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Factors Contributing to the Limited Use of Information Technology in State Courtrooms

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Walden University
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Abstract

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Concetta Tranea Manker

MS, American InterContinental University, 2005

BBA, Savannah State University, 2003

Dissertation Submitted in Fulfillment

of the Requirements for the Degree of

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Abstract

Few state courtrooms in the United States have integrated information technology (IT) in court trials. Despite jurors' beliefs that using courtroom technology improves their abilities to serve as jurors, the attitudes and experiences among attorneys and judges toward the utility of IT continue to pose barriers. The purpose of this phenomenological study was to explore and describe the experiences of attorneys and judges in the State of Virginia with regard limited use of IT in state courtrooms. The conceptual framework included Davis, Bagozzi, and Warshaw's (1989) technology acceptance model; Rogers's (2003) diffusion of innovation theory; and Venkatesh, Morris, Davis, and Davis's (2003) unified theory of acceptance. A snowball sample of 22 attorneys and judges were interviewed using in-depth, semistructured questions. Data were analyzed using open coding techniques to identify themes and patterns with findings supporting the need for improved and expanded courtroom technology. Finding showed that attorneys and judges believed courtroom technology could be useful; however, the lack of training and the cost to implement technology limited their use of technology in courtrooms. Implications for positive social change include increasing the adoption rate of courtroom technology to support courtroom processes and empowering courts to improve the quality of justice through technology in an efficient and effective manner, thereby benefiting everyone in the judicial system and the public.

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Dedication

This work is dedicated to my husband, Louis John Manker, for his motivation and support of my educational goals. I also dedicate this work to our beloved son, Landon Miles Manker, for all the precious moments away from him that I used to complete this dissertation. I hope that this accomplishment will inspire him to pursue his doctoral degree in the future. Finally, I dedicate this work to my parents, Calvin James Gray, Sr. and Anita Laverne Gray, for all the encouragement, confidence, and support that they've provided me. To all of you, I say thank you and I love you.

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Chapter 1: Introduction to the Study

Information technology (IT) is "the study, design, development, implementation, support or management of computer based information systems, particularly software application and computer hardware" (Information Technology Association of America, 2014, para. 1). The increased speed, information-processing capabilities, and connectivity of computers and Internet technology can substantially increase the efficiency of business processes as well as communication and collaboration among people (O'Brien & Marakas, 2010). Thus, the abilities of IT to improve organizational efficiency have prompted growing interest in the integration of technology into U.S. courtrooms. Gruen (2003) defined *courtroom technology* as "any system or method that uses technology in the form of electronic equipment to provide a clear benefit to the judicial process" (p. 345). For purposes of this study, *IT* also refers to courtroom technology used to expedite court proceedings.

The legal profession is traditionally among the most conservative U.S. professions in terms of technology adoption; however, it is now becoming a major beneficiary of IT (Dixon, 2012). Although members of the legal profession are expected to use IT to address issues arising from IT adoption and use, they often lack the technological expertise to do so (Lederer, 2010). Stakeholder interest in high-technology courtrooms has grown, but litigators and judges whose skills developed without using innovative courtroom technologies are often reticent to embrace new technologies (Dixon, 2012). Similarly, technologists who design and install courtroom technologies often have little understanding of the U.S. legal system (Reiling, 2010). Because of its potential to

improve case efficiency and the communication of evidence, the extensive adoption, acceptance, and use of IT in courtrooms can have profound implications for the parallel disciplines of law and IT. Consequently, research that explores the intersection of law and IT is needed, rather than that which investigates these two traditionally independent disciplines in isolation.

I explored and described the experiences of attorneys and judges in the State of Virginia related to factors that contribute to the limited use of IT in state courtrooms. The specific problem I explored in this study was two-fold: (a) IT use in state courts lags behind that of federal courts, and (b) little information on factors that contribute to this phenomenon was available (Quigley, 2010; Wiggin, 2006). Despite findings that jurors believe the overall use of courtroom technology improves their abilities to serve as jurors, few U.S. courtrooms have embraced the use of IT during judiciary trials (Dixon, 2009; Lederer, 2010; National Center for State Courts, 2011). “Courts are generally far behind many other professions in utilizing technology to improve operations,” stated Judge (Ret.) Patterson (Schiffner, 2012, p. 4). The potential for improvements in trial efficiency from courtroom technology may add value to the integration of such innovations. This chapter includes information on the background of the study, the problem and purpose statements, research questions, conceptual framework, the nature of the study, definition of terms, assumptions, scope and delimitations, limitations, significance of the study, and a summary.

Background of Study

The use of courtroom technology in the United States has improved since the early 2000s; however, attorneys and judges have not overwhelmingly embraced technology that would expedite trials. Contini and Cordella (2015) noted that, "Very little interest and attention has been given in literature to the changes that have occurred in association with the digitization of the judicial systems despite their relevance for the operation of almost every other activity of the State" (p. 124). Although not all U.S. attorneys are early adopters of courtroom technologies, many embrace technology that assists with office functions (Kantzavelos, 2013). Newer technologies such as iPads have gained the attention of the legal field (Nelson & Simek 2013). Sleek tablet computers can be used to present evidence during trials. Despite the assistance that such devices can provide, many litigators are uncomfortable presenting electronic evidence themselves, and hire experts to prepare and present exhibits instead (Nelson & Simek, 2013). Farrell, Tripping, Farrell, and Woordard (2013) believe that there is much enthusiasm for adopting the iPad for trial presentation; however, overcoming traditional barriers such as "(1) low aptitude toward using unfamiliar technology in an unfamiliar environment" and (2) "the lack of proper IT infrastructure in courtrooms" (Farrell, Mouzakis, & von Baggo, 2011, p. 108) is needed for successful adoption of courtroom technology.

Tablet computers are not commonly used in U.S. courtrooms as a component of courtroom technology, but they are used frequently by attorneys in their general practices to conduct business with clients while they are away from the office. The American Bar Association's (2013) "Legal Technology Survey Report" noted that 91% of attorneys

reported using a smartphone for talking, emailing, and other law-related tasks while away from their primary workplaces. However, data does not indicate the number of litigators that use the devices for trial delivery. Previous researchers have not tracked the limited use of courtroom technology with time. In the Chapter 2 literature review, I provide a detailed examination and examples of the types of technology currently used in U.S. courtrooms by attorneys, judges, court administrators, and jurors.

Compared to the traditional manual system, which uses massive amounts of paper and hardcopies of files, courtroom technology can significantly improve service delivery and enhance the capacity of courts to efficiently handle cases (Wiggins, 2006). Worldwide, various forms of IT are gradually being integrated into courtrooms to expedite court processes and improve efficiencies and the dispensation of justice (Reiling, 2010). Courtroom technology

> . . . impacts the way in which the law is interpreted and enforced in various ways: standardizing processes and procedures, guiding the collection of data and information, enhancing the access to justice, contributing to the identification of relevant case-law and jurisprudence, and guiding judicial officers working practices and writings in many ways. (Contini & Cordella, 2015, p. 124)

As courtroom technology become universal, (a) more court proceeding will be routinely recorded, (b) courts will move data to the cloud, (c) online resolution of disputes, and (d) e-filing and e-discovery are likely to become more common (Nelson & Simek, 2013).

Technologies used in court include four main categories (Velicogna, 2007). The first category consists of fundamental computer technologies and software applications,

such as desktops, laptops or mini-laptop computers, word processing programs, spreadsheet applications, and external and internal email systems for judicial and court staffs. The second category consists of software applications used to support court registry and related administrative functions. This category includes technologies such as automated registries, case management systems (CMSs), e-filing systems, and queue management systems (QMSs). Court administrative personnel responsible for processing cases can use such technologies before or after judicial proceedings. The third category includes technology designed to support the activities of officers or judicial personnel, such as judges and magistrates. Technologies in this category include law and case law indexes, electronic libraries, and sentencing support systems. The fourth category consists of technologies used within the courtroom during actual judicial proceedings, such as court recording and transcription (CRT) systems and audio videoconference (AVC) systems.

According to Velicogna (2007), a number of supporting actions and measures are recom`mended in conjunction with technology dissemination and use in court systems. Most of these supporting actions revolve around human resource development and adjustments of organizational culture and attitudes. Supportive actions that affect human resource development and capacity building include adequate training of court administrative and judicial staff on efficient and proper use of these technologies. The scope of such training should also cover any relevant, precautionary practices and socio-legal issues associated with the use of such technologies (Reiling, 2010).

Judicial staff should be given sufficient opportunities to practice using courtroom technologies, especially during trainings and the early stages of implementation (Reiling, 2010). Practice can help judicial staff improve their efficiency, familiarity, and comfort levels with different devices and applications. According to Reiling, these actions promote technological competence among the staff of judicial systems. Supportive actions and measures associated with organization culture include cultivating new working practices, fostering change acceptance, promoting a culture of technology adoption, acceptance in the legal system, and promoting a spirit of strategic collaboration with technologists to ensure that the hardware and software used are continually updated (Quigley, 2010; Wiggin, 2006). This opportunity would also facilitate the installation of more advanced technological innovations as staff competence increases or as the need for such advancement arises (Quigley, 2010; Wiggin, 2006).

Using technologies in courts and throughout the legal system has been associated with many benefits. First, digital technologies have a strong potential to expedite, streamline, and improve the efficiency and convenience of court procedures that are tedious under manual systems (Workman, 2007). Workman reported that CMSs that employ specialized software to store data improve the efficiency of data retrieval through comprehensive search functions. Under a manual filing system, an individual must sort through stacks of files to find required information, which is a long and tiresome process. However, software can allow users to search for and retrieve information in a matter of seconds.

Courtroom technologies also have the potential to reduce case backlogs by allowing cases to be processed faster, thus creating more time for the processing, determination, and disposition of a larger volume of cases (Dixon, 2012; Wiggins, Dunn, & Cort, 2003). Wiggins et al. argued that the ability to simultaneously view information or exchange digital documents improves the speed of discovery procedures and the adjudication of matters filed in court. Digitally stored information also occupies significantly less space and volume than traditional paper files. Further, once data is stored in digital form, reproduction or dissemination is easy.

Adopting technology presents several challenges to U.S. justice systems, particularly in courts. After critical review of the technology acceptance model (TAM), researchers have argued that most users do not readily accept new technology due to negative perceptions of its value or usability (Panayiotis, Dimitrovski, Lazuras, & Bath, 2012). Misperceptions of the perceived value or usability of courtroom technology among court officials, especially aged, top judicial officials, may hinder adopting new courtroom technologies (Morris & Venkatesh, 2000). Closely related to issues of acceptance are concerns regarding whether courts are adequately equipped for adopting technologies (e-readiness) and whether court practitioners, court staff, and litigants are prepared to use them (Venkatesh, Thong, & Xu, 2012). These social issues relate to issues of fairness in the administration of justice (Venkatesh et al., 2012).

Further, IT adoption in courtroom settings has security, legal, and social implications. Digital data are vulnerable to unauthorized access and computer-related crimes, such as data mining, hacking, and unauthorized dissemination (Kleve, De

Mulder, & van Noortwijk, 2011; Rahman, 2012). These vulnerabilities can impinge on confidentiality agreements and privacy rights (Kleve et al., 2011; Rahman, 2013). As Wiggins (2006) reported, emerging technologies in the legal system also raise evidential concerns, such as the admissibility of videotaped confessions and videoconferencing in criminal proceedings. Further, the possibility of electronic data manipulation and the traditional requirements of signatures in some documents increase risks related to the authentication and integrity of data (Mankoff, Gillian, & Kasnitz, 2010).

Few researchers have examined factors that contribute to the limited use of IT in state courtrooms. However, the integration of courtroom technology has many potential benefits to the justice system. To improve its acceptance and integration, it is important to understand factors that may impede using such technology. This phenomenological research study may address this gap by exploring and describing the experiences of attorneys and judges in the State of Virginia.

Statement of the Problem

Few U.S. courtrooms have embraced IT in state judiciary trials (Dixon, 2012; Lederer, 2010; Papandrea, 2013). Low levels of user acceptance created longstanding barriers to successfully adopting and implementing court technology (Davis, 1993; Farahat, 2012). For example, Davis (1993) reported that early adopters of courtroom technology embraced it as a tool to explain complex concepts and improve jury engagement. In contrast, late majority adopters of courtroom technology are often skeptical about courtroom technology due to usability misperceptions. Papandrea (2013) discussed the Supreme Court's reluctance to embrace cameras and modern

communication technologies, explaining that such resistance is often based on the justices' lack of understanding and hostility toward courtroom technologies. This resistance to technology can potentially prevent state courtrooms from accessing the advantages of courtroom technology including (a) a potential decrease in trial time, (b) streamlined litigation, (c) increased juror understanding and comprehension, and (d) reduced overall cost (Contini & Cordella, 2015).

The general problem I addressed in this study was the lack of information about the factors that contribute to the limited use of IT in U.S. courtrooms (Dixon, 20012; Lederer, 2010; Papandrea, 2013). The specific problem was the lack of available information regarding factors that contribute to the limited use of IT in state courtrooms, according to the National Center for State Courts (2011). Given the significance of the state courtroom technology problem, I conducted a phenomenological research study to explore and describe the experiences of attorneys and judges in the State of Virginia regarding these factors.

Purpose of the Study

The purpose of this qualitative phenomenological research study was to explore and describe the experiences of attorneys and judges in the State of Virginia with regard to some of the factors that contribute to the limited use of IT in state courtrooms. Adults today use digital communication in their everyday lives (Michael, 2013); are familiar with video teleconferencing through using software applications, such as Skype and Face Time; and express thoughts through social media sites using technology such as smartphones and tablet computers. Therefore, because many adults are IT literate, they

carry this knowledge with them when they serve as jurors and are comfortable with technology. A more effective method for communicating with jurors is one that embraces these newer modes of technological communication (Michael, 2013). Because implementing IT can drive organizational changes, it is important to explore its functionalities and benefits in courtrooms.

Research Question

The following research question guided this study: What are the lived experiences of attorneys and judges in the State of Virginia with regard to some of the factors that contribute to the limited use of IT in state courtrooms? Appendix C contains a list of interview questions derived from this research question.

Conceptual Framework

The conceptual framework of this phenomenological research study used Davis, Bagozzi, and Warshaw's (1989) TAM; Rogers's (2003) diffusion of innovation (DOI) theory; and Venkatesh, Morris, Davis, and Davis's (2003) unified theory of acceptance and use of technology (UTAUT) model. The TAM has been applied in IT and communications to predict how organizations accept and adopt technology (Davis, 1989). The increasing use of technology in society has prompted the integration of technology in the judicial system (Rieling, 2010). Traditionally, court personnel perceived this system as too rigid to change; however, integration of technology has become more important in judicial reforms due to associated cost benefits and increased efficiency.

Rogers's (2003) DOI theory described patterns in the adoption of ideas and technology, and how such patterns spread throughout cultures. Rogers (2003) defined

diffusion as "the process by which (a) innovation (b) is communicated through certain channels (c) over time (d) among the member of a social system" (p. 5). *Innovation* is an idea, practice, or object perceived as new by an individual or other unit of adoption. Innovation development refers to the activities that prompt decision-makers of the given organization (e.g., executives and court justices) to consider adopting the innovation (Lawrence, 2010). These activities may be based on encouragement from other organizational stakeholders, such as judges and managers (Lawrence, 2010). Likewise, Simspon (2013) noted that "You need a network of people from diverse backgrounds where you can bounce ideas around and see the future of legal services or legal technology in new ways, such as with legal and design; legal and outsourcing; legal and big data; legal and six sigma" (p. 1). Encouragement may also come from responses to changes in the market, perceived performance gaps, or preference. Decision-makers base technology adoption choices on analysis and beliefs. After decision-makers decide to adopt a technological innovation, it is introduced into an organization. The DOI theory includes the innovation-decision process, which consists of the following five stages: (a) knowledge, (b) persuasion, (c) decision, (d) implementation, and (e) confirmation (Rogers, 2003). Chapter 2 includes a discussion of these stages in detail.

The UTAUT model provides a useful tool for managers who need to assess the likelihood of success for new technology introductions. The model can also help managers understand drivers of acceptance in order to proactively design interventions targeted at populations of users that may be less inclined to adopt and use new systems (Venkatesh, Morris, Davis, & Davis, 2003). The UTAUT model to integrate elements

across eight models: (a) theory of reasoned action; (b) TAM; (c) motivational model; (d) theory of planned behavior; (e) a model combining the TAM and the theory of planned behavior; (f) model of PC utilization; (g) DOI theory; and (h) social cognitive theory (Venkatesh et al., 2003). Over a 6-month period, researchers collected data from four organizations with three points of measurement. Analysis revealed that the eight models explained between 17% and 53% of the variance in intention to use IT. The researchers tested the UTAUT model and found that it outperformed the eight individual models (69% variance). Upon further testing of the model within two other organizations, the results were similar (70% variance).

Nature of Study

The purpose of this qualitative phenomenological research study was to explore and describe the experiences of attorneys and judges in the State of Virginia regarding some factors that contribute to the limited use of IT in state courtrooms. I selected a phenomenological research design because I wanted to study individuals' experiences to obtain rich description reactions to events or phenomena. In turn, a phenomenology approach may provide researchers with multiple facets of a phenomenon for analysis (Patton, 2014). In addition, I selected this research design to reveal the meanings that underpinned participant perceptions toward courtroom technology (Tracy, 2013).

A pilot study with one judge and one attorney tested the interview protocol. I collected data through in-depth, face-to-face and telephone semistructured interviews with 11 judges and 11 attorneys in the State of Virginia until data saturation occurred. I interviewed participants living within a few miles of me face-to-face, while remote

participants were interviewed by telephone. I used snowball sampling to recruit 11 judges and 11 attorneys for the study. Potential participants known to meet the selection criteria of being male or female judges or attorneys from the State of Virginia were initially contacted by phone, email, and through face-to-face conversations. Prospects were given or sent invitations to participate in the study and asked to recommend other judges or attorneys who met selection criteria and who may have been willing to take part in the study (see Appendix A). A snowball sampling technique was used until the required number of 22 participants was reached or until data saturation occurred. I transcribed each of the interviews, coded, and analyzed transcription data using NVivo software to help uncover themes and patterns. The study was conducted in accordance with the parameters established by Walden University's Institutional Review Board (IRB) to ensure the ethical protection of research participants.

Definition of Terms

Active rejection: "Considering and trying the innovation out on a limited basis before deciding not to adopt it" (Rogers, 2003, p. 178).

Adoption: "Making use of an innovation that provides the best course of action" (Rogers, 2003, p. 473).

Case management system (*CMS*): "Case management database with electronically entered case details (often extracted from e-filing system) that are systematically sorted and kept. Information in these databases may be retrieved, transmitted, and concurrently viewed by multiple authorized users" (Adkins, 2000, p. 5).

Compatibility: "The degree to which an innovation is perceived as being consistent with the existing values, pass experiences, and needs of the potential adopter" (Rogers, 2003, p. 473).

