

A need for information on information needs

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Abstract

Introduction. We report a study on everyday life information needs in order to obtain a deeper understanding and insight of what constitute information needs, and how they can be characterised.

Method. The information needs stems from three different simulated work task experiments where the real needs served as baseline. The users in Set 1 were bachelor and master's students from several disciplines resulting in 26 information needs. Set 2 provided 23 information needs from bachelor students in Library and Information Science. Set 3 was from a boarding school and consisted of 38 information needs from pupils and teachers.

Analysis. The users answered three questions: 1) What are you going to find information about?; 2) Why are you interested in this information?; and 3) What are you going to use the information for? In the subsequent coding, the three questions formed the basis for identification of the topic, domain and purpose of the information needs. The data were coded inductively.

Results. The information needs belonged to three different domains (work, studies and personal interest). The needs served ten different types of purposes (to decide between two or more alternatives, to make a decision influencing your personal life, to make a decision changing your life; to find inspiration for something you want to achieve; to find information supporting you in hobby/leisure activities; to learn something new about a phenomenon; to plan a holiday trip; to compare prices, quality etc. for purchasing something; to let time pass by; and to write an assignment, report or similar).

Conclusion. The nuances and depths of the information needs are best understood in the light of the domain and purpose, because they add insight about the context of searching and the motivation for searching.

Keywords: Information needs, Interactive information retrieval, Methodology

1 Introduction

The concept of an information need is fundamental to library and information science, as a central aim of the field is concerned with the retrieval of information relevant to the user's information need. Nevertheless, the concept "information need" is rarely discussed or defined. In a recent review, Savolainen (2017, p. 3) notes that: "...even though information need is probably the most widely used construct explaining why people engage in information seeking, this concept is still vague". That said, hypotheses and theories do exist concerning the development and recognition of information need, e.g., Taylor's (1962; 1968) four levels of information needs, the anomalous state of knowledge (ASK) hypothesis (Belkin, Oddy, & Brooks, 1982), Dervin's sense-making approach (Dervin, 1992), and the Information Search Process model (Kuhlthau, 1991). However, not much attention is given to what constitutes an information need, perhaps with the exception of Ingwersen (e.g., 2000) who presents three basic types of information needs. Wilson (1981) suggest, as an alternative to "information needs", to rather speak of "information seeking towards the satisfaction of [physiological, affective or cognitive] needs".

One explanation for the lack of attention could be the change in focus from information needs to work tasks and search tasks in interactive information retrieval. Another explanation could be that there exists a common, unspoken 'ground truth' about what constitutes an information need. However, the concept of an information need remains poorly understood. Therefore, in this paper we take a closer look at what characterises such needs.

Our study is based on a sample of 87 genuine information needs aimed for searching the World Wide Web. The analysis of the information needs is grounded on the users' own descriptions, including explanations of why they are interested in this information and what they are going to use the information for.

The objective of the study is to obtain a deeper understanding and insight into what constitutes information needs, and how they can be characterised. An insight that may complement existing knowledge on types of information needs, and further contribute to inform the design of simulated work task situations used in evaluation of information systems.

The remainder of the paper is structured as follows: in Section 2, we present a review of information need related literature. In Section 3, we describe the sample of genuine information needs as well as outline the analytical approach taken. In Section 4, we report the characteristics according to the three dimensions based on the users' descriptions and explanations of their information needs. In Section 5, we discuss the findings and their applicability. The paper closes with summary and future studies in Section 6.

