

Organizational Usability of Digital Libraries: Case Study of Legal Research in Civil and Criminal Courts

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Digital Libraries (DLs) is a recent term used to refer to information systems (IS) and services that provide electronic documents—text files, digital sound, digital video—available in dynamic or archival repositories. Some insist that DLs refer to documentary collections that are accessed via the Internet, while others refer to DLs as any collection of electronic text, sound, or video files used in a shared space. There is much at stake in these debates. If DLs are narrowly defined, then we lose the ability to learn about key DL issues from previous research, theory, and professional practice in IS and librarianship. We present a case study of the use of legal research DLs (LRDLs) in the California Civil and Criminal Courts. We extend the concept of organization validity (Markus & Robey, 1983) in IS to that of organizational usability in LRDLs. The results suggest that points of access to LRDLs influence usage, that there is a strong interplay between home computer use and LRDL use at work, and that legal professionals prefer one-on-one assistance rather than group training. Conditions fostering organizationally unusable systems are presented based on empirical data.

Introduction

Digital libraries (DLs) are a recent term used to refer to information systems (IS) and services that provide electronic documents—text files, digital sound, digital video—available in dynamic or archival repositories. The legitimate use of the term DL is somewhat contested terrain—some insist that DLs refer to documentary collections that are accessed via the Internet, while others refer to DLs as any collection of electronic text, sound, or

video files used in a shared space. Fox and his colleagues (1995) noted these kinds of conceptual differences when they observed:

The phrase “digital library” evokes a different impression in each reader. To some it simply suggests computerization of traditional libraries. To others, who have studied library science, it calls for carrying out of the functions of libraries in a new way, encompassing new types of information resources; new approaches to acquisition (especially with more sharing and subscription services); new methods of storage and preservation; new approaches to classification and cataloging; new modes of interaction for patrons; more reliance on electronic systems and networks; and dramatic shifts in intellectual, organizational, and economic practices. (p. 24)

They also note that the name “digital library” itself has had varied connotations:

As we consider many of the discussions and activities in this area over the period 1991–1993 . . . we note a shift from *electronic library* to digital library as the preferred term, perhaps following the growing interest in digital networks, digital audio, and digital video relative to electronic publishing. (Fox, Akseyn, Furuta, & Leggett, 1995, p. 24)

There is much at stake in these terminological debates. If DLs are defined in such a way that only IS and services of recent vintage can enjoy the label, then we lose the ability to learn about key DL issues from relevant traditions of research, theory, and professional practice in IS and librarianship. There is a lot of genuine excitement about some of the new pilot DL projects (Becker, 1995; French, Fox, Maly, & Selman, 1995; Smith & Frew, 1995; Wilensky, 1995). It is conventional wisdom that these systems should be engineered for high levels of individual usability (Adler & Winograd, 1992; Gould & Lewis, 1985; Nielsen, 1993), and they should be designed with

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a user-centered approach (Gould, Boies, & Lewis, 1991; Greenbaum & Kyng, 1991) so that professionals will want to use them.

However, an important body of IS research finds that high quality interfaces and content alone are not sufficient to ensure that IS are widely used within specific organizations (Bullen & Bennett, 1996; Culnan, 1983; Eason, 1988; Grudin, 1989; Kling, 1992; Markus & Keil, 1993). To promote substantial use of IS, those who implement or configure them for particular organizations, should address socio-technical issues at the *organizational level* related to the adoption and continued use of technology. This article extends this body of research to DLs. Empirical studies of actual use of DLs in specific organizations are rare (Covi & Kling, 1995; Levy & Marshall, 1995). The purpose of this article is to examine socio-technical issues that support or impede the use of DLs within professional organizations.

Although previous researchers have termed LRDLs, computer-aided legal research (CALR) systems, we refer to them as LRDLs in this article. Since legal research corpuses have been called electronic libraries, online services, or full-text retrieval libraries for several decades, it is appropriate to refer to them as LRDLs.

Lexis/Nexis and *Westlaw* are the two main sources of full-text databases of legal archives (Leiter, 1992; MacLeod, 1996). For the last two decades, law firms and courts have been using online LRDLs, in lieu of, or in combination with, books as a means of improving the timeliness and quality of legal research (Caldwell, 1977). While online LRDLs have been available for many years, they have not been widely adopted by many small to medium-sized law firms and courts (Aaron, 1995). For these legal professionals with limited budgets, a recent trend has been to complement or replace online LRDL services, and/or books with CD-ROMs (Baldwin-LeClair, 1995; Bantliff, 1992; Evans, 1995; Information Today, 1994; Kornowski, 1995; Shimpock-Vieweg, 1995). The move to CD-ROMs, accessible over local area networks (LANs), reaps cost savings because their publishers offer flat monthly fees in contrast with the relatively costly hourly charges of *Lexis*-type services (about \$4 per minute).

An understanding of what constitutes a workable configuration of online and CD-ROM LRDLs could help the LRDL implementor or configurer, who might be a manager in a law firm or in the courts, incorporate LRDLs into workplaces so that professionals will gain value from them in their work. Organizational issues in IS designs have been studied previously in domains such as general IS (Eason, 1988; Markus & Robey, 1983); office systems (Kling, 1992; Mouritsen & Bjorn-Anderson, 1991); groupware (Bullen & Bennett, 1996) and manufacturing (Adler, 1992; Kling, 1987; Kling & Iacono, 1989). Many researchers have suggested that good IS designers would adapt IS design to the structure of organizations, or that organizations would be restructured to improve the over-

all performance or quality of work when information technology was introduced. Explicit ideas for how to go about this were provided (Eason, 1988; Mumford, 1983). Our article advances this literature by giving information professionals an analytical approach to an organizational level analysis that we have refined and illustrate with systematic empirical data. We extend the work of Markus and Robey (1983) to DLs. They proposed a conceptual framework to clarify the concept of organizational validity—the “fit” between an IS and its organizational context of use. We extend Markus and Robey’s conceptualization of organizational validity by refining it into one called *organizational usability* (Elliott & Kling, 1996b; Kling & Elliott, 1994) and illustrate it with empirical data from our study of the configuration and use of LRDLs by civil attorneys, district attorneys (DAs), public defenders (PDs), and judges in the civil and criminal courts of Los Angeles County, California. There, LRDLs consist of legal archives of statutes and case law available via online information services and CD-ROMs.

The basic concept of the usability of a computer system is that “any system designed for people to use should be easy to learn (and remember), useful, . . . contain functions people really need in their work, and be easy and pleasant to use” (Gould & Lewis, 1985, p. 300). Organizational usability moves beyond this individual view of usability to refer to the match between a computer system and the structure and practices of an organization, such that the system can be effectively integrated into the work practices of the organization’s members.

