ABSTRACT

Usability evaluation methods, specifically usability testing, have been touted as an essential part of a user-centered design (UCD) strategy of having the user as the focus of the design process. Communication is said to be the tacit hallmark of this methodology because research has indicated that design practitioners believe that communication with users makes them more aware of users’ needs, and this awareness; in turn, leads to products that users find more useful, usable, and enjoyable. However, the notion that design practitioners perceive such communication to be instructive and/or useful as indicated by their design practice has not been well documented and represents an unexamined assumption—an axiom of sorts—in the design field.

This dissertation used Sense-Making Methodology, a methodology in the tradition of Grounded Theory, to isolate the contradictory communication behaviors related to design practitioners’ belief in UCD and their practice of UCD methodology, characterized by usability testing, and implementing users’ suggestions. The goals of this research were to trace the contradiction to determine how design practitioners perceive communication between themselves and the users—the UCD rationale—and by extension, to better understand communication’s impact upon their subsequent design decisions and upon the resulting products. The following research questions flowed from this idea: (a) How does the contradiction between design practitioners’
values and practices play itself out in their experiences communicating with users to
implement UCD in the form of usability testing? (b) What do design practitioners say
about the reasons that factor into their decisions to exclude users’ suggestions from the
final product design? Thus, in this project, the researcher examined ‘usability’ as
theory of design and as design practice.

Twenty-two in-depth Sense-Making interviews were conducted to elicit design
practitioners’ previous experiences communicating with users during usability testing.
Twelve practitioners, six males and six females, acted as respondents for this project
contributing two interviews each, with the exception of one male and one female who
combined their responses into one interview. Sense-Making’s Communication-As-
Procedure analytic was used to analyze the data from which 32 occurrences of
contradicting communication behaviors were gathered across the 22 interviews.

The results of this exploratory study indicated that communicative tactics that
demonstrate that practitioners are seeking connection with and direction from users
through validation of the product under design, led most often to a design effort that
included usability testing and in which users’ suggestions were valued and/or
implemented. On the other hand, the results of tracing the communication showed that
behaviors and tactics that disconnected from users, did not seek to orient toward the
direction of their needs, and in the end rejected their input led most often to a design
process that excluded both usability testing as a means of UCD and excluded users’
suggestions from the final product.
Dedicated
to the Jenkins Family
and to my colleagues – design practitioners
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CHAPTER 1

INTRODUCTION

The call to user-centered design (UCD) has gone forth (Karat, 1998; Norman & Draper, 1986), and usability engineering has become a computer industry standard (Butler, 1996; Nielsen, 1993, 1997). However, the reality of difficult to use, un-used, and/or under-used information and communication technologies (ICTs) remains; accompanied by users’ disappointment and frustration. Such frustration is a cliché due to its prominence as part of the use experience. Wildstrom (1998), a Business Week technology columnist, begins his September 28, 1998 column with a series of rhetorical questions that convey the depth of user frustration and cynicism. He writes, “Did you ever get so angry with your computer that you wanted to take a baseball bat to it? Have you ever been stumped by some error message that bore no relationship to anything in the manual or the online help? Have you ever been cold in winter?” (p. 1). A suburban newspaper reports an actual example of computer-user dissatisfaction when “on March 15 a man threatened to shoot a computer with an AK-47 at a residence on U.S. Route 23” (ThisWeek, March 28, 2001).
High levels of frustration, and sometimes, injury (Casey, 1993), accompany failed attempts to understand and to utilize poorly designed ICTs. Design practitioners' efforts to design products that users find acceptable and useful result in studies of factors that contribute to product failure. Research indicates that organizational, system, and individual components play a part in failure. (Jiang et al. 1999; Lucas, 1975; Lyytinen & Hirschheim, 1987; Markus & Keil, 1994; Molina, 1998). User-centered design methods have been proposed as one way to design systems that users find acceptable.

UCD focuses on the user in that it “places the user at the center of the process” (Rubin, 1994, p. 10), and is, therefore, characterized by some form of interaction between design practitioners and users. Various UCD methods call for more user-practitioner contact than others. Methods may prescribe user-practitioner contact along a range from no contact (designers design with their ‘ideal’ user in mind), to full user involvement (as described in collaborative and participatory design). (See Damodoran, 1996) Usability evaluation methods, specifically usability testing, are touted as an essential part of a user-centered design (UCD) strategy and are enlisted in design and to remedy ICT failure (Nielsen & Mack, 1994; Shneiderman, 1998). Usability methods are purported to enjoy wide acceptance in the design industry – an idea that is borne out by the literature (Gould, Boies, & Lewis, 1991). The issue of system failure aside, the real design task is to gain some insight into how individuals interact with technology.

For this purpose, usability engineering and evaluation methods continue to evolve to aid designers, researchers, and users design more usable products. Usability testing

---

1In this paper, design practitioners are professionals whose work may be described as designing, developing, and/or maintaining information systems. This move follows the example found in Gefen and Keil (1998) wherein the researchers used the term developers to include “analysts, designers, programmers, and others involved in the delivery and maintenance of software applications” (p. 36).
allows users to experiment with products in a controlled setting so as to gain an understanding how useful a product is to the user, in a specific context of use. Rubin (1994) defines usability testing as a process employing “techniques to collect empirical data while observing representative end users using the product to perform representative tasks” (p. 22).

Usability testing may be conducted in such a way as to promote meaningful interaction between users and designers of ICTs. Meaningful interaction for purposes of this project is the same as communication. Several assumptions exist regarding the communication between users and design practitioners. One assumption is that communication with users makes designers more aware of users’ needs and; in turn, makes the product more useful, usable, and enjoyable. An attendant assumption about user-practitioner communication is that the success of the design process is indicative of how successful communication between all stakeholders has been. Design methodologies, such as UCD, that promote and incorporate communication between practitioners and users are said to be useful. However, research on the use of design methodologies indicates that designers rarely follow design methodologies, and when they do; they do so in an idiosyncratic fashion. (Fitzgerald, 1997, 1998)

This being the case, not only is communication between designers and users--a hallmark of the UCD rationale--assumed to be effective, but the notion that designers perceive such communication as instructive/useful in design is assumed, as well. HCI literature and communication-in-design studies (Guinan, 1986; Guinan & Bostrom, 1986; Sonnenwald, 1993, 1995,1996; Sonnenwald & Lievrouw, 1991) have delineated several communicator roles and communication-related themes pointing to the importance of
communication as a factor when assessing user participation in the design process.

Studies in management information systems have found that effective communication is a factor in successful MIS design. (Hartwick & Barki, 1997, 2001)

However, this vital ingredient in UCD, the impact of meaningful interaction/communication between users and designers, as designers perceive it, has not been studied as it takes place during the usability testing cycle. Effective practitioner-user communication as part of the UCD rationale is the focus of this research, and adds to the HCI communication-in-design literature. This research proposes to study usability in a dual sense. Usability will be examined as process and as practice—usability as process includes ‘idealized’ design as mandated by codified ISO standards and UCD guidelines, and practice is user-centered design ‘realized’ as formally implemented in usability testing. In another sense, usability testing is divided into two parts—the rhetoric of usability (design anecdotes, accepted design wisdom, guidelines, and methodologies) and the practice of usability (embodied in communication in design between users and designers, implementing UCD according to ISO 13407). Thus, this project examines usability in this dual sense—as communication within the practice of designing for usability during usability testing as a means of looking at the processes of usability. [See Figure 1.]

**Communication and the Rhetoric and Practice of Usability**

Gould and Lewis (1983; 1985) and Gould, Boies, and Ukelson (1997) devised four usability principles that designers of ICT must follow in order to design systems that users can understand and use. These principles are: 1) Early and continual focus on users, 2) empirical measurement, 3) iterative design, and 4) integrated design. Gould, et
al. (1997) point out the connection between practitioner-user communication and ICT disuse, when they advise designers that their job is to design a system that has the right functions in it so people can do their work better and like it. You can’t figure out what people want, need, can do, and will do without talking with them…. Often without iterative user-designer interaction there is little relation between what designers build and what intended users are likely to ever use. (pp. 235, 236) [italics added]

Gould and Lewis (1985) developed a process called designing for usability. In the course of devising this process, the researchers asked designers what recommendations they would make to someone who asked about axioms of design. After collecting a cogent list, they sent that list to practicing designers and asked them to rank the axioms that each used in design. Surprisingly, there was a difference between what designers offered as design advice, and subsequent descriptions of their design practice. For the purposes of this research, those guidelines that designers recommended are called
the rhetoric of usability; while designers’ descriptions of their behaviors using a user-centered methodology are termed the practice of usability.

The diagrams below illustrate the differences in these approaches to designing. Contrasting the practice of usability with the rhetoric of usability, one comes to understand that rhetoric involves paying lip service to ISO standards and UCD methodology. On the other hand, the practice of usability means that standards and guidelines inform the methodology of design—that the design process involves communication with users, as well as implementing users’ suggestions. Thus, the process yields a product that is, theoretically, at least, more useful. The double-sided arrows indicate movement as in iterative design.
Marketing and Distribution
(User evaluation and
domestication)

Final Product
(Product as Designed
for Implementation
and Domestication)

Rhetoric of Usability
(ISO Standards/UCD
guidelines)

Practice of Usability
(UCD practice including
Communication in
Design Processes)

Figure 2. The Practice of Designing for Usability
Figure 3. The Rhetoric of Designing for Usability

As Figure 2 indicates, design work that is undertaken without taking advantage of the communication opportunity provided in UCD methodologies is not practicing usability in design. Products of this process run the risk of not being useful in the context of users’ lives, and so may be more likely to fail. Thus, the rhetoric of designing for usability is characterized by design professionals advocating and perpetuating design axioms, in theory, but neglecting to apply the UCD methodology that ensures that their
design practice flows from them. As Figure 3 illustrates, communication with users is the difference between usability practice and usability rhetoric.

Research indicates that there is a difference between what designers say they value, and the values they exhibit as they design ICTs. (Dagwell & Weber, 1983; Hedberg & Mumford, 1975) Reasons for this schism differ, but researchers have discussed a conflict—with the organizational culture and the professional’s personal beliefs about design sometimes clashing. (Dagwell & Weber, 1983) Whatever the cause, the schism exists. One way to ascertain how designers perceive the rhetoric of usability—which includes the user-centered design rationale—is to ask them. Of special interest in this project is to understand more about how the designer perceives meaningful interaction/communication between herself and the user, specifically, during usability testing.

According to HCI research results, design practitioners advocate the rhetoric of usability, and that rhetoric’s formal adoption as an industry standard has been assured via ISO/IEC 13407—which outlines a user-centered design process for ICTs. On the other hand, research has not demonstrated how and/or if designers value the interaction processes that characterize the user-centered methodology. If designers do value the interaction processes, to what extent do they report that this communication has impacted their subsequent design decisions and attitudes.

**Rationale**

Intuition and previous research acknowledges communication’s vital role in design, and in UCD. However, research has not explained the apparent contradiction between UCD rhetoric (i.e., usability engineering is a good idea) and UCD practice
To date, researchers have not investigated, extensively, the impact that designers’ views of the UCD process have on the implementation of certain user-centered methods that involve communicating directly with users. The present research is being undertaken to shed more light on designers’ perceptions/attitudes regarding communication between themselves and users. This will broaden our knowledge about the mis-match between the rhetoric of designing for usability and the practice of designing for usability.

The preponderance of research on communication in design indicates that interaction occurs primarily in the requirements-gathering process or is assumed to underpin the entire design process. (Dorsey, 1988; Guinan, 1986) Some research examines previous design experience as precursor to design practices and product design (Bucciarelli, 1988, 1994). However, no empirical research examines practitioner-user communication during usability testing to ascertain the role this communication plays in the formation of perceptions of UCD methodology and, by extension, users’ involvement in the design process.

Organizational and management literatures indicate that organizational culture plays a part in designer’s choice of method, however, designers’ attitudes and values are also implicated. Meister’s (1982a, 1982b) work investigates designers’ attitudes as it relates to human engineering; Gould & Lewis (1985) and Lund (1997) report on designers’ attitudes about usability testing, proper; Jiang, et al. (1999), and Acker & McCain (1992) look at designers’ values. In other research, Gingras & McLean (1982), and Dagwell & Weber (1983) analyze designers’ attitudes toward users, while Ljung & Alwood (1999) and Foster & Franz (1999) look at user involvement in the design process from the point...
of view of designers. This project does not run counter to HCI design research in its intent; rather, the current research proposes to focus on how consideration of designers’ communication practices and experiences is actually a research agenda that, in certain instances, precedes a discussion of ICT design methodologies or design practices.

It is important, in the face of international efforts to coordinate design and assure quality that UCD practice focus on potentially thorny issues. The gap between the rhetoric and the practice of usability is one such issue. This being the case, research efforts should help to identify and seek ways to ameliorate perceptual, behavioral, and environmental challenges that predispose designers toward practices and methodologies that are incompatible with ISO and UCD guidance. Much of the UCD research relates to how the user utilizes the information artifact. User studies are important because they address the unmet needs of the user, directly. Use studies comprise the great majority of studies to test design quality. However, studies focusing on system characteristics and how users understand them are less prevalent. Even fewer studies actually look at the design of information technology from the perspective of the designer. In other words, what is the designer’s notion of the value of the rhetoric of usability as it relates to his/her practice? Do designers say that they value UCD and do they understand the fundamental role that communication with the user plays in UCD as it is defined, even by ISO/IEC documents? These are important questions, however, they are rarely asked in research on ICTs.

This project focuses on designers’ attitudes and perceptions concerning communication with users—a fundamental assumption of UCD. This researcher examines the communication phenomenon as it is reportedly practiced in usability testing
to answer the following questions: What do design practitioners say about communication between themselves and users? How is communication during usability testing perceived? What, in designers’ opinions, is the impact of user’s suggestions on the product during the usability phase of design? Ascertaining designers’ responses to these questions will help to elucidate designers’ impressions of the place of communication in UCD, and will, coincidentally, allow insight into their thoughts on usability testing as a process (e.g., ISO-like standards and guidelines) and as a method, as well. This research effort rests upon two literature sets: HCI user-centered design literature (research that analyzes the designers' perspective), and communication-in-design literature (studies that look at the communication that occurs between designers and users and between designers and developers).

**Definition of Terms**

The field of Human Computer Interaction (HCI) with its ties to the computer industry, is taught as part of the formal education, corporate training and continuing education of engineers (Nielsen, 1994, p. xii). Different entities (professional organizations, individuals, nations, etc.) use different terms to describe the field. Nielsen reports that it is known variously as, “CHI (computer-human interaction), HCI (human-computer interaction, which is preferred by some who like ‘putting the human first’ even if only done symbolically), UCD (user-centered design), MMI (man-machine interface), HMI (human-machine interface), OMI (operator-machine interface), UID (user interface design), HF (human factors), ergonomics, etc.” (p. 23). For the purposes of this project, \textit{HCI (human computer interaction)} is the preferred acronym.
Usability engineering is one specific method used in HCI research, and HCI is geared toward helping designers and engineers produce more useful ICTs. Nielsen (1997) defines *usability engineering* as “a set of activities that ideally take place throughout the lifecycle of the product, with significant activities happening at the early stages before the user interface has even been designed” (p. 1440). The National Cancer Institute’s website offers the following definition of usability engineering as a methodical approach to producing a Web site or any user interface. It is a practical and systematic way to deliver a product that works for users. Usability engineering involves several methods, each applied at appropriate times, including gathering requirements, developing and testing prototypes, evaluating design alternatives, analyzing usability problems, proposing solutions, and testing a site (or other interface) with users. ([http://usability.gov/basics/](http://usability.gov/basics/)).

Usability engineering parallels the entire design process and as the process may call for varied design methods at any given time; so also, different usability engineering methods may be relatively more useful than others during the different phases of the design cycle. In addition, this definition indicates that conducting a single ‘test’ for purposes of ‘blessing’ a product at the end of the design life-cycle is not the goal of usability engineering. Thus, usability engineering is implicated as processes that run concurrently along the software design process (even preceding it, in some cases), and is not characterized by a single evaluation or method.

*Usability testing*, in its turn, is one of the methods used in usability engineering. Again, the National Cancer Institute offers a cogent definition, stating that usability testing is part of the process of usability engineering. Usability testing includes a range of methods for having users try out a site (or other system). … Testing may include collecting data on the paths users take to do tasks, the errors they make, when and where they are confused or frustrated, how fast they do a task, whether
they succeed in doing the task, and how satisfied they are with the experience. The goal of most usability testing is to uncover any problems that users may encounter so those problems can be fixed. (http://usability.gov/basics/)

Bevan (1995) defines usability, itself, as “synonymous with quality of use, i.e. that the product can be used in the real world” (p. 115). In this early paper, Bevan describes usability’s dual role in design “as an attribute which must be designed into a product (implicating the design process), and as the highest level quality objective which should be the overall objective of design” (p. 115). According to this definition of usability, a user’s perception of quality is decided during the use experience and is determined by whether or not a user can accomplish a task within a given context. With this definition Bevan asserts that the true assessment of usability is found only through the use experience—the user judges usability of a product via his/her perceptions of the product.

*Design* is a word with many meanings. The Oxford English Dictionary defines it as “a plan or scheme conceived in the mind and intended for subsequent execution.” The word is understood in common parlance as being both a noun and a verb. In the sense of the verb, design means to conceive a goal or a plan—to develop a mental picture; while as a noun, design refers to a composition—a drawing, a sketch or a pattern. Looking at design in each of these ways leads one to look at usability in those ways, as well. Usability as a verb will refer to the design process—designing for usability – practicing user-centered design; while in the sense of the noun, usability points to a product’s usefulness in a specific context of use. A *user* is someone who interacts with a product in a specific environment to accomplish a task, and a *design practitioner* is a professional who designs/develops/maintains a product for a user population.
Rubin (1994) describes designing information systems as the process of “designing the relationship [between] product and human” (p. 9). He goes on to state that in order for designers to grasp this notion, they need methods that “work from the outside-in, from the end user’s needs and abilities to the eventual implementation of the product” (pp. 9-10). *User-centered design* (UCD) is an approach that does this—it “represents not only the techniques, processes, methods, and procedures for designing usable products and systems, but just as importantly, the philosophy that places the user at the center of the process” (p. 10). UCD is characterized by three principles: (a) An early focus on users and tasks, (b) empirical measurement, and (c) iterative design (Gould & Lewis, 1985, p. 300). In addition to isolating these UCD principles, Gould and Lewis indicate that there should be direct contact between users and the design team throughout the design cycle. Such contact directly implies interaction between users and designers during design. Suchman, (1987) looking at human action, defines “interaction, or communication … as the mutual intelligibility of action” (p. 3) and Lievrouw and Finn (1990) define communication as “the sharing of meaning [that] takes place in a particular social context” (p.49). In this project, these two definitions will be combined and *communication* will be construed as mutually intelligible action that has meaning in a specific context.

This project presents Chapter 2 as a review of the relevant literature on usability in human factors research (including information and library science), and communication-in-design literature. Chapter 3 provides an overview of the study and describes the test population, location, and the method that were used to gather and analyze data and to interpret results. Chapter 4 reports the findings articulates tenable
conclusions based on the findings. The final chapter contains a discussion of the implications that these results have for the process of user-centered design involving usability testing, and ways to facilitate practitioner-user communication during that process. The final chapter, also notes particular limitations of this study and indicates avenues for future research.
The Usability Idea in HCI Research

Usability evaluation methods, specifically usability testing, are touted as an essential part of a UCD strategy and are enlisted to remedy ICT failure. User involvement has several advantages, according to Damodaran (1996), and may be characterized along a continuum from marginally involved in design to participating in and influencing design decisions. Usability methods are also purported to enjoy wide acceptance in the design industry—a fact borne out by the literature. (Gould, Boies, & Lewis, 1991) If it is true that user-centered methods involve the user and lead to more useful ICTs, what accounts for the continued failed products? Despite protestations to the contrary, reports championing the usability cause are not the sole opinion. Indeed, just as there are notable examples that make the case for UCD (Butler, 1996; Mayhew, 1999; Nielsen, 1997; Norman, 1998); there are examples of research that find problems with user-centered methods. (Heinbokel, et al., 1996; Sugar, 2001; Webb, 1996) Given this tension, it seems necessary to take a step back from espousing the rationale of UCD, for the present. The question at hand seems even more fundamental than disuse of ICTs, or whether UCD is desirable or beneficial. In fact, continual high levels of user
frustration and ICT failure begs the question regarding how design practitioner's work world, motivations, and perceptions, have implications for and impact the design process, itself.

If, indeed, the design process involves practitioners as stakeholders as well as users and user advocates; then, does not the practitioners’ role as a stakeholder have purchase in this research? As Acker & McCain (1992) assert, "the central role of the designer in influencing whether technology-based communication is made easier or more difficult, the ambiguity of the design process, and the penalty for design error, make the designer and those factors which influence his or her work of critical importance" (p. 177). Therefore, the design practitioner should be a topic of research as is the user.

Research indicates that design is a "conservative industry (Platt, 1999) and that designers value input that makes a tangible difference in the product (Meister, 1982a). However, not only is the product 'design'; the process, itself, with its practices and underlying philosophy is also 'design'. In fact, this latter notion of design precedes product and lingers within an organization long after a product is shipped.

The purpose of the current research is to better understand how design practitioners view the experience of design for usability and of interacting with the user during usability testing. The practitioner's conception of one stakeholder interacting with another stakeholder, during testing, is important to study because it will provide further insight into the contradiction between the stated importance of UCD methods (backed by ISO-like mandates), and the fact that these methods are not used, or are used in an idiosyncratic manner in many organizations (Lee & Truex, 2000). Research on design has focused on users, the products, organizations, and some studies have concentrated on

Since the designer is an important stakeholder in the design process, research of this nature is needed to help researchers develop a more complete picture of the design process and how it has implications for systems that are usable, useful, and that enhance user productivity and enjoyment. The user-centric design philosophy carries notions of usability as an idea and as a practice. The designer's idea of usability has merit and a place in the actual (as opposed to the rhetorical) design process. An attendant issue is whether in the designer's mind, the user has an actual (as opposed to a rhetorical) place in the design process. In effect, these two points aim to inquire into the designer's notion of design practice where usability testing becomes a site of meaningful interaction between designers and user. This study, therefore, is an investigation of the attitudes toward the concept of user-centered design, from the designer's perspective.

In an attempt to isolate reasons for user frustration and subsequent ICT failure, human-computer interaction (HCI) literature indicates several research scenarios. The largest body of research conceptualizes the user as problematic. Studies of user type (Cotterman & Kumar, 1989) motivation and participation level (Barki & Hartwick, 1989; Baroudi, Olson, & Ives, 1986; Hartwick & Barki, 1997; Hawk, 1993; Hirschheim, 1985; Ives & Olson, 1984), and/or ability to describe his/her work needs are often the
dependent variables in such research. Earlier attempts to understand ICT failure in the
HCI literature involve examining system design (Casey, 1998). Shakel (1997) states of
design related research that "such work as existed was scattered and mostly still focused
upon hardware issues, large systems, and process control..." (p. 972).

Human factors researchers also examine the organization from which a product
originates in HCI research. (Lucas, 1975) Meister (1982a, 1982b) claims, based upon
his experience as a human engineer with the federal government, that parent
organizations do not support human factors engineers adequately, and are almost
exclusively bottom-line oriented. Platt (1999) acknowledges that "[f]or all its youth
culture, late nights, and high energy, [engineering] is a surprisingly conservative industry:
(p. 4). Thus, a bottom-line orientation and conservatism characterize the computing
industry. Organizational/industry-wide conservatism may express itself as a reluctance
to adopt new design methods (Fitzgerald, 1997). In fact, Fitzgerald (1998) concludes that
"[m]any current methodologies are derived from practices and concepts relevant to the
old organisational environment..." (p. 326). Organizational culture does impact the
designer's choice of method, and may act as an organizational ritual and social defense
(Wastell, 1996, 1999) and, thus "may impose a considerable degree of inertia on the

A third research thrust found in the general management literature related to HCI
locates the engineer's work practices as a potential factor in ICT failure. Platt (1999)
states quite clearly about software engineers that "[w]e all resist altering the status quo"
(p. 4), and part of that resistance is seen in a reluctance to follow new or even to follow
closely, certain design methodologies (Fitzgerald, 1997, 1998; Lee & Truex, 2000).
Fitzgerald (1998) observes that "methodology use is not on the increase" and when these methodologies are applied, they "are neither applied rigorously nor uniformly, even when training ... has been provided" (p. 326). However axiomatic UCD has become, HCI research indicates that there is a disconnect between the rhetoric of usability and the practice of usability methods in design organizations (Fitzgerald, 1997; Lee, et al., 2000).

