis for understanding events, as demonstrated in the above use of the channel metaphor.

Given the increasingly fluid nature of the current on-line digital environments, information seekers are largely freed from preconceptions that were once locked in by physical constraints associated with information retrieval. The on-line environments, as they are less rigidly structured, have the potential to exist as multiple structures in accordance with individuals needs. Such metamorphosis of previously rigid channelized structures in information seeking, such as, catalogues, printed indexes, and books on shelves, to flexible on-line computer assisted cyberspace environments requires detailed acknowledgment of how our we ourselves process information.

This acknowledgment is particularly important because of the way that metaphors can **structure the process of understanding**, and thus contribute to changes that will be meaningful to information seekers. The major writers in information studies have historically adopted invoked and used metaphors. A seminal example is Taylor's "filters" (Taylor, 1968). These "filters" became one of the prevailing ways of understanding the information retrieval process, that is; "useful" information was said to be information "filtered" from the large mass of (un-useful) information. It can be seen how differently the process of information seeking may be viewed if the targeting metaphor is adopted to define our understanding rather than the filtering metaphor.

If the process of information seeking is explicitly acknowledged as a metaphoric process where professionals and information seekers use metaphors to understand and experience their problems/needs, it can be seen that there is a need for learners to use the metaphors

in a integrated and effective manner, if necessarily in a subjective manner. The difficulty however is in understanding the nature of metaphors, as the use of metaphors is situational, personal, and at the heart of understanding individuals and their experiences of the larger external world.

However powerful they are it can be seen that each metaphor has its strengths and weaknesses. For example, Kelly (1963) saw the information/knowledge acquisition process in terms of constructs. It allowed him to visualise the construction of meaning. Thus Kelly in explaining how individuals (information seekers) resolve their information deficit used the metaphor of constructs to understand and explain and most importantly to explore the problem. In explaining the construction process he allows for **visualisation** of the cognitive process of information seeking which enables the “parts” to be **seen** and the way they “**fit**” together and to be examined. Yet even this approach had its limitations for once the metaphor of constructs was adopted it necessarily inhibited the use of alternative lenses (metaphors) for viewing information and learning.

The ideas presented in the above paper represent the first stage of an emerging investigation using Q methodology that seeks to track the development of metaphors used by information seekers over an extended period. This research is particularly important at this time when information infrastructures are becoming less restrained by physical environments and are becoming increasingly fluid digital environments. It is essential that a greater understanding of the user’s experience of information environments and seeking

processes be achieved during this period of transition from physical to digital. The authors are attempting to meet this challenge with research that examines user's metaphors to explore their experience of information and information seeking and would welcome any assistance, advice, or comment that you may provide.



## Methodology

Q methodology if used for statement generation begins with a concourse, which can be a discussion an interview, or a review of sources such as newspapers or journals to elicit what people have to say about a topic. It is from the concourse that statements are elicited and hopefully agreed to by the group. Another advantage of Q is that it does not require large samples of the population to produce a meaningful result, as a rule a Q sample from 30 to 50 individuals can produce an accurate picture of the range of views on a topic, (McKeown & Thomas ,1990).

The method of the research undertaken here was accordingly staged so that data generation and collection consists of two distinct parts. The first part consisted of concourses in which data generation in that large students and a smaller group of academics were asked to state and list and discuss all the possible “terms” or “statements” which describe their understanding of three areas,

- 1) information,
- 2) information seeking
- 3) information technology.

The statements were listed on a board or paper in front of the groups and duplicate statements were removed until the group was satisfied that all the relevant statements was listed.