2 Related work

In Library and Information Science, the information need concept is usually presented by means of the significant contributions by, e.g., Taylor, Belkin, Dervin, and Kuhlthau. Taylor (1962; 1968) was one of the first to introduce the concept of an information need as a personal, psychological, at times inexpressible, vague and unconscious state (Bruce, 2005). According to Taylor an information need develops over four levels from early, inexpressible recognition of the need for information to the

formal encounter with an information professional or the information system. The four levels are labelled: the visceral need, the conscious need, the formalised need, and the compromised need (Taylor, 1968, p. 182). In 1980 Belkin proposed the ASK hypothesis as a synthesis of previous suggestions, including Taylor's four levels. In brief, the hypothesis describes how users encounter information systems because of an anomalous state of knowledge, which make them realise a need for information. Belkin explains how an ASK shares characteristics with Taylor's visceral and conscious needs (Belkin, 1980, p. 182). The formulation of the ASK hypothesis is an attempt to understand the information need and address the challenge of non-specificability of information needs. Another significant contribution on information needs is made by Dervin (1992) who talks about knowledge gaps that require information to be bridged. Her focus is on the actions of needing and bridging in order to make sense of the whole. The sense-making approach calls for a shift in focus from user, system, and interaction to a focus on information use as part of micro-moments of sense-making in daily-life. Kuhlthau's work on the Information Search Process (ISP) model (Kuhlthau, 1991) is influenced by Taylor and Belkin and addresses the issues of uncertainty and emotions as part of a longitudinal seeking process. In each of their ways, these contributions are significant to our understanding of the information need, and at the same time they inform us only, that the information need is what we do not know.

Ingwersen (2000) identified three types of information needs based on user-librarian dialogues observed in the public library: the verificative information need, the conscious topical information need, and the muddled topical information need. A user with a verificative information need wants to verify information objects with known non-topical (structured) data, such as author names, client address, cited authors, journal name, and facts. A verificative information need is characterised by being well-defined and stable. A user with a conscious topical information need wants to clarify, review, or pursue information in a known subject matter and domain, where known subject matter signifies topical (unstructured) data about contents, such as terms, concepts, and image representation. A conscious topical information need is characterised as being well-defined, but at the same time to be of a more variable nature. A user with a muddled topical information need is engaged in the exploration of new concepts and relations outside known subject matter or domain (Ingwersen, 2000, p. 164). The muddled topical information need is characterised by being poorly defined in the user's consciousness, which results in high cognitive uncertainty (Ingwersen, 2000, p. 165). The conscious topical information need, and the muddled topical information need share the topical focus of the information needs and can, in brief, be differed by the prior knowledge of the user of the topic in question. They also share the nature of explorative search being initiated for the satisfaction of the information needs.

Wilson (1981) suggested that, instead of speaking about "information needs", we should rather address information searching performed to satisfy physiological, affective and cognitive needs. In our view it is still meaningful to use the term information need, but to emphasize that the general purposes for the information need may be physiological (e.g. to find the closest shelter during rain), affective (e.g. to be entertained by a movie for two hours) or cognitive (e.g. to solve a school assignment).

The introduction of search tasks by Borlund (2003), known as simulated work task situations, established the task-based information system evaluation practice. The assignment of search task can be viewed as a way of operationalising information needs. Search task are typically defined from an activity perspective as seen by Wildemuth, Freund, and Toms (2014, p. 1134) who define search tasks as "...goal-directed activities carried out using search systems", or Li and Belkin (2008, p. 1823) who explain information search task as "...a task that users need to accomplish through effective

interaction with information systems". In addition, search tasks are also classified according to properties (e.g., complexity, difficulty, urgency, structure, stage) which can be seen as aspects of information needs, as well as divided into types (e.g., fact-finding vs. information gathering; known-item vs. exploratory) (Kelly, Arguello, Edwards, & Wu, 2015, p. 102).

3 Participants, information needs, and methodology

The information needs derive from three different studies conducted in Denmark. In each of these studies, the participants were asked to describe and bring with them a genuine information need of personal interest to search the World Wide Web as part of the study. The genuine information needs served as baseline for the search interaction of the assigned search tasks.

3.2 Participants

The studies were conducted between 2011 and 2013. Table 1 gives an overview of study participants, who were from two different universities and one boarding school. In one of the studies, a student described two genuine information needs.

