

A Common Information Space in Criminal Courts: Computer-Supported Cooperative Work (CSCW) Case Management Systems

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Abstract

The Los Angeles County criminal courts process about 600,000 cases per year, more than any other state court in the United States. This complex task is facilitated by large-scale, distributed case management computer-based systems. This paper presents results of a case study of computer-supported cooperative work (CSCW) systems in the criminal courts and how their implementation changes work practices. We studied the Trial Court Information System (TCIS), a case management system adopted for Los Angeles Criminal Courts, and computer-aided legal research (CALR) systems. We show how the work culture of judges and court clerks has an impact on attitudes regarding computer usage. Our results indicate that the use of TCIS to generate minute orders and reports has improved efficiency while creating a sense of deskilling for some court clerks. In addition, there is a dichotomy of computer use by judges – some completely integrate computers into work while others reject them.

1. Introduction

The Los Angeles County criminal courts process approximately 600,000 cases each year, more than any other county in the United States. Despite this massive undertaking, cases are processed and closed within the required legal guidelines. This is made possible with the help of large-scale, distributed computer-supported cooperative work (CSCW) case management systems. Such systems have become institutionalized in the work culture of the criminal courts where lawyers, judges, and court clerks use them daily to monitor courtroom activity, to record and retrieve minute orders (MO)s, and to derive statistics regarding case histories. Due to the constantly changing nature of the law, these systems are continuously evolving in context and use. When making changes, consideration must be given to both the technical

requirements and the social nature of the work and how these alterations fit with the institutional culture. Research has shown that computer-based systems that are not compatible with the overall work culture of an organization may be underused or rejected ([7],[22]).

This paper presents results of an ethnographic study of how the work culture of judges and court clerks in Los Angeles County Criminal Courts had an impact on attitudes regarding information technology adoption and use. We characterize the courtroom workgroup as consisting of judges, attorneys, and court clerks. They all contribute to and utilize information from a common information space (CIS) defined in [27] as a “central archive of organizational information with some level of ‘shared’ agreement as to the meaning of this information (locally constructed) despite the marked differences concerning the origin and context of these information items.” We contribute to the CIS research by examining data from an ethnography in which an organization is moving from a paper-based CIS to a combined paper and electronic CIS.

In this paper we focus on two types of CSCW systems used in the Los Angeles County Criminal Courts for the processing of court cases: case management systems such as the Trial Court Information System (TCIS) and computer-aided legal research (CALR) online systems such as Lexis. Both require networked connections between courthouses and subgroups such as judges and the District Attorney’s Office. Researchers have characterized the construction and maintenance of a CIS [27], defined it as a dialectical space with both open and closed views [3], and proposed a refinement of the CIS concept using seven parameters such as the degree of distribution of work and the level of required articulation work among others [5]. We further this characterization of the CIS conceptualization

by presenting a case study of how the work culture of the Los Angeles County Criminal Courts strongly influenced the content and use of a CIS.

The organizational culture [26] of the courtroom ensemble involves an inherently competitive work environment. The adversarial nature of the criminal processing system involves a unique setting for cooperative work where conflict is institutionalized in highly formalized rules regarding procedure, precedent law, and documentation. We use an organizational culture perspective ([17], [18], [26]) to characterize the work practices of the court and to analyze how the work culture influences the use of the TCIS and CALR systems.

This study is germane to other state criminal courts in the process of implementing large-scale distributed case management systems. Case management computer-based systems are used in courts for many functions such as initial case filings; completing MOs; recalling warrants; dismissing cases; adding sentences; and retrieval of case history, defendant criminal history, and attorney case information. Such systems are expensive and difficult to design, develop, and implement in state courts. Some state courts [5] are still working without automated case management and are seeking funding to revamp existing case management systems. More research is needed to identify best practices in designing and implementing computer-based case management systems. In addition, the results of this study have implications for other areas of cooperative work involving large-scale, distributed networked CSCW systems with an archived organizational memory.