The groups included Information Science students and academics. This method of data generation while in accordance with Q methodology is very similar to Belkin's (date) **freeform interview technique** that was used to elicit problem statements, and the statistical word co-occurrence he used for analysis that derived network representations of the problem statements and abstracts. Belkin used the structural characteristics of the representations to determine classes of ASKs, ( \_\_\_\_\_ States of Knowledge) and both ASK and information structures were evaluated by users and authors. Similarly this research will have user generated statements and the statements will be assessed by small groups of users. However instead of developing a new procedure this research will adopt Q Methodology as it is a well supported and proven technique for assessing subjectivity. Furthermore as Q Methodology consists of three related techniques: Q sample, Q sort and Q factor analysis, ( Stephenson, 1935), each of these facets of Q methodology will be used in turn in the research methodology being applied in this research. The Q sample and the Q sort were used for gathering and sorting the data respectively and the Q factor analysis was used for statistical analysis of the data. Q methodology is particularly suitable for the metaphorical analysis being undertaken as it is a qualitative assessment technique that focuses on the words and phrases used by respondents and the importance that they place on those words as demonstrated in a Q sort. Q methodology in this places particular importance on subjectivity from a self referent perspective. For example McKeown and Thomas (1978) define, " 'a persons communication of his or her point of view' [being] ... anchored in the person's own internal frame of reference, or 'self reference'." This study would suggest that the "internal frame of reference" is likely to metaphorical and would

concur that the individual's communication of his or her point of view (action) is anchored in the metaphorical referent.

Q samples and Q sorts involve obtaining statements about a set of topics, in this case, information, information seeking and information technology and the categorizing of the statements. Typically the statements are placed on index cards, one statement per card and the cards are ranked by the respondents. There are a number of ways that a Q statement can be achieved. In this study several large groups of students and a smaller number of academics were used to generate the statements. This like Belkin's freeform interview technique was used to elicit the personal views on the areas identified with a minimum of direction.

Once the problem statements were generated they were refined and categorised into a set of statements. These statements were presented to different smaller groups of students, academic and professional librarians.

### **Analysis of data - Results and Discussion**

Data was collected from participants in three countries, Australia, China and Denmark in autumn 1997. In each case about 35 participants were tested in regard to their view of three subjects, namely, information, information seeking and information technology.

The participants consisted of a mix of undergraduates, graduate students and a smaller number of academics and practitioners from the discipline of Library and Information Science. The same procedure was followed in each case and each group was asked to sort a set of cards, where each card, contained a statement that expressed a single aspect of meaning for each area. For example, a statement on one card says that *Information Seeking is a search for knowledge*, where the statement on another card is *Information Seeking involves strategy*. The cards containing the statements were sorted in a 'fixed sort' based upon the degree of agreement / disagreement with the statement on a scale that ranged from -4 to +4.

From each of the subject areas, ie, information, information seeking and information technology, four factors were formed for each, that is groups of people who expressed like views based on the sorts they performed.

For Information Seeking the following statements were among the most strongly accepted ones. They included:

Table 1

Factor 1 Positive Statements		Statements from separate groups
Information seeking involves strategy	DS DS	af1, df1&3
Information seeking requires skill	*DS	af1,cf1&2&4 af1,cf2,df1(n), df3
Information seeking requires objectives		af2&4,cf1,df3
Information is an attempt to reduce uncertainty		af4,cf3(n),df1&3
Information seeking is a process to answer questions	DS	af4(n),cf1&2&3&4
Information seeking requires ability		
Information is a systematic process	DS	af2(n)cf4, df3
Information seeking is dependant upon education		af2(n),cf2&3df2(n),df3&4
Information seeking involves initiative		cf2
Table 1 Section 2		
Factor 1 Negative statements		
<i>Information seeking is fun</i>	*DS*D	Cf1&3,df1(p)
<i>Information seeking is a trip to the unknown</i>	S*DS	Af2(p),Cf1(p)&cf2&4,df3
<i>Information seeking requires luck</i>	DS	Af1&3,cf1&2&4,df1&2&3
<i>Information seeking is libraries</i>		Af1&2,cf1&2,df3&df4(p)
<i>Information seeking is spiritual</i>		Af1&2,df1&2&3&4

The DS or \*DS stands for 'distinguishing statement'. A distinguishing statement is determined by the weight given to it by a particular factor (group) in comparison with the weight given to it by the other groups. \*DS indicates a distinguishing statement with a significance at,  $p > .01$ .

Factor 1 view of information seeking is as a serious occupation/job that requires, objectives, ability, skills and organisation ie it is systematic. Similarly it clearly states that

Information is not Fun or something that requires Luck, or a Trip to the unknown. For this factor Information seeking is a serious planned and skill based activity.