Complexity: "The degree to which an innovation is perceived difficult to understand and use" (Rogers, 2003, p. 474).

Confirmation: "That which occurs when an individual seeks reinforcement of an innovation-decision that has already been made but may reverse this decision if exposed to conflicting messages" (Rogers, 2003, p. 474).

Courtroom technology: "Any system or method that uses technology in the form of electronic equipment to provide a clear benefit to the judicial process" (Gruen, 2003, p. 1).

Courtroom technology management system (*CTMS*): Courthouse technology with centralized and integrated video and audio conferencing features, which has the capability to convey multimedia evidence simultaneously to court presiding judge, court clerks, jurors and the members of the public through an integrated network of microphones, assistive devices, monitors, and flat screen displays **(**Virginia, 2014).

Decision: "When an individual engages in activities that leads to a choice to adopt or reject an innovation" (Rogers, 2003, p. 474).

Diffusion: "The process by which an innovation is communicated through certain communication channels over a period of time among the members of a social system" (Rogers, 2003, p. 5).

Diffusion of innovation (*DOI*) *theory*: "Pertains to the spread of ideas from an institution in society to other parts of a given society" (Rogers, 2003, p. 120).

Discontinuance: "A decision to reject an innovation after having previously adopting it" (Rogers, 2003, p. 474).

Disenchantment discontinuance: "Decision to reject an idea as a result of dissatisfaction with its performance" (Rogers, 2003, p. 190).

Implementation: "When an individual utilizes an innovation" (Rogers, 2003, p. 474).

Information technology (*IT*): "The study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware" (Information Technology Association of America, 2014, para. 1).

Innovation: "An idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 475).

Observability: "The degree to which results of an innovation are visible to others" (Rogers, 2003, p. 475).

Passive rejection: "Consists of never fully considering the use of the innovation" (Rogers, 2003, p. 178).

Perceived ease of use (*PEOU*): "The degree to which a person believes that using a particular system would be free from effort" (Davis, 1989, p. 320).

Perceived usefulness (*PU*): "The degree to which individuals believe that using a particular system would enhance job performances" (Davis, 1989, p. 320).

Rejection: "Not adopting an innovation" (Rogers, 2003, p. 476).

Relative advantage: "The degree to which an innovation is perceived as better than the idea it supersedes" (Rogers, 2003, p. 476).

Replacement discontinuance: "A decision to reject an idea in order to adopt a better idea that supersedes it" (Rogers, 2003, p. 190).

Technology: "Technology is a design for instrumental action that reduces the uncertainty in the cause-effect relations involved in achieving the desired outcome" (Rogers, 2003, p. 13).

Technology acceptance model (*TAM*): "The TAM provides an explanation of determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing and theoretically justified" (Davis et al., 1989, p. 985).

Trialability: "The degree to which an innovation may be experimented with on a limited basis" (Rogers 2003, p. 476).

Unified theory of acceptance and use of technology (*UTAUT*) *model*: "The UTAUT model provides a useful tool for managers who need to assess the likelihood of success for new technology introductions and helps them to understand the drivers of acceptance in order to proactively design interventions, such as training and marketing, which are targeted at populations of users that may be less inclined to adopt and use new systems" (Venkatesh et al., 2003, p. 425).

Assumptions

Several assumptions were made for this study. First, I assumed that attorneys and

judges had some experience with courtroom technology. I also assumed that the interview questions would allow me to adequately explore the experiences of attorneys and judges in the State of Virginia to create a better understanding of some of the factors that contributed to the limited use of IT in state courtrooms. I also assumed that the questions were worded such that the participants could accurately interpret the questions being asked. A pilot study was conducted to test the interview instructions and questions. Finally, I assumed that participants would answer all interview questions honestly and openly given that privacy and confidentiality was assured. Findings from this study may or may not be generalized to similar populations of attorneys and judges in Virginia. This is discussed further in the Limitation section.

Scope and Delimitations

The study's participants included 11 judges and 11 attorneys in the State of Virginia. A delimitation of the research was that the sample was drawn from the population of attorneys and judges in Virginia, and the opinions and perceptions of judicial professionals in other geographic regions were not assessed. The focus of the study was the experiences of attorneys and judges regarding factors that contribute to the limited use of IT in state courtrooms.

The scope of this study was limited to IT factors that contribute to and shape the intersection of law and IT, such as IT adoption, acceptance, use in courts, and users' attitudes. Attorneys and judges who resided in other states or countries were not included in this study. In order to prevent perceived coercion to participate due to any existing or expected relationship between the participants and the researcher, I did not include

anyone with whom I had personal relationships, such as family members, friends, coworkers, or professional associates.

Limitations

Several limitations were noted for this study. First, a possible limitation related to the sample selection method. A snowball sample of 22 participants was used, and the results of the study are limited beyond similar populations of attorneys and judges in Virginia. I used a phenomenological research design of 22 attorneys and judges to explore and describe their experiences related to courtroom technology. The findings from the study may be generalized to similar populations of attorneys and judges, but the results are not likely generalizable to other populations, states, or countries. As von Eckartsberg (1998) stated, "The basis for generalization in existential-phenomenological research is the specific experiences of specific individuals and groups involved in actual situations and places" (p. 4). Von Eckartsberg continued "people in a shared cultural and linguistic community name and identify their experience in a consistence and shared manner" (p. 15).

Second, self-report or social desirability bias may have existed. Attorneys and judges might want to be perceived positively, so they may not respond honestly to interview questions. However, an assumption was that participants would honestly and openly answer the interview questions by sharing perceptions about the questions asked. A third limitation applied to the data collection stage. Observation data were not collected from all participants. During this stage, participants living within a few miles of me were interviewed face-to-face, while others were interviewed by telephone.

Significance of Study

Advances in courtroom technology can revolutionize today's legal landscape by improving jurors' abilities to understand concepts and improve their decision-making skills. Legal professionals are prompted to embrace this new trend. As legal technology affects courtroom operations and document management, the gap between legal professionals' IT literacy and how to use it continues to grow. Findings from this study may add to the existing body of knowledge on courtroom technology. Legal practitioners may benefit by understanding factors that contribute to the limited use of IT in courtrooms. This section is organized in the following subsections: significance to practice, significance to theory, and significance to social change.

Significance to Practice

The intersection between IT and law is a cross-disciplinary practice area of growing importance. Electronic communications and interactions with courtroom processes are becoming more prevalent. Anticipated benefits include benefits to attorneys, judges, courtroom administrators, jurors, and other legal practitioners during the legal practices. Findings from the study may provide further knowledge that can assist law practitioners with the adoption of courtroom technology, thereby helping to expedite courtroom processes in an efficient and effective manner as well as contribute to the field of courtroom technologies. Thus, the research findings from this study may contribute to the existing body of knowledge on the use of courtroom technology.

Further, exploring some factors that contribute to the limited use of IT in state courtrooms may improve courtroom technology implementation processes. Participant

and researcher recommendations may benefit the courtroom IT management system. These recommendations aim to enhance service delivery and cost effectiveness in the process of introducing technology in the legal system.

Significance to Theory

The technology theories analyzed and discussed in this research are important because they provide a complex and conceptual understanding of the reasons behind the lack of IT adoption in the legal field, specifically, during courtroom trials. In the U.S., the majority of courtrooms are not equipped with technology; thus, the few that use courtroom technology are not representative of how most courtrooms operate. The theories may also provide insight into the legal culture while creating a framework for analysis. This study may influence future studies in a manner that leads to additional research and contributes meaningfully to the body of knowledge at the intersection of IT and law.

Significance to Social Change

This research study is significant to different sectors of the society as well as the judicial system. Research on the limited use of IT in state courtrooms may improve the adoption of technology. The findings of the study are expected to benefit the court information management systems, particularly through recommendations based on scholarly literature review, and the study's analysis and findings. This may result in cost-effective court proceedings and increased service delivery in courts that employ IT systems. Hence, findings may improve knowledge, which may increase the adoption of courtroom technologies and help in expedite courtroom processes.

Summary

The creative use of IT can be a vital tool for promoting reliable, convenient, and prompt access to justice. However, launching and implementing IT systems in courts is a daunting task, characterized by numerous social, legal, economic, and technological challenges. The aim of the present study was to explore factors that contribute to the limited use of IT among attorneys and judges in Virginia state courtrooms. The discussions, findings, and recommendations of this study may provide policymakers, legal practitioners, litigants, and solicitors with additional information on the current use of IT in courts.

In addition to IT acceptance, concepts, and theories of technological innovation, diffusions with legal concepts, such as access to justice, forms the basis for creating or improving current directions, practices, and methods for adapting legal rules and procedures to advance the use of courtroom technology in the quest for prompt and convenient justice. The TAM, UTAUT theory, and DOI theory formed the conceptual framework for this study.

Chapter 2 includes an in-depth discussion of the existing research related to courtroom technology use and adaptation. Chapter 3 includes a review of the current study's methodology, including the research design, rationale, role of the researcher, data analysis plan, issues of trustworthiness, and a summary. Combined, Chapters 1, 2, and 3 address the plan for the study.

Chapter 2: Literature Review

The purpose of this qualitative phenomenological research study was to explore and describe the lived experiences of attorneys and judges in the State of Virginia regarding factors that contribute to the limited use of IT in state courtrooms. Challenges associated with the implementation of courtroom technology are due to attitudes and opinions regarding its acceptance and perceived usefulness. The problem this study explored was the lack of information available on factors that contribute to the limited use of IT in state courtrooms, even though most jurors believe it would help them better serve (National Center for State Courts, 2011).

An important technological development has been the introduction and widespread use of information communication and technology. The growth of these sectors has been rapid and expansive (Neubauer & Fradella, 2013). Technology has entered courtrooms around the world and some U.S. courts are now equipped with technology for use during trial presentations (Lederer, 2010). As with other technology, courtroom technology faces several barriers to its adoption. One of the most prominent barriers with regard to this new technology is the technical and legal risks. Modern technology makes it easy for one to manipulate data and metadata. High risks of data modification can compromise quality of evidence (Haider, 2014). Therefore, key decision makers involved in accepting this technology can shy away from new technology if it does not guarantee the same level of accuracy and quality as the legacy technologies.

This is also connected to the reliability and performance of the technology. Decision makers need to understand whether the new technology can perform well or

even better than previous technology. Budgetary priorities or financial constraints must also be considered (Haider, 2014). When courtroom technology is expensive, adoption may not be imminent due to budgetary constraints. The effects of disruption, availability of time and resources for training, and work stress and time for making changes or adjustments may also affect the ability of authorities to adopt technology (Haider, 2014). In addition, the social implications and changes in collaboration and communication styles may also affect adoption. Employees become resistance to new courtroom technology, especially in cases in which they are already comfortable or conversant with current technology. This chapter includes a description of the literature search strategy, conceptual framework, a review of the relevant literature, and a brief conclusion.

Literature Search Strategy

I performed an exhaustive search to locate relevant research for this review. I accessed several online databases through the Walden University Library, including EBSCOhost, Citebase, ProQuest, and LexisNexis. The primary sources included in this chapter are peer-reviewed journal articles, professional websites, and dissertations. I searched the Google Scholar, Information Systems and Technology, and the Multidisciplinary databases at the Walden University Library, which produced limited sources centered on courtroom technology and courtroom technology adoption in the United States. My search focused on courtroom technology and included the following key words: *technology acceptance model*, *courtroom technology*, *courtroom technology adoption*, *current trends in courtroom technology*, *impact of courtroom technology*, *efficacy of courtroom technology*, *judges' perspective on courtroom technology*, *lawyer*

perspective on courtroom technology, court administrators perception of courtroom technology, and *challenges of courtroom technology*. Articles I found in the databases provided a number of relevant results; however, research within the last 5 years was limited because the topic of courtroom technology use in the United States is relatively new and has not been studied extensively. Because literature is sparse relating to the adoption of technology in U.S. courtrooms, many seminal sources were used to provide insight and help deepen understanding of the topic. Contini and Cordella (2015) noted that, "Very little interest and attention has been given in literature to the changes that have occurred in association with the digitization of the judicial systems despite their relevance for the operation of almost every other activity of the State" (p. 124). The literature review presents numerous seminal sources important to the cross-discipline law and technology. Contini and Lanzara (2014) also noted,

> Researchers have paid very little attention to the study of the changes brought about by the digitization of this sector, as well as on the impact digitalization has on pre-existing institutional settings and on the broad range of values underpinning the judicial function and enforced by the judicial power. (p. 215)

I used the ISI Web of Knowledge Index of Citation for electronic citation and tracking, and my literature search strategy also focused on theories and concepts relevant to courtroom technology adoption. These theories and concepts represent a variety of ideas that pertain to using courtroom technology. I retrieved the information I used to form the study's conceptual framework from current scholarly journals and books.

Conceptual Framework

The conceptual framework for this phenomenological study used the following theories: TAM (Davis et al., 1989), DOI theory (Rogers, 2003), and UTAUT model (Venkatesh et al., 2003). This section includes the following subsections: TAM, DOI theory, and the UTAUT model.

Technology Acceptance Model

Adopting and integrating technology have been the focus of a substantial body of research on user acceptance of various forms of technology (e.g., Davis et al., 1989; Lederer, 2010; Dixon, 2012;). Specifically, the TAM (Davis et al., 1989) has received significant empirical support and has been applied in IT and communications to predict how organizations accept and adopt technology. The increasing use of technology in society has prompted the integration of technology in the judicial system. Traditionally, the judicial system has been perceived as rigid and unwilling to accept change; however, the integration of technology into judicial reforms has become increasingly important because it can improve efficiency and reduce costs.

Figure 1 depicts the TAM (Davis et al., 1989) based on the principles of Ajzen and Fishbein's (1975, 1980) theory of reasoned action. Ajzen and Fishbein argued that a person's behavior could be determined by considering previous intentions and beliefs surrounding a given behavior. In addition, the researchers proposed that the behavioral intentions of an individual are dependent on attitudes toward the actual behaviors and the subjective norms associated with them. According to Ajzen and Fishbein, a person's attitude describes negative or positive feelings towards performing a behavior. On the

other hand, subjective norms refer to the normative beliefs and motivations that prompt an individual to comply with a behavior. This means that an individual's performance of behavior is significantly influenced by the belief of how others will perceive him or her after a behavior is performed (Fishbein & Ajzen, 1975). The study refers to an individual's belief on how others will perceive technology in the courtroom.

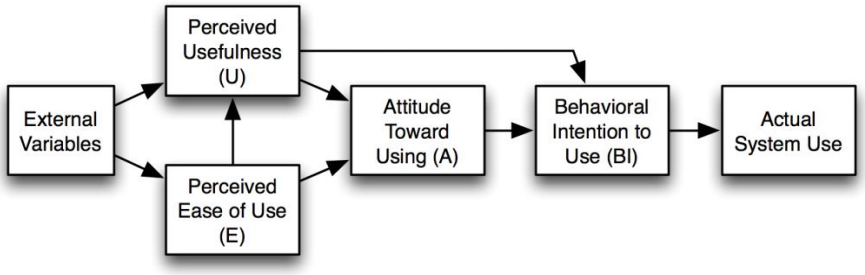

Figure 1. Technology acceptance model. Reprinted from "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," by F. D. Davis, R. P. Bagozzi, & P. R. Warshaw, 1989. *Management Science*, *35*(8), p. 985. Technology Acceptance Model by Nippie from Wikimedia Commons is licensed under CC BY 3.0.

Davis et al. (1993) developed the TAM to explain the assimilation and use of new technology into various fields. According to the researchers, the TAM provides an explanation of factors that determine the effective assimilation and use of IT, which could then be applied to different fields (such as the legal and criminal justice arenas). In the courtroom, the TAM provides direct and causal relationships between the ease of application and usefulness of technology, a person's intention to apply it, and the actual adoption of technology. Davis related that perceived usefulness of technology in the courtroom refers to the subjective probability that the use of a specific device or application will increase an individual's performance in the courtroom. In contrast,

perceived ease of use determines the usefulness of a device. These principles significantly influence an individual's use of and attitude toward the integration of technology within a courtroom.

Various studies have sought to modify the TAM. Venkatesh et al. (2003) extended the the application of TAM by in organizations to illustrate the concept of user acceptance behavior. According to Ventkatesh et al. (2012), the TAM did not address why many technology applications fail to meet organizational expectations. User acceptance of technology is not only dependent on a technology's ease of use and perceived usefulness. Venkatesh et al. (2012) considered additional influence of technology adoption, such as voluntary use, social factors, and intrinsic motivation. Researchers can incorporate other external variables that may influence perceived usefulness and ease of use to predict user's behavioral intent and actual use of technology devices.

Diffusion of Innovation Theory

Rogers's (2003) DOI theory relates to the spread of ideas from an institution across other parts of a given society (Arun & George, 2011). According to Arun and George, in the event that an organization decides to adopt a certain innovation, behavior, or product, the process of diffusion commences. Innovation refers to a concept that is new to the organization, but may not be novel in the absolute sense. The diffusion process is characterized by four main elements; thus, Rogers (2003) defined *diffusion* as "the process by which (a) innovation, (b) is communicated through certain channels, (c)

over time and (d) among the member of a social system" (p. 5). *Innovation* is an idea, practice, or object that is perceived as new by an individual or other unit of adoption.

Innovation development refers to the activities that prompt organizational decision-makers (e.g., executives and court justices) to consider adopting an innovation (Arun & George, 2011). Arun and George noted that these activities might be based on a push from other organizational stakeholders, such as judges and managers. The activities may also be based on responses to changes in the market, perceived performance gaps, or requests Decision-makers' choices to adopt or not is based on analysis and beliefs (Arun & George, 2011). New technology may be implemented by organizations after decision-makers decide to adopt technological innovations.

The DOI theory is based on the innovation-decision process, which consists of the following five stages: (a) knowledge, (b) persuasion, (c) decision, (d) implementation, and (e) confirmation (Rogers, 2003). Figure 2 illustrates the five-stage process that potential adopters encounter when interacting with innovation.