Meister (1982a) states, "more than 30 years of system development experience suggest that complex systems would be grossly inefficient if they were not exposed to the human engineer's scrutiny" (p. 124). However, in the same report, he states that "[t]he designer is reluctant to accept an input unless the benefits resulting from that input are immediately obvious [and] since human engineering contributions are preventive ... they are invisible to the designer ..." (p. 120). The accepted wisdom in design practice is that ICTs designed with the user's input are more likely to succeed. The majority of studies of usability are centered on the user (e.g., user participation, user involvement, and user satisfaction). Bevan (1995) argues "that usability as an objective is synonymous with quality, i.e., that the product can be used in the real world" (p. 115). This definition is compatible with ISO/IEC standard 9126-4 regarding metrics for use in context. ESO/IEC DTR 9126-1 relates quality with and defines usability as "the capability of the software product to be understood, learned, used and attractive to the user, when used under specified conditions" (ISO/IEC FDIS 9126-1, 2000).

However, if the product is to be used by and/or useful and attractive to potential users, then, usability as a design activity is implied. (Bevan, 1999; http://www/usability.serco.com/trump/resources/standards.htm, 2001; Jokela, et al., 2003) In the final analysis, a user's judgment of attractiveness, usefulness, and
understanding of a product hinges upon whether designers practice user-centered design methodology during product development, i.e., that they utilize design methods that imply interaction between designers and the users during the design cycle. Absent this degree of involvement with the user (arguably different given the level of user participation) during the design process, design is not, by definition, user-centered. ISO 13407 means to insure a user-centered stance in development/design practice as a "tool for those managing design processes [that provide] guidance on sources of information and standards relevant to the human-centered approach" (TRUMP resources, p.13). However, this standard may be thwarted if the methodology it outlines is followed in an idiosyncratic way or is not followed at all, as research suggests (Fitzgerald, 1997, 1998). In the final analysis, designers' attitudes toward methodologies, including ISO standards, may determine whether products that follow from them are successful--if the methodology or process is successful. Meister (1982b) suggests that designers' attitudes are important, and calls them the "gate-keeper' for developmental inputs" (p. 219). In his opinion, a designer's "attitude toward behavioural factors determines in large part whether or not they will be incorporated into design" (p. 219).

The Usability Idea in Library and Information Science Research

Researchers and practitioners in many fields are making contributions to the study of HCI by implementing usability testing. Library and Information Science website and digital library research represents a case in point. Bevan’s definition of usability as "synonymous with quality of use" (Bevan, 1995, p. 115) implies that a system's usefulness can only be determined by judgments formed through actual usage. The integrated library systems (ILS) is one example of such a system in use. The discussion
that follows is undertaken to show how usability testing may impact design when users are involved and when users’ suggestions are implemented into the final system design. Successful use, in the library system context, is a measure of whether patrons can satisfy their information needs. When library users cannot access information via online public access catalogs (OPACs), library usage becomes problematic and design is implicated (Borgman, 1986, 1996; Smith & Tiefel, 1992).

Borgman's article (1986) provides impetus for discussing usability issues as they relate to library systems. In this article, Borgman asks why online catalogs in libraries were so hard to use. Smith & Tiefel (1992) aimed to identify potential difficulties and design solutions to them during the initial stages of designing an information gateway. To answer such questions, one may study the users to ascertain their use patterns i.e., conduct a user study. Another option is to study the designers of the system and the process by which use and usefulness are determined. This project inquires about design practitioner's perceptions of and reasons for not conducting usability testing to ascertain their perceptions of the communication that occurs between the user and the designer during the design process.

Librarians and designers of library information systems have often worked closely on OPAC design projects to insure that systems for information seeking were designed with the user in mind (Harter & Hert, 1997; Kuhlthau, 1988, 1991; Marchionini & Komlodi, 1998). Designers of library information systems realized early on that communication with the user plays a vital role in library usage and that their interaction with an information system was an analogy for their use of a library. This being the case,
designers have had to consider the user—designing for usability in libraries had to be done more or less as a matter of course.

Rousseau, Jamieson, Rogers, Mead & Sit (1998) conducted a study of the usability of the online library system at The University of Georgia. One research goal was to inquire about users "current usage patterns and problems [and] to indicate where design and training improvements [were] needed" (p. 275). In a survey of 966 users and 114 non-users of the system, they discovered that "41% of the problems were system-related [pointing to] the importance of design improvements for the on-line system" (p. 280). After consulting with system users (and non-users, in this case) Rousseau, et al. concluded that though training was an option, due to an increase in remote access of the OPAC "system redesign may be a more viable means of improving user performance than training" (p. 281). Upon discovering that the online help was underused and in need of redesign, Rousseau, et al. concluded that in order to redesign the help to be better utilized "user input to the design process is essential" (p. 281). Though far from problematic, designers of library systems understand the immediacy of the response if the user cannot use a system to complete a task. Thus, user-centered design practice in libraries became systematic (Harter & Hert, 1997).

In recent years, designers of library systems began adopting HCI principles to construct digital libraries and portals or gateways to information on the World Wide Web (WWW). Graphical user interfaces and underlying website architecture have become important points to test as by and through them libraries provide their patrons with avenues to information. Thus, usability issues as articulated in HCI has come to be a major point of reference in designing digital libraries and library websites. Buttenfield
(1999) suggests that the differences between a traditional and a digital library require a
different type of evaluation.

This author refutes several commonly held assumptions claiming that: (a) that
unlike traditional libraries, users "sometimes use the digital library in ways that are not
anticipated by system designers" (p. 41), (b) digital libraries have the disadvantage of an
interface, and (c) technology underlying the interface architecture changes rapidly.
Buttenfield recommends a type of usability evaluation that involves designers,
developers, users, and evaluators in a taxonomy of design using the Alexandria Digital
Library Project as a case study. She concludes that "[a]ll three corners of this triangle
should have equal credibility in resolving usability problems...." (p. 55).

In the context of the library, websites and digital library gateways have become
the site for usability studies, indicating how valuable designers find input to be from
users. Theng, Duncker, Mohd-Nasir, Buchanan & Thimbleby (2000) note that recently
"the Web, ... has been extended to include many digital libraries" (p. 167). They define
digital libraries as "collections of information that are both digitised and organised and
give opportunities we never had with traditional libraries or even with the Web" (p. 167)
and set out to discover which design features "world-access" users found most effective
in digital libraries. This work represents work done to assess the cross-cultural usability
of digital libraries.

Ten subjects (seven with digital library experience and three with web
experience) evaluated three digital libraries using a 40 item 7-point scale. Researchers
found that "users' overall impressions of digital libraries [were] determined by how
effective the digital libraries [were] in helping them to complete the tasks successfully"
This measure of usability led researchers to list two flaws that were present in all three digital libraries: problems with navigation and lack of consideration for users' cultural and browsing needs. They provide a set of design recommendations for correcting these two flaws that had been identified through their interaction with users as design intermediaries.

In describing a case study that examined the use of HCI concepts to design a library's website for usability, Battleson, Booth, & Weintrop (2001) test the University of Buffalo's site. Battleson et al. articulated the steps one should take in conducting this type of research, then indicate what lessons they learned in the process. First, researchers articulate an objective for the research. "The goal of the usability test was to determine how effectively the libraries' Web sit 'worked' when used for library research by undergraduates with little or no experience using the site" (p. 190). In the test, researchers also gathered qualitative data from users as informal comments. The authors report that "informal comments and opinions of the students tested were as enlightening as their test performances", (p. 195) and conclude that usability questions "must be directed at real users, who are the key to successful usability testing" (p. 197).

In an effort to gauge the overall usability impact of website architecture, not just the 'look and feel' of the system, Gullikson, Blades, Bragdon, McKibbon, Sparling & Toms (1999) assessed "the ability of a user to navigate" (p. 293) an academic website. These researchers point out that "how information is categorised, labeled, and presented and how navigation and access are facilitated ... determines not only whether users will and can find what they need, but also affects user satisfaction and influences return visits" (p. 293). Thus, they make the case for the importance of studying information
architecture as a dimension of usability. The website they chose was that of Dalhousie University—which had won three awards for its design.

Twenty-four people (twelve undergraduates, three faculty members, and nine graduate students) participated in this study. Each participant was assigned to find answers to six questions on the Dalhousie website. After answering these questions, participants responded to a perceptions test. Then, they watched the playback of their session on videotape and made comments about their choices, expectations and methods for answering the questions. Participants performed poorly on the questionnaire questions that the researchers had rated as not hard. Due to participants' difficulty in finding information on the web site, the researchers made several design recommendations regarding the information architecture on this site.

As these studies demonstrate, library information systems, including web sites and digital libraries benefit from interaction between those who design/facilitate/mediate and the users of the system. As this type of interaction illustrates, users' reactions are hardly those that a designer holds, or in some cases, may anticipate. These studies establish that each usability testing experience yields information that can be used to improve access to a library's collections for subsequent users. User-centered design has found a niche in LIS, and users’ involvement in the process is considered standard procedure.

**How Design Practitioners and Users Differ**

Research into designer's attitudes indicates that designers' views and perceptions differ from those held by users of the products they create. This finding is apparent in regard to designers' perceptions of ICT failure. Jiang, Klein, and Balloun (1998)
conducted a study "to determine which problems, during the system development process" (p. 933) were perceived alike by both users and designers. Using a 27-item questionnaire composed of 7-pt Likert scales, these researchers surveyed 78 participants who were either IS users (management executives or department managers) or IS professionals (IS managers, project leaders, or programmer/analysts). Employees from 50 firms participated. The goal of this research was to examine the expectation model of system failure (Lyytinen, 1988) that indicates that stakeholder perceptions differ by category, e.g., users or professionals. Major results supported the expectation model, finding that "for failures associated with IS development, users and IS professionals do indeed have differing perceptions" on issues that "directly involve IS users" (p. 936).

Unlike IS users, IS professionals thought that enough users are included on development teams. Additionally, IS professionals did not perceive analysts' interviewing skills to be problematic (as did users), nor did IS professionals agree with users that user input in system design was not sufficient (Jiang, et al., 1988, p. 935).

Gingras & McLean (1982) document a discrepancy between designers and users in regards to what characterizes the 'ideal' user. In this study, the investigators looked at users' and designers' profiles of the designer, the user, and the 'ideal' user. Seventeen designers and 52 users responded to a questionnaire containing 38 bi-polar scales (later reduced to 17). When comparing the profiles of users to those of designers, researchers found that the two groups differed on their perceptions of the user--the designers' image of the user was significantly different from the users' self-image. This result led to further questions, and in response the researchers compared the users' profiles of the ideal user with that of the designers. Based upon this comparison, "designers were found to
perceive the ideal user of their system to be much different than the actual user, the former possessing more positive characteristics than the latter" (p. 179).

This led to the further realization that designers construct systems for users very much like themselves; despite the fact that their actual users differ significantly from that profile. Gingras and McLean concluded that when "designers claim to be user oriented, they probably are; but the user they have in mind when they are designing the system is a person who differs considerably from the real users of the prospective system. Instead, it is a person who looks very much like themselves" (p. 179-180).

Hsu, Chuang, & Chang (2000) found that users and designers exhibit liking based on different values. They surveyed 20 designers and 20 users regarding 24 product forms for telephones. They found in their Taiwanese population that "the same product form will give designers and users different impressions. On the other hand, the same evaluative term or image-word might have different meanings for designers and users" (p. 390). This value difference caused "the discrepancy in preference" (p. 390).

Similarly, when Acker & McCain (1993) looked at the values of designers from different countries as they related to videoconferencing, they noted that the discrepant power resources at the designers disposal "allows technological systems to be the carriers of the designers' values into the adopting organisation", and noted further that "a similar clash may exist between the values of users and designers even within the same culture" (p. 177-178). Users and designers do demonstrate different values and their preferences follow from those values.

HCI literature indicates that there are contrasting perceptions between designers and users regarding: the appropriate level of user participation in the design cycle, and
estimations of the ideal user. Research also points out that the designer has the power to bring his/her values to bear in the design process while the user may not. If designers and users differ on these issues, might they not also differ in regards to their attitudes regarding communication between designers and users during the usability testing cycle? What do designers report as their views regarding the notion of usability testing, and by extension, the practice of designing for usability?

Designers’ Attitudes Toward Usability

Designers and developers say that they value the usability process. Gould & Lewis (1985) set out to discover if this were true, addressing their discussion towards "people who have the responsibility and/or interest in creating computer systems that are easy to learn, pleasant and easy to use, and are useful" (p. 300). These researchers began by isolating three broad design principles (early focus on users and tasks, empirical measurement, and iterative design), then set out to discover whether design professionals would mention these principles when asked what major steps a designer should go through when developing or evaluating a system for users. Of the 447 participants:

- sixty-two percent mentioned something about early focus on users;
- 40 percent mentioned something about empirical measurement, that is, behaviorally testing the system (or a simulation or prototype of it) on people (regardless of their characteristics); and
- 20 percent mentioned something about iterative design, that is, modifying the system based on these results. (p. 301)

Gould & Lewis contend that "these ‘common-sense' design principles are not fully understood by many designers, even when they mention them" (p. 301). This early study clearly indicates that designers may say that they value UCD, but at least in this example, practitioners clearly did not recommend usability principles as design steps. Gould &
Lewis conclude that this is possibly because designers do not "understand their full force" (p. 301).

Later, Lund (1997) asked designers to list their favorite usability guidelines from memory. A listing of this sort was deemed informative because the "maxims may represent part of the expertise of the experienced professional... capturing the categories of design characteristics that the professional has found to be meaningful" (p. 15). After collecting the listing, Lund deleted all duplicates, randomly arranged the list, and sent it to a group of designers, and usability professionals for them to rank the entries.

In the second phase of the study, the list was again randomized and sent out to listserv members who worked in the HCI area. Eighteen people participated in the second phase. Results indicated a high correlation between the first and second lists with the top-rated items being consistent across both lists. These top-rated maxims were considered to be most important for usability in that they provide "insights for a theoretical structure for usability that can be empirically extended to provide practical and powerful engineering guidance" (p. 20). Designers' perceptions are, thus, shown to be important because these are based on past experience, and may guide future design behavior.

Since designers and users disagree on what is the desirable level of user participation, the image of the ideal user, and also disagree along certain value lines, it would be reasonable to seek to understand what constitutes designing for usability for designers. It stands to reason that this question precedes design methods questions and is, in fact, a critical antecedent question. This question is not one that assesses whether certain products are useful in certain conditions, but looks at the process of design, itself
to ascertain the value and effectiveness of the design for usability rationale. Thus, it may be possible to discover whether designers' attitudes about the process indicate that they use the user-centered design process or not.

If the process is not used, then results may suggest that this process failure can contribute to product failure. Bevan, et al. (1999) reports research on the INUSE project in which they developed a "procedure and a set of criteria that can be used to assess how closely a development process has followed the principles of The International Organisation for Standardisation (ISO 13407)" (TRUMP resources, p. 14). ISO has published document #13407—a set of guidelines for the development of human-centered computer-based systems. Document 13407 describes human-centred design as a multidisciplinary activity, which incorporates human factors and ergonomics knowledge and techniques with the objective of enhancing effectiveness and efficiency, improving human working conditions, and counteracting possible adverse effects of use on human health, safety and performance" (p. 13 http://www.usability.serco.com/trump/resources/standards.htm).

ISO 13407 literally outlines how human-centered design of computer systems should proceed; thus, giving developers/designers insight into what factors constitute designing for usability.

Few researchers conduct studies of the designer's work environment. Bucciarelli (1988, 1994), Kraut & Streeter (1995), and Sonnenwald (1993, 1995, 1996,) are noteworthy exceptions. Bucciarelli (1994, p. xi) seeks "to understand and explain the engineering design process in more than the usual instrumental terms...." This researcher concentrates on describing the work of the engineering firm, and in this way indicates how research on the design process and design practitioners is important because
computers and other products of this subculture are everywhere (Norman, 1998). This fact calls for research not just with the design practitioners’ work, or design methods, or users in and outside organizations; research must also probe designers’ motivations and perceptions that lead to and result from design practice. Of special interest are their perceptions and motivations regarding communication with the user and with UCD.

Why study design practitioners? In truth, the designer is not a disinterested party. Quite to the contrary, the designer has material as well as ego rewards bound up in the success or failure of the design process. His/her perceptions, environment, and actions affect the final product. This being the case, it is important to allow the designer center stage as the unknown variable in the design equation. Bucciarelli (1988, 1994) and other researchers (Kraut & Streeter, 1995; Rasmussen, 1990; Sonnenwald, 1993, 1994) study the entire design process to isolate designers' work practices, including their communication behaviors. While this focus has proven informative, such a broad focus tends to obscure the point of connect between the user and the designer. This is the reason the current research focuses tightly upon usability testing, using it as the design process in microcosm.

As a fruitful trajectory, HCI research should perhaps focus more narrowly on the usability test as the site of meaningful interaction between designers and users. For that reason, this project will study the social processes embodied in communication between designers and users during usability testing. The outcome may yield more knowledge about how designers conceptualize the usability process, how designers look at users' roles within the usability testing cycle and UCD, generally. In addition, results of this
study will allow researchers to get a glimpse of how designers characterize the communication between users and themselves during design within the usability testing cycle.

Much of what is known about the way designers conceptualize users and usability testing is gleaned from anecdote. (Gould & Lewis, 1985; Lund, 1997 are exceptions) However, given the importance of designers' perceptions and motivations during the design process, on the finished product, it becomes imperative to discuss these issues with the designers, themselves. Studying usability becomes important because use and perceptions of usefulness, the very concepts that define usability, are central design issues.

Research into designers’ perceptions about their design values and how their design behaviors flow from them, is also rare. However, as this study by Dagwell and Weber (1983) indicates, designers recognize that their values impact the design of a product. Replicating a study in an Australian setting that had been done in Sweden, the UK and in the US; the researchers list as part of this study’s rationale, the belief that information system use problems may be caused by “the inadequate conceptualization of users that system designers hold that influences them to design tightly structured systems that lower the quality of working life” (p. 987).

Dagwell and Weber administered a three-part questionnaire to system designers from eight large organizations to elicit responses concerning their attitudes/characteristics and to gather information about the organizations in which they worked. The study had four goals: (a) gather more information about system designers’ implicit theories about system users, (b) provide additional cross-cultural evidence on designers’ user models,
(c) test the validity and reliability of the research instrument, and (d) determine whether designers’ held a single view of users. These researchers concluded that designers did not hold inadequate user models, adding the designers’ “user models cannot be determined independently of the design context in which they operate” (p. 996). In effect, this research indicates that user models, designer values, and context are all important elements of design practice.

The Rhetoric of Usability and Communication-in-Design Research

Gould & Lewis’ (1985) design for usability rationale shows how design practitioners may implement UCD principles based on organizational culture/constraints, though they acknowledge that there are certain axioms that a design practitioner should follow in the practice of design. Research does indicate that designers do not always follow their own values when designing ICTs, but resort to organizational precedent in design methodology and practice (Acker & McCain, 1992; Dagwell & Weber, 1983). Fitzgerald (1997, 1998) finds that design methodologies are implemented in a 'piecemeal' fashion, if at all. This, then, is the rhetoric of designing for usability.

In describing the rhetoric of designing for usability the researcher makes the claim that while usability is called an industry standard, such rhetoric continues to depart from the practice of designing for usability--wherein designers actually implement UCD methods. Meister (1982a) opines that the designer determines whether to use a methodology or not. Thus, what designers miss out on when they do not utilize those UCD methods, prescribed by proponents of the rhetoric of designing for usability, is the opportunity to interact with users. This interaction is the linchpin upon which the UCD methodology turns, and the communication it facilitates is a foundational assumption. In
other words, how can UCD be user-centered if meaningful communication does not take place between the users and the designers of information systems?

As the foregoing review of designer-based HCI research has shown, designers rarely avail themselves to participate in the communication that is made possible through the processes of UCD. Too often, for various reasons, designers do not meet with actual users of the products they design, though many of them repeat the rhetoric of designing for usability. Corporations and designers may accept the rhetoric of usability, but their practice of usability is not in line with their rhetoric. Designers may advocate designing for usability, but will their experiences record that they value the practice of designing for usability that affords interaction with users? When designers assert that to design for the user implies interaction with the user, but then proceed to design in isolation from those users; the rhetoric versus practice schism is being played out.

Interaction with the user is, in a real sense, the un-spoken, defining characteristic of UCD and is an opportunity afforded by usability evaluation. The communication that takes place during the design process is a valid topic of study, in that case. However, communication-in-design literature is fairly recent in origin, therefore; the literature is sparse. Several studies of the communication that takes place during the design process exist, yet in much of this previous work, communication is implicated as being important, tangentially, and is studied as a one of several possible variables that can impact the design task. Communication is not studied as the *sine qua non* of user-centered design. Though this project does argue that communication makes design possible – to say that design is *all* about communication is not a true statement; HCI research must examine the
central role that communication plays in commonly held assumptions regarding the nature of user-centered design.

In HCI research that may be classified as communication-in-design research, Hartwick and Barki (1997, 2001) conducted design research that studied communication as one variable among several that influenced user participation in design processes. The main objective of this study was to develop an instrument that measured user participation. Along the way to understanding that phenomenon, the researchers sought to “clarify whether user – IS relationship [the relationship between users and members of the information systems staff] consisted of a single dimension or several distinct dimensions” (1997, p. 68). The study included several items that assessed communication, and overall managerial duties. To analyze communication, the researchers looked at user communication, i.e., users with IS practitioners, users with other users, and users with senior managers. Other communication-related items in this study looked at managerial activities (making progress reports, preparing and approving schedules, etc.). Hartwick & Barki concluded that communication represented “a new and important dimension of user participation” (p. 74).

Communication-in-design research may also detail roles and communication behaviors that are in evidence during design. Often literature of this nature encompasses the entire process of design. From the results of research of this nature, researchers may make recommendations concerning stakeholder roles, and point out what is the most effective way to structure work teams from the standpoint of group dynamics. Also, this type of research may identify communication/work themes and suggest ways to manage these themes for maximum productivity for in-group work.
Sonnenwald conducted recent work in the communication-in-design genre. Her initial work (1993) was undertaken to articulate “a predictive model that suggest[ed] strategies which may help participants interact more effectively and ultimately improve the quality of design outcomes and the design process” (p. ii). This model described communication behaviors, roles, and patterns of communication between designers, users, and developers. From this particular work, the researcher came to understand that communication in design is characterized by “contested collaboration”. This concept acknowledges the cooperative nature of design work, but because the participants represent different fields—speak a different language, and have varying goals—conflict arises during the design phase. In effect, “the uniqueness which brings participants together also separates them, making collaboration and communication difficult” (p. 171). She explains

> it is often difficult for participants to collaborate and mutually explore one another’s life-world due to the uniqueness of each life-world. This uniqueness separates participants through differences in language, expectations, motivation, and perceptions of quality and success. These differences can cause misunderstandings and as a result, participants contest, or challenge, each other’s contributions (p. 168).

Contested collaboration indicates a need for negotiation. However, communicating for the purposes of getting others to accept one life-world over the other may have a negative impact on the design process and design outcomes (Sonnenwald, 1995). Sonnenwald outlines strategies and roles that can help accomplish this interchange and help to make the design process successful (Sonnenwald, 1996).

In earlier research into designers’ perceptions of their design habits, Dagwell & Weber (1983) sought to explain why problems occur during information system
implementation, and in this effort asked whether designers’ conceptualizations of users may be at fault. Communication-in-design research asks how certain communication habits and roles impede or facilitate the design process, and Dagwell’s designer’s model of their users indicated that when designers have an ‘undifferentiated’ user perception, this may translate into unusable products. In other words, when designers fail to see users as having varied motivations and skill levels, they are more likely to design products that users reject.

Hedberg & Mumford (1975) ask similar questions as Dagwell and Weber, drawing similar conclusions in some of their early research that presaged socio-technical system design methods. Though later research found operational flaws in this research design, the researchers discovered that designers held inconsistent “models of man” (perceptions of system users). On the one hand, the designers reportedly viewed users as “mature, sophisticated individual[s] with a desire for challenge and achievement….”. However, as Hedberg & Mumford pointed out, “this model [was] not extensively reflected in their work” (p. 57) [italics in original]. While the designers perceived users in one way, their design practice reflected that they design according to a completely different ‘model’. Designers worked on two different levels: (a) thinking about/conceptualizing users, and (b) designing for users.

Hedberg and Mumford’s designers saw a mature user, unfortunately, in design practice they utilized the opposite user model. In effect, designers practiced a contradiction. Hedberg & Mumford concluded that the solution to this problem was “to change the model of man which the systems designer uses at the operational level to that which he uses at the theoretical level” (p.57). Acknowledging that the change would take
time, the researchers looked to effect change initially in the practitioner-user relationship, which in their opinion “too seldom contains real communication” (p. 57) [italics added]. Hedberg and Mumford point up an area in which designers needed to change, and in the process indicated a direction for future HCI research—a direction that involved studying and facilitating real practitioner-user communication. Communication that one considers to be real may be non-mediated and direct as that implied in user-centered communication and afforded by usability testing.