Table 1 Data sets and participants

Data set	Participants	Age	Gender
1) Aalborg university	26 students	20-37 (avg. 24 years)	11 females
2) Royal School of Library and Information Science	22 students (23 needs)	19-43 (avg. 25 years)	19 females
3) Boarding school	30 pupils	14-17 (avg. 16 years)	13 females
	8 teachers	20-46 (avg. 35 years)	3 females
Total	86 participant/87 needs	14-47 (avg. 22 years)	46 females

Data Set 1 and 2 were collected from university students whereas Set 3 contains data from pupils and teachers from a Danish boarding school. The students in Set 1 aimed for degrees in several fields, including communication, sociology, medicine, psychology, health technology, political science and administration, environmental planning, and math. Set 2 students were at their second semester of their bachelor degree in Library and Information Science. The three sets gave us a sample of 87 genuine information needs of Danish users searching the World Wide Web. The average age of the participant is 22 years (range: 14-47 years, modus: 22 years).

3.2 Information needs

The participants described a genuine information need by answering three questions in writing.

The following is an example of a participant's description of his information need by answering the three questions (from Set 1, need no. 11: S1_N11):

1. What are you going to find information about?

"face detection and face recognition".

2. Why are you interested in this information?

"Because I am very interested in photo and image processing and that is why I think this is very interesting".

3. What are you going to use the information for?

"I am trying to create a software program that may solve these two tasks".

3.3 Methodology

The information need descriptions have been subjected to an inductive, qualitative content analysis (Zhang & Wildemuth, 2009). The starting point of the coding was the three questions introduced in the section above. The three questions were transformed into the following three coding categories: Topic (what are you going to find information about?), Domain (why are you interested in this information?), and Purpose (what are you going to use the information for?). In the topic category, the topic of the information need was listed, e.g., Amnesty International, cycling sport, wedding entertainments, or face detection and face recognition, as in the case of S1_N11 presented above. The Domain category classified the underlying reason for the information need, e.g., whether the information need was related to work, study, or of personal interest to the participant. Example S1_N11 was coded as related to the participant's personal interest. The Purpose category identified what the information was to be used for, e.g., write essay, hobby activity (leisure), making personal decision, or recreational purposes. We coded S1_N11 to be a hobby/leisure activity. We let the purpose sub-categories reveal themselves instead of being forced into categories. In order to remain loyal to the information need descriptions they were read literally in contrast to interpretive reading. However, coding cannot be neutral, and was not in our case either. In applying the devised coding system, which also included whether the information need was multi-faceted or not, assumptions was made about, in particular, the purpose category. Examples are given below. In practise, the coding and analysis were a result of joint work of the authors and took place through six stages following the instructions on thematic analysis by Braun and Clark (2006): (1) familiarizing with the data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report (i.e., the findings presented below).

4. Findings

The 87 information needs were coded according to three categories: the topic, the domain, and the purpose for which the participants intended to use the information.

4.1 Topics

The topics that our participants were interested in differed to a very large degree. We have not categorized topics, but when presenting examples of different information needs belonging to different domains and serving different purposes, we show some of the variety of topics in our sample.

4.2 Domains

We identified three domains in the study: work, studies, and personal interest.

Work: a small number (n=5) of the participants stated that the information they needed were directly to be used in a work situation. We believe the small number reflects the participant in the three studies, which for a large part consisted of students and pupils. Four out of the five participants describing work-related information needs were teachers at the boarding school.

Studies: 15 of the information needs were to be used in a study setting of which nine came from Set 1.

Personal interest: the remaining 67 information needs belonged to the personal interest domain. As we shall see these differ a lot with respect to topicality as well as intended purpose.

4.3 Purposes

In all, we found ten different types of purposes. Three of these belong to a hierarchy of decision making. There is also a potential overlap between some of the other purpose types, which we shall discuss with concrete examples below. We find examples of physiological, affective as well as cognitive purpose types in our data, in fact some of the purposes probably belong to more than one of these categories; to plan a holiday, e.g., has a cognitive dimension (compare prices and travelling schedules) as well as an affective dimension (the experience imagined by the searcher). We shall return to the discussion below. The purpose types are described in Table 2.

