

Chapter 3

A focus on usings

Introduction

In the past twenty-five years or so, we have seen what some have referred to as a user-centered revolution.¹ This revolution is manifest in the policy, theory, methodology and practice of a range of disciplines and fields of study. The terminologies used to describe a focus on the beneficiaries or recipients of services, products, systems or professional actions vary. Engineers design end-user technologies. Businesses, organizations and institutions claim to be client centered, customer oriented or market driven. The education field is learner centered.

Various stakeholders in the development of the Internet have developed versions of the user centered revolution but overall we can see a shift from technology to people, from product to service, from outcome to process and so on. The common ground is a focus on people—user oriented, people centered, user based, human centered, user responsive and so on. The user focus is an amalgam of methods, approaches and techniques that provide professions and disciplines with ways to define, understand, explain, measure and ultimately serve, the needs of people. This may involve the design and development of new practices, systems, services, resources, products and technologies. Central to our focus on the Internet is that the user orientation means that the intuitions of designers and engineers and the levels and scale of technical innovation are no longer sufficient for prescribing technological development agendas. Technological innovation is no

longer being driven by the potential of technology or the research agendas of technicians and engineers but by the needs that people have for using these technologies in their daily professional and personal lives.

It is difficult to know how the contemporary focus on people (users, audiences) across various disciplines has been manifest in the evolution, development and diffusion of the Internet. In recent years the Internet has become a broad-based, information and communication infrastructure. We may wonder, could this have occurred in the absence of a focus on people by the stakeholders of Internet development? Equally, it is difficult to know just how much of the agenda for change and innovation has been specifically driven by those who espouse and practice a user orientation. Nevertheless, the Internet as it is defined today, is not so much the internetworking of computers as the internetworking of people and services that address the needs of people. Chapter 1 of this book, which described and expounded the evolution and end-user provenance of the Internet, introduced us to the proposition that we can best understand the Internet by understanding the people who use it. In Chapter 2 we introduced the theories that elaborate the role that people collectively and individually play in technology diffusion. What follows from this introduction is the proposition that we should view Internet development in terms of the ongoing or future needs and uses of people in various contexts.

Is this a reasonable proposition? The notion that operational effectiveness should override design efficiency as the driving force for innovation² would certainly have been novel (some might say impossible) in the early days of the ARPA experiments, for example. When computers were the size of large rooms and enormously expensive it would have been difficult to imagine the needs of an individual user as the design imperative. The technology was primitive and inflexible. It could be claimed also that as the communities of users of the fledgling Internet evolved from the middle up, there was also a camaraderie of shared experience that created an elite user type that rejected the idea of making the Internet easy to use on the basis that newbie users should be required to undergo a rite of passage in the form of system learning that all dedicated users of the new infrastructure had undergone before them.³

In the early 1990s the huge increase in novice and unaffiliated Internet users, together with an increasingly flexible technology swept aside these sentiments and constraints. Broader acceptance of the user

oriented perspective coincided with technology developing to a level where user oriented ways of thinking and designing were feasible and practical. As Donald Norman states in his article entitled “Toward Human-Centered Design,” by the mid 1990s, we found that we could:

...make machines that fit human needs, independent of mechanical constraints.⁴

Contemporary Internet technologies could, therefore, be more responsive to the demands of people wanting to use the network because our technical knowledge had increased but broader acceptance of the user oriented paradigm also depended on an increase in the numbers and types of Internet users.

Researchers must develop techniques for collecting data that facilitate deeper understandings of the characteristics of system or service users but they must also be willing to accept the value of an accumulating volume of research into the behaviors and perceptions of system users. In late 1992, the author was astounded, for example, to find that the communication and computer engineers responsible for the development of the Australian Academic and Research Network had not studied the users of this network in any way prior to, or during the development of this national infrastructure. While it might be argued that researchers had few users that they could study at this time (there were just a lot of non users and potential users of the network) there was, in fact, an abundance of research about people using electronic information environments that developers could have referred to. For example, at this time, researchers were able to characterize the users of developing networked systems as highly motivated by work outcomes as apposed to design elegance or data structure. Research had also found that people wanted answers not pointers; in other words, document delivery not information retrieval. It was also known that users wanted to minimize the cognitive load of information searching in an electronic environment and to maximize their enjoyment of the process.⁵ Clearly, this research had arisen from, and been informed by, the user-oriented paradigm.

Research through the 1990s has continued to have a user-oriented focus and data from this work and what it tells us about the user's view of the Internet will be analyzed in detail in the next chapter of this book. Before doing so, it is important to note the broad acceptance of the user oriented perspective across a range of disciplines and profes-

sional fields that have a significant interest in the development and use of the Internet. For this reason, I would like to turn to a description of how the focus on users and people has developed in the fields of business, education, cognitive engineering and information science. This will lead us to a refinement of the user-oriented paradigm based on science studies and information science. The result is an analytical lens for teasing through data collected by Internet researchers (described in Chapter 4) and converting this data to theoretical constructions that are *the users' view of the Internet* (Chapter 5).