Table 2

Factor 2 Positive Statements		Statements from separate groups
Information seeking is life long learning	*DS	AF1 & aAF3, CF3, DF2
Information seeking is curiosity	*DS	DF2
Information seeking is challenging	*DS	AF2, DF2 & DF3
Information seeking is ultimately individual	*DS	AF4(n)
Information seeking leads you in unexpected directions		AF2, CF2(n) & CF3(n) & F4(n)
Information seeking is a search for knowledge	DS	AF1 & AF4, CF3, DF1 & DF2
Information seeking is learning		AF1 & AF3 & AF4(n), DF2
Information seeking is fun	*DS	AF1(n), CF1(n) & CF3(n)
Table 2 Section 2		
Factor 2 Negative statements		
<i>Information seeking is stressful</i>		AF3, CF1, DF1 & DF2
<i>Information seeking is a service</i>	*DS*D	AF1 & AF3, CF3(p)
<i>Information seeking requires luck</i>	S *DS	AF3, CF1 & 2 & 4, DF1 & 2 & 3
<i>Information seeking is done for gain</i>		AF3, CF3, DF3 & 4
<i>Information seeking is expensive</i>	DS	AF1 & 2 & 3, CF3, DF2 & 3
<i>Information seeking is libraries</i>	*DS	AF1 & 2, CF1 & 2, DF3 & DF4(p)
<i>Information seeking is a business</i>	*DS	AF1 & 2, CF3(p) & CF4(p), DF2
<i>Information seeking is something done with apprehension</i>		AF1 & 2 & 3, DF2 & 4
<i>Information seeking is spiritual</i>		AF1 & 2, DF1 & 2 & 3 & 4

Factor 2 views information seeking as fun, as a challenge, a search for knowledge and learning that takes you in unexpected directions. Similarly it clearly states that Information is not a business or something that is stressful or something that is done with apprehension.

Table 3

Factor 3 Positive Statements		Statements from separate groups
Information seeking is a trip to the unknown	*DS *	AF2, CF1&3,DF3(n)
Information seeking is an attempt to reduce uncertainty		Af1 &2&4, CF1, DF2&3
Information seeking is a search for knowledge	DS	AF1&4,CF3,DF1&2
Information seeking is a process of seeking wisdom	*DS	AF2(n),CF1,DF1
Information seeking requires skill	DS	AF1,CF1&2&4,DF1&3
Information seeking is life long learning	*DS	AF1&3,CF3,DF2
Information seeking is a learning tool	*DS	CF2&3
Information seeking requires ability	*DS	Af4(n),CF1&2&3&4,DF3
Table 3 Section 2		
Factor 3 Negative statements		
<i>Information seeking is a right</i>	*DS	CF2(p),df2(p)&df4(p)
<i>Information seeking is expensive</i>		Af1 &2&3,cf3,df2&3
<i>Information seeking requires luck</i>		AF3,cf1&2&4,df1&2&3
<i>Information seeking is fun</i>	*DS *DS	Af1,cf1&3
<i>Information seeking is ultimately individual</i>	DS	Af4
<i>Information seeking is confusing</i>	*DS	AF3&4,cf1&4,df1
<i>Information seeking is time-consuming</i>	*DS	CF1&4,df1
<i>Information seeking is frustrating</i>		CF1&3&4,df1

Factor 3 views information seeking as a life-long quest for knowledge, a trip to the unknown, an attempt to reduce uncertainty, a search for wisdom and lifelong learning.



Similarity they do not view information seeking, as frustrating, time consuming, or confusing. So for this factor information seeking is not problematic.

Table 4

Factor 4 Positive Statements		Statements from separate groups
Information seeking is a search for knowledge	*DS	Af1&4, CF3, DF1&2
Information seeking involves strategy	DS	AF1, DF1&3
Information seeking is a right	*DS	CF2, DF2&4
Information seeking is research	*DS	AF1, &4, DF3&4
Information seeking is systematic		AF2(n), CF4, DF3
Information seeking is a process to answer questions		AF4, CF3(n), DF1&3
Table 4 Section 2		
Factor 4 Negative statements		
<i>Information seeking is stressful</i>		Af3, cf1, df1&2
<i>Information seeking is something done with apprehension</i>		Af1&2&3, df2&4
<i>Information seeking is frustrating</i>		Cf1&3&4, df1
<i>Information seeking is fills the gap</i>		Af4(p), cf2(p)&cf4, df4
<i>Information seeking is confusing</i>	DS	Af3&4, cf1&4, df1
<i>Information seeking is an eternal quest</i>	DS	Df1&4
<i>Information seeking is trial &amp; error</i>		Cf4, df4
<i>Information seeking is spiritual</i>	*DS	Af1&4, df1&2&3&4