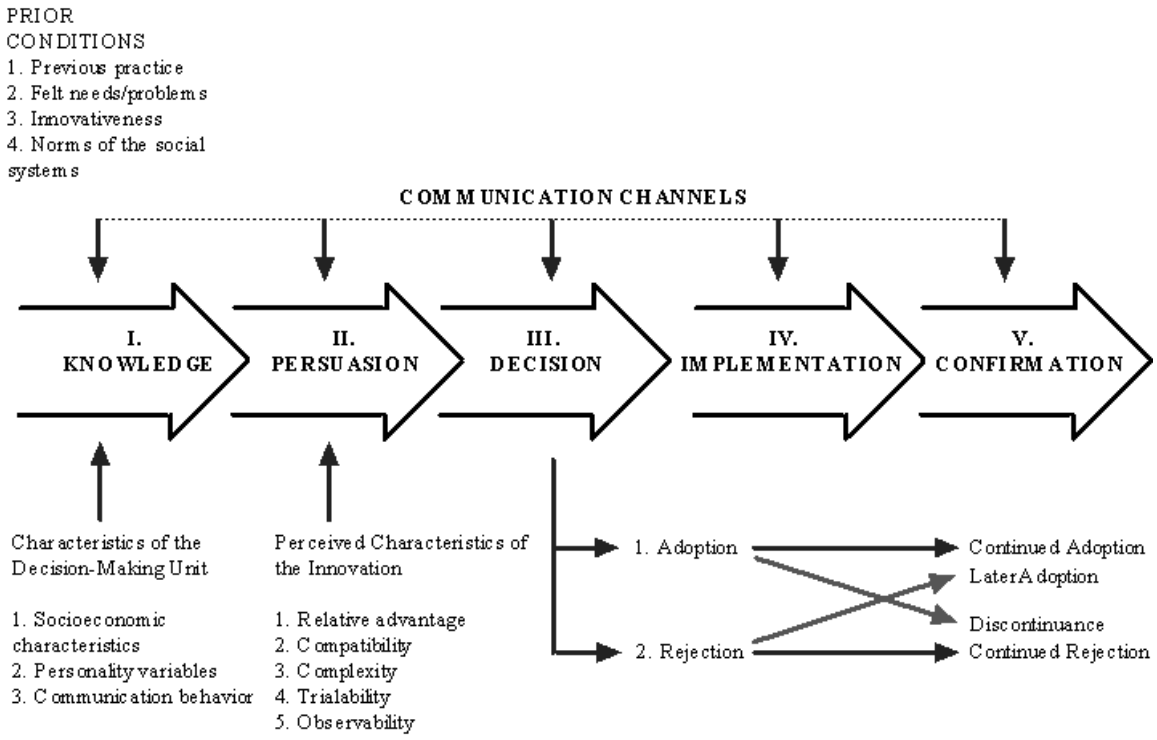

Figure 2. Five stages of Rogers's (2003) innovation-decision process model. Reprinted from *Diffusion of Innovations* (5th ed.), by E. Rogers, 2003: New York: The Free Press. Copyright 2003 by the Free Press. Reproduced by permission of the publisher.

The first stage of the innovation-decision process, *knowledge*, begins when an individual becomes aware of a given technology's existence (Rogers, 2003). Rogers reported that during this stage, an individual gains some understanding of a technology's functionality, how to use it, and how it works. Organizational characteristics include previous practices, prior conditions, felt needs, culture, and innovativeness. These characteristics play a critical role in the diffusion process and innovation decisions.

Within the knowledge stage, characteristics of decision-making units, such as judges and administrators, influence diffusion and adoption efforts through socioeconomic factors, personalities, and communication behaviors. Rogers (2003)

related that individuals are unlikely to expose themselves to communication regarding innovations without first having experienced a need or interest in those innovations. Moreover, individuals' perceptions (e.g., attorneys) about the innovation may influence behaviors toward the communication message from the decision-making unit. Even if individuals are exposed to innovation messages, such exposure will have little effect unless the innovation is perceived as relevant to organizational needs and consistent with the overall attitudes and beliefs of individuals within that organization (Rogers, 2003).

During the second stage, *persuasion,* an individual develops a comprehensive opinion of the advantages and potential problems related to the use of a new technology (Rogers, 2003). If the individual forms a favorable attitude, adoption will occur; however, it is important to note, "the formation of a favorable or unfavorable attitude toward an innovation does not always lead directly or indirectly to an adoption or rejection" (Rogers, 2003, p. 20). Rogers reported that potential adopters derive their attitudes toward an innovation from their current levels of knowledge or awareness. The opinions and belief are form from interactions with social networks of colleagues, friends, and peers, influence adoption rates. Rogers reported that the following five factors influence the rates of innovation adoption: (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (e) observability. Innovations with the least complexity are often adopted faster than more complex innovations. When potential adopters believe that the interaction with an innovation is too complex, the innovation may be rejected. Users' perceptions of the ease-of-use and usefulness of the TAM are used in this phase.

Rogers (2003) defined *relative advantage* as "the degree to which an innovation is perceived as being better than the idea it supersedes" (p. 229). This characteristic is thought to influence the adoption rates of innovations by early adopters due to the economic advantages. For example, attorneys' views of the iPad and whether it offers an advantage over previous ways of presenting arguments to the jurors also determines the attorneys' perception of the iPad's usefulness. In this example, attorneys' experiences determine the relative advantages of the iPad, the conveniences it provides during a trial, and the social prestige the innovation provides.

The characteristic of Rogers' (2003) notion of *compatibility* is "the degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters" (p. 15). The values of the court have been traditional in the past. Attorneys value their abilities to reach jurors through effective articulation of their legal knowledge. This has been a long-standing tradition and the highlight of any court trial. Innovations may threaten these traditions, and some attorneys are concerned that the use of such technology could detract attention away from the details of a trial (Antweil, Grosididier & Dexter, 2011). A bigger concern among the legal community is the inability to properly use such technology, which could detract attention from the attorney and the trial. This incompatibility negatively affects the use of technology and reduces innovation adoption.

Complexity can be considered the opposite of *perceived ease of use*, whereas *relative advantage* is similar to the conception of *perceived usefulness* (Rogers, 2003). Rogers (2003) defined *complexity* as "the degree to which an innovation is perceived as

relatively difficult to understand and use" (p. 15). Complexity affects how fast an innovation is adopted. Innovations that are simple to understand are adopted more quickly than those that require training or new understanding. For example, not all attorneys and judges find the iPad difficult to use; however, understanding how to use legal software such as TrialDirector and Sanction to deliver effective presentations is a complex process that requires training and new understandings. Attorneys are presented with the legal aspects of the case coupled with challenges of understanding and using technology in addition to surfing the Web, taking pictures, or checking email. In addition, an attorney may feel apprehensive that they will not be able to represent their client fully if attention is divided between a case and learning how to use new technology. As a result, negative opinions regarding the technical complexity may begin to form throughout the legal community. As a result, the relative advantages are lost and adoption is delayed.

The rate of adoption can increase through *trialability* (Rogers, 2003). According to Rogers (2003), *trialability* is "the degree to which an innovation may be experimented with on a limited basis" (p. 16). This is important for late adopters and those who plan to purchase a new technology later. Attending training classes or courses reduces the uncertainty associated with an innovation, thereby increasing the probability of its adoption into an organization and its culture.

It should be noted that *trialability* is especially difficult within the legal community. Limited training is dedicated to technology use for court trials. In addition, legal professionals are often too busy to practice using technology outside the court.

When a court case calls for technology use, court technologists are often employed to set-up the cases and provide attorneys with brief technology demonstrations.

Lastly, Rogers (2003) defined *observability* as "the degree to which the results of an innovation are visible to others" (p. 16). Conversations with peers can help decrease the uncertainty about innovations. Role modeling or peer observation is the key motivational factor behind the adoption and diffusion of technology (Rogers, 2003). Visible results and feedback from professional peers often correlates positively with technology adoption rates, as friends often discuss and request information about a product. However, observability is rare within the legal community because many courts feature limited technology and IT infrastructures that may not support all courtroom technologies.

In stage three, *decision*, the individual executes activities, which lead to the option of adopting or rejecting a technology (Rogers, 2003). Rogers defined *adoption* as the "full use of an innovation as the best course of action available," while *rejection* refers to the decision "not to adopt an innovation" (p. 77). *Active rejection* and *passive rejection* can be expressed throughout the decision stage. A potential adopter may actively participate in the trial process of a new product, but later decide against adopting it while in a passive rejection situation. Activities such as initial trials, education, and communicating with peers can improve the innovation-decision process; thus, increasing the likelihood of adopting the technology. When influential individuals endorse and promote innovations, the anxiety associated with the technology may decrease and result

in its adoption and implementation. Ventkatesh et al. (2012) indicated that coworkers' behaviors often have a greater influence on technology use than supervisor behaviors do.

The fourth stage, *implementation*, occurs when an individual puts the new technological innovation to continuous use (Rogers, 2003). According to Rogers (2003), individuals play a significant role in this stage because their attitude toward the innovation determines use frequency, which ultimately determines the acceptance of the project given to them by upper management. Individuals also determine the usefulness of the technology and may seek additional information and training. When a new technology becomes embedded in an environment's existing infrastructure, it becomes the *new normal*. The TAM is frequently referred to in this stage in order to access the attitudes and behaviors of users toward the integration of the technology into the environment, while management discovers ways to institutionalize its usage and processes.

The fifth stage, *confirmatory*, is defined as the "stage the individual (or other decision-making unit) seeks reinforcement for the innovation-decision already made, and may reverse this decision if exposed to conflicting messages about the innovation" (Rogers, 2003, p. 189). As users work toward integrating an innovation into their work behaviors, conditions such as *dissonance* and *discontinuance* can occur. Dissonant individuals are motivated to reduce this condition by changing their knowledge, attitudes, or actions (Rogers, 2003). Users who seek information and training required to successfully use an innovation usually avoid dissonance. Afterwards, a favorable or unfavorable opinion is formed regarding the adoption.

Discontinuance of an innovation is also likely in the confirmation stage. *Discontinuance* is a "decision to reject an innovation after having previously adopted it" (Rogers, 2003, p. 190). Rogers described two types of discontinuance: *replacement discontinuance* and *disenchantment discontinuance*. *Replacement discontinuance* is "a decision to reject an idea in order to adopt a better idea that supersedes it" (p. 190). Technologies that have become obsolete or no longer comply with an industry's current standards are often abandoned and replaced. At times, technologies are replaced with an older version of a current product. For example, many users replaced newer Windows Vista operating systems with its predecessor, Windows XP. Criticisms regarding Vista performance, compatibility, digital rights management, and user account control systems prevented many businesses from ever adopting the new operating system.

Disenchantment discontinuance is a "decision to reject an idea as a result of dissatisfaction with its performance" (p. 190). For example, many users abandoned Microsoft's Windows operating systems and converted to Apple's operating systems and its applications. Figure 3 presents the adopter categorization on the basis of innovativeness model and continues to further describe that those who adopt technology later demonstrate a higher risk of discontinuing an innovation or experiencing disenchantment.

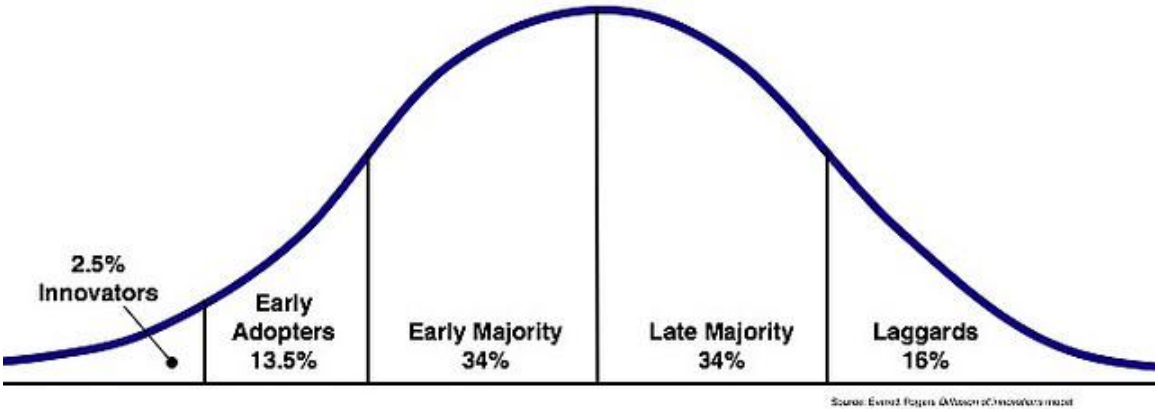

Figure 3. Adopter categorization on the basis of innovativeness model. Reprinted from *Diffusion of Innovations* (5th ed.), by E. Rogers, 2003, New York, NY: The Free Press. Copyright 2003 by the Free Press. Innovativeness Model by Wesley Fryer from Flickr is licensed under CC BY 3.0

Rogers' (2003) five adopter categories are: "(a) innovators, (b) early adopters, (c) early majority, (d) later majority, and (e) laggards" (p. 280). Rogers reported that *innovativeness* is the criterion for the adopter criterion. "Innovativeness describes the degree to which individuals embrace new ideas" (Rogers, 2003, p. 22).

Innovators consist of 2.5% of the population (Rogers, 2003). Rogers related that innovators usually have access to substantial financial resources that allow them to be risk-takers and adventurers. Innovators tend to be people who are discoverers, founders, inventors, researchers, and theorists. They are often highly intelligent and well-educated people who possess the abilities to understand and apply complex knowledge to a variety of situations. Innovators are self-confident, worldly, and usually rely on scientific information to make decisions.

Early adopters consist of 13.5% of the population (Rogers, 2003). According to Rogers, unlike innovators, who are more active outside their communities, early adopters

are younger and more community-based. They are often described as *early knowers* who have more education, social status, exposure to mass media, channels of interpersonal communication, change agent contacts, and social participation than the early majority (described next). Early adopters with high-income levels tend to be individuals in leadership positions, such as business owners, directors, professors, city mayors, and councilmen.

The *early majority* consists of 34% of the population (Rogers, 2003). Rogers noted that these individuals are consumers who collect information and compare the benefits and drawbacks of technology before making purchases. The early majority relies on the opinions of leaders in their communities to help form their decisions. Families and friends encourage early adopters to purchase new technologies. Often, early majority adopters are slightly older and do not hold leadership positions; however, they are usually financially sound. Early majority members typically include healthcare workers, IT professionals, engineers, and reporters.

The *late majority* consists of 34% of the population (Rogers, 2003). Rogers reported that this group usually consists of skeptics who are less educated and more reluctant to adopt innovations until most of their families and friends have done so. Individuals in this group are usually older, have modest income levels, and respond to social pressures to conform. Late adopters are more likely than early adopters to discontinue innovations (Rogers, 2003). These deliberate decision-makers consist of older retirees but also can include those in skilled trades and labor careers, such as factory and mechanical workers.

Finally, *laggards* are the last 16% of the population to adopt innovation (Rogers, 2003). Rogers described laggards as traditional people that dislike change. They are the least educated and oldest of the *adopters'* category. These individuals base decisions on past generational ideas and methods. Because laggards have fewer resources to risk, they are more likely to experience disenchantment discontinuance. Laggards usually reside in rural communities and are unmotivated by advertisements or the opinions of leaders.

The adopter categorizations are cardinal factors that influence the innovation-decision process (Rogers, 2003). Characteristics of innovation affect adoption success and rates of diffusion to (Arun & George, 2011). The literature review further synthesized the rate of adoption and address diffusion theory as it relates to user acceptance of technology in the judicial system.

Unified Theory of Acceptance and Use of Technology Model

The UTAUT model provides a useful tool for managers who need to assess the likelihood that a new technological introduction will be successful (Venkatesh et al., 2003). In addition, the model can help managers understand the drivers of acceptance to proactively design interventions, such as training and marketing, that target populations of users that may be less inclined to adopt and use new systems. Venkatesh et al., (2003) formulated the UTAUT model to integrate elements from eight models: (a) theory of reasoned action, (b) TAM, (c) motivational model, (d) theory of planned behavior, (e) a model combining the TAM and the theory of planned behavior, (f) model of PC use, (g) DOI theory, and (h) social cognitive theory. Using data from four organizations throughout a 6-month period with three points of measurement, the researchers found that

the eight models accounted for 17% and 53% of variance in user intentions to use IT. The researchers tested the UTAUT model and found that it outperformed the eight individual models (69% variance). The researcher further tested the UTAUT model using two new organizations and found similar results (70% variance).

Venkatesh et al. (2003) reported that seven constructs appeared to be significant, direct determinants of intention or usage (pp. 446–455):

1. Performance expectancy: "The degree to which an individual believes that using the system will help him or her to attain gains in job performance. Based on existing literature, the authors expect that the influence of performance expectancy will be moderated by both gender and age" (p. 447).
2. Effort expectancy: "The degree of ease associated with the use of the system. The authors propose that effort expectancy will be most salient for women, particularly those who are older and with relatively little experience with the system" (p. 450).
3. Social influence: "The degree to which an individual perceives that important others believe he or she should use the new system" (p. 451).
4. Facilitating conditions. "The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (p. 453).
5. Attitude toward using technology: "Individuals' overall affective reaction to using a system" (p. 455).

6. Self-efficacy: “The degree to which individuals judge their abilities to use a particular system to accomplish a particular job or task” (p. 455).
7. Anxiety: “The degree of anxious or emotional reactions associated with the use of a particular system” (p. 455).

However, Venkatesh et al. (2003) found that only the first four constructs played a significant role as direct determinants of user acceptance and usage behavior: (a) performance expectancy, (b) effort expectancy, (c) social influence, and (d) facilitating conditions. Figure 4 illustrates the UTAUT model.

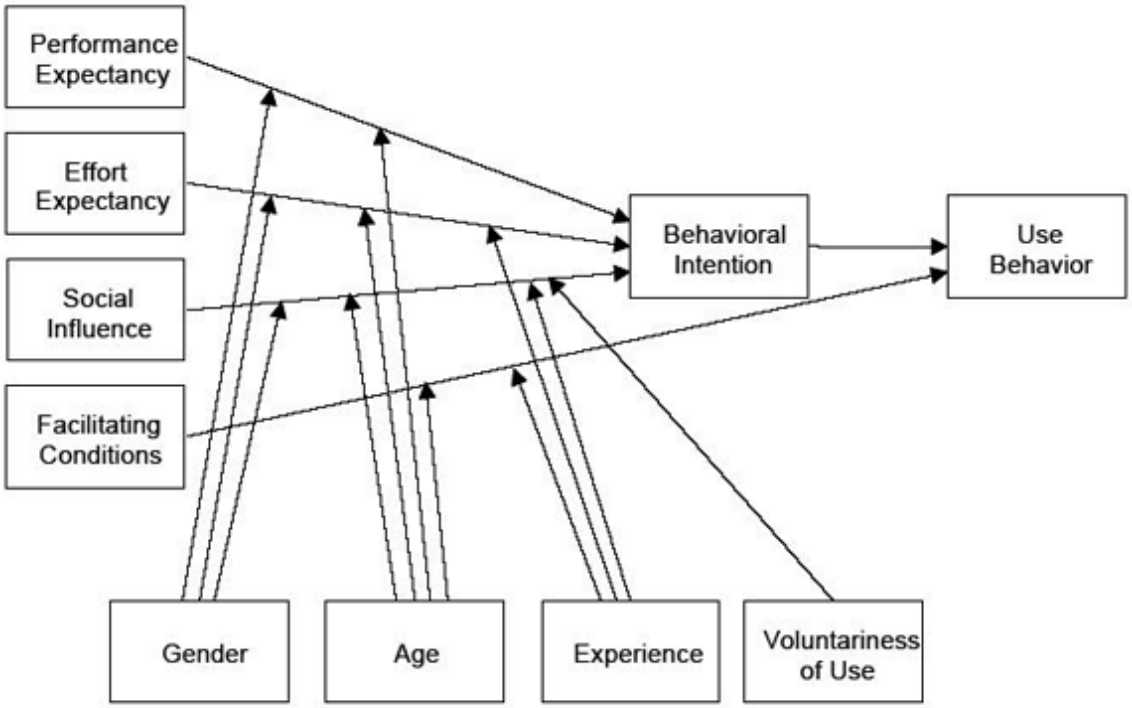

Figure 4. Unified theory of acceptance and use of technology model. Copyright (2003) by MIS Quarterly. Reproduced with permission. “User Acceptance of Information Technology: Toward a Unified View,” by V. Venkatesh, M. G. Morris, G. B. Davis, & F. D. Davis, 2003, *MIS Quarterly, 27*, p. 447.