Our research questions include:

1. How can the organizational usability of a LRDL system be characterized and how does it vary across organizations?
2. How do institutional and cultural influences affect adoption and usage patterns of LRDLs?
3. How does an organization’s environment influence the adoption and usage of LRDLs?
4. What conditions impede organizational usability of LRDLs?

We use institutional theory (DiMaggio & Powell, 1991) to understand the powerful role that social behavior outside of a specific court plays in the adoption of LRDLs in the courts. The data from our study indicate that organizational usability of LRDLs varies across organizations depending on their context of use. We begin with a description of our research methods and follow it with a description of LRDLs. Then we outline the way that Markus and Robey (1983) characterize organizational validity and extend their conceptualization to a framework of organizational usability of LRDLs at three levels: *Individual*, *organization*, and *environment*. Finally, we conclude with a discussion of the conditions that can limit the organizational usability of LRDLs.

Research Method

Since February 1995, we have been conducting an ethnographic case study of the use of LRDLs in the California civil and criminal courts in Los Angeles County using a qualitative approach (Lincoln & Guba, 1985; Yin, 1984). The first author conducted field work for about 11 months, and for the last 5 months of that period, spent 10–20 hours per week observing and interviewing the participants in a California municipal court, a California superior court, and a civil law firm. In order to learn about a wide spectrum of usage levels, we selected courts with varying levels of computer equipment, from no hardware to high technology equipment (computerized evidence presentation and computer-aided transcription), and attorneys and judges with varying levels of computer expertise. Our sources of data include: Court documents; semi-structured interviews with attorneys, judges, and court reporters; legal technology documentation and legal literature; hands-on use of legal research technology; and ethnographic participant observation. In exchange for research access to a branch of the Los Angeles County PD's office, the first author acted as an unpaid consultant—helping attorneys with technical problems in legal research and general computer usage, and attending about 20 hours of meetings to assist in a study (Elliott, 1996) of the effects of computerization from a 2-year experiment where personal computers (PCs) were given to PDs for legal research and case management.

As part of this study, we have interviewed 46 professionals: 22 PDs, three PD administrators, seven judges, four court reporters, three DAs, one criminal defense attorney, three civil attorneys, one paralegal, and two IS court specialists. The study also entailed observation of approximately 40 hours in several courtrooms in two different cities—called here Ocean and West City for anonymity—in Los Angeles County, preceded or followed by interviews with attorneys and judges involved in the courtroom proceedings.

We analyzed our interview and observational data using categories that we derived from Markus and Robey's organizational validity concept, and dimensions of organizational usability from our previous research (Elliott & Kling, 1996b; Kling & Elliott, 1994). Dimensions of the match of LRDLs to an organization's context of use were then formulated to characterize organizational usability (a detailed definition is provided later). We used two criteria for determining the dimensions of organizational usability: 1) Our informants' opinions about the roles of LRDLs in altering the timeliness and quality of their work, and 2) whether or not LRDLs were used. Measuring the timeliness and quality of legal research is complex, and previous researchers (Caldwell, 1977; Sager, 1977; Sutton, 1994) have shown the measurement problems inherent in the subjective nature of legal research.

Sager (1977) reported findings of a study on the use of LRDLs to determine whether LRDLs would improve

the efficiency or quality of the legal research performed by officers and employees of the US courts. While the time saved could be evaluated by actual recorded periods of research, the potential for LRDLs to improve research quality was more difficult to measure. According to Sager, there are two research questions to address regarding the relevance of information retrieval in computerized legal research: 1) Were cases found that would not ordinarily be found with traditional library research? 2) Did the cases found lead to a better opinion or a better final product (e.g., legal draft)? For his study, users' impressions of improved quality were used as a criterion.

Similarly, Caldwell (1977) notes that both LRDLs and manual legal research have inadequacies. If the criterion is that only relevant cases can be retrieved, then neither system is entirely satisfactory. A manual search might miss relevant material due to human limitations like running out of time and energy, while a computerized search might fail to find the appropriate match between a search phrase and a potentially useful document, or it might retrieve too much information for careful preview. Caldwell claims that legal research is a subjective process:

It has long been recognized that computer-assisted research is significantly faster and more accurate than conventional methods. . . . This advantage in speed is very difficult to quantify because all legal research is a subjective process. The criteria of success differ from lawyer to lawyer. (p. 5)

Sutton (1994) conducted a study on the role of attorneys' mental models of law in determining the relevance of cases obtained using LRDLs. He defines the concept of relevance as a function of the mental models or cognitive maps attorneys construct and maintain of the law. In other words, a relevant case is one that has some impact on the cognition involved in structuring a legal argument or framing legal advice. His study showed how relevance is influenced by the ways that attorneys use case law in the construction of mental models of controlling principles. He also showed that assessments of relevance depend upon an attorney's evolving mental model of the law. He concluded that relevance is *not* a binary judgment, but admits to degrees, and that designers of LRDLs should consider these relevance issues when designing and implementing new systems.

We are persuaded by these studies to view legal research as having an important subjective element. Hence, in our research, we qualitatively compare what promotes organizational usability by analyzing how lawyers and judges perceive improvements in timeliness and in quality due to the use of LRDLs, or by the simpler criterion of use versus non-use of specific LRDLs.

Legal Research Digital Libraries in California Courts

For readers unfamiliar with legal research procedures, we will briefly describe the use of LRDLs in the Los

Angeles County Courts. In preparing for trials and hearings, attorneys interpret statutes and case law (the appellate and Supreme Court decisions) that might be beneficial for their arguments and evidence presentation in court. Since this law is constantly evolving, depending on the particular circumstances surrounding the case, lawyers need to keep abreast of recent changes to statutes and case law by reviewing the legal literature. Online and CD-ROM LRDs provide avenues for legal professionals to remain current in a manner superior to books since materials that are placed online overnight and on CD-ROM within a month are not published in book form for several months.

The CD-ROM and online service vendors offer corpuses which include federal and state law for all US jurisdictions. In the Los Angeles County Courts, both CD-ROMs (*LawDesk* and *West*) and online services (*Lexis/Nexis* and *Westlaw*) are used. The following California legal information is available on CD-ROM and from online services: California case (or statute) legal research (full text), *Shepard's* California citations (up-to-date rulings on cases and statutes), and *Witkin* treatises (summaries of California law). In addition, the online full-text databases, *Lexis/Nexis* and *Westlaw*, include statutes and case law for states other than California, federal case law, and various general information databases. In Los Angeles County, judges are allocated an online account to *Lexis/Nexis* and/or access to a CD-ROM; DAs share CD-ROMs in individual offices and have access to online services in their main library; and PDs share CD-ROMs in individual offices but do not have access to online services (except by calling the Appellate division to do the online research for them).