In the next section, we describe the cooperative work and a CIS in the criminal court. Section 3 discusses the organizational culture perspective used in this study followed by section 4 on research methods. Section 5 describes the court systems studied: TCIS and CALRs. This is followed by section 6 which describes the court culture. Next we present the court administration information cultural analysis in section 7, the court clerks' subculture in section 8, and the judges' subculture in section 9. Finally, we discuss the results in section 10 and the study conclusions in section 11.

2. Cooperative Work in the Courts

Schmidt and Bannon's [27] definition of cooperative work will be used for purposes of this study. They characterize cooperative work as people working together who are mutually dependent in their work and thus, must cooperate in order to complete that work.

"Being mutually dependent in work means that A relies positively on the quality and timeliness of B's work and vice versa and should primarily be conceived of as a positive though by no means

necessarily harmonious, interdependence [27, p. 13]".

The work of the criminal courts is highly dependent on actors completing their work in a timely manner within the required deadlines of the law. During various phases of a case's processing, attorneys on both sides work cooperatively towards settling a case before it reaches the trial stage. The courtroom is the meeting place for these negotiations with the judge as the referee.

Cooperative work is exemplified in the criminal courts where attorneys work together under the rubric of cooperation with an adversarial component. In an effort to "win" a trial or be granted a request from a judge, attorneys elicit opposing views during pre-trial and trial proceedings, yet work cooperatively to resolve conflicts and to see that justice is accomplished. Judges stand as referees during this process enabling the resolution of conflicts and adjudicating appropriately within the confines of our system of jurisprudence.

The court arena is a unique brand of CSCW where attorneys and judges continuously contribute to a CIS through processing cases. This CIS consists of electronic documents stored online, paper-based documents archived in case files, and verbal agreements (e.g. sidebars that are off the record). Such cooperative work can be characterized as cooperative work supported by a CIS having a large and perhaps indeterminate amount of workers, incompatible strategies, conflicting goals and motives, etc [27]. In the next section we discuss the organizational culture perspective and its application to the court data.

3. Organizational Culture Perspective

An organizational cultural perspective ([17], [18], [26], [31]) is used in this study to analyze the court's organizational culture and its impact on the use and diffusion of the CSCW systems comprising the CIS. Organizational cultural perspectives ([19], [26], [31]) used to analyze information systems phenomena ([13], [25]) are rare. Important insights can be gained by examining organizational cultural influences in IT use.

For purposes of this study, organizational culture is characterized as a set of socially established structures of meaning that are accepted by its members [23] and which are socially constructed realities [4]. Culture is treated as a metaphor for organization [29], not as a dependent or independent variable. Organizational cultures, like other cultures, evolve as groups of people struggle together to make sense of and cope with their worlds [31]. It is through the interaction between ideologies and cultural forms that cultures maintain their existence. As in a societal culture, an organizational culture helps individuals and groups deal with uncertainties and ambiguities while offering some degree of order in social life. The substances of such

cultures are formed from ideologies, the implicit sets of taken-for-granted beliefs, values, and norms.

One means of examining the impact of computing on an organization is to identify its information culture - how members of an organization process data, communicate information and knowledge, determine the importance of data items, protect assembled data, and destroy existing data [28]. This culture is derived from accepted values of an organization's members and from their successful behavior with how to deal with information processing. It leads to some implicit standardization for dealing with information in an organization.

Computerized information systems can be identified as material cultural symbols [28] in the information culture. Scholz [28] identifies the concept of computerized information system cultures forming from beliefs and practices related to specific computer-based systems introduced into organizations. In this study, we characterize a *computing subculture* within the courts that emerges as computer systems are introduced to the court and its various subgroups - judges, attorneys, and court clerks. This computing subculture is comprised of shared beliefs, values and norms regarding the use of computerization in general and the use of specific computer-based systems in particular.

Most organizational culture researchers view work culture as a consensus-making system ([18],[26]). However, some researchers view organizational culture as an emergent process. Meyerson and Martin [19] suggest the use of three paradigms to study organizations as patterns of meaning, values, and behavior. Their approach to organizational change involves changes in patterns of behavior, values, and meanings. The three paradigms recommended to explain cultural change are:

- Integration: Culture is defined as that which is shared by a given organization. Emphasis here is on leadership-oriented cultural change and/or on consistency and consensus among cultural members.
- Differentiation: Culture is viewed as resulting in inconsistencies, lack of consensus and non-leader centered sources of cultural content. Emphasis is on sub-groups, both groups and individuals.
- Ambiguity: Unlike integration and differentiation, this paradigm welcomes ambiguity. Culture is viewed as having no shared values except one: the awareness of ambiguity. In this view, culture is continually changing.