Client-Centered Marketing and Participatory Management

In the world of business, organizations and institutions (both private and public) are accommodating new ways of thinking about management and marketing. This new paradigm has been variously referred to as person centered or participatory management; and customer-centered, market-driven, or client-centered marketing. The genesis of this paradigm is difficult to determine. Certainly, it has a theoretical foundation but in the hard-nosed, practical world of business, new marketing and leadership principles can also emerge from successful or exemplary cases that demonstrate new techniques for growing market share, business growth or effective management. Technology and innovation are also key factors. A growing focus on customers and individual clients can certainly be traced to the pressure placed on businesses by savvy consumers. Customers know that technology and innovation make customization and individual attention to their needs possible. This new dynamic in the market has prompted a shift for many organizations away from product-centered operations towards more service centered business practice.

Traditionally, marketing has been based on a simple transaction paradigm. The principles of this paradigm are product, price, place and promotion. A company develops and produces a product, identifies customers for the product and then identifies techniques for convincing customers to buy the product. The company makes customers aware of the product through mass marketing based on advertising and promotion. The customers are told what to buy and the marketing strategies are based on promoting the company's image and credibility. With transaction marketing the focus is on achieving sale of the product by selling the products' features. To some extent, customer service is an afterthought. The business that operates under this

paradigm has a limited commitment to the customer. The business makes contact with the customer only at the point of sale and quality is primarily the concern of the production unit, not the sales and marketing department.

In contrast to the transaction paradigm, customer focused marketing is based on developing a relationship with the individuals that the organization serves. This may appear impossible or at best, from a mass-market perspective, far from cost-effective. It is, however, possible, with the use of interactive databases, for a business to target its customers one at a time and to set the goal of satisfying the individual needs of each customer in terms of how these individuals define their own requirements. Collecting information from customers is obviously of great importance to this paradigm. This is sometimes referred to as developing a learning relationship with the customers and the information gathered is critical to the business that operates under this paradigm because the customer or client is not seen simply as a series of transactions but rather as a component of the business—a member of the production team, a critical factor in driving the business forward. The business is, in this way, market driven as apposed to marketing driven.

The following table taken from Kathleen Allen's 1999 work *Growing and Managing an Entrepreneurial Business*⁶ helps to distinguish the new marketing paradigm from traditional marketing strategy.

Table 3.1: The Changing Marketing Paradigm

The Traditional Marketing Strategy	The New Approach To Marketing for the Twenty-First Century
Market driven	Marketing driven
Producer capacity orientation	Customer demand orientation
Market share focus	Market creation focus
Mass marketing techniques	One-to-one relationship marketing
Focus on increasing customers to increase sales volume	Focus on seeking and retaining customers as stakeholders

Source: Allen (1999), p. 270.

Business leadership and management are undergoing a similar shift in emphasis. This shift emerged from efforts related to quality

improvement models for business and was first described as participatory management and later person-centered leadership.⁷

Participatory management is a management strategy that has captured the imagination of large and small companies. Its origins can be traced to the employee involvement movement that took off in Japan and parts of Europe and the United States between 1920 and 1950.⁸ During the 1980s employee involvement was recognized as an important part of a comprehensive management model called Total Quality Management. Total Quality Management involves process improvement, customer relations, statistical graphing, problem solving, brainstorming, and the establishment of priorities, information sharing and departmental communication.⁹ A number of companies across the United States focused on participatory management as the key component of TQM with some notable successes. The general thrust of participatory management is to create a corporate culture or institutional environment where individual excellence can flourish.¹⁰

Among the success stories associated with participatory management there have also been some notable failures, however, and this has led to the development of person-centered leadership. Person-centered leadership acknowledges the importance of empowering workers but also repositions the worker as an individual at the center of company attention. In summary:

Management is concerned with recognizing and supporting personal and family needs, developing personal well-being, and listening carefully to individual complaints. Management proceeds person by person.¹¹

The essential feature of this new leadership model is to involve those who are doing the work in the decision making process—to use the expertise of the worker. Often this requires creative team construction and management. It also relies on a commitment to life long learning by the worker. Learning must be at the center of the corporate culture.

In short, there has been a paradigm shift in management and corporate leadership—away from mechanistic, bureaucratic, top-down organizational structures. The new management model is flatter, inclusive, and participative. Leadership acknowledges the importance of the individual worker to productivity and quality improvement in corporate and organizational culture.

Learner Centered Education

The culture of the individual has also permeated the educational sector. While businesses have been acknowledging the importance to corporate progress of the life-long learning of workers, the educational sector has been considering new models for understanding and facilitating educational processes. The trend here is referred to as learner centered education and, like the other paradigm shifts discussed in this chapter, features of this new perspective can be contrasted with a pre-existing or traditional viewpoint—in this case teacher centered learning.

With teacher centered learning, the teacher is responsible for, and makes, all decisions related to the learning environment. The teacher decides what is to be learned, how this content is to be learned and how student learning will be assessed. The curriculum is often set in predetermined, mandated packages that individual teachers are expected to follow. There are choices that the teacher can make about delivery, interpretation of content, resources and timetabling, and these decisions will be made according to their preferred teaching style, expertise and experiences. In teacher centered learning, the learner is less responsible for what they learn and less active in the learning process. Learning is linear and the educational environment has set patterns and routines.

