

## **Hindrances as Learning Tools When Seeking Information: Sense-Making Methodology and System Improvement**

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### **Abstract**

Large complex information systems require constant attention to, and improvement in, satisfying user needs when users cannot find required information. It concerns system developers how they can produce such systems and find ways to overcome hindrances to information finding. This paper discusses the concept of the hindrance based on Dervin's (1983) Sense-Making methodology. An appraisal of past research demonstrates the shift library and information systems research has had from a system to user centred focus. An explanation of Dervin's methodology is then presented, in particular her information seeking concept of situation-gap-uses. This concept demonstrates how a user negotiates an information space, such as a library catalogue, to make sense of their information situation and either complete it successfully or move to another way of finding information. Some examples of Dervin's methodology are used as this author's previous research work illustrates how hindrances can inform designers of ways of improving systems or learning from mistakes in creating new systems.

### **Introduction**

Library catalogues, web sites or information systems are judged on their usefulness of finding accurate information quickly. The challenge to have information systems working optimally remains a priority in a system designer's mind; yet failures of information systems and library catalogues is widely reported. Systems designers often undertake user studies in their design requirements gathering because the user is traditionally the focus of why the system is being built. Information systems users often determine the acceptance of the system. Kim and Kankanhalli (2009) restated a common problem in system acceptance; there are gaps in the understanding of the psychological and decision making mechanisms underlying resistance to a new system. There is user resistance in terms of the interaction between characteristics, especially the type of information the system has and the social context of its use (Markus, 1983). Therefore, system designers cannot disregard the user's motivations for seeking information, the context of the seeking or the characteristics of the information sought.

The purpose of this essay is to examine overcoming and minimising system rejection and resistance in the information seeking aspect of system development. This is done by focusing on what hinders users from finding needed information. First, the evolutionary context of the shift to user studies in library and information sciences will be discussed. This will be followed by a discussion of Dervin's Sense-Making Methodology, in particular how hindrances to information seeking are managed and what they can tell a designer about user interactions. The usefulness of this method for system design is illustrated by examples from a Sense-Making study. This paper is motivated by an interest in how library and information system's information seeking strategies can determine system success. It also suggests one way of achieving the goal of minimising user resistance to systems by employing Devin's methodology on information design and information system design projects.

## **Library Science's Shift to Understanding User Information Seeking Behaviour**

Information seeking involves interactions with often complex systems such as library catalogues which hold much information and different ways to obtain it. The ideal goal of a user centred library was described by Butler (1933) as the importance of having an effective understanding of the user's motives and cognitive abilities when seeking information. Researchers in library science, such as Zweizig (1976), supported such assertions that not only was the user not the centre of many systems being developed, which needed redressing, but that finding out user needs involved more complex research methods to understand user information seeking motives and behaviours.

As user studies developed, researchers such as Hjørland (1997) argued that quantitative statistically focused information seeking studies did not take into account the user's role in knowledge creation and ignored user needs and contexts. Information seeking behaviour has a purpose, a need to satisfy a goal, but also to study the micro-level behaviour of the user and all the interactions they perform (Wilson, 2000). Information systems, described by Wasson (2006), are interoperable integrated elements with specific bounded capabilities a user will use to obtain a specific outcome and obtain a probability of success of finding information. This implies a divide between the system and user with the user constrained to certain operations to obtain information. Systems and their design exert powerful influences over users in the informing process, so it is always asked how systems may be improved (Williamson, 1998). The user's negotiation with the system is crucial to understand before system development takes place.

In the seventies library and information science changed with more research taking into account user information seeking behaviours. The emphasis in research shifted from investigating information systems characteristics for information finding to the user as the one driving the information seeking process (Case, 2007). Dervin (1977) urged librarians to stop measuring library activities and user demographics, instead urging them to seek to understand the situations that led people to seek information. It is at this point her Sense-Making Methodology began which influenced researchers to research the user's information seeking behaviours. Information seeking processes are now complex requiring more thought and analysis (Marchionini, 1995). Seeking to reduce uncertainty and eliminate hindrances in systems design has become a preoccupation in commercial and academic systems use.