For this paper, we used the Integration and Differentiation Perspectives to show the court subculture and the differing views of the judges and court clerks with respect to computerization. The Ambiguity perspective is beyond the scope of this paper. In the next section we outline the research methods used to collect and analyze the court data.

4. Research Methods

This study was conducted as a multi-case study [32]. The unit of analysis is a professional group within the same state criminal court system - judges, deputy district attorneys (DDA)s, deputy public defenders (DPD)s, and court clerks. The research site was the Los Angeles County Criminal Courts using two different court locations - Los Angeles and Long Beach. Multiple dimensions were used to explore within-group similarities coupled with intergroup differences [9]. In this paper, we present data from the study of judges and court clerks excluding the data analysis of the computerization of the offices of DDAs [12] and DPDs ([11], [13], [14]). Analysis techniques involved coding of data into matrices, conceptual diagrams and replication logic ([1], [9], [19]). Based on a long-term ethnography lasting five years [13], rich data was collected regarding the work culture of the courts in the form of one-on-one qualitative interviews, participant observation, survey data, court documents, study of court technology, volunteer efforts to train a small group of judges, and participation in court computer training classes. This data was analyzed using content analysis [1] looking for relationships between the work culture of the court in general and of each subculture, and the use of case management and legal research systems.

A total of 128 people were interviewed from 1995 through 2000 over a wide range of positions: criminal and civil judges, DDAs, DPDs, court clerks, court reporters, courtroom bailiffs, clerical court staff, IS court staff, and court administrators. Since the end of the study, key informants have been contacted a few times for information on technology progress in the courts. Most interviews lasted one to two hours. Participant observation activities were incorporated when appropriate throughout the study. In addition, countless hours of courtroom observation of the drama of the courts have been included. The study entailed interviews with the following court personnel:

- 33 judges and 5 court administrators
- 21 district attorneys and 13 DA's staff
- 21 court clerks
- 25 public defenders and 3 PD staff
- 5 TCIS and PIMS computer specialists
- 2 criminal defense attorneys

As part of related studies, surveys were administered to judges, DDAs, DPDs and clerks. Data from these surveys were not explicitly used in this study but comments and descriptive statistics informed the qualitative analysis:

- 287 judges (130 back) and 287 court clerks (63 back)
- 40 DDAs (32 back) and 26 DDAs' staff (23 back)
- 56 DPDs (38 back)

The interview protocol for judges and court clerks is listed in Appendix A. For details regarding the survey questions and results, see [12].

The next section describes TCIS and CALR systems.

5. Court Systems Studied

There are two types of computer-based systems discussed in this paper: TCIS, a court case management system and CALRs, the legal research systems used in Los Angeles County courts.

5.1 TCIS

TCIS is a large mainframe-based computer system developed using COBOL and the Information Management System (IMS), an early computer database management system. TCIS was adapted from a computer system designed initially for the Municipal Court and is now being used by both Municipal and Superior Courts in Los Angeles County. It was developed over 20 years ago and lacks many of the newer user-friendly features like a graphical user interface (GUI) standard on today's database systems. TCIS covers many functions of the Municipal and Superior courts including initial case filings, completing MOs, recalling warrants, dismissing cases, amending Complaints, recording verdicts, adding bails/bonds, adding sentences, retrieving case information, retrieving calendars for courtrooms, retrieving associated cases, adding and looking up attorney information, retrieving booking information in AJIS, retrieving charges, consolidating cases, and accessing the charge table.

Use of the system entails the memorization and referencing of hundreds of three-letter codes, which are constantly evolving as the law changes, or new statistics are requested by some government agency. Since there is no organized method of updating an online dictionary of codes, clerks are notified by memos of changes and additions to the codes. Sometimes the proper way to use specific codes for esoteric court proceedings is just not well understood and can be interpreted differently by two different clerks. These discrepancies are generally resolved by supervision.