Hedberg & Mumford (1975), then, concur with Dagwell & Weber (1983) that designers’ ways of thinking about users and their ways of designing for users are connected. Faulty design perceptions may lead to the development of non-viable design products. Hedberg & Mumford decide that direct practitioner-user communication is the way to begin affecting designers’ perceptions and mental models of users. This present research project follows in that tradition, but combines the communication orientation of communication-in-design research with the research on designers’ mental models of and perceptions of users. In a sense, this current project looks at the contradiction between design practice and the design rhetoric, as did previous research. Unlike Hedberg and Mumford, however, this research looks at that contradiction and asks a different, though related, question. This project asks: Given this inconsistency between rhetoric and practice, in what ways do designers characterize and perceive user-centered design practice and communication with users, based on their previous experiences. Usability testing as part of user centered design methodology and as mandated by ISO standard, provides a useful location within which to isolate such communication experiences and examine this tension.
Chapter Summary

This dissertation project focuses on design practitioners’ communicative experiences as they occur during usability testing in an attempt to isolate and lay out the contradiction that occurs between their belief in UCD and their practice of that methodology. Communication is important to study because, as this chapter established, it is a central aspect of UCD. Usability testing, and by extension, UCD are being cast as embodying communicative processes in this study. Figure 4 provides a visual representation of this idea.²

Figure 4. Picture of the Relationship Between UCD, Communication and Usability Testing

² This figure is based on the picturing tool of Richard F. Carter as adapted by Dervin (1975). User-centered design (UCD) is an entity that has the attribute of communication. The different ways that practitioners may come to understand users’ needs, communicating with them for design purposes (e.g., requirements gathering, through correspondence, usability testing, interviewing, via another person, etc.) become examples of communication and are represented by the small squares with the dashed lines. Usability testing (UT), as the focus of this study, is represented as one of the communicative processes within UCD and is denoted by the filled box with solid lines.
CHAPTER 3

METHOD

Research indicates that designers hold one opinion about designing, personally, but practice design in a totally different way (Dagwell & Weber, 1983; Hedberg & Mumford, 1975). The research objective of this study was to understand the rhetoric/practice schism, i.e., the contradiction, more clearly and to discover what role the phenomenon played in the processes of usability testing and of making/revising products according to users’ input. This chapter discusses Sense-Making Methodology, the research methodology used to gather data and to examine how that data informs the research questions. Sense-Making Methodology has proven amenable to researchers who have chosen either quantitative or qualitative methods, however, the use made of that methodology in this study exploited its qualitative application.

The Qualitative Research Tradition, Sense-Making and HCI Research

Denzin and Lincoln (1994) assert that qualitative research is an interdisciplinary, transdisciplinary, and sometimes counter disciplinary field…. [whose] practitioners are sensitive to the value of the multimethod approach. They are committed to the naturalistic perspective, and to the interpretive understanding of human experience. At the same time, the field is inherently political and shaped by multiple ethical and political positions. (p. 3-4)
Qualitative researchers emphasize “the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, [the] situational constraints that shape inquiry….and] the value-laden nature of inquiry” (p. 4). Miles and Huberman (1994) point out the complementarity of qualitative and quantitative research—combining methods in a particular project through triangulation (See Glassner & Moreno, 1989; Layder, 1993; Neuman, 1997).

The questions in this research flow from the practice of design and therefore implicate the use of qualitative methodology. The project is exploratory in nature, beginning, as it were with questions, rather than with a preconceived theory and/or set of hypotheses. Asking such questions calls for a methodology and method that will allow the theory to emerge, as data are systematically collected and analyzed throughout the research process. Methodology should encourage the ‘unfolding’ of the phenomenon through examination of the data, in the tradition of grounded theories (See Glaser & Strauss, 1967; Strauss & Corbin, 1998). Grounded theory is characterized by the notion that concepts arise from examination of the data, and by the researcher’s ability to think critically and creatively about the research process and results, simultaneously.

Sense-Making methodology, as developed by Dervin and her colleagues, is consonant with these purposes and offers, for the purposes of this research, a depth and level of flexibility not heretofore demonstrated in interviewing methods used in HCI research. Sense-Making’s methodology presents intertwined assumptions about human nature—ways of knowing and being. Dervin (1999) summarizes what makes Sense-Making the methodology of choice for this project in an explanation of its major meta-theoretical themes. She observes that “no linear order of presentation works best because
the linearity of the discourse can only but grasp fragments of what Sense-Making assumes is the complex, analogic, elusive lived human condition” (p. 730).

Interviews have been used to explore how professionals think in action (Schon, 1983), while gathering verbal protocols, recording critical incidents (Flanagan, 1953), and in HCI research involving situated actions (Suchman, 1987). Hirschheim (1985) looked at organizations’ use of participatory design practices using semi-structured interviews of 20 participants in 8 organizations. He found that organizations either practiced representative or consensus design methods as described in Mumford (1981). Hawk (1993) also used a preliminary interview of senior systems analysts to better understand the impact of user involvement in system design. Results, in this cross-sectional field study showed that user involvement in systems design is mediated by personality differences.

The hallmark of such work is that actors’ provide narrations concerning their mental states, their behaviors, their interactions, and their situations. The concept for this idea within grounded theory, is description—“an account related from the perspective of the person doing the depicting” (Strauss & Corbin, 1998, p. 15). Dervin’s Sense-Making interview method was chosen because it offers for the goals of this research a depth of reach and a level of flexibility not heretofore demonstrated in interviewing methods used in HCI research. Though conflicting opinions as to the validity of such data exist [See American Psychologist, 1991; Ericsson & Simon, 1984; Nisbett & Wilson, 1977], qualitative methodology, grounded research, and Sense-Making converge in that each entails immersion in the everyday life of the setting chosen for study, values and seeks to discover participants’ perspectives on their worlds, views inquiry as an interactive process between the researcher and the participants, is both descriptive
and analytic, and relies on people’s words and observable behavior as the primary data. (Marshall & Rossman, 1995, p. 4)

The next section describes Sense-Making’s Methodology and discusses how it has been adapted to facilitate the interviewing task in this project.

**Background and Description of Interviewing Method**

The first use of the Sense-Making’s interviewing analytic analogous to the present research—to study practitioners’ views of users—is found in a two-part study funded by the U.S. Department of Health, Education, and Welfare that examined practitioners’ and clients’ views of client information needs (Dervin et al., 1977). Observing early on that “only the client can judge whether information or service will be helpful”, these researchers put forth the ‘client-in-situation approach’ to help interviewers understand the “situational nature of behavior” (p.14). Sense-Making theory and method have continued to evolve—being used in qualitative and in quantitative research. Sense-Making Methodology has been implemented extensively in the field of library and information science where it re-focuses contextual research, and offers alternative methods for conducting user-oriented research. [See Vakkari, Salvolainen & Dervin, 1997]

The Sense-Making Methodology hinges upon and brings to light several basic assumptions regarding how individuals construe their worlds and understand life to cohere. These assumptions include: a focus on verbs (rather than on nouns) that denote changing people in changing contexts; the understanding that the only way to hear about another’s world is to invite description of their experiences/life-worlds; and that the researcher’s power as expert is mitigated through Sense-Making tenets that allow researcher and researched to investigate the phenomenon of interest together—as co-
researchers (Dervin & Frenette, 2001). In this light, Sense-Making offers the chance to study communication communicatively by “creating procedural conditions that promote and invite two-way sharing and negotiating of meanings” (p. 72). What results is a study of the processes of communication behaviors particular to a gap-filled situation that respondents can only relate through reflection upon their communication practices.

Central to Sense-Making Methodology is a metaphor—a visual, procedural representation—the image of a person who “moves across time and space, facing a gap, building a bridge across the gap, and then constructing and evaluating the uses of the bridge” (p. 73). The movement and gap in the Sense-Making metaphor pertains to the Sense-Making Methodology’s use of the discontinuity assumption, a reference to inherent discontinuity in the human condition. (Dervin, 1998) The metaphor is a framework informing research, not a statement about any given person’s movement through time and space. The idea is to use the Sense-Making metaphor as “guidance for thinking about people, talking to them, asking questions of them and designing systems to serve them…. [t]he metaphor forms the basis of the interpersonal interface….” (Dervin, 1998, p. 39)

This metaphor, conceptualized as a triangle, further posits movement across bridged gaps—from one life situation or experience to another. Sense-making assumes that “as humans move across time-space, both rigidities and flexibilities are possible” (Dervin, 1999, p. 45). Some gaps may be bridged routinely or habitually, some inventively or capriciously, in practice. There are many ways to bridge these gaps—the “myriad ways are conceptualized as verbings” (p. 74). The verbings represent actions and ways of communicating that may be either purposive or non-purposive in nature.
Sense is made and un-made as the particular gap or experience demands. Sense that is made and unmade in these instances becomes outcomes that are used to enable movement to continue. Thus, the major constructs in Sense-Making theory are designated: situation, gap, bridge, and outcomes. This metaphor has guided the development of the instrument that was used in this project.

Similar to Dervin’s Sense-Making metaphor, Strauss and Corbin conceptualized a Conditional/Consequential Matrix (CCM) whose components illustrate the spiraling interplay of structural forces (conditions/consequences) with process (action/interaction) to explain how events evolve over time. Simply stating, and grossly over-simplifying both ideas, the elements of the CCM may be mapped onto Sense-Making one-to-one. In comparison with the CCM, Sense-Making’s situation corresponds with Strauss & Corbin’s condition, the events that lead to an issue or problem (Dervin’s gap). Gap bridgings are analogous to actions/interactions, the ways that individuals respond to issues and problems. Finally, outcomes and consequences are parallels in that these constructs represent what happens when actions are taken to manage situations and to solve problems.

Sense-Making provides, at heart, an instrument that makes communication possible between superficially competing voices—as is the case with design practitioners and users during the usability testing process. In a design process that includes users, practitioners’ interests may diverge from users’ interests causing conflict during the design lifecycle. Research suggests that conflict during interaction—for example, during the design process—is one cause of system failure (Sonnenwald, 1993, 1995). This present research interviews design practitioners to discover perceptions and practices that
may arise out of communicative experiences during the design process; and asks how these communicative experiences have bearing on designers’ impressions of user-centered methodologies and on their future practice of user-centered design at work.

In this study, the Sense-Making interview encourages design professionals to focus on their own perceptions and communication behavior with regard to users during usability testing. In the process of designing, each participant responds to situational conditions in time and space while defining and bridging gaps and discontinuities using communication. Sense-Making theory positions communicating behaviors as the link between individuals, between individuals and culture, between individuals and history, and between individuals and institutions. Sense-Making has been offered “as a methodology for studying and facilitating the making and un-making of sense in any communication situation, particularly when professionals are mandated to serve groups of people usually designated as audiences (e.g., patients, patrons, users, audiences, and customers)” (Dervin & Frenette, 2001, p. 72). In light of this stated purpose, the Sense-Making interview was used to study the communication situation between designers with users. At the conclusion of this project, the researcher will better understand design practitioners’ perceptions of users; their perceptions of the timing for, and value of user input; and their thoughts regarding user-centered design methodology, by uncovering salient themes, patterns or behavior, and indicators about how these themes and patterns are linked together.
Data gathering occurred in two phases. In phase one of the process, a preliminary Sense-Making interview asked respondents about their work experiences and the subsequent communication practices they had engaged in during the design lifecycle. The interviews were from 1 ½ to 2 hours in length. [Appendix A] The questions were used as a conversation starter and were designed to aid recall. The goal was to provide an orientation to the interview, and allow respondents to gather their thoughts and prepare to discuss their design experiences. Fourteen of the 54 interviewees from phase one were eligible for the second phase of research, which focused on design practitioners’ usability-related work experiences. In the initial interview, these 14 respondents had reported having been involved with usability testing at some point in the past. Two of the 14 respondents voluntarily withdrew from the set leaving 12 eligible interview participants who participated in the follow-up second interview. [Appendix B]

The second Sense-Making interview opened by asking respondents to provide working definitions for usability and for usability testing. These interviews were from 1 ½ to 2 hours in length. As in the first phase, the questions were designed to help the respondents identify, recall, and discuss the relevant events from those earlier usability testing situations. Respondents were given the freedom to select experiences from any period of their work histories, and were given the same general overview of the study and orientation to the Sense-Making interview as they had received in the first interview. Respondents were not asked to repeat the series of demographic questions because that

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3 I wish to acknowledge here the close involvement of my advisor, Professor Brenda Dervin, in the development and design of the initial Sense-Making instrument used in this project.
information was already on file and had not changed since the beginning of the data-gathering phase.

Each respondent was asked to think about and discuss usability design situations they had been involved in where: (a) usability testing (or more usability testing) was warranted, but not practiced to their satisfaction, and (b) user suggestions were gathered and available, but design proceeded without implementing the users’ input. The overall aim of the research was to be able to report on their notions of the factors and features of each project that allowed usability testing and users suggestions to be included in or excluded from the design. Using usability testing as a case in point, these statements would constitute a basic mapping of the opinions that practitioners, themselves, hold about communicating with users and usability testing methodology, in general. In addition, by analyzing their reported attitudes and opinions about obtaining users’ input the researcher could make statements about practitioners’ communicative behaviors and how these may have an effect on the decision to include or exclude UCD methods, shedding more light on the contradiction between their values and their practice. Thus, this research was two-pronged: (a) discover attitudes about usability testing as a user-centered design method, and (b) report on how those attitudes may influence the decision to utilize suggestions in the system under design.

Participants

This research project involved professionals whose work may be described as designing or developing information systems. At the beginning of this project, the researcher provided a cogent rationale for allowing only those persons whose educational background, and work experience classified them as graphic designers and/or developers
(computer programmers) to participate. This course would, in the current researcher’s opinion make the results directly comparable with some previous HCI findings. However, it is not uncommon, given the design field and today’s organizational structures, for teams to exist in which members have various roles, including someone who writes code using off-the-shelf applications who has not attained a formal education in the computing sciences. Additionally, with the advent of web-based information dissemination, it is not unusual for each work group to designate someone who is not a programmer as ‘the webmaster’ from that group.

This study, therefore, included those people who are currently ICT developers, proper, as well as those individuals whose informal training and design experiences have allowed them to accumulate knowledge of design principles and to write code using off-the-shelf applications. In the end it was decided that this was the better course of action due to the interrelated nature of work assignments requiring collaboration in most work environments. That this research should still have foundations in the corpus that examines the work habits and behaviors of developers was a concern, thus, some of the respondents in this group were, indeed, representative of that narrowly-defined set. However, the rationale and the purposes of this research point to a wider group of respondents whose education, job title, and description may belie their suitability, and so these professionals were included in the participant group, as well.

Individuals whose list of job duties conformed to those listed above were chosen from the pool of local information and communication technology professionals. Initial contact was made through managers [see Appendix C], who supported the research in the interest of continuing research, and staff training and development. Contact letters [see
Appendix D] were sent to a pool of approximately 120 eligible participants in four local organizations. The resulting sample was considered a random sample of the subset of all those who were eligible to participate. Names of potential participants were arranged on the participant list in random order before sending out the letters. (The researcher also contacted respondents via referrals after the interviewing process began.) Those who responded were sent a copy of the Sense-Making interview scenario, and were given information concerning the time and date of their interview. [Appendix E] On the day of the interview, respondents received an introduction to the study, a brief description of the Sense-Making interview structure [Appendix F], and had the opportunity to ask questions about the research, in general.

Interviews proceeded in the order in which participants responded (i.e., the first person to respond, regardless of their place on the initial list, became respondent #1, and so on). The researcher interviewed respondents from this first group in this fashion until all who had agreed to participate were interviewed. Following the Sense-Making interview, respondents were asked to provide demographic information. This preliminary interview discovered 14 participants who were eligible for the actual data-gathering phase – i.e., design practitioners who had had experience with usability testing. Invitations went out to these 14 participants asking them if they would be interested to engage in further research, and to that end they were sent a copy of the Sense-Making protocol that had been especially designed to reflect the usability scenarios on which this project focused. The researcher scheduled and interviewed this smaller pool using the usability Sense-Making protocol, a second, more sharply focused interview. [Appendix B] In the end, two respondents were not available for the second interview, so that 12 of
the 14 were interviewed in the second phase, yielding a total of 22 audio taped design instances. Two respondents combined the questions, and gave answers in one interview, only. All of the interviews were transcribed fully. Twenty-two coded interviews from 12 respondents form the basis for the analysis in this study.

Design situations whose processes are contradictory to a practitioner’s beliefs provide the focus of this research as participants recounted their usability experiences. Situations that respondents reported on were quite varied. They recalled work experiences from their time spent designing in federal, state, and city government, insurance and banking establishments, and also the educational and entertainment arena. They reported working on products for work as well as for leisure. Respondents had design experiences constructing web pages, integrated information systems, stand-alone products, and entire web sites. The design practitioners in this study had designed for an average of 12.6 years, with 151 years total work experience in the design field. Six males and an equal number of females served as respondents in this study. This sample, as represented in Figure 5, was not otherwise diverse.

The unit of analysis for this research was the particular instance in which the respondent stated a belief and proceeded to negate that statement by describing opposite design practices. In this research, this phenomenon is called the contradiction. The 12 respondents were asked to recount two instances each for this project. In the first instance they were asked to speak about a usability testing experience in which they would have liked to see more (or some) usability testing done on the product. They may have expressed a dissenting viewpoint as the team decided to forego usability testing altogether, or decided not to engage in further usability testing – opting to release the
product as it stood. The second scenario asked that each participant talk about a time when usability testing was completed, however, the product was released without changing it to reflect the users’ suggestions that had been collected during usability testing. When coding, each instance of the contradiction was noted and the subsequent design practices and communicative actions were also noted.
<table>
<thead>
<tr>
<th>Name</th>
<th>Number of Years as Design Practitioner</th>
<th>Gender</th>
<th>Number of Interviews Given</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alex</td>
<td>15</td>
<td>M</td>
<td>2</td>
</tr>
<tr>
<td>Belinda</td>
<td>7</td>
<td>F</td>
<td>2</td>
</tr>
<tr>
<td>Connie</td>
<td>15</td>
<td>F</td>
<td>2</td>
</tr>
<tr>
<td>Dianne</td>
<td>20</td>
<td>F</td>
<td>2</td>
</tr>
<tr>
<td>Edward</td>
<td>25</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>Hubert</td>
<td>9</td>
<td>M</td>
<td>2</td>
</tr>
<tr>
<td>Mack</td>
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<td>M</td>
<td>2</td>
</tr>
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<td>Mary</td>
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</tr>
<tr>
<td>Roger</td>
<td>8</td>
<td>M</td>
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</tr>
<tr>
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<td>Shirley</td>
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</tr>
<tr>
<td>Tonya</td>
<td>12</td>
<td>F</td>
<td>2</td>
</tr>
</tbody>
</table>

Sample size = 12 respondents (6 males and 6 females)
Total number of years design experience for respondent group = 151
Average number of years design experience = 12.6
Total number of interviews = 22

Figure 5. Phase 2 Interview Respondents
The Communication-As-Procedure Grid: Coding Communicative Tactics and Outcomes

The interviews were coded four times in total as the researcher, the sole coder, read through the data to identify contradictions as respondents identified them between their beliefs and subsequent actions. Coding proceeded line-by-line according to micro-analysis as outlined in Strauss and Corbin (1998). During the second and third rounds of coding, the researcher began taking chunks of data—sentences and paragraphs—and inquiring as to the major idea embodied in them. This was done in order to code consistently—in relation to the codes that had been established in the first round of coding, but not rigidly so as not to miss new categories of codes as they presented themselves. This type of coding, known as open coding, formed the basis of the initial coding process as the coder looked “for explanations and to gain an understanding of phenomena” (Strauss & Corbin, 1998, p. 129) in an effort to understand the main issues and problems to which the respondents were responding. During the fourth pass through the data, the coder looked to relate structure (circumstances) to process (action taken in response to issues) and to the phenomenon under consideration. The researcher coded the data until each category reached saturation -- the same data was coded into the same categories.

Data coding was recorded using Muhr’s (1997) ATLAS.ti program. ATLAS.ti is designed specifically to manipulate qualitative data by allowing a researcher to choose single words, sentences or blocks of text to code. This software is based on Grounded Theory Methodology and uses that terminology to denote codes: open, axial, and in vitro. Most of the codes that were assigned in this project took the form of open coding.
The coding schema used in this project was modeled on Dervin’s communication-as-procedure analytic (2003; Dervin & Clark, 1993) in which two dimensions of communicating are promulgated: situation-defining strategies and communicating tactics. This idea highlights the communicative actions that a respondent took in each situation, which are noted as *verbings*. Recall that this word is used in Sense-Making to connote a person’s movement through time and space.

Within the communication-as-procedure model, actors in situations relate to themselves and to other entities. The ways that they communicate in each situation, in turn, depend upon how they define the situations they face at any moment in time and space. Communicating strategies are cognitive *behavings* that actors use to define communicative situations, and tactics are communicative devices used to accomplish tasks. Setting strategies on the vertical axis and tactics on the horizontal axis forms communication-as-procedure ‘grid’, a means to describe how communication occurs. The procedural framework describes how

the microworld of individuals is connected to the macrolevel world of cultures, structures, and institutions and vice versa. … Each cell is seen as a site for isolating communication behaviors – the communicating procedures performed at specific moments in time-space. (Dervin, 2003, p. 177)

In other words, the cells in the communication-as-procedure grid indicated how individuals communicate with themselves and how they responded/created ideas in relationship with others in specific situations.

For the purposes of this project, the communication-as-procedure idea was modified as shown in Figure 6. The particular design situation had been determined to be one in which practice contradicted stated beliefs, so the situation-defining strategies were
list on the vertical axis: practitioner relating to self, practitioner relating to the users, and practitioner relating to the users’ representative.

Communicative tactics were listed on the horizontal axis and consisted of interim tactic sets: attending, connecting, orienting, and ignoring, confronting-opposing, stalling. Also on the horizontal were final tactics (undoing rigidities and recalling). Respondents’ use of interim tactics could have proceeded step-wise as illustrated, or not. Also, the respondents could have indicated use of interim tactics that may not have progressed to either Final Tactic. Emoting was possible as a characteristic in all the communicative situations and was used with either tactic. It was, therefore, listed as a super Tactic. Thus, the communicative tactics that design practitioners indicated they had used to communicate in the situations they recalled in the interviews were mapped into cells of the grid using the ATLAS.ti program.

In order to standardize the coding and to maintain validity of the subsequent analyses, the following definitions were applied to make identification of interim and final communicative tactics more efficient. This practice also makes the findings more transferable, as the definitions will enable the same codifications to be utilized in future research, by isolating similar behavings using the same schema. This researcher applied the definitions listed in Figure 7 to the situation-defining strategies and communicative tactics.
Contradicting behaviors were coded when practitioners designed in opposition to their stated or held opinions about how design should proceed. Contradicting behaviors characterized the situation, however the situation could have been defined as one in which all of the stakeholders (the practitioner, team, users/representatives, usability team) related to each other. In the interviews, behaviors were coded as contradicting when practitioners communicated the contradiction between belief and practice to themselves when reflecting on speaking; to the users or to their representatives. Generally, contradicting communicative behaviors were defined as inconsistencies or ideas that stood in opposition to each other. See Figure 7 for a summary of these tactics and their descriptions.

*Attending* happened when the practitioners and users exchange ideas and the ideas resulted in changes to attitudes and to the system under design. Change and
incorporation of ideas from each stakeholder group marked this process. Some acknowledgement that the stakeholders' opinions were heard and were deemed to be valuable to completion of the lifecycle was the desired end.

*Connecting* was characterized by establishing relationship with team and users for the purpose of designing a system that was acceptable to all stakeholders. This may just be an expressed desire for synergy -- someone with whom to come into agreement, as with a meeting-of-the-minds, who could act as a sounding board or as a checkpoint -- a point of reference. Connecting denoted a development of trust between stakeholders whereby all groups perceived that each stakeholder looked to design with the best interest of all parties in view. Connecting may have been within group (i.e., only trust members of the team) or between groups (a relationship of mutual respect between practitioners and users and the organization).

When users and/or team members gave directions about what, in their opinion, would lead to a successful design that is called *Orienting*. Orienting may have included having the design be acceptable to more than one stakeholder group, but that was not necessary -- such as when the design team thought a design would be acceptable to users because of their past experience. Or when users indicated what they'd like to have in a product without knowledge of the design constraints under which a design team may operate. Orienting was characterized by decision-making that may have been done in conjunction with all stakeholders. When it involved all stakeholders and was a product of joint decision-making, it may be called a by-product of Connecting.

*Ignoring* resulted when practitioners and users understood/perceived that their input or expertise was not being respected and that the other stakeholder was not listening
to what they thought/felt/knew/cared about. The factor that marked this process was that no change occurred and the status quo remained the standard. When stakeholders perceived that this process (Ignoring) was at work in a situation, the response may have been resistance in the form of Stalling or in Confronting/Opposing. The ideal situation would be seen when the stakeholders moved into Attending then into Connecting, Orienting, and Undoing Rigidities.

*Stalling* happened when either a practitioner or a user (includes the organization, or their representatives) did not move forward to utilize the input from a stakeholder, or delayed the process that should produce a finished product. Anything that was perceived as inhibiting the design process and jeopardizing the fixed deadline for release or launch of a product was considered stalling. (Stalling may be objectively indicated -- such as when a dispute arose and the parties did not want to meet to discuss a compromise. Stalling may also have been something that was not seen, but was a perception of a mindset or attitude as when the practitioner perceived that usability testing or testing of any kind or organizational processes would prolong the design lifecycle and result in a missed deadline.) This process was characterized by a lack of progress in the design lifecycle.