Gender, age, experience, and voluntariness of use may also moderate the effect of four key constructs of usage intentions and behaviors (Venkatesh et al., 2003). Venkatesh et al., (2012) extended the UTAUT model to study technology acceptance and use within a consumer context. The researchers proposed the UTAUT2, which incorporated three constructs into the original UTAUT: (a) hedonic motivation, (b) price value, and (c) habit. The researchers hypothesized that individual differences, such as age, gender, and experience may moderate the effects of these three constructs on behavioral intentions and technology use. The researchers conducted a two-stage online survey of technology use. Data collection continued for 4 months after the first survey and study participants included 1,512 mobile internet consumers. Findings indicated that, compared to the UTAUT, the extension proposed in UTAUT2 produced a substantial improvement in the variance explained by behavioral intention (56% to 74%) and technology use (40% to 52%). However, the UTAUT model used in the current study focused on some of the factors that contribute to the limited use of IT in state courtrooms.

Literature Review

This section includes a discussion of literature regarding technology use and integration effects in courtrooms throughout the State of Virginia.

Technology in the Courtroom

This subsection includes an exploration of the types of technologies currently used in courtrooms, as well as the effects of technology in the judicial system. Examples are also given of cases in which technology influenced trial outcomes. The organization of this section is as follows: presenting evidence, visual exhibits, and digital courtroom technology.

A high-technology state courtroom can vary from high-tech federal courts; however, they both consist of technology that has been integrated or built into the courtroom. Such technologies include: (a) video displays; (b) annotation and witness monitors; (c) evidence cameras; (d) laptop connections and other digital input locations; (e) combo VCR/CD/DVD players; (f) printers and electronic storage systems for exhibits; (g) remote witness testimonies and video conferences; (h) wireless installations; (i) and integrated controllers to manage images and sounds of courtroom audio/video (AV) systems (Dixon, 2012).

In the courtroom, traditionalists have long defended courtroom decorum and resistance to change is common; however, the revolution of technology has continuously challenged resistance to change (Patton, 2014). The current generation use technology for various purposes, including entertainment, interaction, and work (Pointe, 2002). As a result, technology is now used in the courtroom. Resistance towards technology use in

the judicial system still exists, despite the increasing use of courtroom technology. This resistance is often associated with social and psychological fears of change and technology. In addition, the Federal Rules of Evidence and Federal Rules of Civil Procedure, coupled with judges' lack of familiarity with various courtroom technologies, have contributed to this resistance.

Historically, courts have used some form of technology until devices were considered obsolete such as typewriters, photography expanders, and video recorders (Bellone, 2005). Integration of technology into courtrooms began in the Ohio Court of Common Pleas in 1960 (Bellone 2005). Judge McCrystal sought to reduce an expanding docket of cases by videotaping depositions. These declarations were edited under the guidance of the court and stipulations from both parties, and then made available to the jury for viewing. The trials, called the *Pre-Recorded Video Taped Trials* (PRVTT), were the first large-scale and well-documented trials that used technology during the proceedings. This led other courtrooms to accept the use of technology due to the provisions of PRVTT. For example, in *Liggons v. Hanisko* (1973), the Superior Court of San Francisco County permitted the application of the PRVTT.

The use of technology within U.S. courtrooms has revolutionized judicial practices (Wiggins, 2006). Emerging technologies such as laptops, computers, video displays, video recordings, and other software have been applied in courtrooms (Wiggins, 2006). According to Wiggins, courtrooms that use technology are collectively referred to as *cyber* or *wired courts*. Cyber courts maintain information websites that facilitate the use of technology to present evidence. In addition, they allow attorneys to present

evidence using technological devices and laboratories. The use of science and technology in the courtroom has always been controversial. For many years, the admission of deoxyribonucleic acid (DNA) evidence, medical evidence, and fingerprints have remained contentious. The application, introduction, and influence of technology in U.S. courtrooms have changed the administration of justice.

Presenting evidence. Evidence presentation technologies are devices that facilitate the simultaneous electronic presentation of evidence to individuals within a courtroom (Bermant, 2005). Today, available technologies include laptops, evidence cameras, computers, electronic whiteboards, and digital projectors (Dixon, 2012). Others technologies include kill-switches and control systems, annotation equipment, and integrated lecterns. The most commonly applied devices are evidence cameras, which are equipped with video cameras that capture data and transmit it to external monitors or projectors for display. Evidence cameras allow users to zoom in and highlight facts that may be significant to a case. These types of equipment are easy to use and can be brought into a courtroom on short notice, or courtrooms may be permanently equipped with them.

Computers and laptops facilitate the presentation of data using sophisticated software (Bellone, 2005). Software such as TrialDirector and Sanction allow users to project and manipulate digital data in a variety of ways. Using these technologies, users can highlight, zoom in, or use a call-out feature that allows them to enlarge or pullout certain portions of a text. In addition, these programs facilitate the juxtaposition of digital images and documents to compare and manipulate videos during information presentation. Other technologies, such as holograms and virtual reality, allow users to

visualize evidence and feel as if they were present in depicted scenes. These innovations also allow for the reconstruction and presentation of evidence according to the exact circumstances of a case (Bellone, 2005).

The divorce case between Frank and Jamie McCourt over the Los Angeles Dodgers relied on the Marital Property Agreement and a drafting error made by Frank McCourt's attorneys (Bay, 2013). Some copies of the settlement agreement signed by the couple used the word *exclusive* instead of *inclusive*. During trial presentation, the attorneys used a 100-inch screen with TrialDirector software to display the differences between the settlement agreements. The technology allowed experts to demonstrate the differences between signatures on each agreement, which resulted in invalidation of Frank McCourt's sole ownership agreement.

The TrialDirector software feature, which allows users to compare documents side-by-side, along with other technology tools to compare signatures, was key in the McCourt case (Bay, 2013). According to case analysts, this visual strategy affected the outcome of the trial (Bay, 2013). Cost concerns related to the use of technology in courtrooms are important to note because small firms may not be able to afford the expense if trial presentation becomes necessary.

Technology also played a crucial role in determining the *Bender v. County of Los Angeles* (2013) trial (Sheth, 2013). In the *Bender v. County of Los Angeles*, the court allowed the use of PowerPoint presentations during this case to quickly display critical evidence (Sheth, 2013). In the ruling, the judge remarked that the PowerPoint presentations had played a significant role in his decision to award attorney's fees, which

included the costs of the technology. Higher courts declined to challenge this finding or contest the technology costs as part of the fees. Such examples suggest that at least some judges are changing their attitudes toward courtroom technology.

Visual exhibits. Computers and laptops have changed the way attorneys display exhibits within the courtrooms (Wiggins et al., 2003). In courtrooms, computer-generated technologies include enhanced images, recreations, computer models, simulations, and static images. Static images are images that are nonmoving, stored, and shown electronically. These images include graphs, maps, illustrations, diagrams, and tables, which cannot be manipulated or enhanced during courtroom presentations. Enhanced images, on the other hand, are advancements of static images that allow for computer-driven manipulation (Wiggins et al., 2003).

The use of visual aids during courtroom cases is significant because it may enhance verbal testimonies (Nelson & Simek, 2013). Visual aids may include PowerPoint presentations, charts, graphs, computer-generated reenactments, color photographs, and visual timelines of events (Nelson & Simek, 2013). In most cases, these categorized artifacts are visual aids used to demonstrate how events, such as the commission of crimes, unfold. For example, color photography can empower juries to understand how crime scene events took place. Further, technology can provide important crime scene elements that may be compromised with time, due to weather changes or human interference (Landström, 2010).

Animations are comprised of static images created to enhance or illustrate events (Marder, 2001). In courtrooms, animations may accompany evidence or demonstrate

witness testimonies (Marder, 2001). Animations can demonstrate scenes from different distances and viewpoints. Simulations and recreations applied in the courtrooms recreate events or demonstrate circumstances surrounding them. Unlike animations, simulations and recreations apply scientific data, variables, and principles to create events and explain how they happened. Simulations are useful for cases that lack eyewitness testimonies. Computer models involve the input of data into a computer for processing using scientific formula to allow users to test multiple hypotheses.

Pointe (2002) conducted an evaluation of the usefulness of computer-generated models. Data indicated that such technologies provide courts with important information to explore events surrounding a case. However, as demonstrated in the *State v Stewart* case, animations can only be used to demonstrate possible events surrounding a case. According to the judge in the case, animations based on the accounts of witnesses, cannot always be relied upon. Although acknowledged for the valuable information provided by the animations, the court concluded that they are only admissible for demonstration purposes within the courtroom.

Courtroom digital technology. The courtroom digital system consists of technologies such as digital monitors built into jury boxes; video conferencing systems for remote testimonies or televised conference calls; real-time reporting or voice-writer reporting to produce real-time transcripts; and digital audio recordings that create electronic court records of each proceeding (Dixon, 2012). Dixon related that other technologies include integrated lecterns and enhanced sound systems. In addition, enhanced sound systems may be integrated into the courtroom environment while using

equipment such as microphones, speakers, data lines, codecs, cameras, and monitors. This equipment is usually provided by the court and requires expert skills for setup, as well as a knowledgeable person with a technical background to manage it. Such digital technologies are the backbone of any high-tech courtroom; however, they can be expensive to implement and integrate.

Despite the high cost of implementing courtroom technologies, they can be useful in most courtroom situations (Dixon, 2012). Many scholars express optimism that the idea of courtroom digital technology cannot be ignored in the current age of information and technology (Antweil et al., 2011; Selbak, 2014). Technology literate attorneys who have embraced computer-generated animations during trials have bolstered anticipations over the deployment of digital courtroom technologies (Selbak, 2014). Such developments indicate a shift in law practices away from the traditional models of presenting evidence. These changes are indicative of growing interests in modern needs to embrace digital courtroom technologies (Antweil et al., 2011).

According to Shuber (2014), the Ontario Superior Court allowed Skype in the child custody case, *State v. Corpening* (2012) because the witness could not afford to travel to Toronto from her residence in Denmark. The use of video conferencing in courtrooms is not entirely new, but this case involved one of the first uses of Skype in family law. The Family Law Rules (2004) have no stance on the use of Skype for testimony, but the Rules of Civil Procedure (2014) relates that an oral testimony should be used whenever possible to improve credibility judgments. The judge considered the benefits of this principle against the objectives of family law and the provision of a fair

and efficient trial (Shuber 2014). Considering the ability to question in real time with the Skype application, the judge determined that the use of Skype for cross-examination would not unduly prejudice the father in Ontario; however, traveling from Denmark would prejudice the mother. However, a clear consensus does not exist about the potential benefits or risks of using long-distance communication in today's courts.

State of Virginia Courtroom and Technology

This subsection includes a discussion on the specific use of technology in Virginia State courtrooms. Virginia features a fully outfitted, high-tech courtroom through its newly installed courtroom technology management system (CTMS). The CTMS system exists in all the county's courts: the Circuit, General District, and Juvenile and Domestic Relations District Courts (Virginia, 2014). This development, completed in 2011, was part of the county's comprehensive CTMS renovations for the three courts.

The CTMS provides many features with a wide range of technological support capabilities for various court processes and personnel. The basic components of the CTMS include the following: microphones, touch panel displays, laptop interfaces, flat screen displays, interpreting headsets, and evidence sources. The various capabilities associated with these CTMS components include: (a) integrated and digital evidence presentation linked to flat-screen displays thereby enabling the jury, judge, and gallery to have a view of the court proceedings and evidence presentation; (b) video conferencing capabilities for remote witnesses, arraignments, and secluded witnesses; (c) assistive interpretive and listening devices; (d) connection to the bench that allows the judge to

control the technologies; and (e) overflow capacity that allows observations of court proceedings from another courtroom.

With the installation of the CTMS, this Virginia county court has significantly reduced the number of logistical and legal challenges associated with the former processes (Virginia, 2014). Such challenges included court backlogs, difficulty retrieving information from court files, the disappearance of court files, and difficulty coordinating parties for lawsuits. In addition, the use of interpretive devices improved case efficiency and reduced the misinterpretation of information. Another improvement to the efficiency of court operations is a feature called Courtroom Technology Reservation Request, which is available at the county's' official website. This innovation allows attorneys to reserve technology by filling out an online form and submitting it to the court. The court responds to attorney's request in 2 weeks.

To ensure maintenance and coordination, courts in this Virginia County coordinate with a special administrative unit in the IT department called the Courtroom Technology Office (CrTO; Virginia, 2014). This office was set up to streamline and improve court operations and management for the three courts and their support offices. In addition to this original mandate, the roles of the CrTO presently include coordinating and facilitating research, automation, and technological enhancement across the court system. *Court system* in this sense refers not only to the three courts within the county, but also to other entities working hand in hand with the courts, including the Commonwealth's Attorney's Office, the Bar Association, and the Office of the Sheriff. The scope of this role includes supporting and maintaining the CTMS. The CrTO is

under the management of a courtroom technology officer, as directed by the county's' chief technology officer, chief judge, and the clerk of the court.

The Effects of Courtroom Technology

This subsection explores the perceptions of attorneys, jurors, judges, and court administrators toward courtroom technology. Its organization is as follows: attorneys and technology, jurors and technology, judges and technology, and court administrators and technology.

Attorneys and technology. The assimilation of technology within the judicial system has changed the processes through which attorneys prepare for courtroom proceedings (Bermant, 2005). According to Bermant, technology has a significant role in legal research, witness meetings, and depositions. Furthermore, the court's ability to provide technology to attorneys has provided equal opportunities for small and large law firms because small firms and single practitioners may not have the resources to purchase such innovations.

Through technology, it is now possible for attorneys to virtually represent clients in faraway nations or states. According to Hazelwood (2014), gone are the days when attorneys required formal communication with clients through business letters, face-to-face meetings, or landline telephone services. Today, attorneys have diverse methods for communicating with clients and representing them in court. However, when attorneys use technology to improve operational efficiency, it is still critical that they remain cognizant of ethical obligations. This will protect obligations to clients, such as maintaining confidentiality and providing competent arguments (Hazelwood, 2014).

Technology has enabled clients, witnesses, and attorneys to overcome logistic challenges during trial preparation (Bermant, 2005). Bermant reported that traditionally, telephones substituted for face-to-face meetings. Today, video conferencing devices allow clients and attorneys to overcome this logistic challenge. Furthermore, the use of technology has enabled attorneys to conduct legal research in a cost-effective and efficient manner. It has also provided attorneys with a time-efficient method for analyzing the details of a case.

Fombad and Moahi (2005) conducted a study to explore the perceptions that attorneys have regarding the utilization of courtroom technologies. The researchers also investigated whether these perceptions had any bearing on IT use and adoption during the adoption stage. The researchers noted that most participating attorneys were positively inclined toward such innovations, even though they tended to be low adopters of technology. Nonetheless, attorneys' perceptions toward courtroom technology were not the only factor that influenced IT use and adoption in courtrooms. Other factors included high costs of equipment, lack of expertise, lack of information pertaining to appropriate software, and insufficient training (Fombad & Moahi, 2005).

Jurors and technology. The appropriate application of technology to display evidence has changed courtroom dynamics in helpful and productive ways (Wiggins, 2006). According to Wiggins, advantages of technology use for judges include the ability to set time limits, decide on issues expeditiously, and control trial proceedings. For juries, technology increases jurors' involvement and enhances their abilities to understand the facts concerning a trial. Wiggins highlighted the usefulness of illustrations and

animations to jurors. According to the researcher, jurors' retention of relevant facts increases with the use of interactive and demonstrative evidence. In addition, it provides trial attorneys with opportunities to communicate with jurors in a language they can understand. Jurors have a constant need for visual illustrations to reinforce the verbal content during the trial process (Antweil et al., 2011).

In jury hearings, technology increases jurors' comprehension, interest, and memory retention while clarifying information (Lederer, 2005). According to Lederer, jurors retain 70% of what they hear after 3 hours and 10% of what they hear after 3 days. However, when the mode of presentation involves both hearing and visual illustrations, jurors retain 85% after 3 hours and 65% after 3 days (Lederer, 2005). In addition, digital displays streamline witness examinations to allow for the expeditious flow of relevant information to judges and juries. It also allows judges and jurors to draw connections between testimonies given by different witnesses. In federal courts, where jurors' boxes are fitted with monitors, the appropriate display of trial information allows jurors to read at their own pace (Wiggins, 2006).

Visual aids can assist juries, due to proximity (Heintz, 2002). Presentations of items, such as photographs and charts, may help jurors observe crime scene elements and other forms of evidence that may not be available in verbal arguments. Reenactments empower the jury with the capacity to visualize the unfolding of events during a crime (Antweil et al., 2011). Other visual aids, such as graphs and maps, can demonstrate the existence of poison or chemicals used during a homicide. Enlarging images can reveal deep details about a crime and help jurors visualize the details (Landström, 2010).

Heintz (2002) noted that visual aids reduce the number of mental steps jurors must take to understand data presented to them. Instead of listening passively and then forming mental pictures, visual aids allow jurors to receive information directly. Accompanying verbal information with visual aids provides jurors with two means of receiving information that can be easily processed and understood on deeper levels. Furthermore, visual aids help juries encode massive amounts of complex information. Internet, television, and screen projectors can simultaneously present information to all parties. Simple illustrations and diagrams allow attorneys to present large amounts of information to enhance jurors' understandings about the facts surrounding a trial (Pointe, 2002).

In addition to increased retention and comprehension of information, visually presented data is more persuasive than verbal descriptions because of the *vividness effect* of visual technology (Marder, 2001). The vividness effect is grounded in the principle that information has a significant effect on social judgments when it is presented through highly imaginable media than when it is pallid. Marder (2001) conducted a study on mock jurors and found that they were more likely to accept a witness's testimony as true when accompanied by vivid details. Thus, the ability to create vivid details to accompany witnesses' verbal accounts may be highly influential to juries.

Jurors listen to evidence during a trial and construct credible narratives to explain the facts of what happened (Wiggins, 2006). Jurors then use witnesses' accounts and other information presented to construct a story upon which to base their verdicts. The use of computer-generated illustrations presents juries with a ready-made story of the

circumstances surrounding the issue from which they can form a verdict. Thus, technology-generated evidence may significantly influence a jury's verdict.