Researchers have used many types of research methods to identify and eliminate hindrances in systems to finding information efficiently with emphasis on user behaviour. The hindrance, or barrier, is an element of a system that stops the information seeker from progressing further. One study by Hartley and Booth (2006) identified hindrances and suggested how to improve them. They identified specific hindrances in the library catalogue they studied which prevented users from finding needed library information. Their finding that the structure and design of the catalogue's tools, such as on-screen directions of what to click to get to the desired point, were hindrances that needed immediate attention as they constrained the user from finding needed information. It is argued that information seekers do bring their own meanings to the system, hence they frame, categorise and contextualise in their own way the data that is retrieved (Wei Choo, Detlor & Turnbull, 2000). While this is true, studies such as Hartley and Booth (2008) and Dervin's (1983) can improve systems by examining what stops the user from using them efficiently.

## **Bridging Gaps to Overcoming Hindrances**

The purpose of Sense-Making is to find out what gap is bridge when a hindrance is encountered. McCracken's (1988) view of Sense-Making gives a broad overview of its purpose; Sense-Making reveals, through the interview of users, what people think and do in an information seeking situation. Dervin, Harlock, Atwood & Garzona (1980) theorised that users attempt to make sense of their world by seeking information to navigate a course of action and obtain answers to move through the time and space of the system. In Dervin's (1983) view the user makes sense of information because there is a constant need to guide them with information at each step of the process to move through the steps to reach the information goal. Until they obtain this information a gap will be present. What is the nature of each hindrance that is stopping the user from progressing? It is in the negotiation of this gap, how it is overcome, what stops it from being overcome and what strategies of information seeking are employed where library and information systems designers can learn much.

In her methods data are collected primarily by interviews and observations of users. Dervin wrote Sense-Making methods (Dervin, 1983, 1992), a part of which is described here, to illustrate the importance of finding user hindrances in information seeking. The basis of her theoretical model (Dervin, 1983) has three parts:

1. A situation of information seeking – the need and the time and space context where this information need is being formed, for example, needing a library book
2. The gap to be bridged – The questions the user has to find the information and construct the sense of where to find it including what is blocking the user from finding information, for example, in a library the journal article will be an online document or a hard copy
3. Uses – The information seeker will evaluate strategies employed and use them to move forward, called helps, or be constrained and seek other ways of finding information, hindrances or hurts, for example, cannot find the library book on the catalogue hinders their obtaining the book so they go elsewhere to look, such as the internet

This model serves as one way to find out what hinders users from finding information. Sense-Making using this model suggests that at any moment in time or space the user will construct what they can about the system and the information in order to move forward and bridge a knowledge gap (Dervin, 1984). The problem with this approach is the reality of the information success or failure finding experience is constructed by the individual. Therefore, what an individual sees as a hindrance is subjective and may be outside the control of the designer. Nevertheless, using this approach is useful for finding out the exact reasons why information seeking users do not move on.

## **Making Sense of Information: Examples of Overcoming Hindrances**

To illustrate Dervin's Sense-Making model, some examples of practice are discussed. The study undertaken by the author (Nycyk, 2001) was interested in how Sense-Making could

contribute to improving system design by examining what constrained users from finding information. The system in the study was the internet and what information was sought by users. A finding was that it was not always the technical features of the information source that constrained the user from moving towards their information goal. It could be anything from the lack of English language on the site, confusing rules about a site's use, people posting in virtual communities vague or inaccurate answers to questions or a distrust of a site's security measures (Nycyk, 2001). In these study examples informant names are disguised. These three examples of information seeking, encountering hindrances and how the user bridged the gaps the hindrances caused will show the types of hindrances that constrain users from bridging information gaps. In turn they show if the user accepts the system or abandons the systems; in this micro detail lies reasons designers can use to improve systems.

Though English is taken for granted as the world's primary language on the internet, making sites in languages other than English constrains English speaking information users. The internet now has many language tools and automatic site translation software on Google to remedy this. The journey of Richard, the first informant reported here, was to find information on working at an overseas airport. He knew which country he wanted to work in, thus the situation was clear but the gap could not be overcome because of the hindrance of the site's Dutch language:

One other site I was interested in getting some communication with was the Civil Aviation Authority of the Netherlands because I heard they were looking to recruit Air Traffic Controllers. So I had an idea to write to them and see if I was within the age group of their recruiting process, but the web site was totally in Dutch, they didn't have an English version. For a country that most of its people do speak dual languages I would have expected something a little better than that or an English or cut down version. But to be totally in Dutch was disconcerting.