Factor 4 views information seeking as a strategic systematic search for knowledge ie research. Similarly it is not trial and error, not an eternal quest, not stressful and not frustrating.

One of the first and most significant results in regard to the factors is that the factors seem to be determined on a cultural basis, for example below is a breakdown of those individuals and it is clear that the factors reflect distinct groups from the three cultures, for example Factor 1 which views information seeking as a **serious occupation/job** that requires, objectives, ability, skills and organisation ie it is systematic, is represented by a high number of Chinese exemplars, (9) a fairly high number of Danes (7) and few Australians (3). Factor 2 - the factor that sees **information seeking as fun and a challenge** contains no one from China, but it contains an equal number of respondents from the Australian and Danish groups, and is the only factor that is strongly represented by Australians, whereas Factor 3 the factor that sees **information seeking as a life-long quest for knowledge** contains a high number (9) of Chinese respondents as exemplars and only a single respondent as an exemplar from each of the other groups. Factor four views **information seeking as a strategic systematic search for knowledge** ie research has a high number of Danish respondents as exemplars, a smaller number of Australians and only 1 Chinese exemplar.

Factor 1 [Serious Occupation/Job]	Factor 2 [Fun, as a challenge]	Factor 3 [Life-long quest for knowledge]	Factor 4 [Systematic search for knowledge]
9C		0C	1C
3A		9A	3A
7D		1D	9D

The pronounced difference between the factor as stated above seems to relate to culture. It is interesting to note how this difference manifested. To examine this we will consider each group in turn.

The Australians unlike the other two groups are only represented strongly on only a single factor, factor 2 which sees information seeking as fun or a challenge. They also have a minor representation on factor 1 where information seeking is viewed as a Serious Occupation/Job and Factor 4 where information seeking is viewed as a Systematic Search for Knowledge. So of the three groups, the Australians, are spread across the largest number of factors. It should be noted here that only 1 Australian exemplar was found on Factor 3 the factor that saw information seeking as a life-long quest for knowledge. Only Factor 1, having 3 Australians and 7 Danes and 9 Chinese, shares respondents as exemplars across the three cultures in significant numbers.

To gain a further understanding of what really contributed to the factors it was decided that each cultural group would be assessed independently so that the voices or views that existed within each group could be examined and that the particular contribution from each group to a particular Factor could be examined.

This has proved to be a very useful exercise.

For example if we examine *Factor 2* the factor where there was a large number of Danes and Australians but no Chinese we can begin to understand how the Chinese view this factor. For while they are not represented on this factor the reason is because of there direct **disagreement** with the statements that constitute it. For instance, the statement *Information Seeking leads you in unexpected directions*, a positive statement in *Factor*

*two*, showed up as a negative statement in three of the four factors consisting of only Chinese respondents. ( Table 2 Section 1)

Likewise the positive, Statement, *Information Seeking is Fun* from *Factor 2* showed up as a negative in 2 of the four factors from the Chinese only analysis. (Table 2 Section 1)

Furthermore if we look at some of the negative statements in *Factor 2* we again find that the Chinese are in direct disagreement with this factor. For example the negative statement *Information Seeking is a business* appears as a positive statement in two of the factors from the Chinese only analysis. So the Chinese while not represented as such in *Factor 2*, do represent themselves by strongly disagreeing with both the positive and negative statements that comprise that that factor.

Whereas in *Factor 3* where there are 9 Chinese and only 1 Dane and 1 Australian each, we find a high degree of consensus, as all 4 of the *Chinese only factor* exemplars, agree with the statement *Information Seeking requires ability*, and 2 of the *Chinese only factor* exemplars agree with the statement that *Information seeking is a learning tool*.