CD-ROMs and online services provide an advantage over using books. The CD-ROMs and online services contain "slip opinions," decisions that have been published in a daily newspaper but are not yet officially in print. Online services offer this information within 24 hours, while CD-ROMs are updated monthly, and books publish this archive within a couple of months. These unpublished decisions qualify as precedent law in court.

A courtroom dilemma to be avoided by attorneys is the citing of law which has been overruled or reversed by a later authority. This can be prevented by pursuing *Shepard's* citations for references in a later authority to an earlier authority. The "Shepardizing" procedure is imperative to avoid courtroom embarrassment or malpractice suits. The manual approach to this process is time-consuming and prone to omissions. With the use of CD-ROMs or online services, citations are shown rapidly on the screen with an indication of which cases cited the previous case.

In order to reduce the costs of online services and individual CD-ROM sets of California law, the Los Angeles County Court's IS administrators purchased several "CD-ROM towers" which house sets of CD-ROMs. These towers eliminate the need for legal professionals

to physically switch CD-ROMs in and out to retrieve the correct legal archive. Further, these towers are connected to the end-users via a LAN so that selection of a particular set of CD-ROMs is incorporated into the PCs' windowing system.

Organizational Validity

Our core concept, organizational usability, has a subtle intellectual history. There is a significant body of writing about the usability and value of organizational IS where analysts suggest that "organizational factors" or "an organization's context" be taken into account. The efforts to provide an explicit analytical approach to this important but vaguely conceptualized idea used the construct "organizational validity." The term organizational validity was coined by Schultz and Slevin (1973) to conceptualize the effectiveness of applied mathematical models in operations research and the management sciences being used in actual organizations. They argue that a computerized mathematical model will be organizationally valid when it has been successfully implemented; they conceptualize successful implementation based on the extent to which there is correct change in a set of variables that characterize individuals, small groups, and organizations. Schultz and Slevin (1975) developed an attitude scale designed to measure the expectations of organizational change and sometimes the structure or perceptions of social relationships. What is most surprising is that they did not develop measures for organizational level variables. Ginzberg (1980) extended the concept of organizational validity to IS and defined it somewhat differently—as a fit or match between a system and its organizational context.

Markus and Robey (1983) proposed significant extensions to the definition of organizational validity as applied to IS and challenged the basic premise that validity is necessarily related to organizational effectiveness. They claimed that organizational validity was still being used normatively with the prescription implied that if organizational validity is increased, then effective system implementation and use will improve. Their view of organizational validity differed from previous models in three ways: 1) It is not a singular concept but one which can be assessed on at least four levels of analysis; 2) it is not a property of systems nor of organizations, but of the match or fit between them; and 3) it is a descriptive and relative concept rather than a normative and absolute one, without a simple connection between it and effective system use.

Markus and Robey characterized four ways in which a system can match its context of use: 1) The match of a systems' key attributes to users' psychological characteristics; 2) the structural dimensions of the organization; 3) the distribution of power in the organization; and 4) the interface between the organization and its environment. In the next section, we incorporate these levels of organizational validity into our definition of organizational usability.

ity. Of most importance to Markus and Robey's argument is that the organizational validity of a system might vary along these levels—a system might be valid along one and invalid along others.

Interestingly, they claim that an organizationally valid system might fail because it has automated inefficient organizational procedures. Moreover, they argue that an organizationally invalid system might succeed because, despite wide-scale resistance during implementation, it might eventually lead to a major improvement in organizational effectiveness. Markus and Robey base their analysis on a collection of studies about the implementation, use, and usefulness of organizational IS. They did not examine their constructs with any systematic empirical data. They argued that subsequent empirical research could ascertain which levels are most critical to the success of IS implementation and they caution against using these levels as a prescriptive method. The four levels of organizational validity are discussed below.

User-System Fit

Markus and Robey characterize this as a fit between the user's psychological characteristics and the system. Organizational validity is accomplished in IS by designing a system to fit existing users and training them to use it, or finding new people to fit its design. People's personal cognitive processes or the ways that people process information are tied to user-system fit.

Organization Structure-System Fit

Marcus and Robey define this as the match between the structural characteristics of an organization and different system design attributes. In order for organizations to coordinate task-related activities of many individuals in reaction to environmental uncertainty, managers devise organizational structural characteristics such as communication channels, decision rules, and chains of command. IS can also be designed to support different organizational objectives. For example, financial control systems can be structured for centralized, decentralized, or matrix organizations. Validity in this scenario can be measured by whether a system matches existing organizational structures or whether the structure is modified to conform to system specifications.

Power Distribution-System Fit

While an IS might be valid in the user-system fit, it might be resisted because it causes a redistribution of power not acceptable to those losing power. Thus, organizational validity can also be defined in terms of the distribution of power within an organization. An IS implementation can be invalid to the extent that it entails a power redistribution not in keeping with the existing organizational context of use.

TABLE 1. Organizational usability framework.

Level of analysis	Dimensions
1. Individual	Integrability into work Reliability
2. Organization	Social acceptability Organization structure Power distribution Institutional norms
3. Environment	Social organization of computing Environment structure Home and worklife ecology

Environment-System Fit

Markus and Robey referred to this as the fit between system design characteristics and the environment of the organization in which it is used. They speculate that organizational validity of this type may refer to data contained in the system or to the organizational routines embedded in the system. Organizational validity may refer to a match between the organizational communication, control, or decision-making routines embedded in an IS and the environment.

Organizational Usability of LRDLs in California Courts

We extend Markus and Robey's conceptualization of organizational validity to a framework for assessing the organizational usability of LRDLs along three levels of analysis: *individual*, *organization*, and *environment*. Each level is subdivided into fine-grained dimensions of organizational usability. Table 1 illustrates each level of analysis and its corresponding organizational usability dimensions. Our framework differs from Markus and Robey's organizational validity conceptualization in that we folded their organization structure-system and power distribution-system fits into our organization level of analysis, including them as dimensions. Our individual and environment levels of analysis correspond to their user-system and environment-system fits, respectively.

Organizational Usability—Individual Level of Analysis

At the individual level of analysis, we are concerned with how LRDLs are used by individuals within organizational settings. The *integrability into work* dimension is one of the most influential in assessing organizational usability of a LRDL in an organization. The *reliability* dimension is concerned with whether or not the information retrieved from the LRDLs is reliable. One of the most distinctively interesting aspects of organizational usability is the *social acceptability* of LRDLs by an organization's members.