Not having the English language or translation was a system fault and showed Williamson's (1998) point that systems exert power over their users in information seeking by constraining choices. Though it is not obvious if the intent of the Dutch Civil Aviation Authority was to constrain users from other countries, or an oversight on the designer's part not to include English, the fact remained that this was an obvious hindrance to information finding that prevented Richard from moving forward with his information goal. Therefore, he did not bridge any gap and abandoned using the system.

By contrast, Richard had had a successful bridging of an information gap with another system when he wanted to find help for his Microsoft certification exams. He turned to newsgroups as the way to bridge the gap because he valued the opinions of others who had similar experiences with the examination.

The fact that I was able to see what other people had done and said about the exams, there were postings where people had tried certain exams and said look out for this one. There were also incorrect postings too which were handy where people would post an answer that was incorrect to a question then there would be some argument to that from different people. I thought was interesting because it kept you on your toes, you couldn't accept that everything you read on the Internet was gospel. I found it a great help to know what the exam format was going to look like, what some of the questions asked previously were like, were they tend to put their emphasis is very handy.

Making sense of information often requires turning to alternative sources, which Richard did, because of the chaos of the spread of information on the internet. Whilst a library catalogue is obviously a more ordered system, Richard's example suggests people move past their hindrances by turning to other systems. His method brought order to the chaos of finding unique information and showed Dervin's (2007) suggestion of making sense of information; he moved through the spaces of newsgroups which had the power to overcome the hindrances of formal sites which did not have answers to exam questions. Library catalogues now include access to answering queries to overcome hindrances such as The University of Queensland's Ask a Librarian feature (The University of Queensland Library, 2010) which helps the user negotiate the system by directly contacting the librarians online.

A third example shows an example of the type of hindrances systems designers where the user moves through the time and space of a library catalogue but ultimately is constrained by the system's feature. This causes conflict in the mind of the user and shows how if this occurs systems can be, over time, abandoned if the constraints prove too much of a hindrance. In this situation, Cal, another study informant, needs articles from a library and sought help from others, yet did not trust the system with his personal details. This interview interaction is atypical of the type of detail a designer using Sense-Making Methodology may obtain:

Interviewer: Did you eventually obtain a way around getting these articles? Was there any particular help that you sought to get these, whether it be from the computer, well basically let me rephrase the question; the situation again is you were up against, trying to get these newspaper articles which you were constrained from getting because of the log in, ok, and you felt that way about it, you felt angry about it. Did you seek any help in any form at all to get to that particular, those articles?

Informant: Just from the, I may have been in a position to where I was in the catalogue in the library and you click on the links that were in the catalogue which takes you into the web site. But then you get assistance from one of the librarians who gives you the access into that web site and then you get to the point where you either have to, I think it was, you had to pay for the article. And because I did not know what was in the article until I actually saw it I did not want to pay for it and I think I, I can't remember whether you had to put any personal details down or not, or you had to register for, you, I can't remember exactly what.

Interviewer: When you found that you had to register, that you had to give your personal details how did you feel overall the fact that you had to impart more information about yourself to find the information that you wanted, you had to give something to get what you were after?

Informant: I chose not to in the end for security and that the Internet is a fairly insecure in terms of, putting, supplying personal details, because you never know, you don't know where that information is going or who is going to be using it or accessing it so I chose not to register with this organisation and sought other ways around it.

In this moment Cal is making sense as best he can in the time-space construct to move forward (Dervin, 1984). His gap was large in his view and he felt the system was inflexible and distrusted where his information might go. In light of security issues well documented in the media, website and system designers do pay meticulous attention to securing their

systems. Nevertheless, Cal's journey was not a success and he made sense of the situation by choosing not to overcome the hindrance he experienced.

### **Conclusion and Implications for System Designers**

Hindrances in systems are learning tools for designers and in discovering what they are, and addressing them, user resistance can be reduced or eliminated. Dervin's Sense-Making Methodology is one approach to user studies that can assist designers in uncovering the constraints users' experience. In the case of complex systems with massive data, such as the library catalogue, these hindrances are vital to overcome. This paper acknowledges that organisations are under budget and resource pressures to improve their systems. What stops the information seeker from going forward must be considered and noted for future improvement of a system. Dervin's work has contributed immensely to library and information science as a methodology for understanding the user. It is up to research practitioners, system designers and the library community to pay attention to the user's comments in order to lay claims to their system being 'user friendly' and fulfilling the goals of finding accurate information quickly.

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