Despite these problems, TCIS is clearly embedded in the work of many agencies. TCIS provides case tracking for the criminal courts and shares case management information with other judicial agencies such as the District Attorney's Office. The District Attorney's Office uses the Prosecutor's Information Management System (PIMS) for calendar tracking, document preparation and data exchange with TCIS. It exchanges data daily with TCIS regarding upcoming hearing dates and filing of Complaints and Informations. PIMS provides TCIS with case filings while TCIS sends PIMS dates of upcoming

court proceedings (See [12] for details on the PIMS study). These integrated interagency systems are essential to the efficient processing of cases and to the furtherance of just adjudication.

In the year 2000, access to TCIS data was provided to the District Attorney's Office, the Public Defender's Office and the Sheriff's Department. By the year 2004, access to TCIS was made available to the general public via a web service on the Los Angeles County Superior Criminal Court website (<http://www.lasuperiorcourt.org/Criminal>).

5.2 Computer-Assisted Legal Research Systems

The Los Angeles County Court system has switched to electronic legal research to save costs and improve the quality of work. The main online research system used by judges in Los Angeles County is Lexis. This service provides access to California and Federal case law, Shepard's citations, Witkin treatises, newspaper and corporate references among others. In some cases such as Shepard's citations, CALRs are replacing books.

6. Court Culture

The courtroom in our adversarial system is a unique setting where judges, prosecutors, and defense attorneys are pitted against each other with discordant goals, yet all work cooperatively under the due process model to see that justice is done. Prosecutors are seeking justice for victims of crimes and striving to make society safer by placing defendants in jail for the appropriate amount of time. Defense attorneys' main interests are protecting their clients from undeserved convictions and lengthy sentences. Judges are the arbiters of justice acting as the referee of all courtroom activity. These three groups work in concert to see that justice is done. They have been vested by our government with power to drastically alter the lives of people accused of crimes. Courtroom proceedings must follow strict laws to maintain fairness for the defendants. However, there are areas along the path of justice laden with discretionary powers. Discretion is essential to our criminal justice system due to limited resources and seeing that justice is accomplished [6]. Defendants have the right to an appeal if procedural rules have been violated or if one can prove that the law is unconstitutional.

Researchers have labeled this courtroom ensemble as the courtroom elite [21], as a workgroup [6], and as part of an organization-wide system [6]. The courtroom elite phrase refers to the three main agents of the courtroom - the prosecutor, defense attorney, and judge - and how their monopoly of power and discretionary capacity to operate anyway they wish within the

confines of the law presents a unique way to look at the justice system.

The results of the study are presented in three sections based on various levels of analysis: Court Administration culture, Court Clerks subculture and Judges subculture. The cultures are characterized in Tables 1-6 of this paper using a matrix approach [18] where content themes are shown in column one and cultural manifestations of those themes are shown in the other boxes. Content themes refer to the beliefs, values, and norms of a culture or subculture that are manifested in a culture's formal and informal work practices, artifacts, symbols, etc. Once computerization is in place, computing subcultures began to form with diverse beliefs regarding the importance of computing and the willingness of employees to use it on a daily basis. We use the differentiation perspective ([17], [18]) to show the diverse attitudes among towards computerization.

7. Court Administration - Information Culture Analysis

Los Angeles County has the largest state court system in the United States. There are approximately 350 judicial officers assigned to criminal and civil courts. In 1998, the courts were unified so that misdemeanor and felony judges are no longer working under separate administrations. Theoretically, a judge who normally handles misdemeanor cases could be assigned felony cases as well. At the heart of the processing of these cases is the case file. A case file is never totally destroyed. After so many years, it is recorded on microfiche and then destroyed.

Each county in the state of California has an Administrative Officer who oversees the assignments of judges, assignment of cases, record keeping, personnel, management of computing infrastructure, and finances. In the late 90's, the Los Angeles County court administrator believed that case management computer-based systems would improve the efficiency and quality of work of the courtroom. Previous efforts to develop a case management system with an outside consulting firm had resulted in a failure of millions of dollars for the court. Thus, the decision was made to modify the in-house legacy Municipal Court system so that the Superior Courts could benefit from automated case management. Consequently, the implementation of TCIS occurred with the expectation of court clerks to readily accept this innovation.