A LRDL becomes an integral part of an individual's work process when it is being used either in lieu of, or in conjunction with, books for legal research. From our data, we found three main factors which contribute to the integrability of LRDLs into the work of legal professionals. First, the expeditious nature of the full-text retrieval of legal archive makes them advantageous for legal professionals. This fast access to legal information can be critical to completing court transactions. Second, the use of LRDLs as an integral part of work practices is correlated with convenient and available points of access. Third, the increase in usage of LRDLs is coincident with the use of computers for word processing and case management. Here we briefly give examples from our data of how these factors influence integrability. For a more detailed analysis, see Elliott and Kling (1996a).

For the 17 Ocean City PDs who use the CD-ROMs on a regular basis for legal research, they reported savings of hours otherwise spent pouring through books to find the appropriate citation. In fact, many suggested that their work days would lengthen if they were confined again to researching solely with books. One PD reported an instance where the judge asked that he and the DA return after a 10-minute break with appropriate case law to support their arguments. Without the use of *LawDesk*, he might not have found the proper citation in such a short time. Similarly, a civil lawyer stated that on one occasion he needed a case to support his position in court the next day, but he could only remember its content from reading about it recently in the *Daily Journal*. Without the help of his paralegal who quickly found the case using *LawDesk*, he would not have been able to "win" his motion in court the next day. In contrast, judges perform legal research in more of a reactive mode verifying an attorney's legal brief or validity of an argument. Approximately one-half of the judges from our study rely on books, not on online services or CD-ROMs, for legal research.

Using intermediaries for legal research is quite common since expert LRDL users can often find citations faster than attorneys alone. In Ocean City, many PDs consult with the misdemeanor head deputy PD who is known as the guru of *LawDesk*. Lunch time raids of his time are typical as often attorneys are directed by judges to return after the lunch break with legal citations to support their positions. Prior to the implementation of *LawDesk*, already known as an expert in legal research by fellow PDs, he filed recent rulings on 3 by 5 cards in boxes organized by categories such as murder, grand theft, etc. He now replaces these cards by full-text searches in *LawDesk's* legal archives. *LawDesk* has become organizationally usable for some PDs via the head deputy's role as an intermediary and legal researcher.

Research has shown that greater PC availability is associated with increased usage (Gogan, 1991). Our data

show similar patterns of an increase in access points correlating with increased LRDL usage. For example, 17 PDs in Ocean City have immediate access to *LawDesk* and *Westlaw* CD-ROM systems from their desks, and the other 13 from a computer conveniently located in a group-shared area. All but two of these PDs have integrated LRDLs into their work practices. In the same courthouse, 44 DAs share the use of one PC linked to the CD-ROM LRDL tower. Given this limited access, Ocean City DAs form a waiting list and some resort to books rather than waiting their turn. In West City, DAs share a CD-ROM and online connection from a library. The West City DA's librarian expressed frustration with the difficulty in converting DAs from books to LRDLs. For judges, access is available to those who request it via a modem link to *Lexis* or a networked connection to a CD-ROM library from their chambers. However, one judge complained of performing the "Shepardizing" procedure from his chambers since the books are no longer being purchased for his personal library. He finds this use of *Lexis* impractical. He likes to read a *Shepard's Citations* book from his bench and it takes more time for him to go to his chambers in the middle of a courtroom proceeding to look up the same information on *Lexis*. Accessing *Lexis* from his bench might facilitate the organizational usability of the LRDL for this judge.

Our last factor influencing integrability of LRDLs into work is the use of computers for more than just LRDLs. An excellent example is the Ocean City PD office where 14 out of the 15 felony attorneys who use computers for word processing and case management, also routinely use LRDLs. The two who do not use a computer for word processing or case management also do not use it for LRDLs. In the civil law firm, the attorney who uses a word processor for typing motions and letters (instead of using a secretary) is also the expert at using *LawDesk*, including hyperlinks and complex Boolean searches. The other two civil attorneys use a secretary for document production, do not use word processing, have a minimal understanding of *LawDesk*, and use it sparingly.

Reliability

Our data show that the reliability of the information retrieved from LRDLs is generally rated by attorneys as higher in caliber than that obtained with manual methods. Online and CD-ROM LRDLs enable quick access to recent decisions before they are published. Both contain "slip opinions," decisions that have been published in a daily newspaper but are not yet officially published in legal archives. This gives credence to the promotion of LRDL information as highly reliable. Many attorneys and judges praised the research tools as extremely valuable.

Attorneys feel more prepared for a trial or court appearance when they have exhausted all searches for relevant research. The LRDLs promote the increased reliability of the research material. However, this perceived increase

in reliability varies greatly among attorneys and judges. Even if attorneys and judges believe that the information from LRDLs is highly reliable, they can be prevented from actively using LRDLs if they do not socially accept computerization as a part of their work world.

Social Acceptability

The social acceptability of the use of LRDLs pertains to the cultural perception of attorneys concerning their role as an attorney. One way to look at cultures of organizations is that the organization has an overall culture with many subcultures within it (Trice & Beyer, 1993). Occupational groups in organizations form distinctive subcultures as “the most highly organized, distinctive, and pervasive sources of subcultures in work organizations” (Trice & Beyer, 1993, p. 178). Even when persons of some occupational subculture are isolated from their associates, they maintain the occupational identities and ideologies through memberships in associations, friendships and other communication mechanisms. Trice and Beyer (1993) describe the legal profession as one highly enculturated with social values:

Doctors, lawyers, and accountants who are employed by corporations are classic examples. Members of these occupations receive intensive and lengthy socialization into certain beliefs, values, norms, and practices. These socialization experiences typically result in members’ internalizing rather detailed sets of expectations for their behavior in their work roles. These subcultural expectations are then made rather sacred by the professional label given to them. Thus, organizations who employ professionals find that they must accommodate to some degree to the mandates of their occupational subcultures. (pp. 178–179)

Cultural models are

Presupposed, taken-for-granted models of the world that are widely shared (although not necessarily to the exclusion of other, alternative models) by the members of a society and that play an enormous role in their understanding of that world and their behavior in it. (Quinn & Holland, 1987)

As a means of understanding the acceptability or resistance to technology evidenced by our informants, we view attorneys’ beliefs and attitudes toward computerization and use of LRDLs as part of their occupational cultural models of the social performance expected of one who is an attorney. Almost one-third of the attorneys, without prompting during interviews, showed us the influence of cultural models in not using computers because their comments had common rationales:

I’m a Luddite. I’m just not machine-oriented. (Criminal defense attorney)

I’ve never liked mechanical stuff anyway. . . . I didn’t go to law school to learn how to use computers. I went to law school to go in a courtroom and act like Perry Mason. (PD)