In the case of attorneys, technology facilitates faster trial paces and makes it easier for attorneys to convince juries or judges (Lederer, 2005). Technology saves time during pre-trials and trials. The use of technology helps reduce the massive amounts of information that attorneys must sort through when seeking highlights for their arguments. In addition, technology enables attorneys to display exhibits in effective and time-efficient manners. Courtroom technology, such as monitors and projectors, allow devices to display information to everyone in the courtroom at the same time. Thus, technology allows attorneys to draw the attention of hearing judges and jurors to certain aspects of exhibits (Lederer, 2005).

Most jurors and other court users also noted the associated benefits of courtroom technology (Dixon, 2012). Most believed that IT in courtrooms increases efficiency and accelerates court proceedings. However, some court users worry that technology use can result in the manipulation of, tampering with, or loss of, information. Hence, the effective installation and use of courtroom technology is mandatory if its effectiveness is to be realized. IT may also increase the self-efficacy of attorneys and other court users (Dixon, 2012).

Judges and technology. Judges, especially trial judges, are in unique positions with special responsibilities (Lederer, 1998). Although all stakeholders in adjudication are united by common goals, it is unrealistic to ignore the different views pertaining to the adoption of technology. Many litigants want courtroom proceedings to move quickly

and be fiscally economical. One aspect of technology that has received significant interest from judges is technology-based court record. Most of the appellate court systems require verbatim records in the event of serious cases. Judges expect that court records are accurate and accessible in a timely manner (Lederer, 1998).

One useful courtroom technology is the computer-aided system utilized by Superior Court Judge Lohrmann (McConn, 2013). The system creates real-time notes through a keystroking stenotype machine, which then immediately translates them into words that judges can highlight, follow, and mark for simplified use in the future. The translation gives more accurate and specific information that is easier to recall. Accurate trial records support competent and conscientious judges. In addition, cases are less likely to be reversed if trial records are accurate (McConn, 2013). Comprehensive video records lead to an increase in appellate affirmations (Lederer, 1998).

Current technologies provide three alternative ways to make useful records: video, real-time, and digital audio (Lederer, 1998). Technology provides judges with immediate access to information materials from the bench (Lederer, 1998). High technology courtrooms allow judges to engage in a visual discussion pertaining to legal authority with counsel and have access to an enormous law library. This is opposed to the traditional system, which requires reliance on memory and notes, or waiting for books from the library to resolve questions.

The primary role of a judge is to ensure that justice is executed under the law; therefore, the accuracy of fact-finding is a matter of pertinent judicial concern (Lederer, 1998). Anything that improves the fact-finding quality is of paramount judicial

importance. Attorneys and judges are aware of the powerful effect of pictures during trials because jurors are able to retain more information when evidence is visual. As a result, some testimonies are ineffective without visual components. However, technological evidence presentations have associated drawbacks. Judges have long debated whether visual information is prejudicial or misleading. Some also fear that technology-based evidence presentations may increase the difficulty and number of such rulings (Lederer, 1998).

Few courtrooms today have unique technology systems aimed at integrating a number of services, such as audio-visual distribution, digital document cameras, computer inputs, video displays, and audio-visual switching controls (Bachman, 2014). Despite the use of portable evidence in some courts, most judges prefer the installation of more advanced permanent systems that allow attorneys to use devices to present evidence to everyone in the courtroom (Larson & Falconer, 2013). However, despite the growing interest in technology and its centrality in evidence presentation, all parties must first obtain permission from trial judges before using courtroom technology. Although most judges can issue blanket authorization for interested courtroom parties to use the systems during pretrial orders or initial scheduling, other judges insist on precise written motions and require attorneys to justify use of the technology (Bachman, 2014).

Despite the lack of acceptance of technology by judges, a Los Angeles Superior Court recently conducted an experiment using iPads to evaluate trial evidence in the courtroom (Aguilar, 2014). The judge agreed to the experiment, with the hope that it would increase jury engagement and speed up trials. Aguliar interviewed a litigation

consultant who stated, “If we can make trial go faster and more efficiently, it allows other people get into that courtroom and get their issues resolved” (para. 5). To capitalize on efforts to become more efficient, the judge also allowed attorneys to bring iPads into the courtroom for jurors to use.

Court administrators and technology. Court administrators are vital to the courtroom environment (Phillips & Capps, 2012). Phillips and Capps reported that in high-tech courtrooms, court administrators act as the IT staff. Although they are not considered drivers of technology in this environment, the court administrators’ jobs are just as important because they may face challenges with understanding the legal environment and its technology, such as case management, document management, and electronic filing. They also have to understand courtroom technology trends in order to move the court forward. Phillips and Capps believed that court administrators must be able to merge technology with court processes. Similar to attorneys, court administrators’ primary expertise consists of different facets of IT. Understanding how and when to apply information in a court environment adds additional challenges to a system that does not typically welcome change.

Borkowski (2014) reported that court administrators, such as those in charge of escorting prisoners, have embraced videoconferencing because of economic factors. In 2003, up to 6,000 charges were made through video in British Columbia, which translated into reduced prisoner transportation costs and body searchers. Every person who appeared in court required at least four body searches. Therefore, the use of video helps to eliminate the chances that a prisoner will return to prison with weapons or other

contraband. Videos also help eliminate the need for lengthy documentation, which reduces the workload for court administrators.

Negative Effects of Courtroom Technology

This subsection includes the challenges associated with the adoption of courtroom technology. A discussion of the current admissibility of technology-generated evidence, and laws and regulations pertaining to courtroom technology is also included. The section includes negative effects and adoption challenges.

Negative effects. Although the comprehensive uses of computer-generated evidence and other forms of technology can be impressive, Wiggins (2006) argued that it could also lead to the manipulation of exhibits. Wiggins noted that the zoom-in, fade out, and close-up features of various technologies could highlight different points that are not necessarily factual. The author argued that data fed into computers might be inaccurate, and full of errors and discrepancies. In addition, the programs may not be designed to detect errors. The possibility of misleading and miscalculating technology-generated evidence is a major concern because jurors tend to rely on such evidence as reflections of facts surrounding a case. However, Bellone (2005) noted that the belief that computer-generated evidence can be incorrect and unreliable can be addressed by requiring all parties to disclose underlying data before the commencement of a trial. In the United States, the Federal Rules of Civil Procedure acknowledges and requires the disclosure of simulations and animations in order to address fears that technology-generated illustrations manipulate the jury.

Cost is another drawback of courtroom technology. Despite its impressive efficiency, the required hardware and software support is expensive (Bellone, 2005). In addition, orientations and trainings regarding new application and use are necessary for attorneys, jurors, and judges (Bellone, 2005). Furthermore, Bellone related that the technology world is a dynamic one that produces new inventions every day. This can make it challenging for decision-makers to choose an optimum technology at any given time because technology regarded as an advancement one day may become obsolete the next. This conundrum has significantly challenged the installation of in-built courtroom technology. As a result, judges are often forced to allow participating attorneys to provide their own forms of technology during trials.

Another limitation is incidents related to technical difficulties in establishing and maintaining the connection between witnesses and courts. McDougall (2013) related that some of these problems are linked to failures of involved parties to sufficiently test systems prior to using them. For instance, technical problems were evident during a U.S. murder trial involving George Zimmerman. During the hearing, Assistant State Prosecutor Mantei attempted to Skype a witness, but the connection failed within a few minutes. At the time, the court was forced to abandon the testimony (McDougall, 2013). Therefore, the effective implementation of courtroom technology requires proactively addressing potentially negative effects that may result from its use.

Adoption challenges. Cost is a major challenge that serves as an impediment in the adoption of courtroom technology (Lederer, 2010). According to Lederer, concerns about additional costs required to set up various courtroom technologies inhibits

widespread use. Although past improvements to hardware have resulted in cost reductions, cost is still an issue with regards to who pays for the installation of courtroom technologies. For inquiries and commissions, the cost of setting up an electronic courtroom is funded by specific governmental allocations. Most high-technology facilities are expensive to install, which can present challenges for courtrooms that are not well funded or supported. Policymakers may influence resource allocation to courtrooms to ensure that they are equipped with the latest technologies (Lederer, 2010).

Another challenge to the implementation of courtroom technology is cultural change (Dixon, 2012). The successful use of courtroom technology requires a commitment from various members of a legal team. Good communication and close liaisons between law firms and courts is a common theme in the recent discussions of courtroom IT. Unwillingness to use the technology and a lack of familiarity can affect the use of courtroom technology. Differences exist in individual's willingness and enthusiasm to adopt and use the technology. As noted in the theory of planned behavior, attorneys, judges, and other court users are likely to adopt new IT when they believe they control the implementation process (Dixon, 2012).

Training is a large obstacle to courtroom technology use (Dixon, 2012). Dixon reported that when a council uses vendors or assistants to run technological equipment, attorneys must possess sufficient understanding of the technology. Similarly, judges must know what can be done with the technology, how to use it, and what its limitations are. Therefore, hands-on instruction is essential. An increasing number of law schools provide classes on technology-based trial instruction; however, they are still scarce (Wiggin et al.,

2003). Modern trial advocates should have an expansive understanding of the available technological modalities. This should include an understanding of evidence presentations and the potential use of reporter-based technologies for real-time recording of components.

According to Wiggin et al. (2003), the Texas Office of the Attorney General has undertaken measures to ensure that attorneys receive technology-augmented trial practice instructions. This is one approach that can be taken to address the challenges associated with courtroom technology integration. Nonetheless, the degree to which courts may provide training assistance to local bars is debatable.

Many individuals that use high-tech courtrooms implicitly agree that they are familiar with and oriented to its requirements (Wiggin et al., 2003). Wiggins et al. noted that courts supply bars with information about the equipment and opportunities to visit the courtrooms on-site, when they are not being used. Some courts conduct periodic familiarization sessions, while others carry out ad hoc case-specific meetings. Most of these sessions tend to be equipment-specific. Demonstration and lecture sessions, as opposed to detailed hands-on training, are usually the routine. Wiggin et al. reported that it is highly unlikely for attorneys to have access to legal technologies for comprehensive trial presentation.

In view of these educational challenges, human resource personnel are often trained in the development or hiring of courtroom technologists (Wiggins et al., 2003). However, these courtroom technologists are often scarce and unavailable (Wiggin et al., 2003). Some courts have technically trained bailiffs and deputy clerks. The senior

courtroom managers are less likely to be courtroom technologists; however, they play a crucial role in resource allocations and technology prioritization because they also advise judges on related decisions.

Future trends in courtroom technology. The future will see more courtrooms adopt technology that can make it easy for witnesses to present their statements or testimony/evidence. Witness monitors and annotation monitors will be more useful. Annotation monitors help witnesses mark exhibits with notations that can be stored for later viewing/usage (Dixon, 2012). Witness monitors allow witnesses to make marks on displayed images electronically. Integrated controllers will also be implemented to help with sourcing audio and video so that images and data can be presented at the appropriate time (Dixon, 2012). Technology for remote witness testimony and video conferencing is also in high demand to assist in faster execution of processes and activities.

The other future technology that is quite important is the virtual reality technology that is used in modern trials. This virtual reality technology is important in assisting courtrooms to recreate past events or simulate circumstances. This can help collaborate witness statements and develop new insights. In future, virtual reality technology will be quite important in courtrooms as professionals seek solutions that can help simulate events and generate new ideas or evidence. E-trial software systems will also be quite important to ease operations (Amani & Theodoros, 2011). Trial by modern devices such as smart phones and tablets is the other next generation technology that is likely to be quite useful in courtrooms (Graham et al., 2012). Technology developers and scientists are also pursuing new technology that can help prove innocence or guilt. An example

technology in this area is brain-imaging technology that can determine innocence or guilt. Lewis (2013), noted that in future, brain scans will be used to determine whether an accused person is guilty or innocent.

Summary and Conclusions

U.S. courtrooms have long been defenders of decorum; however, courts' resistance to change has been continuously challenged by technological revolutions. Therefore, the increasing use of technology in society has prompted courtrooms to incorporate some forms of technology. Courts have always used some form of technology, many of which are now considered obsolete. In the past, available technologies include laptops, evidence cameras, computers, electronic whiteboards, and digital projectors (Bermant, 2005). Currently, more lucrative and sophisticated technology is being used. Technology such as digital court reporting, video conferencing systems, evidence presentation systems, and real-time court reporting is already being used (Virginia, 2014). These devices have revolutionized application of the law within the judicial system.

The theories and concepts with related to technology adoption, diffusion, and acceptance are imperative for investigating the use of courtroom technology. The TAM has been applied to predict how organizations accept and adopt technology (Davis et al., 1989). Rogers's DOI focused on how ideas spread to different parts of organizations and society; therefore, this theory is relevant in explaining the spread of courtroom technology. While some attorneys and judges are positively inclined to integrate courtroom technologies, significant proportions are wary of the adoption of courtroom IT

(National Center for State Courts, 2011). This may be due to numerous social, legal, economic, and technological challenges, such as costs, lack of technology education, and negative beliefs and perceptions. These factors may hinder the adoption of courtroom technology.

Chapter 3 includes a discussion of the research design and rationale, the role of the researcher, methodology, issues of trustworthiness, and summary. A detailed discussion of study results is located in Chapter 4. Finally, I provide an in-depth presentation of the research implications in Chapter 5.

Chapter 3: Research Method

The purpose of this phenomenological research study was to explore and describe the experiences of attorneys and judges in the State of Virginia with regard to some of the factors that contribute to the limited use of IT in state courtrooms. The increasing use of technology in society has prompted the judicial system to introduce strategies that facilitate using these devices within the courtroom. Today, courts have gradually introduced various forms of IT into courtrooms. Although the judicial system is traditionally conservative, legal professionals working in it may benefit from applying various aspects of technology in courtrooms. The introduction of IT has improved the delivery of services and cost effectiveness of various organizations; however, a gap in in the adoption of technology in the legal environment persists.

I collected data for this phenomenological research study through semistructured in-depth, face-to-face and telephone interviews with 11 judges and 11 attorneys in the State of Virginia. I interviewed participants living within a few miles of me face-to-face, whereas I interviewed those farther away by telephone. I transcribed the in-depth interviews and coded the transcripts and analyzed the data using NVivo software to discover themes or patterns in the data. I conducted the study within parameters specified by Walden University's institutional review board (IRB) to ensure the ethical protection of all research participants. This chapter includes a description of the research design and rationale, role of the researcher, methodology, issues of trustworthiness, and a summary.

Research Design and Rationale

This section is organized with following subsections: research question and phenomenological research design rationale.

Research Question

To explore and describe the lived experiences of 11 judges and 11 attorneys in the State of Virginia regarding some factors that contribute to the limited use of IT in U.S. courtrooms, I addressed one central research question. What are the experiences of attorneys and judges in the State of Virginia with regard to some of the factors that contribute to the limited use of IT in state courtrooms?

Phenomenological Research Design Rationale

I considered mixed methods for the research approach but did not choose that method because it requires various views as a practical and natural approach to research. Multiple methods provide construct validity, as well as internal and external validity, while allowing complex issues to be examined using the respondents' language (Guest, MacQueen, & Namey, 2012). Using mixed-methods research may help researchers make better interpretations of the data because the information provided is measurable and analyzed through rich description (Patton, 2014). However, a mixed-methods approach is not needed to answer this study's research question. In addition, a study involving both qualitative and quantitative methods is large, time consuming, and costly, making it an undesirable approach for this study.

I used a quantitative method for this research because individuals' subjective behaviors, beliefs, and opinions cannot be measured with standardized instruments. If a

research problem calls for (a) the identification of factors that influence an outcome; (b) the utility of an intervention; or (c) understanding the best of outcomes, then a quantitative approach is best (Patton, 2014). A quantitative method is also the best approach for testing theories or explanations (Patton, 2014).

I applied a qualitative research method in the study because it allowed me to develop a rich, complex, and holistic understanding of the research problem. In addition, it allowed me to carry out an inquiry process for exploring the research problem within natural surroundings. Using a qualitative research method, an investigator seeks to demonstrate how individuals make meaning of the world and how they perceive different events. Moreover, a qualitative method approach allows investigators some degree of flexibility when researching complex issues in which a relationship of trust is needed between participants and researchers. A qualitative research method tackles human experiences and the transferability of information in validating the findings (Patton, 2014).

I considered ethnography, narrative research, grounded theory, and case study designs for research, but I decline each for specific reasons. First, ethnographic research takes a longer period to produce reliable and thorough results. Next, narrative research was inappropriate because the data collected from attorneys and judges were not stories of life events. Further, the subjectivity of data in grounded theory can make it difficult for researchers to establish the validity and reliability of approaches. Last, I did not choose the case study design because I wanted to focus on the lived experiences of attorneys and judges on a more collective level.

In view of these issues, I selected a phenomenological research design for this research. Phenomenological research uses individuals' lived experiences to obtain rich descriptions of their reactions to an event or phenomenon. These descriptions are the basis for a reflective analysis that helps the researcher understand the essence of participants' experiences (Vagle, 2014). In phenomenology, beliefs and perceptions are part of knowledge (Vagle, 2014) and the role of research is to arrive at the essence of the experience or to grasp an understanding of the participants' "perceptions, perspectives, and understandings of an event that occurred in their lives" (Leedy & Ormrod, 2010, p. 144).

The rationale for this study approach was to allow multiple facets of the issue to be understood and revealed by the investigator (Patton, 2014). In addition, a phenomenological research design provided me with an understanding of the perceptions with regard to courtroom technology among individuals who worked in the legal system. Roger's (2003) DOI theory and the Davis et al. TAM underlay the attitudes of individuals. The phenomenological research design adopted for this study provided holistic information regarding the behaviors, beliefs, and experiences of trial attorneys and judges.

Role of the Researcher

I served as a participant-observer during the in-depth interviews of this phenomenological research study. As a result, I had direct contact with participants because I recruited them through telephone calls, emails, and face-to-face conversations. In addition, I collected in-depth interview data, which was later transcribed, coded,

analyzed, and interpreted. No personal or professional relationships existed between the research participants and myself. Furthermore, I did not have any bias against the potential research participants. I treated all participants with respect and protected them from exploitation. I ensured that the selection of participants was not based on a desire to prove a personal objective. I considered all participants' viewpoints and assured no conflicts of interest existed. After the study was completed, a summary report of the research findings was emailed to each participant.

Methodology

This section is organized in the following subsections: participant selection and sampling strategy, instrumentation and data collection, pilot study, procedures for main study, and data analysis plan.

Participant Selection and Sampling Strategy

Using snowball sampling, which is a subset of purposive sampling (University of California, Davis, 2014), 11 judges and 11 attorneys from the State of Virginia, were recruited to participant in the study. For phenomenological studies, Morse (1994) suggested at least six participants, whereas Klenke (2008) reported that the sample size might range from two to 25. Mason (2010) noted that the sample sizes of qualitative investigations are normally small in comparison with quantitative studies. Therefore, I planned to interview 22 participants for this study or until data saturation occurred.