Table 1 shows the information culture prior to the TCIS implementation. The Superior Court used a PC program called CTCM developed in-house by a judge. This program required all case information to be entered into a main database system each day, such as each courtroom's case dispositions, number of outstanding cases, and future scheduled court appearance dates. This

was known as the "sneaker net" because a courier would "run" to each courtroom at the end of the day and collect courtroom statistics on a floppy drive, copy that data into a database, and generate reports about courtroom dockets.

Table 1 – Court Administration Information Culture (Pre-TCIS)

Content themes	Formal Practices	Informal Practices (Norms)	Artifacts (paper and electronic docs)
Need for courtroom statistics for case throughput efficiency	Manual MO reports from checklists	Daily case information entered on a floppy for staff to use for CTCM data entry	Case management data "sneaker" net reports; MOs, probation reports, etc.
Obligation to attorneys, judges, and general public to provide case information	Attorneys, outside people are permitted to request copies of case file contents	General public contact court clerks by phone	Archived and Active Case File Contents: MOs, motions, probation reports, memos, notes, etc.

Table 2 shows the court administration's information culture after TCIS. The implementation of TCIS resulted in several sets of reports:

- 1) those produced from a menu in TCIS,
- 2) those produced offline by downloading statistical data from TCIS and analyzing the data,
- 3) those requested by governmental agencies (produced offline from TCIS data)..

The Supervising Judge at the Los Angeles courthouse uses the second type of report on attorney caseloads to help reduce the number of outstanding cases. For example, if a DPD is requesting a one-month delay, the judge can look up how many active trials the DPD is working on, and request that he or she give the case to someone else rather than continuing it. This technique was initiated as part of a Trial Reduction Program that was designed to decrease the number of outstanding trials older than 120 days (a typical trial should happen within 60 days of an arrest). At one point there were 500 outstanding cases now reduced to about 50. However, the use of TCIS data for case management by the Supervising Judge has influenced the work practices

of attorneys in that they are more accountable for their outstanding cases. Prior to TCIS, the attorneys' caseloads were transparent to a Supervising Judge. Now the courtroom culture has changed such that attorneys are more accountable for maintaining reasonable caseloads (i.e. giving a case to a colleague).

Table 2 – Court Administration Information Culture (Post-TCIS)

Content Themes	Formal Practices	Informal Practices	Artifacts (Paper and Electronic)
Case management necessary to improve efficiency	TCIS reports used for calendar court for better case throughput	Attorneys more accountable for case delays	“Sneaker” network replaced by TCIS reports
Expanding case data access to help general public	Computer access to TCIS for attorneys, judges, and general public (web)	TCIS access for judges through clerks as mediators	Cases/Defendant histories online reports

8. Court Clerks Subculture

Court clerks believe that their role as manager of the court and recorder of daily MOs contributes to helping to promote justice. Table 3 shows the dimensions of the court clerks' information culture prior to the TCIS implementation. During this time period, court clerks were responsible for the creation of MOs from checklists with additional comments added when necessary. They were responsible for saving case information every day on a floppy drive formatted for data entry into CTCM via the “sneaker net”. As court manager, court clerks also answered phone calls from attorneys and individuals interested in case information. Often this would entail tracing down the whereabouts of a case file to retrieve the requested data. Court clerks took pride in the creation of MOs and in generally assisting the judge.

Table 4 shows the court clerks' computing subculture after TCIS was installed in every criminal courtroom. Court clerks are responsible for entering MOs into TCIS with prespecified codes representing various crimes and dispositions. The creative task of writing a MO with accompanying text has been replaced with an automated process of creating MO text from these predetermined

codes. Some clerks had trouble with this change and felt that their jobs had been deskilled as in this excerpt from a survey comment:

“In using the computer I feel the clerk is no longer memorizing a body of knowledge but instead is just translating knowledge into what “buttons” to press so it reduces the professionalism of the job down to being a data entry clerk. I cannot be as thorough in my MOs as I am limited to what TCIS lets me do. The positive thing about TCIS is making it so much easier to check status of cases and find information...It has made many aspects of job easier but in emphasizing computer aspect of job makes clerk less competent as when we had to have all this knowledge in our computer, that is, our brain.”