Table 2 purpose types

Purpose type	Description	Frequency
Decision	To decide between two or more alternatives	2
Personal decision	To make a decision influencing your personal life	3
Personal decision (life changing)	To make a decision changing your life	4
Inspiration	Find information presenting an idea/thing/concept similar to something you want to achieve	3
Leisure/hobby activity	To find information supporting you in hobby/leisure activities	18
Obtain knowledge	To learn something new about a phenomenon (idea/thing/concept)	26
Plan holiday	To plan a holiday trip	4
Prepare shopping	To compare prices, quality etc. for purchasing something	2
Recreational	To let time pass by	13
Write assignment	To write an assignment, report or similar	12

4.4 Purpose – Domain relationships

Table 3 contains an overview of the distribution of purpose types in the different domains. As shown there is a strong correlation between purpose types and domains.

Table 3 Distribution of purpose types and domains

Purpose / Domain	Work	Studies	Personal interest
Decision		1	1
Personal decision			3

Personal decision (life changing)			4
Inspiration	1		2
Leisure/hobby			18
Obtain knowledge	4	2	20
Plan holiday			4
Prepare shopping			2
Recreational			13
Write assignment		12	

A majority of the purpose types are only present in the personal interest domain of our study. For some purpose types, such as Leisure/hobby and Plan holiday, this is not surprising, but for others it may be due to coincidences of the Personal interest domain in our material. The Recreational purpose type represents a particular challenge in categorizing the material and will be discussed more thoroughly below. We shall present some examples of information needs to illustrate the different domains and purpose types.

4.5 Information need examples

We start by examining different types of *decisions* (purpose). In our sample, we have two information needs which have been categorized as decisions. In Set 2 need 10 (S2_N10) the participant describes her information need as being about “mobile persuasion”, which is a topic she states she is “reflecting and contemplating” to choose to write (hence categorized as decision) a school assignment on (i.e. the Studies domain). Information need S3_N1 stems from a participant who wants to compare different blog solutions in order to decide which to use to write a blog from her holiday (domain: Personal interest; purpose: Decision). We considered none of these decisions to have a big impact in the participants’ personal life. This is in contrast with S1_N20, in which the participant states that she needs information to help her decide on what contraceptives to use, thus being categorized as being of Personal decision purpose type. We consider the information needs S1_N14 and S2_N15 as even more personal, and ‘life changing’. Both participants wanted to find information helping them to select a career as “life coach” and pursuing a master degree in health sciences, respectively. We admit that differentiating between the purpose types *personal decision* and *personal decision (life changing)* can be difficult, in our categorization the degree of irreversibility of consequences was important. It is easier to switch contraception method than career.

The purpose *inspiration* was identified in three cases, two belonging to the personal interest domain and one that was work-related. In S2_N17 the participant states that she looks for “wedding entertainment”. She explains that for her sister’s wedding she and her brother plan to come up with some kind of entertainment. Now she wants to search for information that will give her “ideas and hints” on what kind of entertainment will be fun and that her sister will enjoy. The work-related Inspiration need (S3_N6) was specified by the participant as finding two different musical arrangements which she wanted to use as “inspiration for arranging music with her pupils”.

We have several information needs that are categorized as supporting the participants’ *leisure/hobby*, which we have also categorized as being in the Personal interest domain. In Set 3 three participants have expressed needs related to their favourite football teams (S3_N2; S3_N3; and S3_N14). We were uncertain whether to categorize the purpose as *obtain knowledge* or *leisure/hobby*, the difference being the emotional utterances from the football fans. For example,

S3_N14 stated that “to be a fan of Chelsea means so much to me”. Another example of a participant having a Leisure/hobby information need is S1_N15 who is looking for information about sting rays, stating that “when I get tired of having a fresh water aquarium, one with salt water is the natural step forward. Sting rays are very interesting and not often found in private aquariums”.