Potential participants known to meet the selection criteria of being male or female attorneys and judges practicing in the State of Virginia were initially contacted through phone calls, emails, and face-to-face conversations. Each prospective participant was

given a study invitation letter and asked to recommend other judges or attorneys who met selection criteria and who might be willing to take part in the study (see Appendix B). Using the recommendations provided by potential participants, additional participants were sent invitations to participate and recommendation requests. Thus, a snowball sampling technique was used until the planned number of 22 participants was reached or until data saturation occurred.

Instrumentation and Data Collection

In-depth semistructured, face-to-face and telephone interviews served as the main data collection instrument for this study. These interviews allowed me to obtain the experiences of attorneys and judges in the State of Virginia with regard to some of the factors that contributed to the limited use of IT in state courtrooms. Participants living within a few miles of me were interviewed face-to-face, while others were interviewed by telephone. I designed the interview protocol to answer the central research question and to foster open and honest communication between with the participants (see Appendix A).

All interview questions were open-ended to provide a deep exploration of the topic. Participants were able to provide detailed information with this interview format, and I able to dig deeper to gain a better understanding of the concepts under investigation (Turner, 2010). The importance of this type of interview question becomes clear when compared to the closed-ended questions, which only allow for a simple, often single-word, ‘‘yes’’ or ‘‘no’’ response.

Pilot Study

Prior to the main study, a pilot study was conducted to test the interview protocol and minimize errors or confusion during the interview process. The results of the pilot study also helped establish internal consistency for the data analysis technique. Pilot studies help researchers determine the time needed to conduct the interviews and the feasibility of the research (Denzin & Lincoln, 2011). I selected an attorney and a judge who resided within a few miles of me to participate in the pilot study; therefore, I conducted in-depth, face-to-face semistructured interviews with two participants to test the instructions and questions.

Procedures for Recruitment

I completed Human Research Protections training with the National Institutes of Health (NIH) Office of Extramural Research (2013) prior to data collection. In addition, I complied with all federal and state regulations, which included informing participants of the study's level of confidentiality. After receiving study approval from Walden University's IRB, I conducted the pilot study and made necessary changes to the interview protocol. After completing the pilot study, I began the main study.

To begin the snowball sampling process, potential participants known to meet the study's selection criteria were initially contacted through phone calls, emails, and face-to-face conversations. I provided each prospect with an invitation letter to participate in the study and asked them to recommend other judges or attorneys who met selection criteria and might be willing to participate (see Appendix B). Using the recommendations provided by potential participants, I recruited additional participants by sending them the

invitation to participate and recommendation request until the planned number of 22 participants was reached or until data saturation occurred. In order to prevent perceived coercion to participate due to any existing or expected relationship between the participants and myself, I did not include anyone that I had a personal or professional relationship within the study.

Once I received email responses to the questions included in the study invitation and recommendation request letters from the attorneys and judges who may have been interested in participating, I emailed each prospective participant a consent form that had my electronic signature and request for their consent (see Appendix B). Prospects indicated their consent by replying *I consent* to the email. Participants were informed that they could ask questions about the study by email or phone before signing the consent form. As I received the consent forms, each participant was contacted by phone or email to set-up interview appointments at times that were convenient for them. Participants living within a few miles of me were interviewed face-to-face, while others were interviewed by telephone.

Prior to the interviews, each participant was given a $5.00 Dunkin Donuts gift card as a thank you gift. This was done such that participants could feel free to withdraw from the study at any time without feeling obligated or coerced to participate in order to receive the gift card at the end. Each interview was audio-recorded and took approximately 45 minutes to complete (see Appendix C for interview questions). Before interviews concluded, I discussed the member checking process with participants and

asked *whether* they had any questions or concerns. After addressing any questions or concerns, the interviews were concluded and participants were thanked for participating.

After the interviews were transcribed, I emailed all participants the interview transcript and asked them to review the transcript for accuracy. This is called member checking, which is a quality control process to ensure that the accuracy, credibility, and validity of what was recorded during the interviews (Harper & Cole, 2012). I discussed the participants' feedback with them via telephone or email correspondence. The member checking process took approximately 25 minutes. A summary report of the research findings were emailed to participants upon study completion. Data were kept secure in a locked file cabinet and on a password-protected computer to which only I had access. Data will be kept for a period of at least 5 years, as required by Walden University. After that period, it will be destroyed.

Data Analysis Plan

I conducted a thematic analysis on the 22 participant interviews. The in-depth, semistructured interviews used open-ended questions to guide me in gathering the needed information and ensure that new meanings and ideas emerged from the responses. I employed a computer software program, NVivo, which aided me when coding participant responses. The coding process followed a prespecified protocol based upon terms such as *courtroom technology*, *training*, *ease of use*, *implementation*, *usefulness*, *limited use*, and *recommendations*. Next, I proceeded to the data analysis portion, which followed the method of thematic analysis.

Thematic analysis presents data in a highly organized and detailed manner while connecting findings to general subjects through researcher interpretations and extraction of meanings (Guest, MacQueen, & Namey, 2012). The goal of thematic analysis is to uncover themes that are alive in the data (Van Manen, 2014). These characteristics allowed me to explore the experiences of the participants as attorneys and judges, and discover new meanings and knowledge about their experiences with courtroom technology. Next, I followed the Guest et al. (2012) six steps of thematic analysis to provide further evidence of trustworthiness. Guest et al. explained and presented the following steps modified to properly fit this research study's methodology: "(a) Step 1. Coding of material, (b) Step 2. Identifying of themes, (c) Step 3. Constructing of thematic, (d) Step 4. Described and explored thematic networks or groups, (e) Step 5. Summarized thematic networks or groups, and (f) Step 6. Interpreted the patterns" (p. 35). See Appendix D for details.

Issues of Trustworthiness

This section is organized in the following subsections: credibility, transferability, dependability, confirmability, informed consent, and ethical considerations.

Credibility

Ensuring credibility is one of most important factors when establishing trustworthiness (Trochim & Donnelly, 2006). Several strategies were used during this study to establish credibility. First, credibility was established through the use of member checking, which was described by Trochim and Donnelly as the single most important provision that can be made to bolster the credibility of a study. I emailed all participants

the transcript from their interview and asked them to review it for accuracy. This is called member checking, which is a quality control process to ensure the accuracy, credibility, and validity of what is recorded during interviews (Harper & Cole, 2012). I contacted all participants by telephone and email to discuss their feedback.

There are different methods of ensuring credibility in concerts compensates for individual limitations and exploits respective benefits (Guest et al., 2012). Credibility is judged by the extent to which the study process seems to accurately and fairly represent the data collected. All participants' views were fairly represented.

Transferability

Readers were presented with a thick description of the phenomenon under investigation such that they may be able to duplicate the study. It is the responsibility of the researcher to ensure that sufficient contextual information about the fieldwork site is provided to enable the reader to make such a transfer (Trochim & Donnelly, 2006). Detailed descriptions provided readers with insight into the actual details of the investigation; therefore, knowledge sharing is important. A major drawback of transferability is that the findings in qualitative research are only applicable to small populations of individuals within a particular environment, which makes such finding from studies impossible to duplicate. However, Guest et al. (2012) suggested that each case is an example within a broader group, and although it is unique, the prospect of transferability should not be immediately rejected.

Dependability

In establishing trustworthiness, dependability is described and justified for use within the context of this phenomenological study (Guest et al., 2012). To ensure that future researchers can repeat the study, details of the observations, interviews, and interpretations of findings were clearly documented. This created audit trails, which "consist of a thorough collection of documentation regarding all aspects of the research" (Rogers, 2003, p. 43). The audio-recorded interviews and the transcriptions of those interviews can be authenticated by comparing the two forms of data.

Confirmability

A key criterion for confirmability is the extent to which researchers admit their own predispositions (Trochim & Donnelly, 2006). In this study, confirmability was established through reflexivity, which requires the researcher to disclose any biases, values, and experiences related to the research topic (Patton, 2014). A reader can follow a study's audit trail to determine if the researcher's conclusions, interpretations, and recommendations of the study can be traced step-by-step. Other strategies for enhancing confirmability include the following: (a) continuously checking the write-up of field notes; (b) presenting an in-depth methodological description; (c) using diagrams to demonstrate audit trails through a data-oriented approach; and (d) applying reflexivity (Patton, 2014). Tracy (2013) reported that knowledge cannot be separated from the knower and that researchers must be aware of the effects they have on the processes and outcomes of a study.

Informed Consent and Ethical Considerations

I completed the NIH Office of Extramural Research (2013) Human Research Protections training prior to data collection. In addition, I complied with all federal and state regulations, which included informing participants of levels of confidentiality in the study. The study was conducted in accordance with Walden University's IRB (12-01-14-0052063) parameters to ensure the ethical protection of research participants.

Prior to data collection, all participants were emailed a consent form in order to obtain consent to participate in the study (see Appendix C). The consent form outlined participants' protections and ethical guidelines followed during the research study. Participants were informed of the potential benefits and risks associated with study participation. In addition, participants were informed that participation was voluntary and they could withdraw from the study at any time.

Further, I informed participants that their identities would be kept confidential and any identifying information would be excluded from all study reports. Maintaining the confidentiality of participants in a qualitative study while presenting rich accounts of their lives is essential (Denzin & Lincoln, 2011). Maintaining the confidentiality of data gathered from study participants means that only I was able to identify individual responses. I took the necessary steps to prevent participants' identities from being linked to the individual responses, which included removing all identifiable data and numbering or coding the interviews to match the participants.

Participation was unlikely to arouse any acute discomfort because participants were not obligated to answer any questions with which they were uncomfortable, and

were permitted to stop at any point during interviews. Participation in this study did not pose a risk to individual safety or wellbeing. Participants were informed that the interviews would be audio-recorded and that a verbatim transcription would be created for data analysis. All audio-recorded data was kept secure and transcribed by me. Only my supervising committee members had access to the data.

All data from this study will be kept in a locked file cabinet and on a password-protected computer at my residence for at least 5 years, as required by Walden University. After that time, all data will be destroyed. I am the only individual with access to data stored in my private office. Participants were provided with contact information for both my dissertation committee chair and me in the event they had any additional questions or concerns about the research. I also provided all participants with the contact information of a Walden University representative, with whom they could discuss their participant rights in private. After the study was complete, a summary report of the research findings was emailed to each participant.

Summary

The purpose of this phenomenological research study was to explore and describe the experiences of attorneys and judges in the State of Virginia with regard to some of the factors that contribute to the limited use of IT in state courtrooms. In-depth, semistructured interviews were conducted. All interviews were audio-recorded and transcribed. Once interviews were complete, transcriptions were analyzed for themes and codes with the assistance of NVivo software.

Potential participants who are known to meet the selection criteria of being male or female judges or attorneys from the State of Virginia were initially contacted via phone calls, emails, and face-to-face conversations. Each prospective participant was given or sent a participant invitation letter and asked to recommend other judges or attorneys who might be willing to participate and who met the study's inclusion criteria (see Appendix B). Using the recommendations provided by potential participants, additional participants were recruited by invitation to participate and recommendation request. This was repeated until the planned number of 22 participants was reached.

All audio-recorded data remained secure, and only my dissertation supervising committee and myself had access to it. All data was secured in a locked file cabinet and on a password-protected computer. As required by Walden University, data will be kept for a period of at least 5 years. I provided participants with contact information for my Dissertation Committee Chair and myself in the event they had further questions or concerns about the research. Participants were also provided with the contact information of a Walden University representative with whom they could discuss their participant rights. After the study was completed, I emailed a summary report of the research findings to each participant.

In Chapter 4, I also includes a description of the study setting, demographics, data collection, data analysis, evidence of trustworthiness, results, and summary. In Chapter 5, I include an interpretation of the findings, limitations of the study, recommendations, implications, and conclusion.

Chapter 4: Results

The purpose of this qualitative phenomenological research study was to explore and describe the lived experiences of attorneys and judges in the State of Virginia with regard to some of the factors that contribute to the limited use of IT in state courtrooms. The research question that guided this study was: What are the lived experiences of attorneys and judges in the State of Virginia about with regard to of the factors that contribute to the limited use of IT in state courtrooms? This chapter is organized by the following topics: pilot study, research setting, demographics, data collection, data analysis, evidence of trustworthiness, results, and summary.

Pilot Study

I conducted a pilot study before the main study to test the interview protocol and to minimize errors, bias, or confusion during participant interviews. Further the results of the pilot study helped establish the internal consistency of the study's data analysis technique. A judge and an attorney who resided within a few miles of my residence were selected to participate in the pilot study. Thus, their close proximity permitted in-depth, face-to-face semistructured interviews. Results from the pilot study indicated that the interview protocol's instructions and questions were clear and free from bias; thus, no changes were required.

Research Setting

The research setting of this study was the State of Virginia, which involved interviewing attorneys and judges to gain information with regard to some of the factors that contributed to the limited use of IT in state courtrooms. I selected the state of

Virginia as the research setting because one of the counties in Virginia is one of the few counties with a fully outfitted, high-tech courtroom through its newly installed courtroom technology management system (CTMS). These technological developments in this particular county's courtrooms created the availability of various courtroom technologies, including as microphones, touch panel displays, laptop interfaces, flat screen displays, interpreting headsets, and evidence sources.

Demographics

The sample for this study consisted of 22 participants, 11 attorneys and 11 judges. Among the sample of attorneys, three were women and eight were men. Three of the attorneys were older than 60 years, three were aged between 50 and 60 years, three were aged between 40 and 49 years, one was aged between 30 and 39 years, and two were aged between 20 and 29 years. Among the sample of judges, two were women and nine were men. Eight of the judges were older than 60 years and three were aged between 50 and 59 years.

Data Collection

In-depth, face-to-face, and telephone semistructured interviews served as the main data collection means for this study. Participants living within a few miles of my residence were interviewed face-to-face, whereas others outside of this range were interviewed by telephone. The questions were designed to answer the central research question and to foster open and honest communication between the participants and myself. The interview questions (see Appendix A) were open ended to provide a deep exploration of the topic.

Data Analysis

I used thematic analysis to analyze the data I collected from 22 participants, including 11 attorneys and 11 judges. The thematic analysis process used in this study was based on Guest, MacQueen, and Namey's (2012) methodology, with some modifications to fit this specific research study's methodology. The first stage was the reduction or breakdown of text, which involved the coding of material, the identification of themes, and the construction of thematic networks. I used a computer software program, NVivo, to store and organize the open-ended data collected from the participants. The coding process was based on a predetermined set of thematic categories such as courtroom technology, training, ease of use, implementation, usefulness, limited use, and recommendations. These thematic categories served as the bases for the manual coding of the data.

For the identification of themes, I generated, refined, and edited abstracted themes from coded text segments. For the construction of thematic networks, I arranged the themes to determine the essential perceptions of the participants, based on the themes with the highest responses and the codes as the ones that followed. I illustrated, verified, and refined these thematic networks of categories, codes, and themes. The second stage was the analysis stage, wherein I further explored the text by describing and summarizing the thematic networks or groups that were generated. The last stage of the analysis was the integration of the data, wherein I interpreted data for patterns.

Evidence of Trustworthiness

To establish credibility, the interview transcripts were reviewed by emailing participants and asking them to review the transcripts for accuracy. The participants' feedback was discussed with them via telephone and email correspondence. I used triangulation to establish credibility in this study through the inclusion of attorneys and judges to accurately and fairly represent the views of different participants regarding courtroom technologies. Finally, a peer review of the research project by academic professionals and colleagues provided new perspectives and assumptions, which also strengthened the credibility of the study.

To establish transferability, I generated thick descriptions of the phenomenon under investigation to allow other researchers to duplicate this study. Sufficient contextual information about the fieldwork site was provided to enable the reader to make such a transfer. Detailed descriptions provided readers with an insight of the actual situations that were investigated. However, transferability beyond the scope of the present study is not possible due to the study's small sample size, a nonrandom sampling technique, and the focus on a single county.

To establish dependability, detailed observations, interviews, and interpretations of finding were clearly documented. Therefore, audit trails were used to generate detailed documentation of all the research components. Comparing the two forms of data authenticated the audio-recorded interviews and transcriptions of those interviews. Based on the comparison of the recorded data and the transcripts, it was found that the transcripts were an accurate documentation of participants' interview responses. Every

part of the interviews recordings was clear and audible, which resulted in complete transcription process of for all the interviews without any missing information.

Finally, confirmability was established through the use of reflexivity in which I disclosed any biases, values, and experiences in relation to the research topic. An audit trail was made to determine if the conclusions, interpretations, and recommendations of the study could be traced step-by-step. Other strategies that enhanced confirmability included continuously checking write-ups of field notes, presenting an in-depth methodology description, and using diagrams to demonstrate audit trails through the data-oriented approach. Audit trails were documented by assigning unique codes for each participant to protect each participant's identity and to link the transcript to the data analysis and data presentation in this chapter.

Research Results

This section contains the results of the data analysis. The results are organized based on the seven themes that emerged from the data. The presentation of results includes tables and direct quotes from the participant responses. Discrepant cases will are discussed to provide a more complete representation of the data.

Theme 1: Courtroom Technologies

The first theme that emerged from the data was that presentation software (15 of 22 participants, 68%), videos (10 of 22 participants, 45%), overhead/digital projectors (9 of 22 participants, 41%), and evidence cameras (7 of 22 participants, 41%) were the most often used courtroom technologies reported by participating attorneys and judges in

Virginia. Only one participant reported not using courtroom technologies. Table 1 includes the complete coding results for the thematic category, courtroom technology.

Table 1

Courtroom Technology

Technology	No. of participants to offer this experience	% of participants to offer this experience
Presentation software	15	68%
Video	10	45%
Overhead/digital projector	9	41%
Evidence/document cameras	7	32%
Audio system	4	18%
Video conference	4	18%
Integrated lectern/Easels	2	9%
TrialDirector	2	9%
Simulations	2	9%
Real time transcription	2	9%
System controls	1	5%
Electronic whiteboard	1	5%
Real time court reporting	1	5%
None	1	5%

Theme 2: Training

The second theme that emerged from the data was that most attorneys and judges did not receive training on the use of courtroom technologies (12 of 22 participants, 55%). However, four participants (18%) reported receiving in-house training, whereas as three participants (14%) reported receiving training on courtroom technologies in law school. Table 2 shows the complete coding results for the thematic category, training.

Table 2

Training

Type of training	No. of participants to offer this experience	% of participants to offer this experience
No training	12	55%
In-house training	4	18%
Technology training in law school	3	14%
Trained other people	1	5%
Little training	1	5%
Seminars	1	5%

Most of the participants reported not receiving any kind of training regarding the use of courtroom technologies. For instance, Participant 9 said: "I have not had any training for using courtroom technology. I'm not sure where to receive formal or standardized training for courtroom usage." Participant 12 believed that basic understanding of technology is necessary, but reported not being exposed to any type of training involving courtroom technologies: "I believe everyone in the courtroom that will be using the technology needs a basic understanding of how it works, nothing beyond. No, I have not received any training." Participant 18 also did not receive any training, relying instead on IT support: "I have not had any training because the technical staff is available to set up equipment or attorney will bring their own technical people."