Other comments from the surveys showed that some clerks were very frustrated with the lack of a user-friendly interface and the problems with losing data if a MO is entered incorrectly or the system crashes in the middle of data entry.

Another concern expressed during court clerk interviews and in the survey was that using TCIS limited their ability to “float” as a clerk to other types of courts:

“There are so many programs being used for different areas of litigation. Previous to computerization in the courtroom, a floating clerk needed only to “grab” a MO and record the order of the court. Now, the various areas of litigation, each with their own system, makes the work more difficult for a floating clerk.”

Even though most clerks expressed disdain for aspects of TCIS, they all agreed that the use of a case management system had improved productivity with regard to researching case status and to completing handwritten MOs.

9. Superior Court Judges Subculture

Most of the 23 judges interviewed for this study viewed technology as a wonderful agent towards reducing the backlog of cases and towards ensuring that justice is done in the fairest way possible. Even those who did not necessarily personally use a computer very often believed in their importance to the criminal justice system. They are very dedicated people and are committed to seeing that all defendants are granted a fair and speedy trial as entitled by our constitution. In the survey results, the majority agreed that computerization had increased productivity.

Table 3 – Court Clerks’ Information Culture (Pre-TCIS)

Content themes	Formal Practices	Informal Practices (Norms)	Artifacts (CIS)
CC is courtroom manager	Ensuring accuracy of MO creation, maintain case file contents for court	Phone calls to trace case history; Answer calls from DAs/PDs/General public re: case status	Paper-based case file;
Pride in preparing MOs to assist in justice system	Type – written MO; MO checklist and text; record MO in Registry	Data entry into CTCM program for “sneaker net” court statistics	Paper-based MO; Computer-based courtroom stats. reports

Table 4 – Court Clerks’ Computing Culture (Post-TCIS) - Differentiation

Content themes	Formal Practices	Informal Practices (Norms)	Artifacts (CIS)
CC as courtroom manager has expanded role; job more responsibility	TCIS MO entry from codes/ automated text	Fewer phone calls to trace case history; electronic informal messages in MO to other clerks; clerks informed of changes to TCIS codes via email	More automated MO reports due to several agencies; TCIS Case history to judges/ attorneys/ general public
Some CC feel deskilled due to TCIS; TCIS makes job harder		TCIS breakdowns cause MO notes to be lost – need to reenter text	Email used by management to inform CCs of new TCIS codes, etc.

Table 5 shows the information culture content themes and cultural manifestations of the pre-TCIS culture. The judges’ belief in their role as court referee and final arbiter of the law promote the use of legal research to

ensure that their courtroom decisions are based on the most recent and appropriate law. Prior to computerization of the courts, each judge had his or her own set of legal research books. Once the court administration added computer networking to the judges’ chambers, each judge was supplied with a PC in his/her chamber including a connection to a legal research CALR system. Legal research books cost considerably more to purchase than the library books. Our survey indicated that 93 out of 113 judges used CALR systems and 57 agreed that it takes less time to do a search using CALR systems.

There was a dichotomy of computer usage levels with judges – either they were totally integrating computing into their everyday work practices such as taking notes from the bench and typing important documents using a word processor, or they had little use for a PC other than email to other judges. Table 6 shows the judges’ subculture using the differentiation approach. Most judges agree that computerization increases productivity. In fact, of the 93 judges who responded in our survey with having used CALR systems, 57 of those agreed that it takes less time to do a search using CALR systems versus books. Of those 57, 40 agreed that their frequency and amount of legal research had increased when using CALRs.

Still there was a contingent of judges who were somewhat anti-computerization in their attitudes. One judge expressed displeasure with TCIS in a survey comment:

“TCIS has made life difficult. MOs are now very difficult to read – It’s not logical, user friendly. Everything takes more time rather than less. The program won’t allow you to make necessary changes without spending hours on the help line for special instructions.”