Teacher centered learning is a commonly applied model so most readers will be familiar with its advantages and disadvantages from personal experience. These have been summarized as follows:

Advantages

- The teacher can be certain that the students are exposed to all the knowledge and concepts the teacher feels are appropriate for the targeted curricular unit.
- This method is universally recognized by students, teachers, parents, and administrators.

Disadvantages

- Not all students are homogeneous in background, knowledge, and experience; nor are they homogeneous in learning abilities in different areas or in their pace and style of learning.
- The students are generally passive recipients and do not “learn to learn.”
- Teachers usually cannot guarantee that students’ experiences will be useful once they leave the class.¹²

The disadvantages of teacher centered learning draw attention to the characteristics of an alternative approach to teaching and learning called student centered learning. Here again, the primacy of the individual is reinforced. With student centered learning, each learner is seen as an individual with a particular background, set of experiences, beliefs, educational needs, skills and abilities and learning style preferences. The teacher facilitates learning through investigation, discovery and problem solving but it is the student who is seen as responsible for his or her own learning. Some refer to this framework as authentic learning because the student determines what he or she needs to master while grappling with real world problems. There is a strong emphasis on matching learning events to individual skills, aptitudes and interests of the individual learner. The learner and the teacher are positioned as collaborators in the learning enterprise. Students learn how to learn and life long learning is the ultimate goal.

Focus in the learner is the key. In 1990, the American Psychological Association (APA) and the Mid-continent Regional Educational Laboratory (McREL) created a task force on psychology in education that resulted in the publication of 14 learner centered principles. The full text of these principles can be found online at the American Psychological Association website.¹³

Table 3.2: Learner Centered Psychological Principles

<i>Cognitive and Metacognitive Factors</i>	
1	<i>Nature of the learning process.</i> The learning of complex subject matter is most effective when it is an intentional process of constructing meaning from information and experience
2	<i>Goals of the learning process.</i> The successful learner, over time and with support and instructional guidance, can create meaningful, coherent representations of knowledge
3	<i>Construction of knowledge.</i> The successful learner can link new information with existing knowledge in meaningful ways.
4	<i>Strategic thinking.</i> The successful learner can create and use a repertoire of thinking and reasoning strategies to achieve complex learning goals.
5	<i>Thinking about thinking.</i> Higher order strategies for selecting and monitoring mental operations facilitate creative and critical thinking.
6	<i>Context of learning.</i> Learning is influenced by environmental factors, including culture, technology, and instructional practices.
<i>Motivational and Affective Factors</i>	
7	<i>Motivational and emotional influences on learning.</i> What and how much is learned is influenced by the learners motivation. Motivation to learn, in turn is influences by the individual's emotional states.
8	<i>Intrinsic motivation to learn.</i> The learner's creativity, higher order thinking, and natural curiosity all contribute to motivation to learn. Intrinsic motivation is stimulated by tasks of optimal novelty and difficulty, relevant to personal interests, and providing for personal choice and control.
9	<i>Effects of motivation on effort.</i> Acquisition of complex knowledge and skills requires extended learner effort and guided practice. Without the learner's motivation to learn, the willingness to exert this effort is unlikely without coercion.

Table 3.2: Learner Centered Psychological Principles (continued)

<i>Development and Social Factors</i>	
10	<i>Developmental influences on learning.</i> As individuals develop, there are different opportunities and constraints for learning. Learning is most effective when differential development within and across physical, intellectual, emotional, and social domains is taken into account.
11	<i>Social influences on learning.</i> Learning is influenced by social interactions, interpersonal relations, and communication with others.
<i>Individual differences</i>	
12	<i>Individual differences in learning.</i> Learners have different strategies, approaches and capabilities for learning that are a function of prior experiences and heredity.
13	<i>Learning and diversity.</i> Learning is most effective when differences in learner's linguistic, cultural and social backgrounds are taken into account.
14	<i>Standards and assessment.</i> Setting appropriately high and challenging standards and assessing the learner as well as learning progress—including diagnostic, process, and outcome assessment—are integral parts of the learning process.

Source: Bonk and Cunningham (1998), p. 29.¹⁴

The advantages and disadvantages of student centered learning are as follows:

Advantages

- Students do “learn to learn” so that they can meet the lifelong need to adapt to contemporary knowledge, challenges, and problems they will need to encounter in the future.
- Students acquire the ability to evaluate their own strengths and weaknesses, to determine their own needs, and to learn to meet those needs.

Disadvantages

- Student centered learning creates many organizational problems. To those not familiar with this type of curriculum, it looks messy and somewhat hard to manage.

- The student-centered approach can create insecurity in students, parents and faculty.¹⁵

In summary, the disadvantages of student centered learning focus primarily on the management challenges of the approach rather than on the effectiveness of the approach in terms of enhancing student learning.