*Confronting/Opposing* happened when there was a dispute between or among stakeholders as to the way the design process should proceed. This could have involved verbal (arguing, speaking with another party about the issues under dispute, or other verbal means of disagreement) or non-verbal (stalling process, absenteeism, not meeting assignment by milestone dates, etc) methods. Again, Confronting/Opposing may have existed for all eyes to see (as when arguments flare up) or it may have been subtle and
hidden (such as attitudes/opinions one group holds about another and ways of working based on those attitudes). The Confronting/Opposing process was characterized by resistance -- either active or passive. Dervin (2003) denoted this simply as “one entity contesting against [an]other” (p. 176).

*Undoing Rigidities* was the process by which new ideas were implemented and different ways of operating were introduced so that the former processes were adjusted or replaced by the new ones. The design team may have accepted a new methodology that shortened the design lifecycle, or that actively sought users’ input and scheduled that into the design lifecycle. The process of Undoing Rigidities may have been accompanied by resistance, such as what may be demonstrated through Confronting/Opposing. According to Dervin (2003), “…the focus is on a conscientizing process …. [wherein] rigidities dissolve and behavior becomes more flexible” (p. 177). The conscientizing process, in theory, permits all stakeholders the opportunity to speak until they have had their say. Flexibility, in this case, was denoted by the decision to design in a way that allowed users to say what their needs were, then incorporated what users said into the product design.

*Recalling* happened when the team resorted to practice according to what had always been the ‘model of practice’, without including new ideas – especially, when those new ideas were the users’ suggestions or suggestions from the users’ representatives. Dervin’s definition for Recalling implicated past experience as a central characteristic as “the focus is on creating memory of own, other, or collective past and bringing memory to bear on the present” (p. 177). Regardless of the reason given for this occurrence, when design proceeded without a change in procedure, Recalling has occurred. This was evident in the interviews when practitioners referred to the team
using a popular, tried-and-true method that had been successfully deployed in the past, or when practitioners utilized static forms of users’ input (user requirements and documentation), or their own past experience, and/or that of their design colleagues.

*Emoting* was the process by which practitioners indicated an emotional impact during or an emotional involvement with the process of getting users’ input. Emoting was coded as a super-code because it accompanied other tactics and seemed to be somehow suspended above each of the other tactics. In view of this, Emoting would rarely occur alone, but would likely appear as part of a tactic pair. Through this communication tactic, the practitioner was able to express feelings that were stirred during the design process, in some way and bore a resemblance to an alternative communication procedure called ‘speak bitter, speak easy’ (Dervin, 2003). While the idea of Emoting does not share the vehemence of the ‘speak bitter’ notion, they do share the notion that someone was “given the floor to talk of their frustrations, angers, and hurts….” (p. 188). Instances of emotional displays were labeled as Emoting in coding.
<table>
<thead>
<tr>
<th>Interim Communicative Tactics</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attending</td>
<td>Attending is characterized by having practitioners and users exchange ideas resulting in changes in attitudes and to the system under design. Attending is characterized by change and incorporation of ideas from each stakeholder.</td>
</tr>
<tr>
<td>Connecting</td>
<td>Connecting means establishing relationship and creating design synergy -- coming into agreement about the product under design. Connecting denotes development of trust and may include building relationships that are maintained beyond the immediate design situation.</td>
</tr>
<tr>
<td>Orienting</td>
<td>When users, representatives, and/or design practitioners give directions about what leads to a successful design, that is Orienting. When Orienting involves all stakeholders and is a product of joint decision-making, it may be a by-product of Connecting.</td>
</tr>
<tr>
<td>Ignoring</td>
<td>Ignoring results when practitioners and users understand or perceive that their input/expertise is not respected and they feel that the other stakeholders are not listening. This tactic may lead to resistance.</td>
</tr>
<tr>
<td>Stalling</td>
<td>This is a process that is characterized by the design process being inhibited such that the fixed deadline for release or launch is jeopardized. Stalling may include verbal or non-verbal behaviors.</td>
</tr>
<tr>
<td>Confronting/Opposing</td>
<td>This tactic involves active disagreement among the stakeholders about the way that the design process should proceed. This type of communicative behavior is characterized by resistance – either active or passive – when one party contests against another.</td>
</tr>
<tr>
<td>Final Communicative Tactics</td>
<td>Description</td>
</tr>
<tr>
<td>Undoing Rigidities</td>
<td>The process by which new ideas are implemented and different ways of operating are introduced so that the former processes are adjusted or replaced by new ones. A central feature of this process is conscientizing.</td>
</tr>
<tr>
<td>Recalling</td>
<td>This communicative tactic denotes a resorting to practice according to an established model, without considering whether a different model would provide greater flexibility, creativity, and power.</td>
</tr>
<tr>
<td>Super Tactic</td>
<td>Description</td>
</tr>
<tr>
<td>Emoting</td>
<td>This process indicates an emotional impact or emotional involvement. This tactic would likely occur as part of a tactic pair, rather than alone.</td>
</tr>
</tbody>
</table>

Figure 7. Communicative Tactics and Descriptions
Chapter Summary

This research was conducted to understand more completely the contradiction found in the HCI literature in which design practitioners’ (i.e., designers and developers) values do not align with their design practices. The project was designed to explore the following questions:

1. How does the contradiction between design practitioners’ values and practices play itself out in their experiences communicating with users to implement usability testing?

2. What do design practitioners say about the reasons that factor into their decisions to exclude users’ suggestions from the final product design?

Coding proceeded according to grounded theory methods and categories were formed as main issues and problems related to those were identified. Dervin’s (2003; Dervin & Clark, 1993) Communication-As-Procedure Analytic was proposed and modified as a means of isolating and laying out patterns of communicative behaviors used in the contradictory situations that the respondents identified. Patterns of behaviors called tactics were uncovered. The tactics were broken down into two sets (A & B) and into two groups (interim tactics, and final tactics). In Tactic Set A, there were three interim tactics: Attending, Connecting, Orienting, and one final tactic, Undoing Rigidities. The second set of tactics were: Ignoring, Stalling, Confronting/Opposing (interim), and included Recalling as the final tactic. The following chapter will look at the results of the data analysis viewing the communicative tactics that were isolated using the Communication-As-Procedure analytic through the theoretical lens of Sense-Making Methodology.
CHAPTER 4

RESULTS

This research focuses on design practitioners’ attitudes about the communication between themselves and users. In this project it is argued that communication is, by definition, a central aspect of user-centered design (UCD). This dissertation focuses particularly on the communication that occurs during usability testing. It is important to emphasize that usability and user-centered design are not always seen as embodying a communication process. Notably, however, recent research on this topic bears out this conclusion. (Gulliksen, 2003; Hartwick & Barki, 2001; Sonnenwald, 1993, 1995)

Usability testing is an activity in the user-centered design (UCD) process that tests a product for qualities that lead to an assessment of usable, useful, pleasant to use, etc.

Recall from Chapter 3, according to the Picturing notion that usability testing was an attribute of UCD, along with other attributes that were not the subject of this project (Dervin, 1975, 2002). By couching UCD as a communicative process, it would beg the question about how other means of gathering users’ input would be characterized. According to this scheme, the other means of getting feedback from the user or of involving the user in the design process would also be seen as communicative in nature. Thus, requirements gathering, getting feedback via correspondence, using one’s past
experience, or colleagues or team members’ experiences would all constitute
communicative processes. However, though these ideas would naturally surface as
respondents related their design experiences, they were not mentioned in detail because
only usability testing was the communicative process under study in this present
investigation.

Respondents also gave information related to their design team members, the
usability team, and about the particular organization in which they were designing.
These issues were not used in the formulation of these results nor in the discussion that
follows since the research questions related specifically to their communicative
experiences during usability testing. Though this may seem to be a tightly conscribed
focus for the study, such a constraint was deemed necessary in order to isolate and to
more clearly trace origins of the phenomenon of interest, the occurrence of contradictory
speech behaviors during usability testing.

Recall that respondent participated in two interviews, an initial, screening
interview and the usability testing interview. The initial interview may have had the
effect of allowing a bond of trust to be established between the interviewer and the
respondents such that they were able to speak candidly about intervening issues during
that initial interview. This would then account for the fact that during the second
interview, the respondents’ answers were more focused on the questions at hand than
they may have been had not the initial interview been done. This secondary benefit of
using the Sense-Making interviewing analytic can be considered a ‘happy accident’, but
the participants’ responses were more directly pertinent to their experiences with
usability testing, rather than about design in general and/or about other types of users’ involvement, during the second interview.

For purposes of this research it was important to mention these issues because unless this necessary first step were made, the resulting strategies and tactics may have appeared to be mis-aligned, and this could possibly compromise the integrity of the study results in the mind of the reader. In this study, the researcher defined the contradictory situations for respondents to concentrate on a product that should've been usability tested but was not, and user suggestions available, but not implemented. The interview questions asked the practitioners to talk about an experience wherein they worked on a product that they knew should be usability tested, but for whatever reason it was not, and also to consider a time when users' suggestions were gathered, but for whatever reason, were not implemented as part of the final product. The goal was to move the respondent from thinking abstractly about a project lifecycle to focus on their actual participation in usability testing, for gathering user comments, and discussing the rationale given for not changing the product although users' input was available in the form of suggestions/comments.

Sense-Making, a methodology that focuses on the *hows* of communicating, provided the frame for the interviewing instrument, as well as the communication-as-procedure analytic for coding and analyzing the data (Dervin, 1999a, 1999b, 2003; Dervin & Clark, 1993; Dervin & Frenette, 2001). The communication-as-procedure analytic captured the communicative processes that occurred in time and space as reflected in: the contradicting design or usability testing situation, practitioners’ actions, and in the consequences of their actions during the design situations they recounted. The
goal was to look at the moves that the practitioners made, rather than at their individual states and traits. Recall from the previous chapter that the communication-as-procedure approach had been modified for the purposes of examining the data in this study – communication practices between design practitioners and users.

The nature of the data in this study warranted the modification of the analytic, formulated as it was to provide a means to relate the macro-level world of the respondent to the micro-level. Use of this modified analytic facilitated a fine-grained view of the micro-level events which were the subject of this study, examining communication as it took place only on the level of the interaction. The macro-level extrapolation was beyond the scope of this project. Summarizing the analytic used in this chapter: the situation corresponds to the belief versus practice contradiction, the actions were the communication behaviors practitioners reported that occurred in those situations, and the consequences were whatever outcomes practitioners indicated happened relative to the practice of design.

The Communicating Situation – Identifying the Rhetoric of Contradiction

The concept of the contradiction was introduced in the first chapter, where the researcher provided a working definition to enable the reader to follow the coding process laid out in the previous chapter. However, this current section provides a formal definition is provided of the concept contradiction that is more typical of common usage. Merriam Webster’s Dictionary (10th Collegiate Edition, 1996) defines contradiction as a:

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4 The sense of contradiction and contradicting behavior that is presented in this research does not relate to the philosophical notion of contradiction. The way that contradiction is used in this paper connotes an
proposition, statement, or phrase that asserts or implies both the truth and falsity of something; a statement or phrase whose parts contradict each other; a logical incongruity; a situation in which inherent factors, actions or propositions are inconsistent or contrary to one another; a proposition so related to another that if either of the two is true the other is false and if either is false the other must be true. (p. 251-252)

Respondents gave several reasons for contradicting their beliefs, in practice. Although there was a difference between what they said they believed and what they actually did, they offered explanations for that fact. In all of the contradictory communication situations, usability testing as a means of getting the users’ input was not done, due to one or more of the reasons listed.

The researcher gathered occurrences of contradicting communicative behaviors were gathered from the interviews and examined for thematic similarity. The researcher found 32 total occurrences of contradicting behaviors spread across the 22 interviews from which were isolated six general themes. The practitioners in this study stated that they had acted in contradicting ways: (a) when earlier version of the product or a template had been usability tested, (b) when there were technical and/or physical limitations, (c) in response to the nature of the work situation, (d) when they had introduced the users’ suggestions in another way besides usability testing, and (e) when they had wanted the users’ responses to form a consensus with the practitioners’.

However, the sixth and foremost reason for the contradiction related to saving time – design practitioners reported that they had excluded usability testing and users’ suggestions because they wanted to complete the project on time. The notion of time inconsistency in speech as related to behavior. One way to look at it would be to think of the adage that the design practitioners who exhibit contradictions in behavior do not practice what they preach.
saving occurred in various permutations, but in the end, the practitioners reported being concerned about meeting deadlines and maintaining the project schedule.

When design practitioners used the rationale that the previous version or a template had been usability tested, they usually expressed a sentiment similar to that reflected in the following quotes. This explanation occurred four times out of the 32, or in 12.5% of the cases. One practitioner opined,

I think part of the un-vocalized reasoning behind it [not usability testing the product] too, was that we were following a template for the [product] anyway, so if we'd tested the template and it worked, then why would we have to test every [product] coming off it.

--Roger, 8 years design experience

Echoing the theme that a previous version’s successful testing eliminates the need to test the current version of the product, a second practitioner stated

I think they’re thinking that we already did usability testing and it turned out OK and, I don’t know. We’ve made changes based on usability testing, but we’ve made other changes that weren’t tested at all by end-users, so…. I just don’t think there’s awareness that there were significant changes that needed to be re-tested.

--Belinda, 7 years design experience

A second reason that practitioners gave to explain the contradiction between their beliefs and actions was that they practiced contradicting behavior when there was a technical or physical limitation where the product was concerned. Such a limitation could have been a problem with the capabilities of the code (computer language), screen resolution, or screen size. This was the reason given for contradicting behavior in three cases – 9.375% of the occurrences. Practitioners reported going ahead with design without usability testing because the technical or physical limitations of a product left
little room to entertain a particular set of users’ requests. An explanation of this type sounded like this:

We had to do a little bit of mind-reading from a user’s point of view. “On this screen, what might a user be asking?” And you really have to limit the questions, there’s only so much room…. They had to short, very terse, but still convey what they might be thinking…. Depending on the screen, there might’ve been a lot of different things.

--Connie, 15 years experience

Or, as in this case when a practitioner described using the first generation of a coding language, “I don't know that there was much of anything that was changed based on the usability tests, primarily because there wasn't much we could change. It was HTML 1.0.” (-- Alex, 15 years design experience)

One practitioner explained candidly that the contradiction was due to technical limitations with processor speed and other hardware capabilities:

There were certain features and functions that we would’ve liked to implement, but because of the processor capacity or the amount of file storage that it would take, it would cost too much to purchase that. It would cause us to raise the price too much – that [users] couldn’t afford it or would scream because we doubled the price. But without being able to buy that hardware or processor capacity, we couldn’t do some functionality or we couldn’t do it as well as we wanted to. … We had to compromise – we had to drop certain functionality and then other pieces of functionality that we did implement, have slower response times, so they have limits to what it can do…. I don’t know if there is always understanding in the [user] community about these other factors – the hardware things, search engine things, and talking with someone’s z-server and all that kind of thing – technical mumbo-jumbo – that they really have an understanding that [it] makes what you’re asking for impossible. I think it is helpful to know what the user wants, even if you can’t accommodate that.

-- Mary, 5 years design experience

The nature of design work was a third reason practitioners cited for designing in opposition to their stated beliefs. Explanations of this kind appeared to be related to the project, the team, the organization, or to some other factor in the design lifecycle.
Illustrating this type of reasoning behind his contradicting behavior, one practitioner stated, “We definitely target to have software that is so easy to use that the users need minimal training or no training. In some cases, that’s [usability testing] just not possible because of the type of work being done.” (---Roger, 8 years experience)

In some instances, the practitioner expressed the contradicting behavior in more emotional terms. One respondent said that a designer could become “jaded” – torn between the dictates of design work, and the need to include the users’ input.

I don’t want to be jaded. I want to be able to stay in touch with the user. On the other hand, in order to be a competent [practitioner], you have to become more technically oriented to understand more … to feel more comfortable navigating and talking to the user about what their challenges might be and help them to get through those. I can’t put myself in their place and ask them, but you know it’s got to happen. I need to have a technical understanding in order to help them get through stuff. It happens as the project goes on and I learn more about it, and even jumping from project to project. The longer you’ve been at a place, the more you know about the products, the more familiar you get with the lingo, you start forgetting that not everyone knows what [terminology] means….

---Connie, 15 years experience

Practitioners also cited two instances (6.25%) of using other forms of users’ input than usability testing results, and one occurrence (3.125%) of wanting users’ input to form a consensus with the practitioners’, as reasons for their contradicting behavior.

These two reasons, combined, accounted for less than 10% (9.375%) of the 32 occurrences of contradicting behaviors found in the data. When a practitioner pointed to using means other than usability testing results for getting users’ input into design, their explanations were constructed as follows:

They measured web clicks on all the sites, particularly of course on the service site. So I thought that was kind of a good experience too its not exactly usability testing but for awhile they had on their site a centered area on the top of the [company] that had four stories on it and they had a little scheme they typically followed. There might be a hard news story, an entertainment story, some
lifestyle/health improvement kind of story and something else that might vary depending on the season or something like that. Then measured everyday how many people clicked story 1, story 2, 3 or 4. They measured by topic area, they measured when, some of them would have a text link and also a graphic link and they measured how many people clicked the test, how many people clicked the graphic, where they associated. So I thought that was a really good lesson in user design.

--- Edward, 25 years design experience

Another practitioner’s decision to exclude usability testing as a means of getting suggestions from the users led to this explanation,

We did not usability test the administrator interface and we should have. It was fairly complex and there was a lot of terminology involved and a lot of navigation to get the tasks done and we did not usability test it, though we were doing regular field conferences and calls with the target users, we never actually ran them through any usability testing.

--- Hubert, 9 years design experience

The single occurrence of the rationale for contradicting behavior that corresponded to the idea that the practitioner wanted the users’ input to coincide with that of the team members, exemplified by the following quote:

I think sometimes with the users if you are planning on making radical changes you can invite problems by bringing in the users because you have to make a decision sometimes when you are looking at making big changes to a system. You want your users input but you also don't want your users sitting there saying, "Well, it’s just fine the way it is."

--- Roger, 8 years design experience

By far the most often-cited reason for not including users’ input via usability testing or implementing users’ suggestions was that of saving time. This reason was given to explain contradicting behavior in 18 of the 32 occurrences found in the interviews. Time saving accounted for an overall 56.25% of the reasons given for not including usability testing as a means of getting users’ input into the design lifecycle. This idea was expressed in several different ways. One practitioner spoke quite candidly
saying, “I’ll tell you exactly what it is prevents people going into usability testing – it takes too much time. And it takes time out of their schedule that could be eliminated.”

This practitioner implicated time or the lack thereof as a factor in the decision not to get users’ input on products:

“We’ve got to get this [project or product] done. I have far more important things. We sacrifice a lot to finish. Probably less so here than at other places I’ve worked where they’re willing to sacrifice an awful lot in order to get it out the door by a deadline. These guys are a little bit more flexible, they’re willing to have things coming in a rolling install – [they say] “Can’t do it right now, but we’re going to be doing an upgrade, we’ll get it then.” Other places: “Can’t do it, we’re going out the door this way. Too bad!”

--Connie, 15 years design experience

Speaking more directly about reasons for not conducting usability testing and getting users’ input that way, a practitioner talked about the timetable and schedule for the current project, “I haven’t heard of any usability testing plans for that, but because of our deadline, they may not do any. … So, I know that anytime that we have not done usability testing it’s always been based on deadline. That’s always been the excuse.”

(-- Roger, 8 years design experience)

The following table provides a summary of the reasons practitioners’ gave for their contradictory communication behaviors. The six reasons design practitioners gave in the interviews for the contradictions between their beliefs and the ways they practiced design were: (a) that an earlier version or template had been tested previously; (b) that they encountered technical or physical limitations; (c) that there were certain characteristics of design work that made it difficult to get users’ input; (d) that they had used other means of getting the users’ input than usability testing, (e) there was a desire for the users’ input to form a consensus with the design team’s, and (f) that the design
team wanted to save time. This final reason was the one that most practitioners gave for not including usability testing, as a means of getting users’ suggestions, in the design lifecycle. Two of the reasons related to usability testing (#1 & #4), two of the reasons were concerned with implementing users’ suggestions (#2 & #5), and two of the reasons for the contradictory communication respondents recalled concerned both usability testing and implementing users’ suggestions (#3 & #6). (See Figure 8)

<table>
<thead>
<tr>
<th>Practitioners’ Reasons for their Contradictory Communicative Behaviors</th>
<th>1. Earlier version/template usability tested previously</th>
<th>4 Occurrences (12.5%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Technical and/or physical design limitations</td>
<td>3 Occurrences (9.375%)</td>
<td></td>
</tr>
<tr>
<td>3. The nature of design work</td>
<td>4 Occurrences (12.5%)</td>
<td></td>
</tr>
<tr>
<td>4. Other forms of users’ input used in design lifecycle</td>
<td>2 Occurrences (6.25%)</td>
<td></td>
</tr>
<tr>
<td>5. Desired suggestions that form consensus with team members</td>
<td>1 Occurrence (3.125%)</td>
<td></td>
</tr>
<tr>
<td>6. To save time and/or to stay on schedule</td>
<td>18 Occurrences (56.25%)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 8. Practitioners’ Reasons for Contradictory Communicating Behavior. The Number of Occurrences and Corresponding Percentages for Each Case.

**Interim Tactics: Attending, Connecting, Orienting, Ignoring, Confronting-Opposing, and Stalling**

Design practitioners reported instances of communication between themselves and the users that occurred in the process of usability testing products. The communication tactics that practitioners used followed one of two general trajectories. On one hand, in tactic set A, communication moved from Attending to Connecting to Orienting to the final tactic of Undoing Rigidities. The other possible set of tactics that
communication could move along was more likely to end in Recalling, designing without the users’ input in usability testing. The preliminary steps possible in tactic set B were: Ignoring, Confronting-Opposing, and Stalling.

Although these were the complete sets of possible tactics, it was possible for communication to begin and/or end at any point in the stream, and not to progress to the final tactic. The communication that practitioners reported could have been between the practitioner and either of the stakeholders in the design situation: the team/other team members, the user or their representatives, and the practitioner could have been reflecting on communication and so the communication could also have been internal. For purposes of this project, only those communicative actions between the practitioner and the users and their representatives will be examined. The practitioner could reflect to himself about the communication with users. The practitioner could speak directly to the users in the situation, or the practitioner could speak with the users’ representatives as proxy for the users.

The Communication-as-Procedure grid is reproduced below. Note that the following grid sets out the Contradicting Situation, by all the possible Communicative Behaviors and their subsequent Outcomes. It’s important to indicate either design practitioners, users, or user representatives could initiate or reply in the communicative behavior under discussion. All the stakeholders could set or change the tenor of the communication. In the final analysis, what mattered for this study was that the practitioners recalled the communicative behavior as somehow being a significant exchange that facilitated and/or occurred during the design process.
Communicative behaviors in this stream were those that had the potential to lead to Undoing Rigidities and to Recalling. Recall that when Attending, practitioners “gave an ear” to what the users were suggesting – at least to let them voice their opinions, Connecting occurred when the practitioners reached out to the users for purposes of establishing a working relationship, and Orienting involved having the practitioners communicate with the users for purposes of obtaining directions on how to best construct the product.

<table>
<thead>
<tr>
<th>Contradicting Situation -- Stakeholders:</th>
<th>Communicative Action -- Interim Tactics</th>
<th>Communicative Action -- Interim Tactics</th>
<th>Final Tactic A: Undoing Rigidities</th>
<th>Final Tactic B: Recalling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practitioner to Self</td>
<td>Attending =&gt; Connecting =&gt; Orienting</td>
<td>Ignoring =&gt; Confronting-Opposing =&gt; Stalling</td>
<td>Undoing Rigidities</td>
<td>Recalling</td>
</tr>
<tr>
<td>Practitioner to Users</td>
<td>Attending =&gt; Connecting =&gt; Orienting</td>
<td>Ignoring =&gt; Confronting-Opposing =&gt; Stalling</td>
<td>Undoing Rigidities</td>
<td>Recalling</td>
</tr>
<tr>
<td>Practitioner to User Representatives</td>
<td>Attending =&gt; Connecting =&gt; Orienting</td>
<td>Ignoring =&gt; Confronting-Opposing =&gt; Stalling</td>
<td>Undoing Rigidities</td>
<td>Recalling</td>
</tr>
</tbody>
</table>

Figure 9. Belief versus Practice Contradiction: Communication-as-Procedure Grid
The sets of possible communicative tactics (in boxes) that may be used in contradicting design situations according to stakeholder (on left margin).
Attending, the first tactic in Interim Tactics, set A was characterized by the notion of the practitioner seeking to give the users an opportunity to be heard so that the practitioner could become more aware of the users’ needs. An element of Attending included being open to the users’ input, such as was heard in this exchange from this practitioner who said, “If we see something in usability early enough, if we see something and it is something they can get in, they are going to be open to it.”