During an interview, a judge described a problem with the logistics of TCIS data entry resulting in a defendant being accidentally released from jail:

“Sometimes a defendant doesn’t appear for bench warrants. Bail is forfeited, the system [TCIS] recalls the warrant. If the clerk doesn’t answer Yes/NO, then the system automatically recalls the warrant. Defendant’s case can be dismissed in the Superior Court and refiled again that day in the Municipal court. But if it is not input back into the computer, the guy goes out the door..NOW if the DA refiles the case, he tells the bailiff, so he won’t be released.”

One judge was so interested in case management that he set up his own system for tracking pending, trials in progress, and post-trial cases in his courtroom:

“Cases in three categories: pending, trials in progress, and post-trial. I create a hard copy once a month. I can put them in certain order. Can encourage attorneys who are slowing down to speed

up and to keep going...For death penalty cases, can need a year to prepare.”

Table 5 Judges’ Information Culture (Pre-TCIS and Pre-Networking)

Content Themes	Formal Practices	Informal Practices	Artifacts
Belief in role as court referee and arbiter of law	Paper-based research; manual note taking at bench	Phone calls for communication with other judges/attorneys as needed	Paper-based Decisions in case files
Keep courtroom cases moving as quickly as possible	Court provides reports of case throughput in courtrooms	Some judges have own records of cases on PC	CTCM – reports of caseloads per courtroom

In some cases, judges do not have the time to devote to learning to use a computer:

“I’m embarrassed to say that I haven’t advanced much since our conversation a couple of years ago. I have gone to daylong classes by the county. ..I spend so much time on the bench and off the bench, I review cases for the next day. I’m not proud that I’m not competent...Retiring in a couple of years from the bench. Maybe it’s subconscious, I don’t need to learn how to use a computer.”

Others want to continue using books instead of computer programs for legal research:

“Right now just email...I’m not a true believer. My secretary can type faster than I can. From everyone who is adept at computers, I hear all the time that it crashed or it froze so why should I bother with using it. County wants to take our books away. I like to use pages – do underlining. Maybe I’m bizarre but I like a book...We don’t have Shepard’s anymore, now in the computers and I don’t want to do it.”

Despite these anti-computerization attitudes, there are attorneys who laud the use of the computer to resolve courtroom disputes. One of the main ways that computers have altered work practices for judges is the availability of CALR systems for legal research, especially for those who use the systems in real-time during court proceedings. For example, this is a statement made by a civil judge:

“Yes, they[computers] have [improved production]. We are relying on an accurate record as possible. More efficient than before...During a trial there was a question of jury misconduct, can the jury use a magnifying glass to look at some document. [at first, someone declared a mistrial due to jury misconduct,

then the judge used Lexis]. Using Lexus, quickly got the research that said you could use the magnifying glass from case law. You know you are right and haven’t delayed the jury deliberation...This is a classic example of how it could take 4 days at one time to search for such a case (Civil Judge). “

Table 6 – Judges’ Computing Subculture (Post-TCIS) Differentiation

Content Themes	Formal Practices	Informal Practices	Artifacts
Belief in computers as improving efficiency and quality of work	Increase in legal research online, notes at bench; Use of TCIS reports	Laptop from bench; Can’t do work w/o computer	CALR; TCIS dockets widely available
Belief that computers are not necessary to perform job	Use clerk as TCIS mediator and secretary for papers	Keep track of cases/attorneys’ loads in own court;	Still depending on paper-based books, etc.

In general, there was a wide disparity between the computer users and non-computer users. When asked the following question, “What three things would change if you could not use a computer at work?”, the judges whose work was totally integrated with IT were appalled at this question. Even though the court clerk serves as a mediator between TCIS and the judges’ desired case information, several judges rely heavily on the use of a PC for things such as taking notes at the bench, writing decisions and memos, conducting legal research, etc.