This has not swayed proponents of the approach who see recent developments in technology and in particular, the World Wide Web, as a fertile context for an educational approach that will challenge the learner to make sense of new information by linking new information with old or the known with the unknown and to think creatively.¹⁶ Indeed, the student centered approach emphasizes the social plane of the individual as the origin of mental activity and growth.¹⁷ The focus is on the individual within a learning community and the World Wide Web is regarded as a learning environment that has enormous potential to extend the scale, scope and range of involvement and collaboration for the individual and endorsement of student centered learning. Indeed, the World Wide Web provides many of the tools and structures that can support student centered learning. It offers an opportunity to blend technological advances with contemporary pedagogical thinking to create, what some refer to as “learner centered technology.”¹⁸ Technology rich learning environments are a fertile context for re-evaluating the role of the teacher and the processes of learning. The expense of technology infrastructure does warrant theoretical or research underpinning rather than relying on assumptions that the learner will benefit.

The World Wide Web is also a fertile ground for adult education. The concept of life long learning is closely tied to the learner centered perspective. In adult education, learner centered approaches have been developed by theorists and writers like Malcolm Knowles¹⁹ who believed that adult learning should be based on the individual learner’s interests, abilities, needs and goals. Knowles’ approach relies on the teacher developing an empathy with the adult learner. He called the system that he developed *andragogy* “the art and science of helping adults learn.”²⁰

In summary, the paradigm that underpins educational processes and practices in the contemporary school, higher education and adult learning environments is centered on learners and learning

communities. Emerging technologies and pedagogies are therefore being analyzed and evaluated from this perspective.

User Centered Design and Cognitive Engineering

Consistent with the theme of the culture of the individual and the user centered revolution is the perception that there may be a mismatch between progress in the human domain and technological or industrial advancement. Some have expressed the concern that we may experience problems with a “culture lag” the more we fail to understand the true nature of the human adaptation to industry and innovation. It has been argued that the critical questions of this mismatch or lag in knowledge need to be answered by the human rather than the physical sciences so that we can begin to predict and control the benefits of innovation and development.²¹

Manifestations of these concerns began to appear in the work of sociological technical systems professionals who, from the 1950s, were examining the technical and social structure of work systems and identifying, for example, that various cultures have differing sociotechnical traditions. Concern for the individual has also found expression in the development of what have been called “human centered” and “work oriented” man-machine systems and the emergence of the human factors professions concerned with applying our scientific knowledge of humans to the design of man-machine interface systems. Human factors professionals apply knowledge from cognitive science, psychology, systems theory, sociology and organizational theory to the central consideration of the human in technology design and implementation.

The background to what is now known as user centered design²² can be traced back to the mid 1980s when Norman and Draper suggested that systems should be designed to account for the goals that people are trying to achieve when they use any type of system.²³ Norman actually coined the term *cognitive engineering* to describe this form of design, which he wanted to distinguish from cognitive psychology and human factors—a combination of psychology and computer science.²⁴ The main aim in cognitive engineering for Norman was the application of what we know about human thoughts and actions to the design and construction of machines.

User centered design is based fundamentally on knowing what people need to do with the machine or tool being designed. This re-

quires an understanding of the elements of the tasks to be performed and the values that may be inherent in this task. It also requires an understanding of how individuals make a translation from the psychological elements of task execution and completion with the physical tools or systems that will enable satisfactory solutions. There are two major goals.

1. To understand the fundamental principles behind human action and performance that are relevant for the development of engineering principles of design
2. To devise systems that are pleasant to use—the goal is neither efficiency nor ease nor power, although these are all to be desired, but rather systems that are pleasant, even fun: to produce.... pleasurable engagement.”²⁵

The goals of a person are expressed in terms that are relevant to that individual. For user centered design or cognitive engineering these are psychological variables. On the other hand, the mechanisms of the system are expressed in terms relative to it and these are considered the variables that constrain or define the physical parameters of design. This split between the psychological and the physical provides the construct for developing a theory of action that can guide design. The Theory of Action (proposed by Norman²⁶) defines the design process as bridging the gap between the goals of people and the physical system. This gap can be bridged by starting from either the system side or from the user side. The designer can start from the system side and bridge the gap (in this direction referred to as the *gulf of evaluation*) by designing the interface to the system in such a way that it makes a best match with the psychological needs of the user. The designer needs to know about the user’s intentions relevant to the system and the sequence of actions that the user must follow in order to achieve the task. In the other direction (referred to as the *gulf of execution*) the gap is bridged by the user’s perception of the system’s capacity to serve his or her goals and intentions. This gap can be bridged when the designer builds effective output characteristics for the system interface.

The Theory of Action identifies seven stages of user activity, which help to align user goals with physical systems—establishing the goal; forming the intention; specifying the action sequence; executing

the action; perceiving the system state; interpreting the state; and evaluating the system state with respect to the goals and intentions.

The steps to user centered design resolve fundamentally through stages in a process aimed at achieving knowledge of the characteristics of the users of a design artifact and then reflecting these characteristics and perceptions into the prototyping, developing and testing of the design. Allen provides some background to what these elements of user modeling ought to be by reviewing the models of Dillon (1994), Olson and Olson (1991) and Mahling (1994).²⁷

The Dillon model for user centered design has five steps:

1. Stakeholder identification
2. User analysis
3. Task analysis
4. Specification, and
5. Prototype²⁸

The Olson and Olson (1991) approach to user centered design is designated by a set of ten questions.