To *obtain knowledge* is the only purpose found in all three domains in our material. It may be argued that this is a super-purpose to which all the other purposes belong, but we have limited these to include purposes where the descriptions reflect a cognitive more than an emotional need. An example is participant S2_N11, who looks for information about the author Ole Lund Kirkegaard because she wants to “obtain more knowledge about the author, how many books he has published, what he has published and some biographical information”. This, the participant claims, is for personal use, and therefore categorized as belonging to the Personal interest domain. S1_N10, on the other hand, expresses the need to obtain knowledge related to his work. He wants to find information on “non-disclosure agreements”, in order to understand “how legally binding they are”. An example of a Studies domain related Obtain knowledge need is S3_N28, where the participant wants to know more about the consequences of the 9/11 terror attack to support him in his social science studies.

In all, we categorized 13 information needs as *recreational*. By this we mean those needs that we interpreted as serving the purpose of letting time pass or as a moment of entertainment. Although these 13 information needs are categorized as belonging to the Personal interest domain, we believe this kind of need often also appear in work as well as study situations. Many of the Recreational needs are motivated by participants being curious about the topic, without stating any further need for the information. The participant stating S2_N12 wonders how it is possible to become a zombie without being bit. She explains she watches a TV-series where this happened and that she has not figured out how it happened. She further states that this is to “satisfy my burning curiosity”. Another participant, S1_N9, is interested in finding information about aerodynamics and flying. “Why is it possible to fly upside-down?”, he asks, stating that he will use the information to satisfy “personal curiosity”. The participant with the information need, S3_N9, says that she wants to find information about rainbows to “learn something fun”.

4.6 Facets of information needs

Most of the information needs, 60 out of 87, were multi-facetted. S1_N1, e.g., is formulated as finding out about “Amnesty International’s organizational structure in the US and the effect of social capital in the organization”. In addition, there were needs that we coded as non-facetted, being loyal to the participants’ descriptions, which in reality were multi-facetted. S1_N16 is formulated simply as “residence”, the participant explaining that she has nowhere to live and the purpose of the need being “to find somewhere to live ASAP”. Facets such as location and price are most probably part of this need, even if not described by the participant.

4.7 Other issues

Topicality of information needs is often indicative of the domain and purpose. In our sample we have, however, found examples of information needs that are topically similar, but do not belong to the same domain and serve different purposes. In S1_N5 the participant wants to find information on “self-realization and the good life”, in S2_N15 the topic is “life coaching”. The first need belongs to the Study domain and the participant’s purpose is to write an assignment on the topic, whereas the latter need stems from a participant who wants to become a life coach, as described above categorized as belonging to the personal interest domain and serving a Personal decision (life changing) purpose.

Our findings show a variety of information needs, representing very different contexts, which can be expressed by the combination of topicality, domain and purpose.

The majority of the information needs in our sample belong to the personal interest domain. We do not know whether this is coincidental or if it reflects any 'general distribution' of information needs. If we were to compare this to pre-web-ages, we are, however, convinced that there are far more personal interest-information needs that lead to the use of digital information systems now, than then. The fact that so many of the needs in our sample derived from the participants' personal interest domain, supports Savolainen in his call for studies on everyday life information seeking. In his famous paper, he argues that everyday life information seeking studies on for example health care and hobbies have been overshadowed by studies of job-related information needs (Savolainen, 1995, p. 259).

It must be noted that the three data sets in our sample are not representative of the general population; in particular, young people are overrepresented. In addition, very many of the participants are students and pupils, which could have resulted in a large number of information needs from the study domain. This, however, is not the case, as there are relatively few study domain information needs in our sample. We have, however, not aimed at representativity, but wanted to analyse dimensions and characteristics of real information needs.