10. Discussion

We presented results from a large-scale study of court technology. We have shown how critical TCIS is to the work of the courts. From the moment the court clerk enters a relevant code to represent a MO, several criminal justice agencies benefit from her actions. First, TCIS provides case tracking for the criminal courts and shares case management data with other judicial agencies such as the District Attorney’s Office, the Sheriff’s office, and the web master who posts this for the general public on <http://www.lasuperiorcourt.org/Criminal/>. The exchange of TCIS data over the network eliminates data reentry by court clerks. Second, the ability of the Sheriff’s department to double-check on case dispositions in TCIS prior to an inmate’s release

prevents unauthorized releases or unnecessary retentions.

As the CIS of the criminal courts expands and grows with computerization, a worker's computer and its software components become cultural artifacts. Computing subcultures evolve when computer systems become an accepted "way to do things around here" (Schotz, 1990).

In [3] Bannon and Bodker discuss the "frontstage" and "backstage" nature of a CIS. Frontstage views pertain to information that is public and is shared with other people, while backstage views are private and restricted to particular sets of people. The Los Angeles Criminal Courts have devised a "frontstage" view of TCIS data with access to its case information via a website, while keeping a "backstage" view of other data.

Another way of viewing TCIS is as a boundary object in the CIS of court information processing. Star [30] developed the concept of boundary objects as shared informational objects that span the needs of various groups for their own purposes. For example, the calendar court judges in Los Angeles use the TCIS reports to monitor caseloads while the court clerks use it to record and print MOs and court schedules (or "dockets"). As such, TCIS is a particularly interesting boundary object as its users continue to grow through the last five years. Now the general public has access to TCIS for defendant history and case status for a nominal fee.

Future work includes the longitudinal study of TCIS and how it has impacted the workgroups of the court. Possible research questions include: 1) Has the passage of time changed the use or extent of case management systems use in Los Angeles County courts? 2) Has the role of TCIS as a boundary object enabled it to become a lasting fixture in the court's information processing domain or will it be replaced eventually by a more "modern" version of a case management system?

11. Conclusion

In summary, our main findings include:

- The availability of TCIS case data has increased a sense of accountability among attorneys regarding case scheduling in a calendar court.
- There is a dichotomy of computer use among judges. For some, the cultural image of their role as arbiter of law does not include the use of a computer at the bench or for legal research – they are satisfied with a yellow pad and books for research. For others, a cultural shift has occurred in their images, having integrated technology completely into their courtroom, taking notes at the bench, using electronic research mediums, and creatively improving personal case management with computerization.
- The use of TCIS to automatically generate and record MOs has improved efficiency for court clerks, but

some feel a sense of deskilling in the automated "writing" of MOs.

- The use of case management systems by judges including computer-aided legal research (CALR) systems improves courtroom efficiency and, in some cases, the quality of work.
- Judges who have created a home/work ecology regarding computer usage and/or those who had a technical degree or job prior to becoming a judge are also frequent users of computer-based systems in the courts.

We have shown how the work culture of the criminal courts is closely tied to the use and resistance of computer-based systems implementations. Those court administrators who plan to invest millions of dollars on the development of new case management software systems should consider the overall court organizational culture and the differences and unique aspects of each working group's culture when attempting to design and implement a new system.

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Appendix A

Judges Interview Questions

- 1) Personal Information - education, length of time on job, training for job
- 2) Level of Computerization - extent of usage (daily, infrequent, never)
- 3) Background experience with computerization - former job, home computing, training
- 4) Attitude towards use of computers to aid in work
- 5) General work habits related to cooperative work/computerization - autonomous, work with other judges on legal issues?
- 6) Work relationship with court clerk and secretary re: computer usage
- 7) Court Calendaring - preference for master or direct?
- 8) Computer Usage - systems in use, laptop at bench?, use computer to work at home?
- 9) Reorganization of court from municipal and superior to unified - effect on general work habits and on use of TCIS reports?
- 10) Three things that would change without a computer.

Court Clerks Interview Questions

- 1) Personal Information - education, length of time on job, training for job
- 2) Level of Computerization - extent of usage (daily, infrequent, never)
- 3) Background experience with computerization - former job, home computing, training
- 4) Attitude towards use of computers to aid in work
- 5) General work habits related to cooperative work/computerization
- 6) Three things that would change without a computer