(--Roger, 8 years design experience) The other element was that the practitioners actively sought out the opportunity to hear what users wanted and needed in a product, as this practitioner did through usability testing. He said:

it [usability testing] was very helpful because you ask the users to talk while they’re using it [the product being tested]. Then you are able to see where they’re successful. You can ask them in a non-leading way what was going through their head when they didn’t spout it out what was actually going through their head. Which was helpful. ... You can ask general questions about the user interface which is very, very helpful because it is very hard to say, does this hurt your eyes, did you find this reasonable to use because you’re looking for specific tasks during the test. But you want to get some generalizations or some overall impressions as well. (--Hubert, 9 years design experience)

When demonstrating the second tactic in set A, Connecting, the following practitioner expressed a desire to “work as a partnership -- with real, live users. It would benefit both sides. It’s true that it would take time, but I think that it would benefit both sides. It would cost money, but like I said, it would benefit both sides.” (--Connie, 15 years design experience) Ideally, this tactic was marked by communication that fostered a mutually beneficial working relationship through which the practitioner was enabled to design a better product, and the users were able to obtain a more useful, and usable product because of their input.
On occasion, Connecting had a downside as in the event that the practitioner had to pass along feedback from the design team about something that had the potential to damage the working relationship. In this case, the practitioner’s wording expressed a need to be diplomatic, but to move the design along at a quicker pace, without incorporating the users’ suggestions in a wholesale fashion: “I’ve been telling them [the users] for six months that this is what we need to do – this is what we want – and it hinders us and it doesn’t look good for us, and it makes communication with the users more difficult – to say, “Well, we just can’t do that.” (-- Mary, 5 years design experience)

The final communicative tactic in set A was Orienting. Recall that this tactic was indicative of communication that provided direction on how to proceed with the design of the product. This tactic differed from the other two in that practitioners asked users to give specific directives about what, in their opinion, would lead to a successful design. One practitioner shared this comment,

I’d like to see some kind of focus group or whatever the mechanism is, of getting user input at the beginning during the planning phase. And then also as the, whatever it is, starts to be fleshed out – when development first begins – to do something else right there to make sure: “OK, did we get it right? Is this what you said? Does this address what you said?” and then after we get it right, then I see the more traditional usability testing from there.” (-- Shirley, 6 years design experience)

Orienting was the mechanism by which practitioners made certain that the design was proceeding according to the users’ needs. When Orienting did not happen or happened late in the project lifecycle, it was hindering to the progress of the project. As this practitioner indicated, without Orienting:
you’re not certain of the direction you’re going in or you think you know where you should be going, but you don’t have that consensus of opinion from users to be certain of that. And again, if that information isn’t coming until halfway through the project and it happens to conflict with what you thought you knew were the requirements, then that either can scrap the project or set you back a lot to have to re-track and figure requirements. (—Mary, 5 years design experience)

The communicative behaviors in Tactic set B included Ignoring, Confronting-Opposing, and Stalling. Ignoring was the communicative tactic that involved practitioners engaging in pseudo-listening with the users. This was called pseudo-listening because in the end, the users’ suggestions were not heeded and implemented. In all fairness, the reasons for this failure were often beyond the control of practitioners, but the outcome was essentially the same regardless of the cause. Speaking about Ignoring, one practitioner bluntly stated, “There’s no conflict if you just don’t ask. I hate to say it, but it’s true. If you don’t ask if people like it, then you don’t have to change it. You don’t have to go through all the changes and updates and reformatting and all those kinds of things.” (—Connie, 15 years design experience)

The Ignoring tactic was sometimes reported accompanied by indications of emotion or wording that was emotion-filled as when a practitioner talked about a product that had been designed without usability testing and subsequently had failed when rolled out to the user. He said:

They did not stop to think about the types of applications that the [users] would be using when they did this, and what turned out was that the few applications that they had tested on when they developed it, of course, worked. … most of the applications that the [users] would use … did not show up in a readable form at the other end. So, something that was “Wow! Whiz bang! Isn’t this cool?” turned into “What’s this gobbledy-gook that you’re sending me? I can’t make heads or tails of this. (—Sam, 15 years design experience)
Confronting-Opposing was the second-stage communicative tactic in set B. This tactic was usually the result of Ignoring when that was the character of the communication between practitioners and users. Opposition, in the form of active disagreements or even truculent attitudes characterized this tactic. As with any friction in the design lifecycle, when Confronting-Opposing occurred, the project was in danger of faltering – not ending on schedule or may have alienated the users. Speaking about such a case, one practitioner observed:

Unfortunately, what the testing did that was bad was that they catered more toward the [new users] and they didn’t cater really too much to the grizzled veterans, and they got ticked. Couple of them dropped out of the program, couple of them started posting really nasty notes, accusing them [the company] of not caring about quality and about the user community, and there were people like myself sitting on the other end, sitting there saying, ‘It’s not that big a deal. You’re asking them to completely recode because you don’t like the way this particular click is being handled.’  

(---Roger, 8 years design experience)

In some cases, the product failed as a result of Opposing-Confronting communicative tactics used during the design cycle. As this practitioner stated, “I think if you don’t really ask the users, they might have something in their hand, but it could be completely worthless. Look pretty and all that other stuff and it’s just all fluff.”  

(---Connie, 15 years design experience)  

Another practitioner concluded that Opposing-Confronting could alter the good will that users had for the company, “They’re looking at us as not caring about their needs. ‘What’s this you’re foisting on me? I don’t have to go to you. … Forget it. You give me this kind of crap? Forget it … I’m going to go to this other place because I need something now and I don’t have any allegiances to you.’”  

(Sam, 15 years design experience)
The final communicative tactic in set B was called Stalling. When Confronting-Opposing affected the design lifecycle, Stalling was the ‘stand-off’ tactic that characterized the communication used during the project. Stalling could be likened to communication without actually communicating – giving an answer for the sake of answering, not to pass along genuine information or to get information from the exchange. A practitioner described the communication that took place during Stalling, “product managers and product producers say [things] that sound very bit-ish, ‘I respect what you are saying, and we’ll take this into consideration…’, which is basically [product]-speak for ‘Bump you. We’re doing what we’re going to do.’” (—Roger, 8 years design experience)

Interim tactic sets A and B consisted of Attending, Connecting, Orienting, and Ignoring, Confronting-Opposing, and Stalling, respectively. These interim tactics were precursors of the final tactics that came about as consequences of practitioners and users using certain communicative behaviors with users. The final tactics denoted by the arrows point toward the final tactics on the table in Figure 9.

**Outcomes of Final Communicative Tactics: From Undoing Rigidities and Recalling to Communicative Themes**

When the communicative tactics progressed from Attending to Connecting to Orienting, the final communicative tactic to which these pointed was Undoing Rigidities. Undoing Rigidities ideally flowed from set A communicative tactics, and a major characteristic was seen when initiating new procedures and processes in the process of design that included the users’ input and usability testing. By definition, Undoing Rigidities would be akin to participative design, in which “users influence decisions...”
relating to the whole system” (Damodaran, 1996, p. 365). Design practitioners who consistently listened to the users, sought mutually-beneficial relationships for the purposes of designing, and followed up on users’ directions as much as possible, would have ideally progressed on to the final stage in which they implemented the users’ suggestions and/or practiced usability testing. Practitioners who communicated with users in this way reversed the sedimented practice of excluding users’ input or only including it when it proved convenient. Undoing Rigidity, when practiced, resulted in experiences such as this practitioner described, “we made several adjustments at the time that we did testing. So we had minimal versions – every time we had something that was useful, we tested. We made several changes based on several users so it was helpful in that regard. Good to see real people use the system.” (--Tonya, 12 years design experience) Or, as this one said:

I think it gave them a better understanding of the thought processes that the users were going through in trying to use the system. The users were subject matter [experts] as was the product manager – but I think they looked at things a little bit differently. I think they [the product team] got a better understanding of the work flow and how people intended to use the product. (--Mack, 14 years design experience)

As a result of design practitioners’ communicative tactics Attending, Connecting, and Orienting, they were able to gain these insights into the users’ needs and workflow and in the final analysis this helped the team design counter to rigidly followed, non-user centered methods to create a better product.

On the other hand, when design practitioners communicated with users from tactic set B, the final outcome was typically Recalling, or designing without the users’ input or without including usability testing in the design lifecycle. In this case, the
practitioners usually practiced tactics from set B incorporating Ignoring, Confronting-Opposing, and Stalling into their communication with users. As a consequence, they continued to design excluding users’ suggestions and/or they also excluded usability testing. This team member spoke about Recalling -- using team members as testers rather than usability testing with real users, and the result of that practice:

Other team members were giving me demos, which I don’t consider observing the user because they’re already the experts. They’re not going to run into the problems, their machines are set up, they’re not going to run into the same kinds of problems and misunderstandings that an actual end-user is going to. So, I don’t consider that observing the user. It was helpful, but I would consider that using another person on the team. I don’t think of them as users. They’re the experts.

This practitioner continued by indicating how different the opinions of users were from those of the design practitioners, “I’m surprised at how many things are not what we believe they are like, I just found this out. … Shouldn’t we provide some option for that? Well we didn’t. See, nobody bothered to ask or to check, even. We did once we went to a site, but by that time, it was too late. It was designed, it was already in there.” (Connie, 15 years design experience) Practitioners understood that in some cases, including users’ input would likely help to make the product more acceptable to users, as was evident by this practitioners’ words, “Other suggestions that we didn’t take -- changing colors. We had a set of colors that they could pick, we weren’t going to put the rainbow in there. It just didn’t make sense.” (--Hubert, 9 years design experience)

Coding revealed that when design practitioners recounted experiences wherein they had communicated with users during usability testing, their communicative behavior could be grouped into eight themes. Four of the themes involved using communicative tactics whose trajectory pointed toward including users’ input: Undoing Rigidities. They
were: Seeking Connection With Users, Seeking Direction from Users, Seeking Validation by Users, and the final theme – a cross between the first two of the major themes – was called Seeking Connection and Direction. The other four themes whose use was indicative of communicative tactics that led to the exclusion of users’ input – Recalling. These themes follow from the communication-as-procedure analytic that denotes communicative action as tactics, and the situation as one in which contradictory communication behaviors were practiced. The researcher modified schema to include interim and final tactics. These concepts have been added to the grid in the proper locations. The themes denoting communicative action flowed from the tactics listed on the communication-as-procedure grid as shown in Figure 10.

The first theme formed as a result of the communicative tactics from set A: being open to users’ input, building mutually-beneficial working relationships and looking for design direction was Seeking Connection with Users. Seeking Connection with Users formed as a result of the practitioner using Attending and Connecting as communicative tactics. In this first theme, practitioners reported that they engaged in communication during the contradicting situation in order to establish a relationship with the users of the product they were designing. One practitioner indicated that excluding usability testing was not good in design practice because:

It disconnects me from the user, which I think is a very bad thing and I think that I need to feel more connected to the user, whether it’s a one-on-one relationship, that we have some kind of relationship -- that I understand them to want to provide something for them. I just don’t think it’s a good idea to disconnect from them in that way and stop caring about what you’re giving them….

-- Connie, 15 years design experience
<table>
<thead>
<tr>
<th>Contradicting Situation Stakeholders:</th>
<th>Communicative Actions:</th>
<th>Communicative Actions:</th>
<th>Communicative Action:</th>
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**Final Tactic B**

Recalling

---

**Communicative Themes**

1. Implementing Usability Testing
2. Implementing Users’ Suggestions

1. Excluding Usability Testing
2. Excluding Users’ Suggestions

---

**Figure 10.** Belief versus Practice Contradiction. Communication-as-Procedure Grid -- Communicative Themes
Another practitioner expressed that same thought – desiring to have a bond with the user of the product. The Seeking Connection with Users theme underscored the idea that the practitioner wanted to establish the bond for the sake of starting a relationship in which the user may have been able to participate in the design process on a long-term basis – to be a kind of ‘go-to’ person. This idea was apparent as the practitioner explained:

I would have liked to have had an end-user I could have worked with. Maybe somebody from the focus group. Just that one point of contact where I could go to them directly to say what do you think of this? … I’d just ask them all kinds of questions. I really wish I would've had that. Matter of fact, I wish I had that on every project – a real, live end-user.

(– Mary, 5 years design experience)

This practitioner showed a desire for a relationship with the user so that they could co-design the product. The idea of having someone to consult with about the design was a desire that this practitioner had relative to every project she worked on.

Rarely did the Seeking Connection with Users theme occur without the practitioner also Seeking Direction From Users, as in the following example. The following quote was more typical of the quotes that exemplified the themes. In this instance, the practitioner said:

This project really did help me identify how to work with users better because for the first time, I had to do that. I had a lot of credibility all the way through from introduction of new idea, bringing people on board before we developed anything because the people who read the plan had done a lot of talking. So we felt a comfort level with saying “This is a problem. When do you have this problem?” So that was something I will always look at. It seems at times people just want to build something they think people need and then tell them “You have this problem, here’s your solution.” We didn’t do it that way. It was like “You told us you have this problem, we’ve developed this solution and now we’re ready to complete the circle. That was a lot more comfortable.

(– Tonya, 12 years design experience)
The first theme, Seeking Connection differs from the second, Seeking Direction, in that in the latter theme the practitioner indicated when seeking direction, that exchange was initiated for a purely non-relational reason – to obtain information that would be useful for helping to develop the product. The practitioner was seeking simply to find a means of moving along in the development cycle, and the interaction with the users was undertaken so as to move the design process along in the right direction. When Seeking Direction from Users the practitioner gave no indication that the connection with the users was sought after for any reason except to get ideas about how best to design the product. There were no references to relational matters in this theme. This Seeking Direction from Users quote illustrated the nature of the theme: “You’ll just keep going down the same road I always have been, not caring whether it’s the right direction.” In a second example of Seeking Direction from Users, this practitioner spoke about how users may react to a product during usability testing saying,

The user segmentation also played a big impact on that. For example, if you brought in a more advanced user, and they blew through it and they had no problems at all, but your middle of the road and your novices were struggling, that template would get kicked just because it’s like “Great, the advanced person can do it, but we’ve already go them, … we’re trying to get the middle of the road and novice guy.” On the other hand if the novice guy did really well with it but we brought in a woman who was a middle of the road or an expert who is saying “This is so redundant, this is driving me crazy.” that template would also get reassessed. Because at the same time that you're trying to make things easier for this guy down here, you also want to make sure that this lady at the top of the technology chain, that you aren’t just boring her so badly to tears that she is just going to go to somebody else. You are always trying to strike that middle balance -- you always want it to be in the middle of the road.

-- Roger, 8 years design experience
The third theme was a combination of the themes, Seeking Connection with Users and Seeking Direction from Users: Seeking Connection and Direction. One practitioner explained how critical communication with the users was to the successful design of that product. The purpose of the theme was to indicate that the practitioners wanted to have communication with users so that they could set a clear course for designing, and check back with the users to make sure they stayed on the right course. Team members’ opinions about usage were not an adequate substitute, in her opinion. She said:

I wish we would’ve had access to an end-user somewhere that I could connect with that person. “What are you doing now? Tell me what’s going on, how are you working on this? Where are you needing help? What is it you think would be helpful to you getting through this?” I wish I had had a user. That brings up this issue. Our nice little team and all, that’s not real. I need to see the real, live thing [a user] and what they’re going to go through. And talking to them on the phone is not the same as watching them do it. I would’ve had a better understanding of a lot of things in the product – why this person even want this product, what they plan to do with it, where they’re going with it, where they’re having problems, where they’re going go when they do have problems – their preferences when they get there, what’s going to help them. Do they go to the places I think they’re going to go to? Do they ask the questions I think they’re going to ask? My speculating as to what the user is like is just not as good as having an actual user.

-- Connie, 15 years design experience

The result of having the communication with users – Seeking Connection and Direction – were obvious in the experiences of the practitioners, as can be seen in the following quote that indicated how the practitioners were:

better able to target exactly what was going to be helpful rather than going off on their own ideas and then coming back to a user and having a user say “Oh no, that’s not at all what we want” or usability testing it and finding out that that’s not something that is useful but they have to throw it all out or whatever. They started out from the beginning with a better idea of the direction that they needed to go because they got direct feedback from the beginning.

-- Tonya, 12 years design experience
The fourth theme that arose during analysis was called Seeking Validation by Users wherein the practitioners sought the users’ opinions, usually after having designed a product – as in through usability testing a finished product or a prototype. Seeking Validation differed from Seeking Direction because validation can only be obtained after a product has been designed, or a design concept has crystallized. On the other hand, Direction should be sought at the outset of the project before anything has been designed, and during the course of the design lifecycle. This distinction may seem to be too fine a point to make, but it is necessary to include this as a separate theme because of the occurrence in the data. The following Seeking Validation quote illustrated that distinction when the practitioner stated,

We got feedback on it from the users and they really like it, and when we were in usability tests, they actually used the help, which was shocking to me. That meant a lot to me in terms of the design, the placement that we had….

-- Connie, 15 years design experience

This practitioner thought communicating with users,

helps to validate things that we think we're hearing from users or that we thought needed improvement and to see if they're hearing that as well. To see what specific problems or maybe other interfaces that they themselves would like to see developed or used.

-- Mary, 5 years experience

Thus, the practitioners’ communicative behaviors that led to including users’ input and usability testing in the design cycle were categorized into the themes explicated above: Seeking Connection with Users, Seeking Direction from Users, Seeking Connection and Direction, and Seeking Validation by Users.

Opposite to the themes that would lead to successful incorporation of users input and usability testing were communicative behaviors that stymied input. Recall from the
communication-as-procedure grid that these four themes were: Disconnecting from the User, Dis-Orienting, Disconnecting and Dis-Orienting, and Rejecting. Interestingly, each of these themes had an element of history in them – that these were embodying lessons practitioners had learned by being involved with users in their past designing experience. When the practitioner indicated a desire to put distance between herself as practitioner and the user, this was indicative of Disconnecting from Users. The practitioner intentionally kept the users at arms length. In a sense, this was not truly disconnecting because the relationship remained intact. The user was not led to have the expectation of full participation in the design process, in this case. An example of this type of communicative action occurred when the practitioner spoke about being honest with the users before starting to get their feedback:

> It’s always helpful to know what the user needs, but when there are other factors that have a stronger weight as to why you have to do things a certain way, then it’s not so helpful to know what the user needs because you already know that you’re working off a different requirement. … “If you want to do this at all, this is how it has to be done.” If the user wants to see XYZ, it doesn’t matter in this case ‘cause this is all that we can do, given the current environment. … It probably does help to keep realistic expectations and also there’s that sense of “We’re being honest with you or just telling you what’s possible and what isn’t possible.”
> -- Mary, 5 years design experience

The second theme that arose relative to communicative actions that excluded usability testing and users’ suggestions was called Dis-Orienting. Dis-Orienting occurred, for example, when the practitioner indicated that the design team had been led astray in the design of a product in the past through the users’ input or due to usability testing results incorporated into a product design. One practitioner said:

> I tended to give more weight to what I learned in the usability test than what I would see even in the number of [moves] people were making. That’s not good. You look at 5, 6, or 7 individuals in a usability test, that’s a fair amount of effort
involved on everybody’s part to do that with ten people. If you spend your time as a [practitioner] observing those people and seeing what you conclude from them, you’re still only looking at 10 people. So there is a hindrance there and it’s a kind of information that is very helpful, but you can’t limit your observations to just that and you can’t weight it too heavily, either.

--Edward, 25 years design experience

The third communicative action theme that presaged a practitioner not relying upon usability testing and the results of it to obtain users’ input was called Dis-Connecting and Dis-Orienting and it is a combination of the first two themes. In this theme there was an indication that the practitioner wanted to keep a clear delineation between the different stakeholder groups’ input, even as the users are kept involved in the design process. At the same time that the practitioner kept the user participation intact, there was the additional component in this theme centering on the practitioners’ experience of exercising every precaution to keep the design project on track. In that effort, the users’ input was being closely monitored so that it would not lead the project down the wrong design path. One practitioner unapologetically told how users’ input and usability testing should be viewed, in his opinion, and why. He said:

I think that, yes, it is very valuable, and I think a lot of other companies realize that. We’re frequently getting requests for tours of the usability lab. I get questions from people I know in other companies about it. I think you have to be careful when you’re setting up usability testing – to make sure that you A: understand your user base, and B: you either get a wide cross-section of users for that, or if you don’t get a wide cross-section of users, that you understand what subset of users you’re getting feedback from. The reason I say that, this didn’t happen from usability testing per se, but it did happen from having close user contact on a different project that I was on, and that is that we had 2 user representatives on our project team and they were from very specific types of [user groups]…. And our user base for this product is just unbelievably – it is all over the world, you know, all over the place. And because we had input from only two user representatives, we skewed, unknowingly at the time, we skewed the requirements and the course of the project toward what they wanted and we found out after we had done some development that the rest of the [user] community was not interested in those things. So I think user input, in general –
that's a caveat that you need to be careful about. It’s great and it’s wonderful to have user input, but you really do have to be careful that you either get a wide representation of your users, or you understand just how restricted your input is so you can counter that in cases where you need to.

-- Sam, 15 years design experience

The fourth communicative action theme that indicated that usability testing and users’ suggestions would not be included was called Rejecting. Rejecting does not quite have the pejorative meaning as it would first appear. Design practitioners do not completely discourage or disregard users’ input in this area. Rather, Rejecting is the way that was chosen to denote the category wherein the users are warned at the outset that their feedback may not result in changes to the product. Therefore, in a sense, practitioners reject the notion of a full-fledged, mutually beneficial working relationship from the outset. In this category, practitioners’ communication represented more of a ‘what could be done’ than what is actually done with the users. However, there was a pointed desire to be honest about the way that their feedback from usability testing may be used. One practitioner stated:

Neither of these are points that are negatives for utesting, they’re just caveats of how you need to apply them. The other one is I think you need to be careful not to have the testers think that by giving their input, they’re telling you what you must do with the product. Again, for the same reasons. An individual has certain preferences – likes and dislikes – and the organization that they represent may be very targeted. So, you need to be careful to explain to them, you know, “We want your feedback, we’re gonna consider your feedback, but this is not promised that we’re gonna incorporate your feedback because we have a wide variety of users to consider.”

--Sam, 15 years design experience

Chapter Summary

This chapter has laid out the findings based on the data: delineating the contradicting situation that fosters interim communicative tactic sets A (Attending,
Connecting, Orienting) and B (Ignoring, Confronting-Opposing, and Stalling). These interim tactics led to final tactics: Undoing Rigidities – following from set A, and Recalling – flowing from interim tactic set B. The eight themes: Seeking Connection, Seeking Direction, Seeking Connection and Direction, Seeking Validation, Dis-Connecting, Dis-Orienting, Disconnection and Dis-Orienting, and Rejecting account for the ways that practitioners’ communicative actions may indicate inclusion or exclusion of usability testing and user suggestions. The first four themes may lead to inclusion of the users’ input, and the last four to the exclusion of it. The next chapter provides a discussion of the implications of these findings as it relates to implementing usability testing and incorporating users’ suggestions into the design lifecycle.
CHAPTER 5

DISCUSSION

In the previous chapters, the researcher put forth the argument that user-centered design is fundamentally a communicative process because it embodies and enables communication between stakeholders participating in the design process. Gullicksen and Lantz (2003) concur, stating, “communication is essential to the success of a systems development process” (p. 12). Results of a workshop led by those researchers yielded three recommendations that workshop participants considered most important, “meet the users, learn more about human communication in daily life, and support construction of shared understanding” (p. 12). Gullicksen and Lantz conclude that a major goal in the development of a system is to support the communication that transpires between stakeholders – creating common ground.

In this study, practitioners’ rhetoric (stated belief) pointed of a belief in usability testing, a process that could yield a usable, useful product. Their practice (what they actually did) yielded scenarios that had four possible trajectories where:

1. it was possible to have a successful product and an unsuccessful project;
2. it was possible to have a successful project and an unsuccessful product;
3. it was possible to have a successful product and a successful project;

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4. it was possible to have an unsuccessful project and an unsuccessful product. In either of these scenarios, communication between users and practitioners could have led to either stakeholder group or to both groups coming away from the design lifecycle feeling it had been successful.

Proponents of user-centered design, of which usability testing is a case in point, may operate under the assumption that when a product is usability tested, the outcome will prove helpful to the design practitioners because it will allow them to produce a product that conforms to the users’ needs. Design practitioners may subscribe to this argument, in theory, but when pressed to the point of making trade-offs during practice; they may act counter to this belief. They may, for either of the four reasons listed above decide not to include usability testing or decide not to implement users’ suggestions – hallmarks of UCD.