Some participants reported receiving basic training in-house. For example, Participant 8 shared: "Yes, I have received training on how to present evidence from an iPad." Participant 19 spoke about receiving some training from the IT personnel: "The IT team showed me some basic troubleshooting skills that I should have for my trials, otherwise, no other training formal or informal." Similarly, Participant 21 shared: "I've

received one hour of legal education lecture/demonstration of possible uses of web-based or other digital presentations of evidence."

Other participants reported receiving training regarding the use of courtroom technologies from law school. Participant 3 shared: "Yes, receive training from the College of William and Mary when I was a law student." Participant 1 believed that law schools are beginning to integrate courtroom technologies in the curriculum of students:

> I believe that more and more law schools are training their students to have a comfort level with technology. I was lucky enough to have a visionary program at the law school that I attended. As a result, I was able to receive technology training even though it's been more than 10 years since I've graduated.

Theme 3: Ease of Use

The third theme that emerged from the data was that most attorneys and judges believed that basic courtroom technologies are easy to use (12 of 22 participants, 55%). However, three participants (14%) reported that the level of ease of use could be dependent on the assistance of IT. Other participants believed that courtroom technologies require some level of practice (9%) or extensive training (2%). Table 3 displays the complete coding results for the thematic category, ease of use.

Table 3

Thematic Category: Ease of Use

Experience of usage	No. of participants to offer this experience	% of participants to offer this experience
Simple to use	12	55%
Depends on assistance of IT	3	14%
Needs practice/testing	2	9%
Depends on infrastructure	2	9%
Needs extensive training	2	9%
Depends on the user	1	5%
Needs a lot of preparation	1	5%
No response	1	5%

Most of the participants believed that basic courtroom technologies are relatively easy to use. Participant #21 shared: "My experience with video recording was not hard to learn and relatively easy to use." Participant #16 concurred with this perception: "The various technologies used in the courtrooms by the attorneys appear to be easy to use." Participant #1 believed that courtroom technologies are easy to use, but wondered if training contributed to this experience: "I have found most court technology fairly simple to use. However, I have more than average experience and training in that regard." Similarly, Participant #5 also believed that courtroom technologies can be easy to use with training and practice: "I have found that with sufficient training, the technology is generally fairly easy to use. But it does require practice to make it a flawless presentation." Participant #19 explained how other attorneys and judged can be threatened by technologies, but found that they are relatively easy to use:

> I think there is a natural fear to using technology when it has to be used in conjunction to your performance. Overall, I find that most technology is easy to

use. When and how to apply it in the courtroom is difficult for most attorneys and judges.

Other participants indicated that IT professionals make courtroom technologies easy to use: “In some places, there are paid support and IT staff that will assist in connecting all technology or your preferred technology that makes it easy to use.” Other participants believed that the use of courtroom technologies required practice or extensive training. For example, Participant #8 believed that extensive training is needed to use courtroom technologies: “I think courtroom technology could be easy to use if attorneys were provided with extensive professional training and not just by in-house staff.”

Theme 4: Implementation

The fourth theme that emerged from the data was that most attorneys and judges thought the use of courtroom technologies should continue to expand (10 of 22 participants, 45%). Four participants (18%) believed that the implementation or integration of courtroom technologies needed to be appropriate. However, three participants believed that courtroom technologies should not be used extensively (14%). Table 4 shows the complete coding results for the thematic category, implementation.

Table 4

Thematic Category: Implementation

Implementation	No. of participants to offer this experience	% of participants to offer this experience
Use of courtroom technology should expand	10	45%
Needs to be appropriate/helpful	4	18%
Should not be used extensively	3	14%
Not often used	2	9%
Should be optional	2	9%

Most attorneys and judges perceived that the use of courtroom technologies should continue to expand. For example, Participant #19 said, "I think courtrooms should invest in courtroom technology so all clients can have access to technology at trials. The cost should be the responsibility of the state not the individual client." Participant #22 explained that the expansion of courtroom technologies is unavoidable: "It is unavoidable; I think jurors expect and appreciate being able to see exhibits and deposition transcripts as they are referred to during the trial." Participant # 1 also spoke about how the use of courtroom technologies continues to expand:

> I think the situation is improving. I think the next frontier for technology and law is in e-discovery or the discovery of electronically stored information (for instance, information stored in the cloud or on mobile devices). That is changing the nature of how civil law is practiced.

Participant #3 also spoke about the emergence of the digital age: "I think that it is crucially important, the rest of the world has gone digital and courtrooms have a lot of work to do to catch up and keep pace."

Some participants believed that the implementation or integration of courtroom technologies needed to be appropriate. Specifically, Participant #5 said, “I think it is a good idea as long as the technology is proven to work correctly almost all the time, and is more helpful than distracting.” Participant #6 also spoke about the need for appropriate implementation of technologies in courtrooms: “As long as it helps juries get a better understanding of the evidence, it is a positive idea.” Participant #7 added: “I support technology, as long as the devices do not overwhelm the fact-finder and generate the impression.”

A few participants believed that courtroom technologies should not be used extensively. Participant #12 said, “I don't think we need that much of it.” Participant #21 explained, “It is important to have technology in the courtrooms; however, many courtrooms that I've worked in does not always have any technology. But more importantly, technology should not overwhelm the facts with technical dressing.”

Theme 5: Usefulness

The fifth theme that emerged from the data was that most attorneys and judges thought that courtroom technologies are useful when properly implemented (11 of 22 participants, 50%). Six participants (27%) believed that courtroom technologies save time, whereas five participants (23%) believed that courtroom technologies save costs. Another use of courtroom technologies that emerged from the data was that they help the jury understand the case (23%). Table 5 shows the complete coding results for the thematic category, usefulness.

Table 5

Thematic Category: Usefulness

Usefulness of technologies	No. of participants to offer this experience	% of participants to offer this experience
Useful when properly implemented	11	50%
Saves time	6	27%
Saves cost	5	23%
Helps juror understand the case	5	23%
Needs proper training	4	18%
Increases security	1	5%

Most attorneys and judges thought that courtroom technologies are useful when properly implemented. Participant #2 said, "I think it can be extremely useful when used effectively." Participant #16 explained, "It can be good or bad, depending upon the ease of use and whether it helps the trier of fact to understand something." Participant #4 provided details on how courtroom technologies can be useful:

> I believe extremely useful: I believe courtroom technology aides in the use of demonstrative evidence, which in my opinion brings to life, conflicts. Jurors often try to make the best of testimony but have little basis outside of what someone is saying. Courtroom technology can aid the ease and expansion of the kind of video or audio evidence available to a trier of fact, it could also assist attorneys and judges in communicating with necessary third parties outside of the courtroom

Participant #5 also spoke about the importance of the proper use of courtroom technologies: "I think it is a useful tool, but can be distracting if relied upon too heavily by the attorney. It should be complementary, but not overbearing."

Some participants believed that courtroom technologies save time. Participant #19 said, “I think most technology is useful. Technology, if used correctly, saves time and money and it improves efficiencies.” Participant #7 also spoke about courtroom technologies being efficient: “The main function should be to simplify and to abbreviate the presentation of evidence.”

Other participants believed that courtroom technologies save costs. Participant # 22 said, “Some technology could be useful as it saves time, money, and aid in the jurors overall understanding of the materials presented to them.” Participant #3 also spoke about saving cost as a result if using courtroom technologies: “It’s extremely important for courtrooms to incorporate technology into the courtroom because it saves time and money and in criminal trials it enables jurors to understand the case.”

Theme 6: Limited Use

The sixth theme that emerged from the data was that attorneys and judges believed costs (10 of 22 participants, 45%) and lack of acceptance (8 of participants, 35%) were responsible for the limited use of courtroom technologies. Table 6 shows the complete coding results for the thematic category, limited use.

Table 6

Thematic Category: Limited Use

Reasons for limited use of technologies	No. of participants to offer this experience	% of participants to offer this experience
Cost	10	45%
Resistance to change/lack of acceptance	8	36%
Lack of training	3	14%
Lack of support	2	9%
Lack of infrastructure	1	5%
Slow adoption of technology	1	5%
No response	1	5%
Malfunctioning of equipment	1	5%
None	1	5%
Jury might find complicated	1	5%
Slow	1	5%

Attorneys and judges considered cost the main reason for the limited use of courtroom technologies. Participant #12 said: "Courtrooms experiences the limited use of technology because of the cost involved with such a venture. Courtrooms have to find ways to absorb the cost without raising taxes." Participant #1 spoke about why costs limit the use of courtroom technologies:

> States need to find a way to fund technology use in the courtroom that doesn't not require much taxpayer money or much involvement by state government bureaucracy. A few courts are funded by the local bar, which allows local attorneys to have more direct input into the design of the system that they will be using.

Participant #15 said, “Cost is the major factor when it comes down to implementing technology in courts.” Participant #13 also spoke about how cost played a major role on why courtroom technologies are not widely used:

> Budget constraints are the biggest factor contributing to the limited us of information technology. I would love to introduce more technology into my courtroom; however, our county is small and our budget is small. If I could find a way without it raising taxes, I would be all for it.

Participant #19 spoke about cost and resistance to embrace new technologies as factors contributing to the limited use of courtroom technologies in Virginia: “Resistance to change by many judges that I know, but budget constraints is probably the biggest hurdle that state courts have to overcome and resolve before all courts can have the High Tech court experience.”

Many participants also thought that a lack of acceptance among attorneys and judges contributed to the limited use of courtroom technologies. Participant #20 said: “I think resistance to change is the biggest contributor.” Participant # 5 also spoke about the challenge of attorneys not willing to embrace new technologies: “Attorneys who are set in their ways and don't want to learn new tricks.” Participant #20 stated that technologies are a waste of time:

> I was in court with five other attorneys and I said we needed to pick a date for the next hearing. One attorney and I opened our (paper) calendars and just looked at each other while five attorneys were pecking away at little digital devices trying to get to their calendar screens and flicking back and forth between pages and

> months or weeks or whatever and checking the other calendar and what not. That pretty much sums up my impression of digital tools. Technology can be cumbersome and a waste of time.

Theme 7: Attorneys and Judges Recommendations

The seventh theme that emerged from the data was that attorneys and judges recommended the careful and balanced implementation of courtroom technologies (6 of 22 participants, 27%). Other recommendations that emerged from the data included encouraging the use of technologies (3 of 22 participants, 14%), expansion of technology use (2 of participants, 9%), address cost and budget (2 of 22 participants, 9%), offer training to attorneys and judges (2 of 22 participants, 9%), and provide access to courtroom technologies (2 of 22 participants, 9%). Table 7 shows the complete coding results for the thematic category, recommendations.

Table 7

Thematic Category: Attorney and Judge Recommendations

Recommendations	No. of participants to offer this experience	% of participants to offer this experience
Careful/balanced implementation	6	27%
Encourage the use of technology	3	14%
None	3	14%
Expansion in the use of technology	2	9%
Address cost/budget	2	9%
Training	2	9%
Access to technology	2	9%
Multi-platform technology	1	5%
System-wide training	1	5%
Address ease of use	1	5%
Lessening the use of technology	1	5%
Uniform technology	1	5%
Judge's prerogative	1	5%

Some attorneys and judges recommended the careful and balanced implementation of courtroom technologies. Participant #16 said, "Technology should only be used if it has a good chance of assisting the trier of fact; otherwise, it's just subterfuge." Participant #17 also recognized the importance of technologies in courtrooms, but cautioned that the real focus should remain on the case presentation: "I recommend that any useful technology that will add to the proceedings be used; but not in place of well-argued presentations, and certainly not where the technology might distract from the case presentation." Participant #18 added, "Occasional use of courtroom technology is acceptable, as long as attorneys can show that the technology will make a difference in the trial." Participant #20 also spoke about balancing the use of technologies in courtrooms: "I don't think the courts need to be over saturated with courtroom

technology. However, I believe that there are some technologies that every courtroom could benefit from having." Participant #3 spoke about the importance of ensuring that everyone understands how technology works within the context of a court trial,

> Be very careful to ensure that all participants in the trial are competent in the use of trial technology, especially jurors. If jurors don't understand or are distracted by the technology it may have a detrimental rather than beneficial impact on the pursuit of justice.

Other recommendations that emerged from the data included encouraging the use of technologies, expansion in the use of technologies, addressing costs and budgets, offering trainings to attorneys and judges, and providing access to courtroom technologies. Participant #2 recommended offering regular trainings to attorneys and judges: "Offer regular training to attorneys and judges how to use courtroom technology." Similarly, Participant #19 emphasized training: "Until budget restraints are resolve, I recommend that attorneys and judges receive formal courtroom technology training so they can become my comfortable with using it, thus leading to integrating of technology into the courtrooms." Participant #4 spoke about the benefit of generating a budget plan to be more efficient:

> I think each jurisdiction should adopt a budget and after consultation purchase the technology that assists in courtroom efficiency in their area. For instance, in some places, it's easier to do bond hearings or first appearance hearings via video conferencing where the defendant and attorney can see the judge and the judge

can see the defendant, of course such proceedings need to be recorded and available for transcript.

Participant #9 recommended the continued expansion of courtroom technologies: "Not many courtrooms currently have technology in the courtroom, but I think it's a great idea to begin integrating more technology into the court environment." Participant #13 also encouraged expanded use of courtroom technologies: "I try to encourage the attorneys that enter my courtroom to use PowerPoint for trial presentation, I think it's helpful to every, especially the jurors." Finally, Participant #22 recommended uniformity across all courts regarding the use of courtroom technologies: "I would like to see more courts provide a uniform level of technology. Every court should have the same type of equipment."

Summary

The purpose of this qualitative phenomenological research study was to explore and describe the experiences of attorneys and judges in the State of Virginia with regard to some of the factors that contribute to the limited use of IT in state courtrooms. Data were collected from 22 participants, including 11 attorneys and 11 judges. The analysis was rooted in pre-determined categories, which included the following: courtroom technology, training, ease of use, implementation, usefulness, limited use, and recommendations. The thematic analysis resulted in seven themes, representing the perceptions and opinions of the entire sample:

1. Presentation software, video, overhead projectors, and evidence cameras are the most often used courtroom technologies by attorneys and judges.

2. Most attorneys and judges did not receive training regarding the use of courtroom technologies.
3. Most of the attorneys and judges believed that basic courtroom technologies are easy to use.
4. Attorneys and judges perceived the use of courtroom technologies as expanding.
5. Attorneys and judges perceived that courtroom technologies are useful when properly implemented.
6. Cost and lack of acceptance were perceived by attorneys and judges as the reasons for the limited use of courtroom technologies.
7. Attorneys and judges recommend the careful and balanced implementation of courtroom technologies.

Chapter 5 includes the interpretation of findings, limitations, recommendations, and implications of the study.

Chapter 5: Discussion, Conclusions, and Recommendations

Many state courtrooms in Virginia have not yet adopted technology despite the numerous strides of technological innovation in U.S. courtrooms. This resistance to change and/or lack of acceptance remains a problem for many attorneys and judges. The purpose of this qualitative phenomenological research was to explore and describe the experiences of attorneys and judges in the State of Virginia with regard to some factors that contribute to the limited use of IT in state courtrooms. I explored various issues related to the use of IT in the state courtrooms to better understand the factors that influence the use of courtroom technology. Sparse knowledge of the factors that contribute to the limited use of IT in state courtrooms prompted me to conduct this study. This phenomenological study addressed the gap and contributes to better understandings of the limited use of IT in state courtrooms.

For this study, I collected through face-to-face and telephone semistructured interviews. Collected data were coded and analyzed for themes or patterns. Themes emerged based on responses from the interview questions. Each interview question explored different views of judges' and attorneys' perceptions. The following themes emerged from the data analysis: (a) presentation software, video, overhead projectors, and evidence cameras are the most often used courtroom technologies by attorneys and judges; (b) most attorneys and judges did not receive training regarding the use of courtroom technologies; (c) most of the attorneys and judges believed that basic courtroom technologies are easy to use; (d) attorneys and judges perceived that the use of courtroom technologies is expanding; (e) attorneys and judges perceived that courtroom

technologies are useful when properly implemented; (f) cost and lack of acceptance were perceived by attorneys and judges as the reasons for the limited use of courtroom technologies; and (g) attorneys and judges recommend the careful and balanced implementation of courtroom technologies.

Study results indicated that many of the participants were exposed to various forms of courtroom technology; however, not every courtroom was equipped with consistent or reliable forms of technology in the State of Virginia. Such technology included the use of document cameras, computer connection access, touch-screen annotation monitors located at lecterns and the witness stands, and assisted listening and interpreting devices. Using video conferencing, teleconferencing, DVD players, and VHS are also allowed in courtrooms. Although some attorneys and judges expressed positive inclinations toward courtroom technology, a significant proportion was wary of adopting IT in the courtroom (National Center for State Courts, 2011). The following section includes a discussion of the factors that contribute to the limited use of technology in state courtrooms.

Interpretation of Results

The data obtained from the first theme were related to courtroom technologies and the different types of technology participants had personally used or seen used in courtrooms during trials. Findings indicated that attorneys and judges were exposed to courtroom technology. Many participants had either used or had observed colleagues who used various technologies during trials. However, it is unclear whether the participants gained this experience from a state courtroom in Virginia. The results showed that 68%

of participants had personally used or observed the use of presentation software, such as PowerPoint, during trials. Forty-five percent of participants had been exposed to videos; 41% had used digital projectors; 32% had used document cameras; 18% had experienced audio systems; and 18% of participants had witnessed video teleconferencing during trials. However, the last 27% of participants were divided equally among those who had personally used or observed the use of equipment, such as integrated lecterns, simulations, and software such as TrialDirector, during trials.

The technologies in courtrooms consisted of video displays, annotation and witness monitors, evidence cameras, laptop connections and other digital input locations, combination VCR/CD/DVD players, printers and electronic storage of exhibits, remote witness testimonies and video conferencing, wireless installation and an integrated controller to control images and sound in courtroom video and audio system (Dixon, 2012). Participants mentioned a number of these technologies they have already used or they have seen colleagues use. Although the source of this knowledge of these technologies is unknown, the technologies mentioned by Dixon are technologies with which participants were most familiar.

The TAM has been applied in IT and communications to predict how organizations accept and adopt technology (Davis et al., 1989; Lederer, 2010; Dixon, 2009). The increased use of technology has paved the way for the judicial system to incorporate technology. Further, the increased efficiency and reduced costs are also important factors in judicial reforms. Participants' responses confirmed how technology has been incorporated into the judicial system.