I’m not mechanical. . . . Secretaries should do the typing. (Civil defense attorney)

So this is an attitude—both men and women don’t feel they should type documents: I’m a lawyer not a trash collector—it feels clerical. (Civil defense attorney discussing other attorney’s aversion to computers)

We did not find that this resistance to computer usage was necessarily related to the person’s age. Several young attorneys, just out of law school, expressed dismay at the thought of using a computer, while a judge ready for retirement was using a computer for real-time court reporting in the courtroom, and for legal research with LRDLs from work and at home (Elliott & King, 1996). We believe that the “Perry Mason” persona as expressed above in the PD’s quote best exemplifies the occupational cultural model conveyed by many attorneys who refuse to use or resist using the LRDLs for research. The socialization of becoming a legal professional can instill ideologies, values, and norms which are difficult to alter because the maintenance of a lawyer’s identity depends upon behaving in conformity with this learned behavior (Trice & Beyer, 1993). Thus, a lawyer who accepts the occupational model of “lawyer as an orator” might find computerization as anathema, while a lawyer who accepts a different occupational model may find computer use acceptable or even highly attractive.

What was most intriguing about the data was that in stark contrast to the one-third who resisted computer usage, about one-third of the attorneys and judges expressed overwhelming support for computerization of legal research, word processing, and case management. In fact, many claimed that they could not work without a computer. For many of these professionals, they had learned how to use computers in a previous job or had taken up computing as a home hobby. The acceptance of LRDLs was ingrained as part of their occupational cultural model, perhaps because they perceived computer usage as not interfering with their image of themselves as a lawyer, or because the use of home computers made it easier to integrate LRDL usage into work routines. For the remaining one-third, the resistance to computerization was apparent during interviews, but they still had minimally integrated LRDLs into their work processes upon experiencing the perceived benefits of increased efficiency. Thus, we found low, medium, and high levels of social acceptability by attorneys and judges for LRDLs.

Organizational Usability—Organization Level of Analysis

At the organization level of analysis, we first explore the dimensions of *organization structure* and *power distribution* within the organizations in this study. In this analysis of LRDLs, the organization structure of an organization refers to the spatial arrangements of shared LRDL resources. This is closely tied to the power distri-

bution dimension where the social positions of subgroups in the courts influence their levels of access to LRDLs. One of the most distinctive dimensions of organizational usability in the courts is the *institutional norms*. Institutional theory indicates that the widespread adoption of LRDLs in other courts can have a major influence in the decision by a specific court to use LRDLs. An essential element to an organizationally usable LRDL is the support for training and maintenance provided by an organization and we address this in the *social organization of computing* dimension.

Organization Structure

Markus and Robey (1983) define the organization structure-system fit as the match between the structural characteristics of an organization and different system design attributes. Rather than limiting ourselves to organizational decision-making structures which are centralized or decentralized, we extend this fit to refer to the match between the social worlds of subgroups within the courts and their access privileges to LRDLs. In Ocean City, the offices of the judges, DAs, and PDs are managed somewhat autonomously within the rules of the court. On a yearly basis, each department is allocated a certain sum of money for computer support and each group has leeway to allocate this money as they wish. But, given the current budgetary constraints of Los Angeles County, this funding is limited and does not support the large-scale development of innovative projects, such as LRDLs. To provide funds for innovative projects which benefit many departments, the county formed an Information Systems Advisory Board (ISAB). Through an application to ISAB in 1993, Ocean City was able to fund the purchase and implementation of the LRDL CD-ROM towers that are now being shared by PDs, DAs, and judges.

Basically, the three groups are virtually sharing the use of the LRDLs over a LAN from their respective offices and, with a modem, from home. If the LRDL CD-ROMs had been physically placed in one room with PDs, DAs, and judges sharing access to PCs, then the project probably would have failed in its early stages given the competitive and adversarial nature of the DAs and PDs coupled with their deference to the judges. Thus, the current CD-ROM configuration matches the organizational structure of their social worlds. The Ocean City CD-ROM tower concept is currently being copied in other cities in the county due to its success and the cost savings involved in eliminating *Lexis* charges and the purchase of books. Closely related to the fit of an LRDL with the spatial structure of work is its match with the power distribution in the courts.

Power Distribution

Social position in the courts has an impact on the level of access to LRDLs. The elevated social role of judges

enables them to have online access to *Lexis* or to the CD-ROMs from their chambers. Although the mere use of LRDLs does not give one group more power than another, judges do have more privileges in terms of requests for computer equipment in their chambers. Several judges were recently given new Pentium HP computers with connections to the LRDL CD-ROMs. For most county PD and DA offices, access to either a *Lexis* account or the LRDL CD-ROMs is through a shared desktop computer centrally located in a library. The Ocean City experiment with each felony PD having access to a PC is rare and not the norm. In West City, DAs have access from their library to the CD-ROMs and are discouraged from using the online systems due to the high costs. In fact, for PDs, only attorneys from the appellate division are authorized for online research. Given the political position of judges as adjudicators of the law, this power distribution in relation to LRDLs is to be expected. Directly related to this power distribution are the institutional norms which influence the adoption of LRDLs.

Institutional Norms

Institutional theory views an organization as a conglomeration of sets of practices, procedures, meanings, and explanations that are persistent, taken for granted beliefs about how organizations should coordinate and be structured. Isomorphism, a process forcing one unit in a population to resemble other units that face the same set of environmental conditions, is used by DiMaggio and Powell (1991) to explain the process of homogenization. They identify three types of isomorphism:

1. *Coercive isomorphism*—Organizations are compelled to adopt standard rules stemming from political influence and the problem of legitimacy.
2. *Mimetic isomorphism*—Organizations model themselves after others to dispel fears of uncertainty.
3. *Normative isomorphism*—Professional organizations adapt controls and standards to define and legitimize occupations.

In the courts, some PDs use LRDLs to give them a competitive edge over DAs who also have access to the same LRDLs. Mimetic isomorphism explains this behavior in that the PDs use LRDLs to dispel feelings of uncertainty during court appearances with DAs and judges. If a PD does not use a LRDL to research a particular issue in preparing a legal motion, then he or she could eliminate a relevant legal reference which could be pointed out in court by the DA or judge. Therefore, many PDs use the LRDLs as a way to circumvent feelings of uncertainty. One Ocean City misdemeanor PD reported that he uses LRDLs as a maneuver when preparing a defense against a DA in court:

The DAs have computers. I've seen their paper. If I didn't have a computer, we'd be hurt (books are bad here . . . inade-

quote). [Without computers], we'd be undermanned and out-gunned. If the DA's have computers and you don't, the DAs are better in court.