This project looked at the rationales that design practitioners offered as explanations for their decisions to practice design in opposition to the underlying tenet of UCD. Figure 11 provides a visual representation of the study results indicating the linkages between the contradictory situation, and communicative behaviors and themes in light of usability testing and implementing users’ suggestions.
Usability Testing Process
(Contradicting Situation)

Users’ Input/Suggestions
(Contradicting Situation)

Interim Tactics A
Attending
Connecting
Orienting

Interim Tactics B
Ignoring
Confronting-Opposing
Stalling

Final Tactic A
Undoing Rigidities

Final Tactic B
Recalling

Communicative Themes

Seeking Connection
With Users

Seeking Direction
From Users

Seeking Connection and
Direction

Seeking Validation
by Users

Dis-Connecting
From Users

Dis-Orienting

Dis-Connecting and
& Dis-Orienting

Rejecting

Communicative Outcomes:
Implementing Usability Testing
Implementing Users’ Suggestions

Communicative Outcomes:
Excluding Usability Testing
Excluding Users’ Suggestions

Figure 11. Visual Representation of the Study Results
Studying communication that occurs between stakeholders in the design process facilitated a focus on two over-arching research questions:

**Question 1:** How does the contradiction between design practitioners’ values and practices play itself out in their experiences communicating with users to implement usability testing?

**Question 2:** What do practitioners say about the reasons that factor into their decisions to exclude users’ suggestions from the final product design?

In this section, Sense-Making was used to discuss how the results of this exploratory research line up with that theory. Following that discussion, the researcher responded to the research questions more specifically to describe the benefits and disadvantages that design practitioners reported in the contradictory design situations, and to discuss how the perceived benefits and disadvantages implicate certain communicative actions. Finally, some directions for future research were discussed along with some limitations of the present research.

**Mapping Sense-Making to Design Practice**

Design practitioners’ talk about design practice has been informative because it has allowed the reader to look inside the design process and to understand some of the communicative moves that energize that process. When design practitioners were faced with a threat to the project timeline, commanded limited technical/physical capabilities, used other forms of users’ input, wanted users’ suggestions to align with the consensus of practitioners, were working on a later version or template that had been tested, or were constrained by the nature of the design activity, itself; they made certain decisions and adopted particular communicative behaviors as a result. The communicative behaviors
shared a similar rationale with design trade-offs, as both classes of actions may be in evidence when there was a need to balance design options with design realities. Design realities may have included limited resources – time being the principle resource to be saved and maximized.

Recall from Chapter 2 that the elements of the Sense-Making metaphor were: situation, gap, bridge, and outcomes. Sense-Making’s elements map nicely to the results of this study in that the situation was the design instance, the gap was the decision to design in opposition to their expressed belief, the bridge may be linked to the communicative tactics that design practitioners used in the process of design, and the outcomes were the themes that were discovered during analysis. The outcome themes were: Seeking Connection with Users, Seeking Direction from Users, Seeking Connection and Direction, Seeking Validation by Users, Dis-Connecting from Users, Dis-Orienting, Dis-Connecting and Dis-Orienting, and Rejecting. Outcome themes, in turn led to design practitioners’ decisions to include or to exclude usability testing and/or users’ suggestions.

The intent of this particular project was to use Dervin’s (1999, 2003) communication-as-procedure analytic to analyze the communication practitioners reported having engaged in with users isolating elements: the contradictory situation, communicative action (behaviors), and communicative outcomes (themes). Previously, the researcher grouped the reasons design practitioners gave for their contradictory design practices into six broad statements. Those statements are presented in Figure 12 laying out each statement’s relationship to either usability testing or to the users’ suggestions. Two of the reasons were statements directly related to usability testing and
two were related to both usability testing and users’ suggestions. The final two reasons were statements related to users’ suggestions. The following section presents a discussion of the contradictions and relates them to usability testing and to users’ suggestions.

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<tr>
<th>Practitioners’ Reasons for their Contradictory Communicative Behaviors</th>
<th>Usability Testing</th>
<th>Users’ Suggestions</th>
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<td>1. Earlier version/template usability tested previously</td>
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<td>2. Technical and/or physical design limitations</td>
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<td>3. The nature of design work</td>
<td>Usability Testing And Users’ Suggestions</td>
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<tr>
<td>4. Other forms of users’ input used in design lifecycle</td>
<td>Usability Testing</td>
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<tr>
<td>5. Desired suggestions that form consensus with team members</td>
<td>Users’ Suggestions</td>
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<td>6. To save time and/or to stay on schedule</td>
<td>Usability Testing And Users’ Suggestions</td>
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Figure 12. Practitioners’ Reasons for Contradictory Communicating Behavior Reasons for Contradictions Corresponding to Usability Testing and Users’ Suggestions

**Question 1:** How does the contradiction between design practitioners’ values and practices play itself out in their experiences communicating with users to implement usability testing?
Contradictions were actually glimpses of how practitioners moved from being uncertain and needing to find information to bridge the gaps, and move on with design. The reasons they gave for the contradictions and the communicative tactics they used in these situations actually made movement and their design work possible. Practitioners’ communicative behaviors demonstrate an ability to move despite the constraint of a cognitively dissonant situation. This communication can be viewed as an ability to demonstrate fluidity in response to the constraint associated with the contradictory situation.

The contradictions about usability testing happened for design practitioners when the design project was threatened with failure. Gulliksen & Lantz (2003) defined a successful project as one “that is on time and on budget, with all features and functions as initially specified” (p. 8). Project failure, then, may be viewed as budget and schedule overruns accompanied by abbreviated or otherwise adjusted requirements. Recall that saving time or staying on schedule was the reason most often given for the decision to exclude usability testing and users’ suggestions from the design lifecycle. Design practitioners reported believing in usability testing because they thought the usability testing outcome would yield a product that was fitting for the users’ needs as this one stated:

I think whenever you put a product out, if you're honest with yourself, there are gonna be areas of concern. It’s nice if you can decrease that. In design the best way to decrease that is to talk to users--talk to the actual users to see what they have to say. Anything else is going to be somebody else's opinion.
As this practitioner indicated, communicating with users was considered to be the way to get the design as close to the users’ specifications as possible. When asked what he would do differently on the next project, he responded

For one thing, I would be doing usability testing. This is very much like what we talked about before. I’d get a lot more user input. That pretty much helps any project I think. Now you've gotta bring in the practicality: the project's gotta get done in a certain deadline, but if we're just saying the best of all possible worlds, then yes that's the first thing I would do—have more user input. (--Alex, 15 years design experience)

When looking at the design process the design practitioners’ goal was two-fold: to design a quality product – doing usability testing to get the users’ input – and to complete the design lifecycle successfully – to meet the deadline. These goals were compatible, but not equal in the sight of each of the design practitioners. As the practitioner stated, he wanted to produce a useful, usable and enjoyable product, but that goal was secondary to the goal of completing the project successfully. He said, “the project’s gotta get done in a certain deadline.” The practitioner wanted to do usability testing because he believed that the users’ input would “help disambiguate problems.” However, the chief benefit that the practitioner pointed to in further explication was that the design process, itself, was successful – as well as the product, in that order. He opined, “the number one goal on any project is to get it [the product] out on the date it's supposed to come out on.”

In this scenario, usability testing would be considered as long as it helped the project forward toward completion. Usability testing was an option as long as the testing results did not indicate major changes to the product that would possibly jeopardize the success of the project timeline. If no usability testing were conducted, there could be no setback in the schedule, “the perceived benefit is that they would be able to roll it out
earlier. By not spending the time on doing usability testing they would be able to deliver the product earlier.” This would lead to the assessment that usability testing was helping the design process, primarily, and leading to a successful product, if only secondarily. In the final analysis, the design practitioners used the communicative tactic of Ignoring and ended up designing without the users’ input, Recalling. Thus, while the design practitioner said that he sought to listen to the users and accept directions from them, he actually practiced Dis-Connecting and Dis-Orienting, as indicated by his final statement that “user input would have delayed implementation. Which is why we probably got less of it—I'm sure of it. We had a very, very quick deadline and so if we had gotten user feedback we wouldn't have made that deadline” (Alex, 15 years design experience).

In his opinion, usability testing in that situation was not practical. It was somehow an appendage to the real design process. Real in this sense meant fixed, permanent, or an immovable part of the design lifecycle. In addition, the act of usability testing did not relate to the practical everyday concerns or design activities. In effect, the notion of usability testing was an ideal, or standard; something that was set and established as attainable only in a perfect world, given perfect circumstances – chief among them, the luxury of time. Thus, the usability standard or ideal was set out as the impossible dream, something that is kept in the back of the mind as a goal to shoot toward with the notion that the reality will always fall short of the goal.

The second contradiction that related to usability testing was found when practitioners declined to test because an earlier version or a template had been usability tested beforehand. This practitioner expressed that sentiment succinctly when she stated, “I think part of the un-vocalized reasoning behind it, too, was that we were following a
template for the [product] anyway. So, if we’d tested the template and it worked, then why would we have to test every [product] coming off it?” (Belinda, 7 years design experience) Using the same rationale, another practitioner stated that the second round of testing would have led to extensive re-writes, and this would have led to time becoming a factor in the design process. She stated that her team “did some usability testing … we did get quite a few suggestions. So, we did try to improve some of that, it was not feasible to do a lot of re-working of content … we didn’t really have any extra time to enhance anything” (Dianne, 20 years design experience).

Communicatively, the latter practitioner practiced Seeking Validation because she reported gathering and evaluating the users’ suggestions as it related to the product. However, the team kept an eye on the schedule, and did not allow the time to become a factor and/or for the deadline to be exceeded; so they chose not to implement the suggestions. While this move had the overt appearance of coming together with the user to design the product, in the final analysis, Rejecting happened because the users’ input was distinguished from that of the team’s and the team managed the project so as to remain faithful to their scheduled roll-out date. In light of communication-as-procedure, the decision illustrates the roles that each stakeholder has and also indicates how unequally distributed power is in the design relationship.

The need to make a decision about the design impels the team to movement – to complete to the project successfully. Paradoxically, however, this also constrains the movement toward designing including the user as full participant in the process. There is the need to practice energizing communication with users to design the product, but the irony is that the communication also provides a constraint when the communication is not
useful for the intended purpose. The result of this communication behavior is that the team does not realize the full potential of the reason for inviting the user into the design process, initially, and design resorts to the status quo.

The third contradiction that related to usability testing occurred when the practitioner said that other forms of users’ input had been used in the design process, so that made usability testing unnecessary. One practitioner said instead of usability testing, his company measured web clicks on all the sites, particularly, of course, on the service site. So, I thought that was kind of a good experience too. It’s not exactly usability testing, … They measured by topic area, they measured when, some of them would have a text link and also a graphic link and they measured how many people clicked the text, how many people clicked the graphic, were they associated. So, I thought that was a really good lesson in user design.

(--Edward, 25 years design experience)

In the same vein, another practitioner stated that the design team of which he was part “did not usability test … and we should have. … We did not usability test it, though we were doing regular field conferences and calls with the target users, we never actually ran it through any usability testing” (--Hubert, 9 years design experience). A third design practitioner suggested that although substituting other forms of user input for usability testing was common practice, usability testing was valuable in and of itself because it would add another facet of users’ input and that would be helpful.

I think it wouldn’t hurt us to do more usability, direct usability testing of some kind. It wouldn’t necessarily have to be a complete test project with lots of people coming into the lab, maybe just some remote testing or something like that. But I don’t think it would hurt to do more of that more frequently. But I think there is kind of an assumption that because we have the various mechanisms in place for users to give us input and they are giving us input, that this kind of observation isn’t really needed. I just think it’s sort of another dimension that would be useful. (Dianne, 20 years design experience)
Practitioners focused their discussion on a de-centered moment, a point in time when they experienced a need to bridge a gap in the world that encompasses their reality of design practice. In this series of examples the communicative behavior demonstrated the tension within which many design practitioners perform their work. On the one hand, there were those practitioners who designed according to the Recalling tactic and did so without much thought because they were satisfied with the level of user specifications that the other forms of users’ input gave them. Just as importantly, there were those practitioners who had a vision for true UCD, which included usability testing. In these statements, the tension was between memory and history as guiding force for design, versus innovation and risk.

The third practitioners’ comments indicated that she sought to balance habit with flexibility, and these communicative moves indicated the search for such a place in design practice. By and large, the communication behaviors in this set indicated Seeking Connection and Direction as the practitioners gathered and kept the users’ input. However, the communication behavior that influenced design practice in the end was the opposite. So, for that reason, the practitioners actually practiced Dis-Connecting and Dis-Orienting.

**Question 2:** *What do practitioners say about the reasons that factor into their decisions to exclude users’ suggestions from the final product design?*

The fourth reason given for behavior that contradicted belief in user-centered design and led to excluding usability testing was one that also implicated excluding users’ suggestions – similar to the most often cited reason – saving time. This reason was that the nature of design work was such that it made the exclusion of UCD practical.
Speaking of his work developing software, one practitioner indicated the design goal was to “have software that is so easy to use that the users need minimal training or no training. And in some cases, that’s just not possible because of the type of work being done” (--Sam, 15 years design experience). Another practitioner lauded the new development methodology that his firm had recently adopted because of what it meant for getting user input, in general, into the design lifecycle. She said “the other positive aspect of the shorter more focused development cycles is that it’s possible to respond to user input and that some of the projects have actually been planned around suggestions from users” (--Dianne, 20 years design experience).

At the outset, such communication sounds tortuous in that the practitioner indicated a desire for the users to be able to use the final product and in aid of that the new way of developing was expressly for including users’ input. However, these statements were made as the practitioner provided reasons for not including the very input that was the reason for changing methodologies. On the face of things, the practitioners’ communicative behaviors reached out to the user for purposes of inclusion, Seeking Connection with Users. However, in the final analysis, the design practitioner carried out design practice without incorporating either usability testing or incorporating the users’ suggestions. In that way, Dis-Connecting was the rule of design despite all communicative appearances to the contrary. When the practitioner indicated that new methods had been adopted for designing, but the outcome of the practice had not changed, this provided another instance of where the movement in design was suspended between constraint and empowerment. The rhetoric was toward empowerment, but the practice was bound by constraint from past design practices.
The nature of design work and the need to save time were two reasons for contradictory behaviors that led to excluding users’ suggestions. One practitioner indicated a desire “to stay in touch with the user. On the other hand, in order to be a competent [occupation name], you have to become more technically oriented” (Connie, 15 years design experience). The practitioner indicated how much the users’ input was needed with the implication that the product would be adversely affected by the lack of users’ input. In the next sentence, however, the practitioner spoke candidly about the real need technical knowledge of the job. With that statement, the practitioner adopted the attitude preceded Dis-Connecting and Dis-Orienting. This practitioner will not seek the users’ input and the affect would be that a practitioner who began design practice seeking input from the users, may actually forget how to stay in touch with the user and not seek that feedback after all.

When looking at the contradiction as it related to not using suggestions from the user the same practitioner stated:

There were just an awful lot of meetings because they asked for everything that they could possibly think of - assuming that the users would get part of what they asked for. Users would ask for everything that they wanted because their assumption is, ‘Well we'll ask for the sun, we'll get the moon.’ So you had to wade through what is it that was ridiculous and they're just asking for it because they're hoping for everything but are willing to settle for less than. Lots of wading through different options.

(Connie, 15 years design experience)

In this quote, the practitioner implied that the users needs dictated too many of the design team’s moves. When this happened, the practitioner began to worry about the amount of time that was being spent on listening to users and on responding to user requests because this time being spent was likely to impact the entire schedule. This was
another case wherein the contradiction between the rhetoric and the practice was apparent. The practitioner spoke of meetings where the design team waded through the information that the users provided. There was also the sense, in this quote, where the users were in a position to have the design team’s ear, so they piled on unreasonable requests and this led to more time being spent looking for the essential instructions in the long list of requirements the users presented. In the end, the practitioners’ communicative stance was Dis-Connecting. They did not discourage nor disregard the input, but the statements indicated that there was a need to keep an eye on the users – possibly to assure that they did not de-rail the schedule, thus jeopardizing the project timeline.

Another reason for the contradiction was that there were technical or physical limitations such as limited amount of space on the screen and a lack of processor capacity made the users’ suggestions unreasonable to implement. The final reason given for the users’ suggestions not being taken and made part of the design was that the suggestions did not meet the approval of the majority of the design team. When designing, decisions must be made about what is reasonable to accomplish given time, budget, human resources, skills and other factors. In line with the rationale for the contradictory behavior, trade-offs may be a result. Some teams come together and decide which suggestions to work into the schedule, and when the input from users does not agree with what the team has decided, it cannot be implemented. In the following example, the practitioner described the situation, and his sentiments. He said, “if you’re planning on making radical change, you can invite problems by bringing in the users because you have to make a decision sometimes when you’re looking at making big changes to a
system. You want your users’ input, but also don’t want your users sitting there saying ‘Well, it’s just fine the way it is.’” (Roger, 8 years design experience)

The communication-as-procedure analytic enabled the discovery and mapping of communication situations, communicative actions, and communicative outcomes. In the previous chapters, the researcher laid out the communication situation as one that is contradictory in that design practitioners practice in opposition to their stated beliefs. In practice, they excluded usability testing, a forum for obtaining users’ input, even as they held fast to the idea that user-centered design promoted a superior product and that incorporating users’ input was more likely to be meet the users need for products that were usable, useful, enjoyable, and that fit the users’ work flow.

Communicative situations could give rise to communicative tactics that would allow the users and practitioners to create such products together, but in the case of contradictory design situations, the data in this study indicated that there were communicative behaviors that could sabotage such constructive activity. The conclusions that emanated from the discussion in response to the questions included observations that when practitioners entered into communicative situations with users seeking connection, direction, and validation, their user-centered design efforts could be fruitful. However, as these data have also shown, when practitioners entered into design situations with users and dis-connected from, dis-oriented from, and/or rejected users’ input; chances were greater that no true user-centered design would occur.

The researcher used elements in the Sense-Making metaphor to identify the situation and its contradictions, the gap the decision to design without users’ input, the bridge made up of communicative tactics, and the outcomes of the communicative
tactics, themes. In the next section, the researcher examines the research questions in light of benefits and disadvantages of usability testing and users’ input.

What did design practitioners say about their decisions to exclude usability testing and users’ suggestions? This question in two parts was the impetus behind this entire project. In effect, the answer to the question has been built, conceptually, throughout the discussion, but now have the conceptual net sufficiently well established to begin to respond to that question – more formally stated in two parts as my research questions: (a) How did the contradiction between design practitioners’ values and practices play itself out in their experiences communicating with users to implement usability testing? and (b) What issues did practitioners say factor into their decisions to exclude users’ suggestions from the final product design? This section describes the benefits and disadvantages that design practitioners reported in the contradictory design situations and discusses how the perceived benefits and disadvantages implicate certain communicative actions.

When practitioners were asked about their design behaviors as it related to communication with users, they responded with alacrity providing succinct but equivocal answers to the question. On the one hand, the practitioners expressed the firm belief that users accepted products more readily and that products were more successful when users’ input was included in the design process. However, they qualified that response, stopping short of enthusiastically embracing users’ involvement in the design process on a participative level. Damodaran (1996) rated users’ involvement on a scale ranging from informative involvement on the low end, through consultative involvement in the middle, to participative at the high end adding that “without effective user involvement in
all stages of planning and design the organization is simply storing up problems for the future” (p. 365). Heinbokel et al. (1996) disagreed with Damodaran, evaluating users’ participatory role as potentially problematic for development. Kujala (2003) provided a review of the user involvement idea in three types of research, noting that there were benefits and challenges to promoting user involvement. This researcher concluded, “the questions may not be what approach and methods to select, but what we can learn from these methods and approaches, and what methods we should use may depend on the situation” (p. 13).

Similar to Kujala, respondents in the current study identified advantages and disadvantages of including user-centered design, at least in the participative range – for both usability testing and for users’ suggestions. Design practitioners were aware of their tendency to practice in contradiction to their beliefs about design, excluding usability testing and the users’ suggestions, at times. This was interesting because one would think that those ways of practicing were unconscious. In effect, the entire human factors research project has been undertaken to aid with designing for usability – the idea that involving the user leads to a more useful, usable product. In this light without supporting evidence, it would be incredible to think that practitioners could design in an opposite way, given the fact of human factors in design. However, that is what these results have indicated.

Such design practices would necessarily be mediated not just by the fact and effect of user input, but also by administrative and organizational factors such as resources, project management, workload issues, personal factors and such like. These are all beyond the scope of this project, however, they were mentioned as the respondents
gave accounts of their experiences with usability testing and implementing according to users’ suggestions. The respondents gave advantages and disadvantages of excluding usability testing and advantages and disadvantages of including usability testing. They did likewise when asked about implementing users’ suggestions into the final product design.

Advantages and Disadvantages of Usability Testing – Awareness of the Contradiction

Practitioners’ own notions of the contradiction associated with usability testing were called Awareness of the Contradiction. When they discussed being aware that there was a contradiction between their belief and their design practice, their discussion was usually accompanied by lessons they had learned from the process of usability testing. Practitioners were also cautious about implementing system features in accordance with the users’ suggestions that were available to them. When they talked about this guarded form of interaction, this was called The User Input Caveat.

Question 1: How does the contradiction between design practitioners’ values and practices play itself out in their experiences communicating with users to implement usability testing?

Practitioners were aware of the contradiction between belief and practice related to usability testing. There were several indications of this awareness. The instances of the Awareness of the Contradiction occurred as the practitioners discussed their decisions to exclude usability testing from the design lifecycle. There were advantages to excluding usability testing. Not surprisingly, given the reasons design practitioners gave as reason for the contradiction, practitioners’ most often cited benefit of excluding
usability testing was that it saved time. One practitioner stated, “there were a couple of perceived benefits and they both related to time-savings. One is there was a complaint that it took too long to schedule usability testing” (--- Sam, 15 years design experience).

Another practitioner talked about the Awareness of the Contradiction in this way, “You can’t eliminate the actual writing, you can’t eliminate the formatting, you can’t eliminate the printing, but you can easily eliminate usability testing. … So, it’s the easiest thing to get rid of and not get spanked on” (--- Connie, 15 years design experience). One practitioner implicated both time and cost in talking about his decision not to include usability testing – indicating that his decision had to do with using resources wisely and efficiently. He did not want to waste time or money. This practitioner said, “There’s definitely a time issue. Usability testing is expensive in terms of time on a project and in the iterations and things like that. Especially if you’re using a consultant to do your interface design, there is a direct cost impact” (--- Hubert, 9 years design experience).

Another advantage that practitioners gave of not doing usability testing was that the design team already knew what the users wanted. Connie expressed it this way, If you’re cutting down to the bare bones of production – getting something out – usability testing, unless it’s required or unless you really feel strongly about it, you can cut it out, claim that you know what the users like. And, of course, all people producing something claim they know what the users like. ‘I’m a user, I know what they like.’ (--- Connie, 15 years design experience)

Dianne, a design practitioner for 20 years said “there are certain people who are not real … they feel they know enough about the users. I think that’s the basic thing. They tell themselves that they know enough about what the users need and want, they don’t need to do it” (Dianne, 20 years design experience). One design practitioner spoke for his
team and admitted an Awareness of the Contradiction between belief and usability testing practice. He said, “I would say that if you asked them if usability testing was a good idea they wouldn’t say ‘No’ – that it is worthless. But, they would say ‘but, no, we don’t need to do it because we have the users involved all the time” (Edward, 25 years design experience). Edward, then, recounted an experience from which he’d learned a lesson about usability testing. He said:

I thought I knew a lot about how this was done, how people would do it, what made sense. And what I may have known a lot about is how professional searchers do things. But that is not the typical user like the services with [company] or other services. So, it was bias or an assumption that I knew a lot more about how people would use this service that I really didn’t know at all. (Edward, 25 years design experience)

In addition to saving time, money, and already knowing what the users wanted, other benefits that practitioners gave for excluding usability testing were: 1) that it made designing easy, 2) practitioners did not have to consider dissenting opinions, 3) users could start using it immediately, (i.e., it went to market sooner).