1. Analyze the goal: what is the purpose of the activity?
2. How should the activity be done, ideally?
3. What potential problems are there with doing it the way it is typically done?
4. How do current technologies or processes support this activity?
5. What are the limits to these?
6. What are the requirements for new aids?
7. How can information technology meet these requirements?
8. What costs may be incurred by new technology aids?
9. What special characteristics of the specific domain must be taken into account?
10. What are the potential differences from groups with various natures and size?²⁹

The Marling (1994) model has six steps:

1. Goal Analysis,
2. Domain/ task analysis,
3. User/ group analysis,

4. Model formation,
5. System design and implementation, and
6. Usability testing³⁰

Information Science and the User Oriented Paradigm

These three models for user centered design come from cognitive engineering and computing. Allen, on the other hand is an information scientist so he is primarily interested in the design of information systems. His model for user-centered design has five steps:

1. Needs analysis
2. Task analysis
3. Resource analysis
4. User modeling
5. Design for usability

To understand the provenance of user-centered design in information science, it is necessary to examine the user-oriented paradigm. The user-oriented paradigm is, to some extent, an amalgam of sociological, psychological³¹ and cognitive³² viewpoints that focus attention on the information user. The first explicit use of the term user oriented (for information science) appeared in a chapter of the Annual Review of Information Science and Technology (ARIST) in 1986. The authors of this chapter (Brenda Dervin and Michael Nilan) were commissioned to review the literature on information needs and uses between 1978 and 1986. The result was a seminal work that coined the term *user oriented paradigm* and explicated the various assumptions that underpin the work of information researchers and practitioners who focus on users rather than systems. From this point on, information scientists had a framework for describing a particular perspective for their work in developing systems and services that would meet the needs of information users. User perspectives enriched the discipline. Researchers described themselves as user centered or user centric. Others focused on the problem space of the user,³³ or the user's cognitive discontinuities³⁴ or uncertainties³⁵ that prompt people to interact with information systems and environments. The

perceptions of individual users of information became the centerpiece consideration for information service and system design.

As a conceptual framework, the user oriented paradigm is an alternative to the physical³⁶ or system oriented paradigm.³⁷ The system oriented paradigm was the dominant approach to research in the discipline of information science up until the late 1970's. The origins of the system oriented paradigm are generally traced back to 1953 when tests in Britain and the United States were conducted to evaluate the performance of alternative approaches to subject indexing and retrieval. These so-called Cranfield tests marked a watershed in the discipline of information science.³⁸ As a conceptual framework for the discipline, the system oriented paradigm, which emerged, is characterized by assumptions about key concepts like information, information need, information seeking, information users and information use. Research that is underpinned by the system oriented paradigm generally focuses on the extent to which an information system has been used and reports on any barriers that may prevent, or diminish satisfaction with, use of the system. When Dervin and Nilan articulated their views on the development of the user oriented paradigm in information science, they described the user oriented paradigm by contrasting its assumptions with those of the physical or system oriented paradigm.³⁹ They achieved this by comparing the paradigms under the categories of assumptions, which appear in Table 3.

Table 3.3: System Oriented and User Oriented Assumptions

System Oriented paradigm	User Oriented Paradigm
<p><i>Objective Information</i> Information has constant meaning. It is a commodity or thing. It can be transported. It reflects an absolute correspondence with reality. It will convey the same meaning to all users.</p>	<p><i>Subjective Information</i> Information does not transmit constant meaning. Information users interpret information and create sense or meaning in accordance with their unique model or image of the world</p>
<p><i>Mechanistic Passive Users</i> Users are regarded as information processing systems. Being informed or benefiting from information is assumed to result directly from document delivery with no intervening user behaviour.</p>	<p><i>Constructivist Active Users</i> The user constructs need out of situations and is actively involved in information transfer. The user undertakes activities that will induce sensemaking. The user is actively involved from the time the information arises to the point of problem resolution.</p>
<p><i>Transituationality</i> Users with similar characteristics in similar situations will react in similar ways, use information similarly and make similar decisions. The information behaviour of users is described in ways that apply across situations.</p>	<p><i>Situationality</i> An individual's responsiveness to information is governed by a range of variables that are unique to the individual and to the information problem that the user is engaging. Individuals operate from different centres at different times.</p>
<p><i>Atomistic View of Experience</i> The focus is an attention on user behaviour at the point of intersection with the information system; the moment of contact and exchange.</p>	<p><i>Wholistic View of Experience</i> A user's behaviour is studied in terms of those factors that lead to an encounter with an information system and the consequences of such an encounter. A broader view of information behaviour from the time need arises to when it no longer exists.</p>

System Oriented paradigm	User Oriented Paradigm
<p><i>External Behaviour</i> Very concrete. Contact with a system is the basic indicator of information need. Focus on what can be observed as overt behaviour.</p>	<p><i>Internal Cognitions</i> Acknowledges the premise that what is going on inside a person's mind (the individual's model of the world) will shape the way information is interpreted and used. Interested in what people think as well as what they do when they engage in information behaviour.</p>
<p><i>Chaotic Individuality</i> Focus on individual information behaviour will cause too much variation. Systems cannot accommodate individual interpretation. Individuality means chaos and prevents systematic research</p>	<p><i>Systematic Individuality</i> The complexity of individuality can be addressed in a way that is consistent with scientific investigation.</p>