This example exemplifies the typical attitude of PDs in relation to their competitive position with the DAs. As both continue to use the LRDLs as "defensive lawyering," the LRDLs become institutionalized through mimetic isomorphism.

The concept of mimetic isomorphism can also be used to explain the civil law firm's decision to integrate CD-ROM technology into their business. The decision had a financial rationale since these CD-ROMs are less expensive than the corresponding books. But another incentive was concern for maintaining a competitive edge with other attorneys and judges who were using LRDLs. The *LawDesk* sales representative informed one of the civil attorneys that all judges in their county's jurisdiction would soon be using *LawDesk*. In fact, since the civil law firm purchased the CD-ROM technology, they have tried to sell their used books to a reseller who buys legal reference books. The reseller is no longer purchasing used legal books because no one is buying them—everyone is buying CD-ROMs or online services instead. This is an example of mimetic isomorphism where law firms are adopting technology to reduce their uncertainty in dealing with professional competitors.

Although institutional norms may influence LRDL usage patterns, an organization needs the appropriate *social organization of computing* to support usage and maintenance of LRDLs.

Social Organization of Computing

The *social organization of computing* dimension focuses on two essential elements of organizational usability: Resource allocation and the social organization of expertise. An organization's computing infrastructure includes workable computing arrangements dependent upon a set of supporting resources, which can be physical, technological, or social (Kling, 1987, 1992). The physical resources include the spatial arrangement of computing equipment; technological resources include electricity and network connections. Social resources include the social organization of expertise which refers to the infrastructure of computing resources that are necessary for supporting and accommodating people as they learn to maintain and use systems. By social resources, we also mean the practices for allocating resources.

Resource allocation for computing support and maintenance has a significant impact on effective usage of LRDLs in an organization. Adequate funding must be provided for the appropriate level of accessibility, maintenance, and training. Resources are allocated in a hierarchical environment in the courts with social positions influencing the amount received. Judges are qualified for LRDL online and/or CD-ROM (if available on the net-

work) access from their chambers, DAs have CD-ROM (both networked and standalone) and/or online access from the library, and PDs have networked CD-ROM or standalone access. The DAs are supplied with a librarian and librarian's assistant in their main library to give continuous support for DL research, while the PDs have no librarian. The reasons for this disparity are complex since funding comes from the county and is dispersed through a bureaucratic allocation scheme. There appears to be a traditional schism between public support for DAs versus PDs, and with crime on the rise in the state of California, it will probably persist. To promote widespread use of LRDLs, resources would need to be more carefully distributed so that more computers are available to PDs and DAs in all branches.

Adequate training makes a significant difference in the organizational usability of LRDLs. Although attorneys and judges are offered classes on the use of *LawDesk* and online resources, many never attend, or they attend the class and do not learn enough from the class to readily begin using the LRDLs. For those already familiar with computer usage for such systems as word processing and case management, learning how to use LRDLs on their own using online tutorials or "help" functions was sufficient.

Informal one-on-one "help" seems to work best for those attorneys who have little or no knowledge of computers. In the civil law firm, attorneys can ask questions of the "expert" computer user in their vicinity. Those PDs with computers on their desks reported that when problems arise, they go to the expert in their group. Although some of our informants who rarely or never use a computer expressed trepidation concerning computers, they also stated that if someone could teach them one-on-one, they would be most receptive to learning to use LRDLs. One aspiring PD, who works as a professor in the evenings, enlisted students from one of his classes to teach him how to use the case management and LRDL software. He is now an avid user. While training classes and a phone "help desk" are available to legal professionals in the courts, it appears that more is needed for some legal professionals to find the LRDLs organizationally usable in this dimension.

Organizational Usability—Environment Level of Analysis

The environment of the courts is less dramatic in shaping the organizational usability of LRDLs than the individual and organizational level behavior that we have discussed. However, there are some important ways that the environment of the organization and its interface to the outside shapes an LRDL's organizational usability.

Environment Structure

The environment of an organization influences the content of appropriate LRDLs. For example, in order to main-

tain a collection of civil law on CD-ROMs, the civil law firm needs the LRDLs for civil statutes and the California Civil Code of Procedure. In contrast, the criminal courts need a collection of criminal law statutes and the California Penal Code. In the civil law environment, the CD-ROMs of criminal law would not be organizationally usable and criminal attorneys would rarely find civil law of value. The organizational environment in which a legal group works can also influence the format of appropriate LRDLs as well as their contents. California attorneys who litigate cases that span the law of several states, or in cases using federal law, need LRDLs with appropriate contents. Depending on the number of states for which legal materials are required, an online *Lexis/Nexis* account may be more suitable for ready access to law from any state and to federal law than usage of CD-ROMs for individual states. In short, the environment of an organization, rather than an a priori conception of “better DLs” may play a strong role in influencing the content and format of LRDLs in use.

Home and Worklife Ecology

We were surprised to find an important environmental influence on the organizational usability of LRDLs—whether or not an attorney’s family owns and uses a home computer. We found that nearly all of our legal informants who praised the computer’s benefits also had computers at home, many of them used them routinely for work-at-home or home computing. Out of the 37 informants who were asked about home computer use, 32 used a computer at work. Twenty-five of those 32 also owned a home computer, and 16 out of this group used their home computer for work-at-home. In the other nine cases, the home computers were used primarily by other family members, or for home financing and entertainment. Out of the five legal professionals who did not use a computer at work, only one had a home computer which was used by a spouse. These professionals have formed a home and work-life ecology where computing easily shifts from one place to the other, often with the help of a laptop computer. Either, the enthusiasm for computer usage at work spilled over into home use (i.e., purchase of a computer), or the familiarity with home computing facilitated their being adept with computers at work. These attorneys became computer advocates. We noticed this synergy of computing at home and work among PDs, judges, and civil attorneys (not enough DAs were included in the study for significant comparisons). In fact, in a related study (Elliott & King, 1996), a judge (who was an advocate of computer use at work and home) claimed that fellow judges who do not have home computers will also be unlikely to use them in their chambers. This ecology of home use spilling over into the workplace, or vice versa, is an intriguing phenomenon that is consistent with “open systems” theories of computerization and worklife (see Kling, 1987; Kling & Jewett, 1994). Its relationship to

organizational usability is a worthy topic of future research.

Conclusion

We have extended Markus and Robey’s organizational validity concept and created a framework for assessing organizational usability based on our empirical data. We have characterized organizational usability for LRDLs as the match between a LRDL and the structure and practices of an organization such that the LRDL can be effectively integrated into the work practices of the organization’s members. Our framework consists of three levels of analysis: Individual, organization, and environment—each with a set of dimensions (Table 1). Each of these dimensions contributes to organizational usability in unique ways. We have shown how the organizational usability of LRDLs varies across organizations. We present three conclusions from this study and discuss the conditions that we believe foster organizationally unusable systems.