When citing disadvantages of excluding usability testing, practitioners’ top two reasons had to do with use and usefulness. Practitioners stated that the predominant disadvantage of not doing usability testing was that the finished product impeded use by confusing the user. Examples of this disadvantage were when Sam said, “there were definite disadvantages, and it didn’t take long for those to come out when the users were exposed to, particularly, certain pieces of functionality…. Users couldn’t stand the original version” (Sam, 15 years design experience). In some cases, the users found the product so unusable that they sought an alternative, and in that way, the company lost
customers. Sam was the practitioner who shared this story about an outcome where products were not usability tested, and use was hindered. He said:

The [other] providers were in the market before we were and already getting a following. Very expensive software, but a lot of [users] have committed to that already and so even though we are cheaper and [ours] allows more collaboration, they’ve made financial commitments to it, so they can’t back out of that. Well, a lot of levies were coming up and their budgets were due about the time that this was released, and so I’m sure that a lot of them said ‘Well, this is too much trouble, let’s go ahead with one that’s tried, true, and proven.’  (--- Sam, 15 years design experience)

The second disadvantage practitioners related regarding not conducting usability testing was that the product was not useful. Connie stated, “I think if you don’t really ask the users, they might have something in their hand, but it could be completely worthless. Look pretty and all that other stuff and it’s just all fluff”  (---Connie, 15 years design experience). Another practitioner indicated that the Awareness of the Contradiction between belief about usability testing and practice was disadvantageous when she said, “the obvious [disadvantage] of building something that doesn’t work for your users, [is] not accomplishing what you set out to do…. If your foundation isn’t strong, then it’s not gonna hold the amount of content that’s added to it over time. And that may affect the way the users [use the product]”  (--- Belinda, 7 years design experience). There were other disadvantages to not conducting usability testing. Those included: having no opportunity to refine the product design; that there was no user input into the design, on principle; that the team wasted time because they had to re-work the design because it was not being accepted by users; and the notion that if you go too far down the road with a design and realize a mistake late in the cycle, it’s more difficult and costly to change at that late date.
Advantages and Disadvantages of Implementing Users’ Suggestions – The Users’ Input Caveat

Question 2: *What do design practitioners say about the reasons that factor into their decisions to exclude users’ suggestions from the final product design?*

Awareness of the Contradiction was associated with excluding usability testing from the project timeline, these practitioners indicated not only their awareness that their actions contradicted their belief, but gave reasons for that fact – personal reasons as well as reasons that impacted the team and the project, generally. Just as design practitioners had knowledge of the way their design practice was opposed to their belief about usability testing, so also these practitioners experienced a similar phenomenon when they did not implement the users’ suggestions. Practitioners were cautious about implementing system features in accordance with the users’ suggestions and talked about this guarded form of interaction, The User Input Caveat. The Caveat had to do with knowing how important the users’ suggestions were to the final success of the product, but having also to consider other factors, including, in some cases, their own particular past experience with getting users’ input. There were advantages and disadvantages related to including suggestions and also related to excluding them.

There were two advantages practitioners cited for not implementing the suggestions gained through users’ involvement in the design process and both of them related to saving time. The first advantage was that excluding the suggestions kept design on track. The practitioner stated when asked why this was useful, “keeping motivation on track, and not freaking the developers. You have to pick your battles. We fixed only show-stoppers” (-- Tonya, 12 years design experience). The same practitioner
also indicated that an advantage of forging ahead with design without including the users’ feedback was advantageous because they were able to meet the schedule, save time and money and keep the team motivated. She opined:

meeting the schedule saves time, money, and keeps up motivation. Changes can always go into the next release. When you have a certain amount of experience or feedback, you may think, ‘Yeah. You’re probably right, but we’re going to release it in a month and a half.’ The benefits may not ever outweigh the time it would take to make that change – to re-architect. Time is connected to this. (-- Tonya, 12 years design experience).

There were also disadvantages associated with excluding users’ suggestions. The most cited disadvantages were that (a) it became harder to change as time passed, and (b) that the system was not useful for some users. When practitioners spoke about changes becoming harder to make with the passage of time, they had in mind a scenario such as this one that Belinda recounted:

One of the big hindrances is it’s much harder to go back and change it the longer you wait. So, yes, that is always a hindrance. And now we need to port information into a new site so we’ll be bringing along with it any of the nasty little bugs that were in the old one. … We’re applying the changes to 500 items instead of five because we waited. The scale of the fix grows in direct proportion to the amount of time you end up waiting before you make the changes. (-- Belinda, 7 years design experience)

Hubert had a similar observation about the difficulty of changing the product after an extended period of time excluding users’ input when he said, “you really want to do this, but it can be a problem in that you are so close to being done that making changes can be difficult” (Hubert, 9 years design experience). There were other disadvantages related to excluding users’ input. Those disadvantages were: (a) that the product did not sell because they did not fix the ‘Achilles’ heel’, and (b) that the system was not useful for some people. In some cases, the product didn’t sell because the users’ input was not
included and the targeted users could not use that system. Hubert shared this lesson he had learned through past experience. He said,

In hindsight, sure, there probably were [problems] because the product failed miserably and I don’t think it was the [user’s interface]. But, I think if it had had some of the additional customization features, the [users] might have been more receptive to the overall product, definitely. (--Hubert, 9 years design experience)

When looking at the Users’ Input Caveat as it related to the advantages of including users’ suggestions, one practitioner inadvertently gave some insight into the differences among developers and their consequent styles of working. Sam observed that:

I’m working on a project now that has had I believe [different forms of users’ input] for web re-design and the developers are sold on it, ‘Oh yeah, we absolutely have to get input.’ That’s a different breed of developer. They’re not the JAVA techie developers who don’t get much contact with the users, these are web developers, web-site developer, HTML and Flash and they’re a lot more of the artistic type and a lot more plugged in with who the users are and what the users want. And a lot more likely to see complaints, too. I think the JAVA techies tend to be insulated from the users. (-- Sam, 15 years design experience)

The other factor practitioners reported to be an advantage of including users’ suggestions was that the team was able to get a deeper understanding about what the users’ needs were. Mack said,

I think it gave them a better understanding of the thought processes that the users were going through in trying to use the system. The users were subject matter experts as well as the product manager – but I think they looked at things a little bit differently. I think they [product team] got a better understanding of the workflow and how people intended to use the product. (--Mack, 14 years design experience)

This would seem to be the ideal reason to seek input from users in the first place.

During the interview, each respondent was asked if they had perceived any advantage from designing without the users’ input. This was a way to ask them about the
contradiction between what they’d said they believed, and what they did – asking them to 
comment on the contradiction that existed and to inquire as to what means of getting 
users’ input they had used to design the product, if any. They had different ways to 
explain their decision, of course. When speaking about the decision and responding to 
my question of what was used as a substitute for the user, this practitioner replied “[w]e 
 kinda wing it. I think of myself as a pseudo end-user – just my own playing and testing.” 
The consequences of this decision was fully known to her as she stated: 

Well, you might be looking at a screen and it seems perfectly obvious to me because I work on these kinds of screens and of course you do X and whatever it is. But from an end-user’s point of view if they’ve not worked with these kinds of products before, and they may not be perfectly obvious, they may be vague and alien. But not having their mindset and see it from their point of view, I would never know that. I would be just so comfortable and familiar with whatever it is that it escapes me altogether. 

-- Connie, 15 years design experience

Although this practitioner was aware that the users had not given feedback about the 
product she was helping design, there was, in her mind something very empowering and 
confidence-building about being able to move forward toward the successful completion 
of the design lifecycle. However, the awareness of the contradiction accompanied the 
feeling of empowerment. She opined:

It was empowering that you could make a decision, because there are seldom times when I feel that I can just, right there, make a decision and move with it. And to know that you can make that kind of a decision, it really empowered you to make more of those kinds of decisions – to keep going and have more confidence in yourself, which may or may not be a good thing. I may not know at all what I’m talking about. Like I said, I’m pretty far removed from the user. Who am I sitting there making decisions for the user when I’ve never even seen one or talked to one. But the more that I am empowered with making those decisions and we’d move on them, the more I’m willing to make decisions for people I have never seen.

-- Connie, 15 years design experience
The user’s needs were not ignored, the team took the requests from users into consideration as they designed, as is noted in the following statement:

There were just an awful lot of meetings because they [user representatives] asked for everything that they could possibly think of – assuming that the users would get part of what they asked for. Users would ask for everything that they wanted because their assumption is, “Well, we’ll ask for the sun, we’ll get the moon.” So you had to wade through what is it that was ridiculous and they’re just asking for it because they’re hoping for everything, but are willing to settle for less than. Lots of wading through different options.

--Connie, 15 years design experience

While the previous practitioner cited an example of the Caveat that was accompanied by personal benefits as well as project-related ones. As was the previous practitioner, this one was aware of the contradiction between the belief that users’ input is important and the decision that was made to practice without it. This practitioner indicated that the entire project revolved around staying on schedule, and this appears to be the rationale for using a certain methodology and for involving users’ input in a limited fashion.

When asked what was used to get users’ input into the design, this practitioner replied,

I think for the most part, like me, they [developers] rely on people telling them what the users have said or indicating it to them directly and part of that is that many times development managers are very focused on setting the schedule, putting every task that the developers have on schedule, meeting every projected date in the schedule along the way so that they get to the end and they are done when they are supposed to [be] and taking a couple hours to go to a usability test or a training session to observe users. …. It certainly seems valid that there has to be some limit to that [getting feedback from users] or nothing would get finished. But I think sometimes there is a tendency to sort of shield them from users as if the users were going to infect them or something, rather than being the positive influence. So, I think that they usually don’t get a lot of direct contact with them, but I’d say that when it has occurred it certainly seems to be positive. Generally, I think they would want to just have the product specialist do more direct interaction with users.

--Dianne, 20 years design experience
From the practitioners’ perspective, getting users’ input was accompanied by a caution. That caution was similar to a ‘buyer beware’ clause in that they understood the tension within which users’ input is gathered and included in the design lifecycle. This tension is akin to the reasons for ‘trade-offs’ in design practice, the idea that not everything can be done, so the team proceeds according to priorities that have been set in the schedule in conjunction with project and product managers. Practitioners in this study spoke of a kind of trade-off that accompanied the attempt to get users’ input, also seen as a way of explaining the contradiction between design belief and design practice. One practitioner spoke specifically about usability testing as a way of getting users’ input,

It’s very important to do the up-front work before actually trying to do a test because you have to be careful, you have to recognize that you can only test selected things and you have to make sure that you are selecting the most useful things. That often requires other knowledge of users needs and things [that] have to be factored into that. But, usability testing is certainly helpful in many ways.

-- Dianne, 20 years design experience

Another practitioner spoke about the need to view the results from usability testing with a jaundiced eye when deciding on how much weight to give to the users’ suggestions gained through such an activity. He recalled:

You still have to use other measures like how many times people click things, maybe surveys, and [maybe] use a broader number, counting how many times people come in, how many times they display an answer, etc. There are other measures you can use if you think about designing things. … Of course, it’s always helpful to talk to the users about what they need. It states the obvious, but in some sense that’s the important thing. I’m only hedging it because, how many users do you have to talk to before you get a good sample or really understand, in general?

-- Edward, 25 years design experience
In a sense, practitioners’ Awareness of the Contradictions and the User Input Caveats were their own identification and discussion of the mis-match between their beliefs and their design practice, and the trade-offs that they made in design. The summary of advantages and disadvantages for including and excluding usability testing and users’ input has been listed in Figure 13.

<table>
<thead>
<tr>
<th></th>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td><strong>Usability Testing</strong></td>
<td>Adds value and increases potential for success</td>
<td>Test is artificial</td>
</tr>
<tr>
<td></td>
<td>Get users’ reactions</td>
<td>Product near finished, no input</td>
</tr>
<tr>
<td></td>
<td>Created standard</td>
<td>Slows down design</td>
</tr>
<tr>
<td></td>
<td>Helped with design</td>
<td>Late in Cycle</td>
</tr>
<tr>
<td></td>
<td>Product near completion, no input</td>
<td>Took Time</td>
</tr>
<tr>
<td></td>
<td>Team-building activity</td>
<td>Usability testing not critical activity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Focused on insignificant things</td>
</tr>
<tr>
<td><strong>No Usability Testing</strong></td>
<td>Made designing easy</td>
<td>Go too far to change design</td>
</tr>
<tr>
<td></td>
<td>Did not have dissenting opinions</td>
<td>Confused user</td>
</tr>
<tr>
<td></td>
<td>Saved money</td>
<td>No opportunity to refine design</td>
</tr>
<tr>
<td></td>
<td>Saved Time</td>
<td>No user input to design</td>
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<tr>
<td></td>
<td>Users start using immediately</td>
<td>Not useful</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not proactive in design</td>
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<tr>
<td></td>
<td></td>
<td>Wasted time</td>
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<tr>
<td><strong>Users’ Input</strong></td>
<td>Got understanding of users’ needs</td>
<td>Too many changes</td>
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<tr>
<td></td>
<td>Listened to users</td>
<td>Required a lot of re-programming</td>
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<tr>
<td></td>
<td>Got instructions from users</td>
<td>Too user-specific</td>
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<td></td>
<td></td>
<td>Threw off schedule</td>
</tr>
<tr>
<td><strong>No Users’ Input</strong></td>
<td>Stayed on schedule</td>
<td>Harder to change longer wait</td>
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<tr>
<td></td>
<td>No commitment to make changes</td>
<td>Hear same suggestions repeatedly</td>
</tr>
<tr>
<td></td>
<td>Keep design on track</td>
<td>System not useful for some</td>
</tr>
<tr>
<td></td>
<td>Met schedule, saved time and money</td>
<td>Too late in design cycle</td>
</tr>
<tr>
<td></td>
<td>Kept up team motivation</td>
<td></td>
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</tbody>
</table>

Figure 13. Usability Testing and User Input Advantages and Disadvantages
Summary of Study Findings

Throughout this study, reference has been made to usability testing and to UCD as a reasonable and even desirable way to design information and communication technologies. The premise has been that true UCD starts with the user and this focus is maintained throughout the design lifecycle. Further, this focus was best evidenced in and through communication with the users for whom the product was being designed. In addition, the researcher argued that the usability testing phase of design can be a site of fruitful interaction between design practitioners and users justifying inclusion of this form of UCD into the design lifecycle. Based on this argument, practitioners were asked to indicate what kind of conversations they engage in when UCD was not included in the lifecycle and when users’ input was not used to design or enhance the product.

Excluding the users’ input had a consequence – actual or implied. For example, one practitioner recalled that “the project management saw usability testing … as being too much overhead, they decided to use what they saw as the quick-n-dirty route and bypassed getting users’ input. There was a lot of user dissatisfaction as a result.” (Sam, 15 years design experience) Another practitioner emphasized that designing a product without getting the users’ input was not the best business strategy for the short term because that way of designing jeopardized user dissatisfaction. By not obtaining user input, a company risks practitioner morale as well as the good will of the consumer groups. This practitioner said:

Just rolling it out, throwing it out there whether or not it’s used or distributed constantly, that doesn’t tell you whether or not what you’ve done is worthwhile. Personally, I need to have some kind of some sense of what I’ve done is actually valued…. I think if it’s not good, and you won’t know that for sure, I think it
could damage your reputation. It could make you appear to be someone who would throw out anything. Not really care about what the user needs or wants.  

--Connie, 15 years design experience

On the other hand, it was possible for a design situation to be transformed by communicative practices in which new design processes and procedures evolve, and a state where new methodologies were used could emerge to become the design standard. This would be the result of practitioners’ working to design in conjunction with the user for a truly user-centered model. However, practitioners have realized that new design methodologies needed to have Champions within the organization who were willing to be the first to use and approve them. One practitioner spoke about such a project manager

He was also not as jaded – he had a different perception. … He has ideas about what we can do, outside of what we have already been. What we have already been – that’s not to say it’s a bad thing, it’s good to have consistency. But there needs to be change as well – the two have to go together and for a long time we’ve coasted along on consistency, “We’re always this way and we’re gonna stay that way.” Which mean we’re not going to be meeting the market needs. And to have somebody like him come in and say, you know what, this is what is going on out there. You don’t see it because you’re entrenched in all of this. This is what’s going on and let me help you see how this will with what you’ve got.  

-- Connie, 15 years design experience

New ways of designing come from new ideas and at least in this practitioner’s opinion, it was difficult for the entrenched notions to be removed by those who practiced them. People with fresh perspectives need to come into an organization and foster the new methodologies that will include making user-centered design a practical methodology, not just a rhetorical one.

The main conclusions drawn from this study as related to question #1 – presenting some of the possible communicative moves that a practitioner could make regarding usability testing could fall into either of two categories. The first line of thought was that
communicating via tactics from tactic set A led to an open relationship with the users. The other idea was that communicating using tactics from tactic set B fostered a closed relationship with the users. In the open relationship, design practitioners’ communication behaviors indicated that they listened to the users, sought to establish a mutually beneficial working relationship with them, and responded to the needs that they heard from the users by incorporating them into the product design. In light of question #1, this would mean that design practitioners would choose to conduct usability testing such that they could have contact with members of the user population. Having that point of contact would allow them to understand, first-hand what the users’ needs were, and in the event that negotiation was needed, that could be accomplished with expediency.

Conversely, in the relationship characterized by tactics from set B, communication was closed and did not lead to including usability testing in the design lifecycle. Tactic set B included such tactics as those where design practitioners did not truly listen to the users, resisted the users either verbally or non-verbally, and set the design lifecycle back in that there was no active, fruitful communication happening. In light of question #1, this would mean that usability testing was dismissed as a means of getting users’ input into the final product. As the results of the study illustrated when this happened, the most often cited reason for not conducting usability testing was that it was too time-consuming and thus put the schedule at risk of overrun. The resulting themes were those that indicated that the relationship had disintegrated and the parties were re-orienting away from each other.

Question #2 asked what were some of the communicative moves design practitioners made as they decided not to incorporate users’ input in the final product
design. Just as was discovered for usability testing, when design practitioners refused users’ design suggestions, the tactics were those isolated as tactics in tactics in set B. Users’ suggestions were ignored, sometimes openly opposed, to the point of bringing the design cycle to a standstill. In fact, this type of communication actually formed a kind of pseudo-communication in which the practitioners responded more to the dictates of the design lifecycle, especially noting time as the reason, again, than to the needs of the users.

When practitioners communicated with users regarding their suggestions using tactics from set A, they were more open to the users’ comments. The trajectory for these tactics involved moving through listening to the users, connecting with them to do the design work, and following up on the users’ needs in designing the final product. The resulting themes were those that indicated a type of communication that made implementing the users’ suggestions akin to the culmination of an agreement in which the design practitioner was bound by the ethic of fairness to honor. In other words, the relationship that had been established led to the practitioners being almost honor-bound to implement according to the users’ reported needs.

The results from this exploration of the communicative behaviors of practitioners indicated that communication with the user was not very important to them despite their stated belief that communication with the users helps them to design a better product. At each turn, even when they made such statements, they countered or qualified them and thus, nullified the idea. The way that practitioners had of qualifying their beliefs led to the contradictions that were isolated from the data. Upon analysis, using the modified communication-as-procedure schema those contradictions pointed to several
communicative behaviors that may foster a participative design experience. This study, also, uncovered several ways of structuring communication such that non-participative design would follow. In the final analysis, design practitioners’ exclusion of usability testing and users’ suggestions meant that these user-centered design methods were not thought to be fundamental to the design of a useful product.

One possible reason that practitioners continue to design without users’ input may be that they lack the knowledge of the methods and of how to go about implementing such design procedures. This may stand as one possible reason that practitioners continue to design without including users’ input despite UCD and ISO mandate to conduct design in a more user-centered way. A promising line of research has come about that implements the UCD process in industry according to ISO 13407 and ISO 18529. ISO 13407 provides guidelines for developing human-centered design processes for interactive systems, and ISO 18529 describes the human-centered lifecycle process. Jokela (2002) proposes a new model of UCD that uses these ISO standards as foundation aimed at communicating the essentials of UCD to design practitioners. The model is outcome-driven and has been used in evaluating the success of implementing UCD and for planning and training purposes. Jokela concluded that “the model makes the essentials of UCD more comprehensible and easier to define. Furthermore it responds to the challenge of integrating usability engineering and interaction design” (p. 26).

In more recent research, Jokela, Iivari, Matero & Karukka (2003) looked again at ISO standards 13407 and included ISO 9241-11, guidance on usability for the ergonomic requirements of office work with visual display terminals (VDTs). They were interested in applying the ISO definition of usability to industrial UCD processes. These
researchers concluded that the standard definition of usability found in these ISO
documents was “not adequate guidance … in a development project” (p. 59). They
concluded that their approach where they “identified user groups, then user goals, and
finally usability requirements” (p. 59) was very helpful in getting knowledge of the user
to the development team through the requirements. HCI research of this nature that uses
UCD guidelines as the basis for informing practitioners about users in ways that are
readily acceptable and useful in the development process helps foster the communication
between practitioners and users that will lead to collaboration. In fact, these studies point
to the Undoing Rigidities communicative theme that was isolated in the data.

UCD methodologies were considered to be important in experiences recounted in
the present research because of the opportunity for communication that was made
possible through them. The fact that this way of designing was not essential exemplified
that the communication was not essential either. This idea was similar to the notion of
the usability blessing or the rubber stamp. Practitioners and researchers have described
usability testing as ‘a blessing’ and as ‘frosting’. The idea of usability as a blessing has
been cited anecdotally as evidence of the belief/practice contradiction found in the HCI
literature (Bovie, et al., 2003; Damodaran, 1996).

Describing UCD in such terms indicated that it was not very highly valued nor
considered a viable means for designing products. Rather, in this view, the processes by
which the design team gain users’ input has been tacked onto the end of the project
lifecycle – and/or usability testing has been done as time permitted. In these instances,
the practitioners did not practice user-centered design because the user was not at the
center of design as Rubin (1994) suggested would be the case in design that was truly
user-focused. The idea that user-centered design may be cast as a communicative process and studied from that standpoint has been corroborated by applying Dervin’s (1999, 2003) communication-as-procedure analytic. When practitioners perceived a contradictory set of contingencies, and utilized certain sets of communicative tactics in design, those tactics foster outcomes – specific design practices.

The designing for usability rationale (Gould & Lewis, 1985; Lund, 1997) and communication-in-design research (Hartwick & Barki, 1997, 2001; Sonnenwald, 1993, 1995, 1996) were used as the basis for the argument put forth in this study – given the inconsistency between the rhetoric and the practice of design, in what ways do practitioners characterize UCD and users’ input. The questions that arose from this central idea asked specifically about design practitioners’ experiences with usability testing (a form of UCD) and with deciding to implement the user’s suggestions that had been gained through usability testing. The researcher wanted to trace the origin of the contradiction between rhetoric and practice by isolating communicative behaviors that gave indications about practitioners’ attitudes towards designing for usability, representing UCD.

Study results indicated that certain communicative behaviors were conducive to the process of including usability testing and users’ suggestions, and also identified those that were not. In addition, the communicative patterns that were isolated could be linked to practitioners’ beliefs about the inclusion or exclusion of UCD methods, evidenced by the practitioners’ Awareness of the Contradiction – the knowledge that their practice deviated from their stated beliefs. Communicative behaviors were also implicated in the finding that design practitioners were aware of their tendency to include users’ input only
at certain times. This User Input Caveat was identified as a communicative pattern signaling the likely exclusion of users’ feedback from the final product design. Thus, the research questions were answered by tracing backward through the practitioners’ statements to draw a picture of how they constructed the UCD situation that was contradictory as far as their rhetoric and practice were concerned. These results provide general knowledge of design practitioners’ perceptions, attitudes and opinions about the UCD methodology as evidenced in their communication.

Limitations and Directions for Future Research

Limitations and future research trajectories can be treated at once in this section. These flow from methodological concerns as well as from logistical issues related to specific design decisions that were made. When considering the methodological limitations of Sense-Making Methodology, one must consider the rigor to which the methodology has already been put, being used as it has in qualitative and quantitative research. However, as the methodology follows along the tradition of grounded theory methodologies, and has evolved to examine the experiential world of individuals, certain non-experiential or administrative factors would have to be examined through the lens of a modified analytic.

For example, this researcher thinks that studying factors that are not necessarily communicative in nature in tandem with the communicative factors to be of value to the design practitioners and to researchers. A suggestion for future research would be to study the impact of non-experiential design factors on the UCD process. Such factors would include organizational processes outside the design arena that would impinge upon it, management issues, resource allocation (financial resources, human resources,
equipment), and work responsibilities. While it is conceivable that these factors could also be looked at from a communicative or interpretive standpoint, looking at these issues from the perspective of the entire system or from the perspective of history would be useful, as well.

Also, given the fact that design activities imply teamwork, future research could focus on the multi-faceted nature of the team’s perspective. The methodology would have to be modified to ascertain perspectives of a group’s way of thinking about, and conducting design work. This could prove to be a fruitful exercise as focus groups and discussions about design issues would benefit from the procedural expressivity that is fundamental to Sense-Making Methodology.

Concerning the study design, the first issue under consideration related to the research questions. In this study, the interview asked respondents to consider users’ input and usability testing and to recount their experiences with each. This move narrowly conscribed the study, and the resulting formulation of analyses and discussion did not contain information relating to other design experiences. In essence, all evidence of interpersonal interaction with the larger team, management issues within the organization, and resource and workflow issues were not part of this analysis. Though this may seem to unnaturally constrain the breadth of this research, such a narrow focus was deemed necessary in order to isolate and to trace the phenomenon of interest, the occurrence of contradictory speech and behaviors during usability testing. However, a trajectory for future research could possibly incorporate the broader ideas into a study, or use that notion as a starting point to design a completely different study.
A second logistical idea related to the study design involved the choices made about definitions of major concepts. This study defined user-centered design as a communicative process. UCD was defined to encompass design methods that feature communication with the actual product users. The two characteristics that were salient in this idea were: (a) the communication orientation – couching UCD as fundamentally a communicative process, and (b) that communication in this method of UCD was with the actual users – not with user representatives, or with user advocates such as usability engineers. In a similar way, the researcher conflated all means of getting users’ input into the example of UCD that was under study -- usability testing. Though there were other means of UCD mentioned in the interview, this study had defined UCD to be usability testing, therefore all other forms were excluded from the analysis of data. A suggestion for research in future would be to examine these data in light of the other means for getting the users’ input into the design process.