We identified ten different purpose types. Following Wilson (1981) the individual purposes can be characterised as physiological, affective or cognitive. We also find examples of purposes that are a mix of cognitive and affective. An interesting purpose that we identified was the recreational needs, i.e., information needs that served to entertain the participant. These we consider belonging to Wilson's affective needs. Although all the recreational information needs in our sample were categorized as belonging to the personal interest domain, we strongly suspect that such needs also occur in the work and studies domain. Recreational information searching can be related to procrastination, i.e., we search for information to spend time avoiding doing other tasks. Other reasons for this kind of searching outside of the personal interest domain, may be the need for relaxation during a tiresome or difficult task. A typical cognitive purpose is the writing of assignments, of which all the examples in our sample come from the studies domain. Many of the purposes are mixed, this includes to "plan holiday", as discussed above, as well as the personal decision making-categories. We find that the latter has a cognitive part, which characterises the thinking related to deciding on, e.g., what career path to select, but also an affective part related to how he/she anticipates how life will be based on the choice made. The selection of contraception and the need to find somewhere to live, both also exemplify needs that serve physiological, as well as cognitive and affective purposes.

The point of departure for the analysis relied on the three questions asked to uncover what the information needs were about. The questions concerned what was to be searched for, why this was of interest to the participants, and what the information was to be used for. Hence, the questions resemble the questions asked in reference interviews. Here we are in line with both Belkin and colleagues (Belkin et al., 1982) as well as Taylor (1968) when it comes to how to deduce information about information needs. Belkin, Oddy and Brooks aim at developing a dialogue-based IR system that can help overcoming the ASK of the user. Taylor refers to this as the question-negotiation process, describing how librarians and information specialists commonly use five 'filters' to sort out what a user's information need is about. The five filters are usually addressed in the following order: (1) determination of subject; (2) objective and motivation; (3) personal characteristics of the inquirer; (4)

relationship of inquiry description to file organization; and (5) anticipated or acceptable answers (Taylor, 1968, p. 183). The first two filters correspond to our three questions reflecting topic, domain, and purpose. The remaining three filters are not relevant to us in the uncovering of information need. Taylor puts it as follows: “However, the five filters discussed above are neither absolute nor fixed”. and continues by saying that “[e]ach filter, however, requires data, analysis, and testing. They could be, for example, further broken down, if it appears fruitful to do so, so that the more important elements could be better understood and utilized by information specialists in the future” (Taylor, 1968, p. 191). This is exactly what we have done. The breaking down has resulted in the deeper insight into this sample of information needs by revealing the details of topic, domain, and purpose depicted in Table 4.

Table 4 Details of topic, domain, and purpose of information needs

Topic	Domain	Purpose
<p>Examples of topics not already mentioned:</p> <p>kayak, road trip in Italy, dementia, Alzheimer and light, Peronism, amigurumi, fish’n chips, open libraries, silver, flight & hotel London, open a web shop, genealogy, floorball and rules, driving license in USA, teenage boys’ brains, indigo children, how fast hair grows, Slipknot, rose growing, sabbatical, Stalin World War 1, Christmas presents</p>	<p>Work</p> <p>Studies</p> <p>Personal interest</p>	<p>Decision</p> <p>Personal decision</p> <p>Personal decision (life changing)</p> <p>Inspiration</p> <p>Leisure/hobby</p> <p>Obtain knowledge</p> <p>Plan holiday</p> <p>Prepare shopping</p> <p>Recreational</p> <p>Write assignment</p>

The topics of the information needs vary, and the essence of the topic crystallises when seen in the light of the domain and purpose. That is, the information about domain and purpose adds significantly to the understanding of the information need in terms of specification.

As mentioned, most of the information needs are at the topical level expressed as multi-faceted (n=60), though 27 information needs were formulated as non-faceted. As for the latter, this can be viewed as an expression of the so-called Label Effect (Ingwersen, 2000), signifying that users, even with well-defined knowledge of their information gap, tend to express their initial request for information by means of very few terms or single concepts. In our sample, the distribution of non-faceted information needs at the topic levels differs among the three data sets, with for example 18 information needs being formulated as non-faceted in Set 3. This calls for further studies of why people formulate their initial information needs as they do. No doubt, the challenge lies in the unexpressed details of the information need given the objective of satisfying information needs as addressed by Belkin, Oddy and Brooks (1982).