Source: Bruce and Todd⁴⁰

Dervin and Nilan summed up their perception of the user oriented paradigm by noting that:

It focuses on the user... examines the system only as seen by the user... [It] asks many how questions... [like] how do people define needs in different situations, how do they present these needs to systems, and how do they make use of what the system offers them.⁴¹

The user oriented paradigm with its assumptions about information, information seeking, information need and information users has since been widely adopted by researchers in the information field. It has provided a framework for research examining information need,⁴² information seeking,⁴³ system design,⁴⁴ a client focus in consumer research⁴⁵ and the way users determine the relevance of the documents they retrieve.⁴⁶ In fact, by the beginning of the 1990's the user oriented paradigm was regarded as a mainstream theoretical framework⁴⁷ that had already begun to spawn a number of related, user

based paradigms or perspectives that shaped research in information behavior during the ensuing decade.

One example is the cognitive viewpoint. Not all information researchers share precisely the same definition of the cognitive viewpoint, but there is, a “kernel” of meaning which is common to most.⁴⁸ The essence of the viewpoint, and its importance to information research is that it:

...explicitly considers that the states of knowledge, beliefs and so on of human beings (or information processing devices) mediate (or interact with) that which they receive/ perceive or produce.⁴⁹

The cognitive viewpoint is defined as an approach and set of constructs for understanding information behavior, which focuses fundamentally upon attributes of the individual. This view of information behavior endorses research that examines the cognitive and emotional motivations for information behavior that carry across contexts or are independent of context. The cognitive viewpoint does not study the context of information behavior and is, in this way, distinguished from the social cognitive view (discussed later) where context (particularly attributes of the social context) is the focus for explaining variations in human information behavior.

At the heart of the cognitive viewpoint rests the concept of knowledge structures. This concept has been borrowed from the cognitive sciences. Knowledge structures are the sets of concept relationships that comprise each individual's model of the world. It is this model of the world that is seen to mediate an individual's information behavior. Each person will apply the knowledge structures that are required to perceive, interpret, modify, or transfer information. Information behavior research from the cognitive viewpoint acknowledges the thesis that:

...any processing of information - whether perceptual (such as perceiving an object) or symbolic (such as understanding a sentence) - is mediated by a system of categories or concepts, which for the information processor, constitutes a representation or a model of his world.⁵⁰

Information research that applies the cognitive viewpoint is therefore interested in studying how an individual will apply his or her model or

view of the world to the processes of needing, seeking, giving and using information.

By the start of the 1990's there had been numerous examples of information research that had focused on the user as an individual, cognitive being. The theoretical framework called the cognitive viewpoint and the focus on the individual as a unique information user had become well-accepted and widely applied leading Belkin to state that there was strong evidence to support the claim that:

...taking the cognitive viewpoint of information science can lead to highly beneficial results, in a variety of areas...

Belkin further speculated:

...the cognitive viewpoint might serve as a means for integrating and relating work in a variety of areas of information science to one another, and therefore provide the structure for a unified and effective information science.⁵¹

To some extent Belkin's words proved to be prophetic for information research during the 1990's. Over this period, the work of information researchers identified with the cognitive approach focused on explaining variations in information behavior according to characteristics or attributes of the individual. A number of researchers attempted to generalize from observations of individuals or groups of individuals (researchers, students, scholars, library users).⁵² These attempts have resulted in models of the information seeking process that are context independent. Where the environment or situation is mentioned,⁵³ the term categorizes aspects or attributes of the individual's *self* rather than the social, professional or information seeking setting. This body of research reveals that there is an individual readiness to engage in information seeking behavior that depends on various preconditions associated with a person's level of information arousal. It describes and analyzes a range of cognitive conditions and emotional responses that arise when people engage in information behavior. It also confirms that information seeking behavior is a process or set of processes or stages that an individual moves through in space and time and that there are reliable methods for mapping these processes and observing the variations and consistent patterns of behavior that emerge. This is not to say that information research has ignored context. Another category of contemporary research in this area, referred to

collectively as multifaceted approaches,⁵⁴ gives a strong emphasis to context in explaining variations in information behavior. This body of work generally attempts to make a distinction between the context of work and the context of everyday life. In fact, many of these studies are focused on examining the information behaviors of professional people as they engage in their work in their work environment. There have been numerous studies of the information behavior of professionals such as engineers,⁵⁵ teachers,⁵⁶ health workers,⁵⁷ and academics.⁵⁸ A small number of studies have also recently emerged that focus on everyday information behaviors. Savolainen for example, conducted a series of interviews with working class and middle class people in Finland to compare their information seeking behavior.⁵⁹ This study elaborated distinctions between what the researcher called *way of life* and *mastery of life* in terms of information behavior. Way of life is the order that is created when people make choices in everyday life based on their individual preferences. Mastery of life is whether people actually adhere to their own preferences when they take on everyday activities. Savolainen found that people usually develop information seeking habits as part of their mastery of life and that both way of life and mastery of life are affected by social, cultural, economic and psychological factors.