First, the organization of access points influences whether or not professionals integrate LRDLs into their work practices. Those who can access LRDLs close to their normal workplaces use them more often than those who have access from an inconvenient location or who share a computer with an inordinate number of people. The level of access varies from court to court, and there is extreme unevenness in points of access among various groups in each court.

Second, there appears to be a strong interplay between computer use at home and the use of computers at work. Attorneys and judges who routinely used computers at work also either owned a home computer or were in the process of purchasing one. These professionals have established a home and worklife ecology moving easily between work computing—for LRDLs, word processing, and case management—and home computing—for work-at-home or other personal reasons like finances, games, and education.

Third, although it is common knowledge among IS professionals that training and support are needed, not all forms of training are equally effective. Legal professionals prefer one-on-one assistance rather than large training classes. They respond more readily to problem-driven learning from a colleague than a syllabus-driven class by a vendor or in-house specialist.

Markus and Robey (1983) based their claims about the unusability (invalidity) of IS on an interesting interpretation of organization theory and IS studies. In contrast, we used our empirical data to assess the dimensions that most contribute to organizationally unusable LRDLs:

- 1) *Organization level, social organization of computing*—Low levels of training and lack of follow-on consulting on a one-to-one basis.
- 2) *Individual level, integrability into work*—Lack of systematic computer use as integral part of work.

- 3) *Individual level, social acceptability*—Disinterest in LRDLs and computer technology, in general.

Separately, each of these conditions can impede organizational usability to some degree. However, these conditions are additive, and in combination, can reduce the usage of LRDLs in specific organizations.

What then can be done to promote organizational usability of LRDLs in the courts? Organizational usability increases with viable training and consulting services. Although Los Angeles County offers beginning and advanced classes on the use of LRDLs as well as phone “help” consulting, such classes and phone services are not sufficient for many legal professionals to gain competence in using LRDLs. We believe that training can be improved by selecting one person—either an attorney or a paralegal—to be the LRDL expert, who becomes an available resource for people needing assistance. This would help dissipate the resistance from people who feel stymied by the use of a computer after taking a formal training class. In terms of integrability into work processes, if all attorneys were attuned to incorporating LRDLs with regular case management and word processing software from a desktop PC or laptop, we believe that LRDL organizational usability would increase. For those who exhibit attitudes of using computers as anathema to their role as a lawyer, they may only become interested in using LRDLs if their access to books is so limited that they are moved to use LRDLs out of necessity, or if they are somehow convinced of the value of LRDLs to their work. Without administrative incentives, research has shown that expectations of a computer system’s use by administration can be mismatched with actual use (Orlikowski, 1996).

Research (Culnan, 1983) shows that people need appropriate training for their skill level in order to use new technology, and that even systems with high levels of individual usability may not be useful to a particular organization’s needs (Markus & Keil, 1993). Organizational usability has many facets. We believe that if configurers of LRDLs adjust their particular implementation to their specific organization’s needs within the framework outlined in this article, then more wide-scale usage will result.

What bearing do our conclusions have on the organizational usability of other DLs? We believe that our suggestions for promoting organizational usability—increased training, incorporating the DLs into everyday work practices, and providing intermediaries where appropriate—can be applied to most other organizational settings. While our depiction of organizational usability was based on the use of LRDLs by legal professionals in a particular place and time, we believe the framework can generally be applied to DL implementations and it should be useful to configurers of DLs in other organizations.

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Appendix: Outline of Interview Schedule

(These topics guided interviews with attorneys and judges—with differences germane to their work situations.)

Professional Career and Educational Background

- Educational background/certification—nature of degrees and specializations
- Occupational background—types of previous jobs, length at current position
- Reason for choosing legal profession
- Likes and dislikes about current job

General Work

- Type of work
- Percent of time spent on legal research
- Amount of work delegated
- Effects of California Three Strikes Law on work load

General Computer Usage

- First experience with a computer
- Training needed/desired for first experience and now
- Contact if trouble with computing? response time?
- Home computer used for what tasks
- Work-related tasks on computer
- Attitude if computer at work is removed—three things which would change in work

LRDL Usage

- How learned—training or self-taught?
- Attitudes/beliefs concerning specific organizational dimensions—technical and socio-technical
- Frequency of use (and triggering conditions)
- Modification to work
- Use of paralegals
- Request for demonstration of person’s use of LRDL

What predictions can you make about future of computing in the courts?

Attitudes and experiences concerning new technology—realtime court reporting, LRDs, multimedia evidence presentation