The topic descriptions often hint what is to be searched for, but do not always provide the complete picture of the information need. Here the domain and purpose add to the understanding of the information need in terms of specifying what the information need is about. Therefore, Table 4, with the outline of domain and purpose, can serve as a framework and source of inspiration for the design and tailoring of simulated work task situations used to replicate genuine information needs in the evaluation of information systems. Similarly, Borlund and Borgers (2018) advocate that book relevance criteria may serve as inspiration for the tailoring of such situations. In a recent meta-evaluation study on the use of assigned search tasks (Borlund, 2016), the tailoring of the simulated work task situations to fit the participants was identified as a major challenge in the analysed studies. In brief, the requirements with respect to tailoring entail the description of a situation that:

- 1) the participants can relate to and identify themselves with;
- 2) the participants find topically interesting and/or of relevance to them; and
- 3) provides enough context for the test participants to be able to understand and apply the situation (Borlund, 2016, p. 396).

Though it sounds very easy, it is quite difficult to create realistic simulated work task situations at a meta-level that allows for the participants' individual adaption. Thus, Table 4 may become handy as a source of inspiration for similar user groups. The range of topics informs us of the interests of this sample of participants, and the domain and purposes of the context and motivation of use of the topics in question. In addition to outlining domains and use purposes, Table 4 also shows how simulated work task situations (which are not limited to depict "work"-related situations only) can benefit from and reflect seasonal-related activities, e.g., planning a holiday, or prepare shopping of Christmas presents. Future studies of information needs of different groups of users may result in sub-domains detailing the domains of work, study, and personal interest even further, just as additional purposes may be added.

In our attempt to understand better the concept of information need, we are interested in ways of explaining and operationalizing information needs with respect to types of information needs. In the section on related work, we highlighted the information need types by Ingwersen (2000) as examples of relatively concrete types of information needs by referring to the general type of information looked for. We approach this differently, by viewing context in the form of domain as the overall type of information need. Hence, we are concerned with work-related information needs, study-related information needs, and personal interest-related information needs. We further apply the category of purpose to imply motivation of the information need, emphasizing that purposes may be affective, cognitive or physical. The actual topic asked for is less important, but in contrast to Ingwersen, who views the information needs from a search perspective, we bring in context and motivation (domain and purpose), and view the information needs from the use and user perspective which adds substance to the content of the information need.

6. Summary and future studies

The motivation for the reported study is that the concept of an information need is still vague (Savolainen, 1995). With this study we wanted to obtain a deeper understanding and insight of what constitute information needs. Based on participants' descriptions of everyday life information needs we analysed a sample 87 genuine information needs. The information needs were coded according to the categories of Topic (the topic to be searched), Domain (the underlying context of the searching) and Purpose (the motivation for the searching). Obviously, when dealing with information needs the topics vary, and though often presented as single facets – taking the form of label effects (Ingwersen, 2000) – most of the information needs were multi-faceted (n=60). The nuances and

depths of the information needs are best understood in the light of the domain and purpose, because they add insight about the context of searching and the motivation for searching. Our sample revealed how the domain can be further characterised according to work, studies, or personal interest of the participants, and furthermore characterised in terms of ten different purposes for searching. Future studies of information needs of different user groups may result in sub-domains detailing the domains of work, study, and personal interest even further, just as additional purposes may be added. In the case of our sample, one may argue that since the genuine information needs were described in advance, the information needs are not that spontaneous. They are, however, still genuine as being formulated by the participants and being of relevance and interest to the participants. However, it calls for a comparative study of the characteristics of spontaneous versus non-spontaneous formulated information needs. Another aspect to address in future studies is the consciousness of information needs. We suggest taking the issue of conscious information needs, or rather unconscious information needs, a step further. With the World Wide Web, tablets and smart phones our information behaviour changes and results in new 'types' of information needs, for example, when switching off the smart phone alarm clock in the morning and out of habit one checks the weather and email inbox. These unconscious, habit-like information needs also need to be studied in order to clarify their characteristics. To sum up, there is a need for information on information needs.

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