Savolainen's work was informed by the *sensemaking* approach initiated by Brenda Dervin in the early 1970's. This approach has been widely used and constantly updated and developed as a metatheory for informing and guiding studies of information seeking through the 1980s and 1990s. Sensemaking addresses all types of contexts that can affect the information behaviors of people. Researchers in various areas such as media studies, education, health and information science have used the approach with several themes emerging:

- Humans are anchored in material conditions and at the same time have mind and spirit and can make abstractions, dream, feel, plan, have ambitions and fantasies, and tell stories
- Humans are involved in a constant journey in time and space of sensemaking and sense unmaking
- Humans and their worlds are constantly evolving and their description, therefore requires verbing
- Human movement is impacted by forces, and those should be always considered

- Ordinary human beings are theory makers
- Humans can articulate emotions, spiritual experiences and embodied unconscious
- Patterns and connectivities among human beings take many forms, including the causal, spontaneous and collaborative
- No a priori assumption about human patterning should be made
- The researcher should be self conscious and self reflexive⁶⁰

The most recent refinement of the user oriented paradigm called social constructionism or the discourse analytic theory has an epistemological and ontological link to sensemaking.⁶¹ In direct contrast to the cognitive viewpoint, social constructionism does not focus upon the mental representations and knowledge structures of the individual as the source of meanings, values and ethical principles. Social constructionism views language as the primary shaper of observations and interpretations of the world. Information holds variable versions of reality that emerge from social interaction⁶² so knowledge and knowledge structures are not seen as subjective or unique to the individual. Rather, knowledge structures are produced by a shared system of meanings and are thus intersubjective.⁶³

Social constructionism draws attention to flaws in the way variations in information behavior have been traditionally explained. Accepting that people create, search for and use information in different ways, information scientists have generally explained these differences in terms of cognitive skills, knowledge states, motivations, educational levels, socio-economic variations, problem situations and so on. The problem is, that individuals can have diverse social roles, tasks and identities and it is impossible to get data on an individual's cognitive skills that isn't in some way contaminated by the cultural bias of the instrument used.

From the social constructionism viewpoint, the central problem that we face when we try to study information users and information using is the variability of knowledge formations. The production and use of information is connected to the variable social life-worlds and interests of people. This means that when we develop information systems our central concern is not that people are incapable of conceptualizing their information needs or formulate need in ways that are different to information producers or information systems. The central

problem is how can we develop systems that are able to incorporate the multiple viewpoints of people who will use them.⁶⁴

Circulating Reference and Usings

In many professional and academic contexts then, practitioners are thinking about people. The discourse, research and practice of these fields is oriented towards users, has a user focus, or values world viewings from a user perspective. This theoretical framework sets the scene for the next stage of our journey towards the user's view of the Internet. Before embarking on this journey, however, we need to take one more theoretical step which will involve positioning the metatheoretic assumptions of the user oriented paradigm through a blending of the work of Bruno Latour⁶⁵ with work by Brenda Dervin⁶⁶. From this blending we achieve the scientific and theoretical explanation for our focus on users and usings of the Internet. The concept of Usings is Dervin's construct. I would like to return to usings after first introducing and explaining Latour's view of how science bridges the gap between mind and object through a process he defines as circulating reference.

Latour, who characterizes himself as a practitioner of the discipline called science studies (pays particular attention to the details of scientific practice) describes scientific practice as a chain of transformations that allows us to bridge the gap between mind and object. The gap between mind and object is too broad so in scientific efforts to understand the object we characteristically engage in a succession of finely grained transformations that construct, and transfer truth about the object. The transfer of truth about the object (the translation from matter to form) depends on the ability of each "link" in this chain of micro-translations to provide that bridge between mind and object. As Latour states:

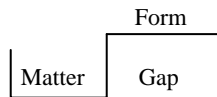
Truth-value circulates here like electricity through a wire,
so long as the circuit is not interrupted.⁶⁷

Latour illustrated this chain of transformations in a description of a scientific expedition to the Amazon Forest (Boa Vista). In detail he deconstructs the steps that a team of scientist takes when translating the object (Boa Vista forest savanna) into a scientific report. He presents

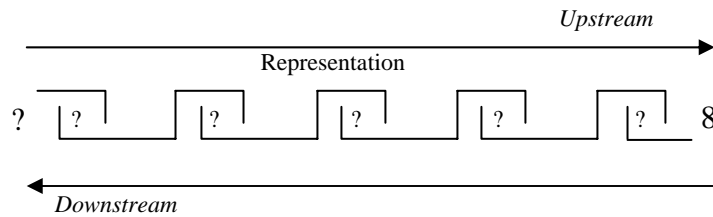
these micro-level moments of scientific translation as a chain of elements of representation (see Figure 3.1).