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APPENDIX A

PRELIMINARY SENSE-MAKING INTERVIEW: PHASE I

Sense-Making Interview
*Designing Systems that Make Sense* Instrument
to be administered by L.R. Jenkins

**Part 1**

Think of design situations you have been involved in. Think specifically of times when there has been input from users and times when there wasn’t. The different kinds of design situations where there has been input from users:

1. where you got it and it helped,
2. where you got input and it didn’t help,
3. where you got it and it wasn’t used,
4. where you got input and it had mixed results.

Then I want you to think of situations where:

1. there wasn’t user input and you thought it appropriate that there shouldn’t be any,
2. there wasn’t any input from users and you thought it was needed, you missed having it.
Definitions to help you with the terms used in this study:

1. A design situation may be any experience where you designed a product alone or as a member of a team.

2. User communication (also called user input in this study) involves any interaction in which you communicated directly with current and intended users of a product. Such communications would take the form of: information gained from watching a live or remote usability test, a face-to-face exchange, a telephone conversation, or information relayed through correspondence (e.g., via e-mail, feedback to the webmaster, a memo, etc.) Communication/input can be considered to be any firsthand source of information from users. Please note that this does not include information gained through an intermediary such as user representatives on your design team, in-house user advocates, marketing surveys, focus group summary information, and the like.

3. A user is a person or group of persons who have access to and utilize the product/system you designed.

4. The product under design may be for use at work, at home, at school, or in leisure activities. It may be intended for mass consumption or for use by a small number of people.

Part 2

Questions for situational entry a:

1. Thinking back to a time when design proceeded with user input and you thought it was helpful, what happened briefly? (first, second, etc.)
2. You said that the user input in this situation was helpful. What led you to this conclusion? (What made the input helpful, in your opinion? How did it help?)

3. Did the presence of user input hinder the design process in any way? If so, how?

4. When you look back on this instance of getting user input, did you have any questions or confusions? What were they?

Looking back at this situation where you got input and it helped, I’d like for you to look at this picture. In this picture, we have users, developers/designers, we have the communication between the two groups, we have the design process, itself; we have the [NAME OF YOUR COMPANY] environment, and we have the particular product that you worked on in this situation, [name the product]. What I’d like you to do is to think about this and we’ll go through each of these elements and I want you to tell me whether you think that there was anything in particular about that particular element that made it possible for the user input to work in this situation, to help/hinder, etc. Let’s start with the product.

➢ Was there anything about that product that made user input be helpful in that situation? [triangulate: conclusions/ideas—what were these?, confusions/questions—what were they?]

➢ How about the design process—was there anything about it that made user input helpful in that situation?

➢ How about the [NAME OF YOUR COMPANY] environment—was there anything about it that made user input helpful in that situation?

➢ How about the communication between users and designers—was there anything about it that made user input helpful in that situation?
➢ Was there anything about the users that made user input helpful in that situation?

➢ Was there anything about the developers/designers that made user input helpful in that situation?

Now, looking again at the picture:

5. Was there anything about the relationship between these elements, in this case where you got user input and it was helpful that could have made the input even more helpful?

6. Now, looking back to this situation where you did/made _____, if you could wave a magic wand, what would be changed in order to make user input even more helpful? [For each idea ask, How would that have helped?]

Questions for situational entry b:

1. Thinking back to a time when design proceeded with user input and you thought it didn’t help. What happened, briefly? (first, second, etc.)

2. You said that the user input in this situation did not help. What led you to this conclusion?

3. Did the presence of user input hinder the design process in any way? If so, how?

4. When you look back on this instance of getting ineffective user input, did you have any questions or confusions? What were they?

Looking back at this situation where you got input from users and it did not help, I’d like for you to look at this picture. In this picture, we have users, developers/designers, we have the communication between the two groups, we have the design process, itself, the [NAME OF YOUR COMPANY] environment, and we have the particular product that you worked on in this situation, [name the product]. What I’d like you to do is to talk
about each of these elements in their turn, and I want you to tell me whether you think that there was anything in about that particular element that made the user input ineffective or not helpful in this situation. Let’s start with the product.

- Was there anything about that product that made user input be *un*helpful in that situation? [triangulate: conclusions/ideas—what were these?, confusions/questions—what were they?]
- How about the design process—was there anything about it that made user input not helpful in that situation?
- How about the [NAME OF YOUR COMPANY] environment—was there anything about it that made user input ineffective in that situation?
- How about the communication between users and designers—was there anything about it that made user input a hindrance in that situation?
- Was there anything about the users that made user input not helpful in that situation?
- Was there anything about the developers/designers that made user input ineffective in that situation?

Now, looking again at the picture:

5. Was there anything about the relationship between these elements, in this case where you got unhelpful user input that could have made the input helpful?

6. Now, looking back to this situation where you did/made _____, if you could wave a magic wand, what would be changed in order to make user input helpful?

[For each idea ask, How would that have helped?]
Questions for situational entry c:

1. Thinking back to a time when design proceeded with user input but it wasn’t used. What happened, briefly? (first, second, etc.)

2. You said that the user input in this situation wasn’t used. What led you to this conclusion?

3. Did the presence of user input hinder the design process in any way? If so, how?

4. When you look back on this instance of getting user input that wasn’t used, did you have any questions or confusions? What were they?

Looking back at this situation where you got input and it wasn’t used, I’d like for you to look at this picture. In this picture, we have users, developers/designers, we have the communication between the two groups, we have the design process, itself; we have the [NAME OF YOUR COMPANY] environment, and we have the particular product that you worked on in this situation [name the product]. What I’d like you to do is to talk about each of these elements in their turn, and I want you to tell me whether you think that there was anything in about that particular element that caused the user input not be used in this situation. Let’s start with the product.

- Was there anything about that product that caused the user input to not be used in that situation? [triangulate: conclusions/ideas—what were these?, confusions/questions—what were they?]

- How about the design process—was there anything about it that caused user input to not be used in that situation?
➤ How about the [NAME OF YOUR COMPANY] environment—was there anything about it that caused user input to not be used in that situation?

➤ How about the communication between users and designers—was there anything about it that led to user input not being used in that situation?

➤ Was there anything about the users that led to user input not being used in that situation?

➤ Was there anything about the developers/designers that caused user input to not be used in that situation?

Now, looking again at the picture:

5. Was there anything about the relationship between these elements, in this case where you got user input that wasn’t used that could have made the input more useful?

6. Now, looking back to this situation where you did/made _____, if you could wave a magic wand, what would be changed in order to make user input more useful?

[For each idea ask, How would that have helped?]

**Questions for situational entry d:**

1. Thinking back to a time when design proceeded with user input and you thought it had mixed results. What happened, briefly? (first, second, etc.)

2. You said that the user input in this situation was mixed. What led you to this conclusion?

3. Did the presence of user input hinder the design process in any way? If so, how?

   Did it help? How?
4. When you look back on this instance of getting user input that had mixed results, did you have any questions or confusions? What were they?

Looking back at this situation where you got input and it had mixed results, I’d like for you to look at the picture. In this picture, we have users, developers/designers, we have the communication between the two groups, we have the design process, itself; we have the [NAME OF YOUR COMPANY] environment, and we have the particular product that you worked on in this situation [name the product]. What I’d like you to do is to talk about each of these elements in their turn, and I want you to tell me whether you think that there was anything in about that particular element that made the user input ineffective or not helpful in this situation. Let’s start with the product. Let’s start with the product.

- Was there anything about that product that made user input have mixed results in that situation? [triangulate: conclusions/ideas—what were these?, confusions/questions—what were they?]
- How about the design process—was there anything about it led to the user input having a mixed impact in that situation?
- How about the [NAME OF YOUR COMPANY] environment—was there anything about it that led to user input having mixed results?
- How about the communication between users and designers—was there anything about it that made user input mixed in that situation?
- Was there anything about the users that made user input mixed in that situation?
- Was there anything about the developers/designers that made user input mixed in that situation?
Now, looking again at the picture:

5. Was there anything about the relationship between these elements, in this case where you got user input that led to mixed results that would have made the input clearly helpful?

6. Now, looking back to this situation where you did/made _____, if you could wave a magic wand, what would be changed in order to make user input clearly helpful? [For each idea ask, How would that have helped?]

**Questions for situational entry e:**

1. Thinking back to a time when design proceeded without user input and you thought it appropriate that there shouldn’t be any. What happened briefly? (first, second, etc.)

2. You said that the project proceeded without user input and that was suitable. What led you to this conclusion?

3. Did the absence of user input impact the design process in any way? If so, how?

4. When you look back on this instance of not getting user input, did you have any questions or confusions? What were they?

Looking back at this situation where you didn’t get input and you thought it was OK, I’d like for you to look at the picture. In this picture, we have users, developers/designers, we have the communication between the two groups, we have the design process, itself; we have the [NAME OF YOUR COMPANY] environment, and we have the particular product that you worked on in this situation [name the product]. What I’d like you to do is to talk about each of these elements in their turn, and I want you to tell me whether you
think that there was anything in about that particular element that made the user input ineffective or not helpful in this situation. Let’s start with the product.

➢ Was there anything about that product that made lack of user input be helpful in that situation? [triangulate: conclusions/ideas—what were these?, confusions/questions—what were they?]

➢ How about the design process—was there anything about it that made the absence of user input helpful in that situation?

➢ How about the [NAME OF YOUR COMPANY] environment—was there anything about it that made the lack of user input helpful or a hindrance in that situation?

➢ How about the communication between users and designers—was there anything about it that made the absence of user input helpful or hindering in that situation?

➢ Was there anything about the users that made the absence of user input helpful in that situation?

➢ Was there anything about the developers/designers that made the lack of user input helpful in that situation?

Now, looking again at the picture:

5. Was there anything about the relationship between these elements, in this case where it was fitting that you did not get user input that could have made the getting user input appropriate?

6. Now, looking back to this situation where you did/made _____, if you could wave a magic wand, what would be changed in order to make getting user input suitable in this situation? [For each idea ask, How would that have helped?]
Questions for situational entry f:

1. Thinking back to a time when design proceeded without user input and you thought it was needed. What happened briefly? (first, second, etc.)

2. You said that the user input in this situation was needed. What led you to this conclusion?

3. Did the absence of user input hinder the design process in any way? If so, how?

4. When you look back on this situation in which user input was needed, did you have any questions or confusions? What were they?

Looking back at this situation where you did not get input and you thought it was needed, I’d like for you to look at the picture. In this picture, we have users, developers/designers, we have the communication between the two groups, we have the design process, itself; we have the [NAME OF YOUR COMPANY] environment, and we have the particular product that you worked on in this situation [name the product]. What I’d like you to do is to talk about each of these elements in their turn, and I want you to tell me whether you think that there was anything in about that particular element that made the user input ineffective or not helpful in this situation. Let’s start with the product.

➢ Was there anything about the product that made user input be needed, in that situation? [triangulate: conclusions/ideas—what were these?, confusions/questions—what were they?]

➢ How about the design process—was there anything about it that made user input needful in that situation?
How about the [NAME OF YOUR COMPANY] environment—was there anything about it that led you to miss user input in that situation?

How about the communication between users and designers—was there anything about it that made user input needful in that situation?

Was there anything about the users that led you to think that user input was needed in that situation?

Was there anything about the developers/designers that led you to think that user input was needed in that situation?

Now, looking again at the picture:

5. Was there anything about the relationship between these elements, in this case where you did not get user input and you thought it was needed that could have made the input more helpful had you gotten it?

6. Now, looking back to this situation where you did/made _____, if you could wave a magic wand, what would be changed in order to lead to getting user input that would be helpful? [For each idea ask, How would that have helped?]

**Generalizing Conclusions:**

Looking back over all these situations you’ve described and other situations you’ve been in,

1. Do you have any general conclusions about when and under what conditions user input is most helpful and useful?

2. Do you have any general conclusions about when and under what conditions user input is most hindering or not helpful?
3. Do you have any questions or confusions about obtaining user input in the design process? What are those confusions?

4. Do you see any inherent contradictions regarding user input in the design process?

Part 3

1. What is your job title?

2. Please describe briefly what you do at work.

3. How many years have you worked in this field?

4. Please tell me about your college degree and the specialty in that degree.
   (undergraduate, some graduate work, graduate degree (Masters or Doctorate), post-graduate work)

5. In your judgment does your organization/design group follow ISO standards?
   Please describe the standards, briefly.

6. Gender

7. Ethnicity
Figure 14. The Design Environment
Let’s talk about usability. Would you define usability testing for me? What does it mean to do usability testing on a product?

**Situation 1**
**Description1:**
You have indicated that you have been involved in usability testing in the past. I want you to tell me about a time when you worked on a project where you knew that the product (or system) you were working on should be usability tested, but there was none or less than you thought there ought to be. Can you tell me, briefly, what happened?

**Elicit Factors:**
Even though you thought there should be more usability done (or at least some done), what were some resulting benefits of going ahead with the status quo?

**Triangulate Factors:**
List of benefits [for each]

How did it help?

Given that you thought there should be more usability done, were there disadvantages that resulted from going ahead [with minimal or without usability testing]?
List of hindrances [for each]

How did it hinder?

Magic Wand—Usability Testing

If you could have changed usability testing such that it would have been appropriate for your team’s needs in this project, what would you have done?

How would that have helped?

Triangulate User Input: [List of ways designers come to know about users’ needs]

Which of these methods did you use in the project to understand the users’ needs, other than usability testing?

[For each used]

Did it help? How?

Did it hinder? How?

Situation 2

Description2

Now I want you to tell me about a time when you worked on a project where usability testing was done, but in the end, the users’ suggestions were not implemented for whatever reason. Briefly describe what happened.

Elicit Factors:

Given that usability testing was done, what were some advantages of going ahead without implementing according to the users’ suggestions reported via usability testing?

Triangulate Factors:
List of advantages (benefits) –[for each]

How did it help?
Were there any disadvantages related to going ahead with the implementation without incorporating users’ suggestions?

List of disadvantages – [for each]

How did it hinder?

**Magic Wand—Usability Testing**

If you could have changed the users’ suggestions such that they would have been appropriate for your team’s needs in this project, what would you have done?

How would that have helped?

**Triangulate User Input:** [List of ways designers come to know about users’ needs]

How did the user input, in this project, lead to your understanding of the users’ needs?

How did it help?

How did it hinder?

**Generalizing Conclusions:**

1. When is it most helpful to get information about users’ needs?

2. When is it least helpful to get information about users’ needs?

3. In your experience, how do developers and designers come to understand users’ needs?

4. Is usability testing, as you have seen it practiced, a good way to obtain knowledge of the users’ needs? What leads you to say that?

5. Did you have an opportunity to speak with the users during usability testing? Did you? Did it help? How? Did it hinder? How? [Don’t need to ask if covered in either situations.]
6. Can you tell me briefly and in your own words what ‘usability’ is? [Only ask this if not asked at beginning of interview.]

Demography

1. Job title

2. Describe briefly what you do at work

3. How long in field? At present organization?

4. Highest degree?

5. Area of specialization?

6. Does your organization follow design standards? [Such as ISO?]

7. Gender

8. Ethnicity

Thank you for your help!
Call for Participation

Hello,

My name is Lillie Jenkins. I am a doctoral student at OSU, and I am employed as a Research Assistant to Mike Prasse in the Usability Testing Lab. I am conducting a study to fulfill the research portion of my degree, and I am sending this note to ask for volunteers. In my research, I would like to interview designers and developers regarding their experience with the design process.

I estimate that the interview will last between 1 and 1 1/2 hours. Participation in this research is voluntary and will not compromise one’s professional standing. As such concerns are legitimate, however, participants will be asked to participate anonymously. I will audiotape the sessions, but participants will be allowed to remain anonymous. Please consider participating. If you would like to participate, for the good of research, or because you would like to help out a colleague; please respond to me by [DATE]. If you do not wish to participate, but can recommend someone who can participate but that person is not an employee, please forward that person’s contact information to me.

If you decide to participate, when you contact me, we can discuss arrangements for the interview: date, time, and location (if appropriate). At that time, I will give you a packet of information that includes a copy of the interview questions, and my contact information. Please note that I have listed my OSU e-mail account and my home phone number below. I ask that you use these to contact me, but you may also use the work e-mail address and phone number listed.

Thank you very much.

Lillie

jenkins.290@osu.edu
Hi!

My name is Lillie, and I am conducting a study in which I interview information system design practitioners (e.g., software developers/engineers, systems analysts, programmers, designers, etc.) regarding their work experiences. I have been given your name as a possible participant. Would you be willing to participate? I know you’re busy, but I would appreciate your help very much. I am doing this project to complete requirements for a degree from OSU.

During the interview, I ask about one very successful work experience and one that was more challenging. You may choose these experiences from any part of your work history.

I estimate that the interview will last between 1 and 1 ½ hours. We can break the sessions into two parts if that is more convenient. Although the sessions will be audio taped, my final report will contain only summary information, thus maintaining your confidentiality.

If you are willing to participate, thanks!! Please contact me at Jenkins.290@osu.edu or at x3590. At that time I will schedule an interview through Outlook, unless you indicate otherwise. We can make arrangements to meet before or after work, during evenings or on weekends, at work or at an off-site location—whatever is convenient for you.

If you do not wish to participate, but can recommend someone, please forward that person’s contact information to me.

If you have questions, please contact me at Jenkins.290@osu.edu. You may also contact my faculty advisor at OSU, Professor Brenda Dervin, at dervin.1@osu.edu.

Thanks again for your help with this project.
**APPENDIX E**

**SENSE-MAKING INTERVIEW PRE-VIEW – SENT TO RESPONDENTS**

*Designing Systems that Make Sense for Usability Instrument Schematic*

OSU Institutional Review Board Exempt Protocol #: 02E0369  
Professor Brenda Dervin, Principal Investigator  
Lillie R. Jenkins, Graduate Student, Instrument Administrator

Lead in (Orienting instructions for respondents)  
[Before we begin, I will tell you that these questions will sound repetitive, but that is a necessity of the interview structure. In effect, I will ask you the same questions for each situation you describe. May we begin?]  

Part 1  
I want you think about your career as a systems designer or developer, considering the projects that you’ve worked on—alone or in teams. If you will, look at this list of types of user input and give me a quick one-liner definition of each type, and tell me if/when you’d be more likely to use that particular type of user input.

Part 2  
Now, I’d like for you to tell me about 2 design situations from your own career—your most successful experience, and your most challenging one. Briefly describe the situations for me. What happened at the beginning, in the middle, and what happened at the end.

Now, I’d like for you to answer some more detailed questions about each of your experiences. For your most successful/most challenging one: [Remember, I will basically ask you the same set of questions about each experience, so at times, this may sound repetitive, but that is a necessity of the interview. If you feel you’ve answered these questions as fully as you can, tell me, and we will move on.]

What type(s) of user input did you use?  
USER INPUT? TYPE:
<table>
<thead>
<tr>
<th>Observing user(s)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>From Reading or Research about users</td>
<td></td>
</tr>
<tr>
<td>Your own past experience as a developer or designer</td>
<td></td>
</tr>
<tr>
<td>From another person (team member, colleague, supervisor, product/project manager, user representatives), etc</td>
<td></td>
</tr>
<tr>
<td>User Requirements document(s)</td>
<td></td>
</tr>
<tr>
<td>Talking to and/or interviewing users</td>
<td></td>
</tr>
<tr>
<td>Survey Results/Focus Groups/Usability Testing</td>
<td></td>
</tr>
<tr>
<td>Correspondence with users (via e-mail, letters of complaint, congratulatory letters, memos, user group or bulletin board postings, etc.)</td>
<td></td>
</tr>
<tr>
<td>Other (write-in)</td>
<td></td>
</tr>
</tbody>
</table>

LED TO? For each type:

<table>
<thead>
<tr>
<th>How did it Help?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did it Hinder in any way? How?</td>
</tr>
</tbody>
</table>

USER INPUT--NONE?

LED TO?

<table>
<thead>
<tr>
<th>How did it Help not to have User input?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did it Hinder in any way? How?</td>
</tr>
</tbody>
</table>

TEAMS’ OPINIONS DIFFERENT about User Input?

<table>
<thead>
<tr>
<th>What were differences? ^ (What led to?, help? (how?), hinder? (how?))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were they Bridged? How?</td>
</tr>
</tbody>
</table>

RESOLUTION?
### Did Resolution Help? How?

<table>
<thead>
<tr>
<th>Did Resolution—Hinder? How?</th>
</tr>
</thead>
</table>

### QUESTIONS OR THOUGHTS About USER INPUT?

<table>
<thead>
<tr>
<th>What were they? (led to, help-how?, hinder-how?)</th>
</tr>
</thead>
</table>

### MAGIC WAND—CHANGE?

<table>
<thead>
<tr>
<th>How would that have helped?</th>
</tr>
</thead>
</table>

### Were DIFFERENT DEPARTMENTS REPRESENTED on the design team? SKIP if not

**DEPARTMENTS DIFFERENT? WHAT WERE DIFFERENCES?**

<table>
<thead>
<tr>
<th>What were differences? (What led to, help? (how?), hinder? (how?))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were they Bridged? How?</td>
</tr>
</tbody>
</table>

### RESOLUTION?

<table>
<thead>
<tr>
<th>Resolution—Help? How?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution—Hinder? How?</td>
</tr>
</tbody>
</table>

### QUESTIONS/THOUGHTS About DESIGN PROCESS?

<table>
<thead>
<tr>
<th>What were they? (led to, help-how?, hinder-how?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Related to Users’ Input? What were they? (led to, help-how?, hinder-how?)</td>
</tr>
</tbody>
</table>

### MAGIC WAND—CHANGE?

<table>
<thead>
<tr>
<th>How would that have helped?</th>
</tr>
</thead>
</table>

### SUCCESSFUL Scenario:

Looking back to the situation that you described as being your most successful one, what, in particular do you think led to the experience being a success? [Triangulate]. Was there anything that hindered it? [Triangulate] Was hindrance related to users or user input in any way?

### UNSUCCESSFUL Scenario:

Thinking back to the situation you’ve described as being particularly unsuccessful or challenging, what, in particular do you think led to it being unsuccessful? [Triangulate]. Anything helpful? [Triangulate] Was helpful thing in any way related to users or user input?

### GENERALIZING CONCLUSIONS:

<table>
<thead>
<tr>
<th>When (under what conditions) is UI most helpful?</th>
</tr>
</thead>
<tbody>
<tr>
<td>When (under what conditions) is UI least helpful?</td>
</tr>
<tr>
<td>Thoughts/Questions/Confusions about obtaining UI during design process?</td>
</tr>
</tbody>
</table>

167
Contradictions regarding UI in design process?
Anything else?

Part 3
1. What is your job title?
2. Please describe briefly what you do at work.
3. What do you consider to be your area of specialization?
4. How long have you worked in this field?
5. What is your highest college degree?
6. Does your organization/design group follow ISO standards? Please describe the standards, briefly.
7. Gender
8. Ethnicity
## TYPES OF USER INPUT:

- Observing users
- Reading or Research about users
- Another person (team member, colleague, supervisor, product/project manager, user representatives)
- User Requirements document(s)
- Talking to and/or interviewing users
- Usability Testing
- Survey Results
- Your own past experience
- Focus Groups
- Correspondence with users (via e-mail, letters of complaint, congratulatory letters, memos, user group or bulletin board postings, etc.)
- Any other source? (write-in)
APPENDIX F

SENSE-MAKING INTERVIEW INTRODUCTION

Before the Interview: (Introduction to study—to be read with participants on the day of the interview at the
time they sign the Consent Form.)
Script: You are being asked to participate in an interview that will last approximately 1-1 1/2 hours. Your
voluntary participation is appreciated. Should you wish to terminate your involvement at any stage of the
research/interview process, please feel free to do so without penalty or repercussion. This research does
not require that you divulge your identity, and for that purpose you will be assigned a random number.
Should you identify yourself on the tape, that portion will be erased and excised when the tape is
transcribed. Feel free to ask any questions about the interview process before the interview begins, or after
it has ended. However, during the actual interview, I will not be able to answer questions of that nature.
Thank you for holding questions/suggestions that arise concerning the interviewing process until the
interview has ended. After the interview, I will gladly answer your questions.

The interview will consist of a series of questions relating to your experience as a designer/developer of
information technologies. I will ask you to recount your experiences, prompting you using a set of open-
ended questions. Prompts are designed to jog your memory, and get you started in your responses. I have
structured the interview questions in such a way as to allow you to explore your answer as thoroughly as
possible. Therefore, some questions may sound repetitive, but each question aims toward exploring a
different, though related, facet of your experience. This cyclical recurrence in questioning, is called
redundancy. However, if you think you have answered a question as thoroughly as you would like; just
inform me, and I will move on to the next question. Remember that the goal of the interview is to let you
respond as fully to a question as you would like, so at times, there will be periods of silence—as in normal
corversation—to allow you to collect your thoughts and to continue with a train of thought or to indicate
that you have finished with that response.

Upon completion of this research, results may be mailed or otherwise distributed to
you, at your request. Simply contact me at the address listed in your
information packet.