References

- Aaron, A. (1995, January 9). The struggle to get California's courts online. *California Law Business*, 18+.
- Adler, P. S. (1992). Introduction. In P. S. Adler (Ed.), *Technology and the future of work* (pp. 3–14). New York: Oxford University Press.
- Adler, P. S., & Winograd, T. A. (Eds.). (1992). *Usability: Turning technologies into tools*. New York: Oxford University Press.
- Baldwin-LeClair, J. (1995). CD-ROMs from west publishing. *Legal Assistant Today*, 12(4), 32–33.
- Bantliff, B. A. (1992). Introducing CD-ROMs into a law library: Administrative issues and concerns. *Law Library Journal*, 84, 725–740.
- Becker, H. S. (1995). Library of congress digital library effort. *Communications of the ACM*, 4(38), 66.
- Bullen, C. V., & Bennett, J. L. (1996). Groupware in practice: An interpretation of work experiences. In R. Kling (Ed.), *Computerization and controversy: Value conflicts and social choices* (2nd ed.). San Diego, CA: Academic Press.
- Caldwell, R. (1977). *Issues in automated legal research*. Denver, CO: National Center for State Courts.
- Covi, L., & Kling, R. (1995). Digital shift or digital drift?: Dilemmas of managing digital library resources in North American universities. In M. K. Ahuja, D. F. Galletta, & H. J. Watson (Eds.), *Proceedings of Association of Information Systems Americas Conference* (pp. 487–489). Pittsburgh, PA: Association for Information Systems.
- Culnan, M. (1983). Chauffeured versus end user access to commercial databases: The effects of task and individual differences. *MIS Quarterly*, 7, 55–67.
- DiMaggio, P. J., & Powell, W. W. (1991). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. In W. W. Powell & P. J. DiMaggio (Eds.), *The new institutionalism in organizational analysis* (pp. 63–107). Chicago: University of Chicago Press.
- Eason, K. D. (1988). *Information technology and organizational change*. London: Taylor & Francis.
- Elliott, M. (1996). Moving from paper to digital documents: Case study of public defenders using legal research and case management tools. In J. F. Nunamaker, Jr. & R. H. Sprague, Jr. (Eds.), *Proceedings of the 30th Annual Hawaii International Conference on System Sciences*, Vol. 6 (pp. 97–106). Los Alamitos, CA: IEEE Computer Society Press.
- Elliott, M., & King, J. L. (1996). From OJ to OK: Lessons from the use of emergent CSCW technologies in California courts. Working paper. Irvine, CA: University of California, Irvine.
- Elliott, M., & Kling, R. (1996a). Case study of legal research digital libraries in Los Angeles county courts. Working paper. Irvine, CA: University of California, Irvine.
- Elliott, M., & Kling, R. (1996b). Organizational usability of digital libraries in the courts. In J. F. Nunamaker, Jr. & R. H. Sprague, Jr. (Eds.), *Proceedings of the 29th Annual Hawaii International Conference on System Sciences*, Vol. 5 (pp. 62–71). Los Alamitos, CA: IEEE Computer Society Press.
- Evans, J. (1995). Discs versus data streams. *California Lawyer*, 15(9), 59–60.
- Fox, E. A., Akscyn, R. M., Furuta, R. K., & Leggett, J. J. (1995). Digital libraries. *Communications of the ACM*, 38(4), 23–28.
- French, J., Fox, E. A., Maly, K., & Selman, A. L. (1995). Wide area technical report service: Technical reports online. *Communications of the ACM*, 38(4), 45.
- Ginzberg, M. J. (1980). The impact of organizational characteristics on MIS design and implementation. Paper presented at the joint meeting of Operations Research Society of America/The Institute of Management Sciences.
- Gogan, J. L. (1991). Should “personal” computers be personally allocated? *Journal of Management Information Systems*, 7(4), 91–106.
- Gould, J. D., Boies, S. J., & Lewis, C. (1991). Making usable, useful, productivity-enhancing computer applications. *Communications of the ACM*, 34(1), 74–86.
- Gould, J. D., & Lewis, C. (1985). Design for usability—key principles and what designers think. *Communications of the ACM*, 28(3), 300–311.
- Greenbaum, J., & Kyng, M. (1991). *Design at work: Cooperative design of computer systems*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Grudin, J. (1989). Why groupware applications fail: Problems in design and evaluation. *Office: Technology and People*, 4(3), 245–264.
- Information Today (1994). Acceptance of technology is changing legal research. *Information Today*, 11(8), 14.
- Kling, R. (1987). Defining the boundaries of computing across complex organizations. In R. Boland & R. Hirschheim (Eds.), *Critical issues in information systems*. New York: Wiley.
- Kling, R. (1992). Behind the terminal: The critical role of computing infrastructure in effective information systems' development and use. In W. Cotterman & J. Senn, (Eds.), *Challenges and strategies for research in systems development*. London: Wiley.
- Kling, R., & Elliott, M. (1994). Digital library design for usability. In J. Schnase, J. Leggett, R. Furuta, & T. Metcalfe (Eds.), *Proceedings of Digital Libraries '94 Conference* (pp. 146–155). College Station, TX: Texas A&M University.
- Kling, R., & Iacono, S. (1989). The institutional character of computerized information systems. *Office Technology and People*, 5(1), 7–28.
- Kling, R., & Jewett, T. (1994). The social design of worklife with computers and networks: An open natural systems perspective. In *Advances in Computers*, Vol. 39, (pp. 239–293). Orlando, FL: Academic Press.
- Kornowski, J. (1995). CD-ROM for the law office: Moving beyond the potential of books and paper. *Los Angeles Lawyer*, 17(11), 62–64.
- Leiter, R. A. (1992). Legal research yesterday, today, and tomorrow. *Legal Assistant Today*, 10(2), 150–153.
- Levy, D. M., & Marshall, C. C. (1995). Going digital: A look at assumptions underlying digital libraries. *Communications of the ACM*, 38(4), 77–84.
- Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry*. Newbury Park: Sage.
- MacLeod, D. (1996). The Internet, LEXIS and WESTLAW: A comparison of resources for the legal researcher. *Database*, 19(1), 50–57.
- Markus, M. L., & Keil, M. (1993). *If we build it, they will come: Designing information systems that users want to use* (Tech. Rep.). Claremont, CA: The Graduate School.
- Markus, M. L., & Robey, D. (1983). The organizational validity of management information systems. *Human Relations*, 36(3), 203–226.
- Mouritsen, J., & Bjorn-Anderson, N. (1991). Understanding third wave information systems. In C. Dunlop & R. Kling (Eds.), *Computerization and controversy* (pp. 308–320). Boston, MA: Academic Press.
- Mumford, E. (1983). Successful systems design. In H. J. Otway & M. Peltu (Eds.), *New office technology: Human and organization aspects* (pp. 68–85). Norwood, NJ: Ablex.
- Nielsen, J. (1993). *Usability engineering*. Boston, MA: Academic Press.
- Orlikowski, W. J. (1996). Learning from notes: Organizational issues in groupware implementation. In R. Kling (Ed.), *Computerization*

- and controversy: Value conflicts and social choices* (2nd ed.). San Diego, CA: Academic Press.
- Quinn, N., & Holland, D. (1987). Introduction. In D. Holland & N. Quinn (Eds.), *Cultural models in language and thought* (pp. 3–40). New York: Cambridge University Press.
- Sager, A. M. (1977). *An evaluation of computer assisted legal research systems for federal court applications*. Washington, DC: Federal Judicial Center.
- Schultz, R. L., & Slevin, D. P. (1973). *Implementation and organizational validity: An empirical investigation*. West Lafayette, IN: Purdue University.
- Schultz, R. L., & Slevin, D. P. (1975). A program of research on implementation. In R. L. Schultz & D. P. Slevin (Eds.), *Implementing operations research/management science*. New York: American Elsevier.
- Shimpock-Vieweg, K. (1995). Comparing apples to oranges. *Legal Assistant Today*, 13(2), 65–67.
- Smith, T. R., & Frew, J. (1995). Alexandria digital library. *Communications of the ACM*, 38(4), 61–62.
- Sutton, S. (1994). The role of attorney mental models of law in case relevance determinations: An exploratory analysis. *Journal of the American Society for Information Science*, 45(3), 186–200.
- Trice, H. H., & Beyer, J. M. (1993). *The cultures of work organizations*. Englewood Cliffs, NJ: Prentice Hall.
- Wilensky, R. (1995). UC Berkeley's digital library project. *Communications of the ACM*, 38(4), 60.
- Yin, R. K. (1984). *Case study research: Design and methods*. Thousand Oaks, CA: Sage Publications.