Figure 3.1

Elements of representation

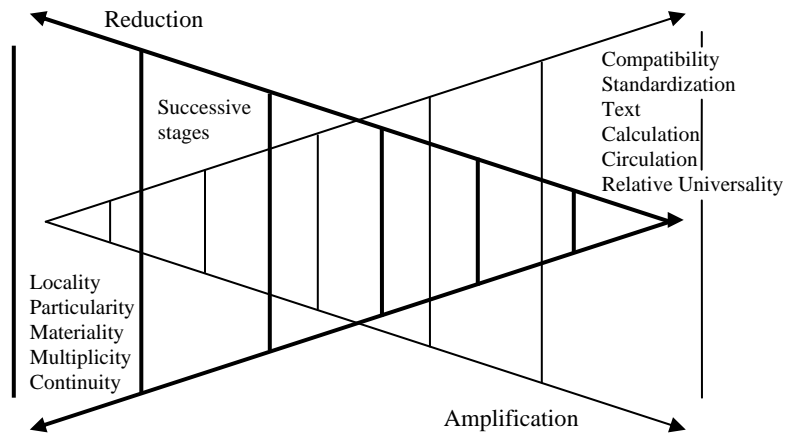


Chain of elements



Latour then elaborated the character of this translation by explaining that as we move from the middle of the chain to its extremities we are both losing something and gaining something. We are, through each information-producing scientific translation, losing the locality, particularity, materiality, multiplicity and continuity of the object of study. Latour refers to this as reduction. At the same time, we are also gaining compatibility, standardization, text, calculation, circulation and relative universality, which Latour calls amplification (see Figure 3.2).

Figure 3.2



This construct contradicts a philosophical tradition that positions phenomena at the meeting point between objects and human understandings (what is in the human mind). Instead, as an alternative, Latour proposes that phenomena appear at each step in this reversible chain of transformations where some properties of the phenomena are lost through reduction and others are gained through amplification. This chain of transformations starts at the middle and works outward towards extremities that are continually being pushed away.

Figure 3.3

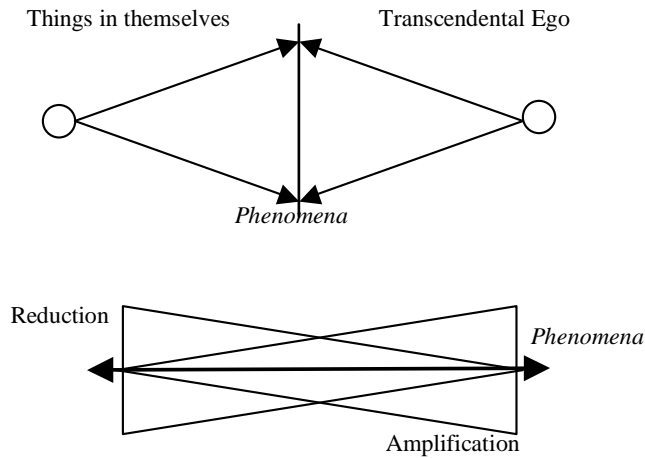
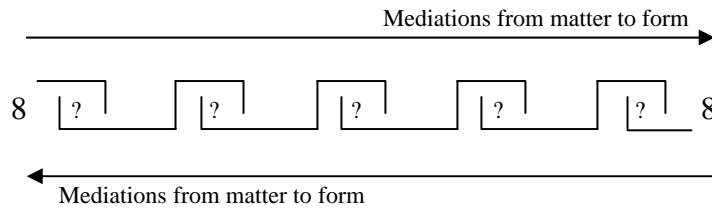


Figure 3.4

Circulating reference

With this construction in place, let us now turn our attention to some propositions recently offered by Brenda Dervin.⁶⁸ At the time, Dervin was responding to a background paper that was designed to facilitate preliminary discussion of information needs and information seeking for a digital libraries workshop. In her response, Dervin draws attention to the meta-theoretic assumptions that are the basis for our thinking about information needs and information seeking. Like Latour, she attempts to focus attention on the particular way that we look at the world. In terms of information needs and seeking, Dervin states, our attention is primarily turned to what we consider as scientists, three discrete and discernible points of interest—contexts, users and systems. Have we ever considered that users may not see or give any attention to these three points? From a users point of view do they exist or is it the connection between these points (the behaviors) that are of real interest—the micro-moments of human use? Dervin calls these micro-moments of real interest and significance “usings.” Users are not “real.” What is “real” is usings and the world viewings, seekings and valuing that they comprise.

The challenge is then—how do we theorize users contexts, systems and usings? The answer proposed here, it to see usings as the key elements of representation in Latour’s conception of circulating reference. Where we are concerned with the object (Internet) our representation of this object is achieved through a chain of transformations made up of the micro-moments of human usings of the Internet. The Internet as a composite of usings. As we constantly observe and represent (through insights from our researching) the Internet from its smallest constituent part (a using), stage by stage we reduce the complex phenomenon of the Internet (in Latours case, this was the Boa Vista in

the Amazon) so that we hold (understand) through this chain of elements of representation the essence and the explanation of the object study.

The goal for the rest of this book then, is to examine and describe in detail the researching of Internet usings. In most cases, the research that will be analyzed was originally designed to focus on contexts, users and systems but the data has a richness that we can exploit for our purposes if we adjust the lens of our analysis to tease out a characterization of the micro-moments of Internet usings. We will see the phenomena of Internet circulating through these usings. This analysis will render representations that expose *the user's view of the Internet*.

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