The second theme that emerged from the data focused on training to use courtroom technology. The findings indicated that most attorneys and judges failed to adopt technology because they never received training to use it within the course of their practices. This means that although technology may be effective in certain areas, attorneys may not take advantage of the benefits because they do not know how to operate the technology (Dixon, 2012). Participants who had undergone in-house training on available courtroom technology still expressed concerns that IT was only effective when users knew how to properly operate it. Only 14% of the participants had been trained to utilize courtroom technology for case development during law school. This reported lack of training suggests that attorneys and judges do not possess the training and confidence required to utilize courtroom technology. The judges may have a difficult time interpreting results from technological devices brought before the court. The attorneys may also lack the necessary experience to present evidence using courtroom technology.

Table 2 indicated that 55% of participants reported they had received no training on courtroom technology; 18% of participants had in-house training; and 14% of participants received training in law school. The remaining 15% were divided among those who had received training from other people or attended training seminars. Participants also expressed the belief that the attorneys who would like to use technology to provide evidence before the court would be with their own technical staff. This means that the courts lack the necessary personnel to set up the equipment or assist in the event that technology fails during a presentation (Feigenson, 2010). This unfamiliarity with

courtroom technology has contributed to resistance to use courtroom technology among attorneys and judges (Pointe, 2002). Despite the challenges related to inadequate IT training and experience, most of the attorneys believed that technology is necessary, and training and use would soon become standard practice in courtrooms and law schools (Antweil, Grosdidier, & Dexter, 2011).

The findings obtained for Theme 3 suggested that most of the participants thought that basic courtroom technologies were user friendly. The results indicated that 55% of participants believed that basic courtroom technologies are easy to use; however, three participants (14%) reported that the level of ease of use could be dependent on the assistance of IT. Other participants believed that courtroom technologies need some level of practice (9%) or extensive training (2%).

Participant responses highlight the need for courtroom technology training. While some technologies may be easy to use, participants indicated that training was still necessary. Technology use appeared to be dependent on the availability of IT assistance, as well as participants' beliefs that practice and training were needed to effectively use courtroom technologies. This also related to the second theme, which indicated that attorneys and judges failed to adopt courtroom technology because they lacked necessary training to use it. Bellone (2005) mentioned that the technological orientation and training of attorneys, jurors, and judges is necessary for the effective application of available technologies. Similarly, Dixon (2012) noted that training was a large obstacle in the use of courtroom technology.

Theme 4 indicated that most attorneys and judges believed that courtroom technology use should continue to expand (10 of 22 participants, 45%). Four participants (18%) believed that the implementation or integration of courtroom technologies must be justified. However, three participants believed that courtroom technologies should not be used extensively (14%). The UTAUT is a useful tool for determining the likelihood of the success of technology adaptation. This may help with the implementation of new technologies by highlighting the most appropriate approaches or interventions for the adoption of a new technology (Venkatesh et al., 2003). To facilitate the expansion of technology and introduce it into courtrooms, it is crucial to identify the best approach. The correct approach my reduce user resistance by proactively addressing such barriers.

The fifth theme that emerged from the data was that most attorneys and judges perceived courtroom technologies as useful when properly implemented (11 of 22 participants, 50%). Six participants (27%) believed that courtroom technologies save time, whereas five participants (23%) believed that courtroom technologies save costs. Another use of courtroom technologies that emerged from the data was helping juries to understand cases (23%). The TAM has been used to predict how organizations accept and adopt technology. Although the judicial system was once rigid, technology has become an important aspect of judicial reform, due to its ability to increase efficiency and reduced costs (Davis et al., 1989; Dixon, 2012; Lederer, 2010). The TAM also provides an explanation of which factors determine the integration and effective use of IT to certain fields (Davis et al., 1989). The reduction of cost and improved efficiency were highlights from participant responses.

Findings from the sixth theme correlated with research reviewed in Chapter 2, which indicated that the cost of courtroom technology is one factor that limited the use of technology use in the courtroom (Cordella, 2012). New technology is very expensive and dynamic, which means that courts must continuously update various items. Technology is not long lasting; therefore, operational costs associated with courtroom technology will also increase as companies introduce new forms of technology (Bellone, 2005). Concerns regarding courtroom technology costs are particularly significant for smaller firms that may not have the resources to use such technologies (Bay, 2014). Attorneys and firms may pass these expenses off to their clients if they cannot afford to shoulder costs.

The negative perceptions of courtroom technologies are heavily influenced by the high costs of equipment, lack of expertise, lack of information, and lack of training (Fombad & Moahi 2005). Costs are major challenges in the adoption of courtroom technology, and concerns regarding the additional costs of installing and setting up different courtroom technologies acts as an impediment to IT use (Lederer, 2010). One of the major issues related to costs is determining what parties are responsible for paying for technology, its installation, and any necessary training. In general, the costs associated with courtroom technology are shouldered by special governmental allocations (Lederer, 2010). This poses a challenge for courts in regions that have poorly funded courtrooms. However, policymakers may influence the allocation of courtroom resources to ensure that they are equipped with the latest technologies (Lederer, 2010). The state or county funds most courts in Virginia. Some small counties have small budgets. Thus, the funds infrastructural development funds allocated to courts are limited.

Findings from this research indicated that some attorneys and judges reject or are resistant to courtroom technology. Such resistance still exists, despite the increasing use of technology within courtrooms. This resistance has been associated with social and psychological fears of change and technology (Pointe, 2002). In most cases, resistant individuals are unaware of the benefits that technology can grant the judicial system and the individuals it serves. Some attorneys are also rigid and do not want to embrace the use of technology because they perceive it as a waste of time. These individuals often support their opinions by citing some of the negative aspects of technology, such as problems with data security and equipment failures (Virginia, 2014).

The seventh theme that emerged from the data was the recommendations by attorneys and judges recommend for the careful and balanced implementation of courtroom technologies (6 of 22 participants, 27%). Other recommendations included encouraging the use of technologies (3 of 22 participants, 14%), increasing the use of technologies (2 of participants, 9%), addressing costs and budgets (2 of 22 participants, 9%), training attorneys and judges (2 of 22 participants, 9%), and providing access to courtroom technologies (2 of 22 participants, 9%). These results were aligned with other themes related to the importance of training (Theme 2) and the implementation and reduced costs of courtroom technology (Theme 5). These other themes also related to the TAM, in which the acceptance and adoption of technology are the focus.

Despite the many challenges that limit the use of technology in courtrooms, the findings from this indicated that the attitudes of attorneys and judges toward courtroom technologies are changing. Recommendations from attorneys and judges, Theme 7

revealed that 50% of the participants believed that technology is useful when properly implemented. A considerable percentage of the participants also agreed that technology had time and cost-saving potential. This finding indicates that despite the rigid nature of attorneys and judges related to technology that was observed in previous studies, most participants expressed a willingness to adopt courtroom technology on a larger scale than before.

Such attitudes may be encouraged by the obligation that attorneys have to provide their clients with the best available services (Aguilar, 2014). This means that attorneys must be ready to adopt any measures that will somehow benefit their clients. He or she must be able to maintain his or her competence, as well as a working knowledge of relevant technologies. Attorneys must also ensure that information on the benefits and risks of technology are relayed to clients. The recommendations of the attorneys and judges also show that, with the right mechanisms in place, technology can be a valuable part of the courtroom (Virginia, 2014). The TAM was the most applicable in this study, given that the focus was on the limited use of courtroom technology. This model focuses on how organizations accept and adopt technology. More so, the TAM provides an explanation of the factors that determine the assimilation and effective use of IT that can be applied in different fields, such as the legal and criminal justice arenas.

Limitations of the Study

Despite the success of the study, some limitations may have affected the results. One reason for the limited use of technology in Virginia's courts is the high cost. This factor is worsened by the paltry allocation of resources given to courts for the

development of infrastructure. This may not be the case for courtrooms in other states that are better supported. Thus, cost may not be a factor in the limited use of courtroom technology in other areas. Also, the assumption that some of the attorneys and judges ignored the use of technology may not be consistent in all parts of Virginia and other states. For example, attorneys in other states or countries may be unaware that such technologies even exist (Aguilar, 2014).

Social desirability was another limitation of this study, in the sense that attorneys and judges may want to be perceived positively. This means that they may not have responded honestly to all interview questions. The participants may have also provided information in a certain way to reveal a particular stand on the use of technology. This limitation may have been enhanced by the ages of participants. Those who went to law school in more recent years have a higher chance of using technology due to changes in training. However, older generations of attorneys may have been trained at a time before today's courtroom technology became available. This means that older generations of attorneys may oppose the use of technology in case development, owing to lack of experience and knowledge in the interpretation of data derived from technological devices.

Recommendations

The research illuminated some of the reasons why courts in Virginia have not adopted the use of technology. However, the study limitations may have affected the results. Thus, further scrutiny is needed to ensure that better results are obtained. It would be a good option for future researchers to broaden the scope of the study to achieve a

more in-depth analysis of the lived experiences of attorneys and judges regarding some of the factors that contribute to the limited use of IT in state courtrooms. Accordingly, recommendations for future research are as follows:

1. Increase the sample to include more participants. To address this study's lack of generalizability, future researchers should examine a larger sample. A broader analysis of the experiences of attorneys and judges could reveal the extent to which factors already discussed contribute to the use of courtroom technology.
2. Focus on one age group. It should be noted that younger generations of attorneys are more likely to embrace technology than older generations who were trained at a time when technology was not as developed as it is today. Differentiating attorneys and judges by age categories may provide a better picture as compared to the previous study. It is important to note that some of the attorneys and judges in this study had no experience with courtroom technology, which means that conducting research on them may not provide a clear picture of the reason behind the limited use of technology in courtrooms. To eliminate the factors of age and differences in educational backgrounds, future researchers may focus on one age group (for example, the young age group).
3. Recreate the current study in other geographic locations. One of the limitations of this study was that cost might not be a reason for low technology use in other states. Virginia has low budgetary allocations to

courts for the development of infrastructure. To develop a better understanding of what causes the limited use of courtroom technology, a similar study could be conducted in states where budget is not an issue. Future researchers could investigate the factors in other states to see if they mirror the issues and experiences that affect the limited use of courtroom technology in Virginia. Generalizability may also be improved with this.

Implications

There is an increase in the number of technologies used in the court. With proper training, attorneys and judges will be able to utilize available technology and understand the various ways to interpret information provided by these devices. This will help attorneys represent their clients in a comprehensive way. It will also align their practices with recommendations provided by the American Bar Association, which requires attorneys to embrace the use of technology in case presentation (Adkins, 2009). Similarly, the use of technology by attorneys helps to ensure that quality case decisions are made and that all the parties are fairly represented.

Today's economy makes it essential for law firms to become more responsive to clients and to operate more efficiently. Technological innovations have led to the development of devices that enable legal professionals to accomplish more with fewer resources. In turn, technological innovations have increased client expectations of attorneys. Communication between attorneys and clients is also enhanced, as face-to-face meetings are not a must anymore; thanks to advancements in technology (Adkins, 2009).

The use of technological devices by attorneys and judges may provide advantages when cases are presented before court. Research indicates that people understand and remember oral information more clearly when accompanied by visual aids (Aguilar, 2014). Courtroom technology also enables attorneys to access case information during presentations to a jury. This is especially beneficial for complex cases in which the understandings of mediators or jury members can be supplemented with visual media. In some cases, an oral discussion of evidence alone may not produce the required result to impact judges or juries. In such instances, visual aids may help them individuals better understand an attorney's argument or evidentiary details (Feigenson, 2010).

Visual representation may be imperative to cases that involve complex scientific descriptions, such as the use of DNA, genes, forensic and other sophisticated areas of biological sciences. The use of modern technology is also advantageous to attorneys owing to the efficient practice of law enabled by the efficient accessibility of case information. It is also advantageous to the client when an attorney's argument is well presented. The use of technology can improve the odds that all parties are content with trials, but cannot guarantee that all parties will be happy with the outcomes (Antweil, Grosdidier, & Dexter, 2011).

As stated earlier, the use of technology in courtrooms is also advantageous to the courts because technology improves the efficiency of case presentation. Thus, a greater number of cases can be tried in less time when courtroom technology is employed (Adkins, 2009). In addition, the storage and retrieval of information in courts may be improved if the technology, such as information management software, is adopted in

Virginia courts. Such technology may replace the slow, cumbersome, and traditional paper system. Computerizing Virginia's court system may also reduce operating costs because fewer staff members and materials will be required. Calendar processes can be automated in such a way that every case is assigned a specific time and day with ease. Cumulative case data may also be accessed with ease, thanks to computers and other information storage devices (Dixon, 2012).

However, as this study reveals, the use of technology in the courtroom has many obstacles. Training must accompany any attempt to use technology in any section of the court. Attorneys and judges must undergo training to ensure they are equipped with the skills to appropriately utilize the technology. One of the greatest issues that can affect courtroom technology is data security (Dixon, 2012). Data theft risks can be elevated with technology, which could lead to the complete loss of data or information, thus jeopardizing a case. The loss of case information can significantly impact the fate of a case (Bermant, 2005).

Another challenge that affects the use of technology is hacking, which refers to accessing another person's computer without permission or with malicious intent. The ethical and legal obligations that attorneys have to clients means they cannot afford to risk the leak of case information. There is also the probability of technological failures, which might delay court proceedings. This can result in unnecessary wasting of time ore reductions in the confidence clients have in their attorneys. Such negative effects demonstrate the need for careful implementation and management of technology to ensure it does harm clients or cases (Bermant, 2005).

Several recommendations can be made to better address the limited use of courtroom technology in the judicial system. First, training seminars should be held to teach attorneys and judges about the various applications of technology for case development and presentation. Such trainings should be accompanied by a feasibility study of the various ways that technology can be adopted without affecting the case efficiency of court systems.

Instructing attorneys and judges on the adoption of technology may also reduce ignorance and fears associated with courtroom technology. Such training could provide legal professionals with the experience and confidence required to utilize technology without fear or intimidation (Dixon, 2012). This may also lead to a better representation of clients in court cases, by reducing the chances of case details being overlooked. Training attorneys and judges on the possible applications of courtroom technology may also reduce the number of experts that attorneys must hire to compile and present evidence before the court (Feigenson, 2010).

Another recommendation from the study is based on the desire of attorneys and judges to implement courtroom technology in a careful and balanced manner. Further research should be conducted to determine the ways that technology can be implemented without unfairly affecting any individuals or sections of the court. This may involve hiring competent to address related challenges, such as the failure of devices, issues of data security, and connectivity within the court. This will ensure that attorneys and judges are not required to possess high levels of troubleshooting or other technical skills (Bermant, 2005).

State governments should fund the implementation of courtroom technology. Consequently, research should be conducted on the approximate implementation and operational costs associated with high-tech courtrooms. The various ways that the court system may acquire necessary funding should also be addressed, such as through an increase in the taxes charged by the courts. The budgetary allocations made to court system should support the adoption of necessary technologies (Bermant, 2005). Finally, a similar study could be conducted in another state, which may have completely different resources or needs than the courts in Virginia. The courtroom technology exposure of attorneys and judges in other states or countries may differ significantly.

The findings from this research indicated that attorneys and judges in the State of Virginia might be willing to use courtroom technology and support its adoption. Despite is limited use in courts, some courtroom technologies have been adopted and used to improve the effectiveness and efficiency of courtroom processes. Such technologies include presentation software, videos, overhead projectors, and evidence cameras (Antweil et al., 2011).

The literature review for this study indicated some incidences in which technology has been an effective tool in the presentation of trial evidence. The presentation of details may have not been possible without the use of technologies during evidence presentation. This finding was confirmed a study conducted on a sample of attorneys and judges that revealed the use of technology can benefit all parties of a court case (Feigenson, 2010). The American Bar Association requires attorneys to represent their clients to the best of their abilities before a court of law (American Bar Association,

2013). Expansion of the use of technology is one way to ensure that this requirement is fulfilled (Aguilar, 2014).

Conclusion

Findings from this study confirmed those indicated in the literature review. The adoption of technology in Virginia courts significantly lags behind adoption in federal courts. Costs, ignorance, and fears of technological failures are some of the reasons that attorneys and judges lag behind in terms of technological use in case presentation. Research indicates that most of the attorneys and judges agree that the use of technology is expanding and that it is just a matter of time before its adoption becomes mandatory in most state courts. Despite the willingness to adopt such technologies demonstrated by attorneys and judges, a great many of those interviewed during this study argued that implementation must be done in a careful and balanced way that does not negatively affect the efficiency of court processes. From these findings, it is clear that a strong need exists to make sure that law schools train their graduates to use such technologies.

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Appendix A: Invitation to Participate and Recommendation Request

Dear **Name Will Be Inserted Here**,

My name is Concetta Manker and I am currently a doctoral student at Walden University. I am exploring the perceptions of attorneys and judges in the State of Virginia about some of the factors that contribute to the limited use of information technology in state courtrooms.

I would greatly appreciate your participation.

This would involve participating in an interview, which would take about 45 minutes. Participants living within a few miles of me will be interviewed face-to-face while others will be interviewed by telephone. Face-to-face interviews will be conducted at the Portsmouth Public Library located at 601 Court Street, Portsmouth, Virginia.

The information from the interviews will be kept strictly confidential and no one who participates will be identified in any of the study's report that I prepare.

If you have any questions about the study, please feel free to email me at XXXXXXX or give me a call at XXXXXXXXX.

If you are interested in participating in the study and/or would like to recommend another attorney or judge from the State of Virginia to be a participant in this study, please complete the questions below in a reply email to me.

Thank you in advance for your consideration and assistance with my research project.

Sincerely,
Concetta Manker
XXXXXXXXX

If you are interested in participating in the study and/or would like to recommend another attorney or judge to be a participant in the study, please complete the questions below in a reply email to me at concetta.gray@waldenu.edu:

1. What is your name?
2. What age group do you belong to? (Please select by **bolding** your answer)
    a. 20-29
    b. 30-39
    c. 40-49
    d. 50-59
    e. 50-69
    f. Other_____

3. What is your contact information?
4. Would be willing to share your experiences about some of the factors that contribute to the limited use of information technology in state courtrooms, which will take approximately 45 minutes?
5. If you participate in the study, would you be willing to verify the accuracy on your interview transcript that would be emailed to you at a later date after the interview has been completed and the interview has been transcribed? This will take approximately 25 minutes by phone or email.
6. Could you recommend other attorneys and judges from Virginia to be participants in this study? If so, what are their names and contact information?

Appendix B: Consent Form

Consent Form

You are invited to take part in a research study on the limited use of information technology in state courtrooms. The researcher is inviting attorneys and judges in the State of Virginia to be in the study. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Concetta Manker, who is a doctoral student at Walden University.

Background Information:
The purpose of this study is to explore the experiences of attorneys and judges in the State of Virginia about some of the factors that contribute to the limited use of information technology in state courtrooms.

Procedures:
If you agree to be in this study, you will be asked to:

- Take part in an in-depth face-to-face or telephone interview, which will take approximately 45 minutes. The interview will be audio-taped.
- Participate in a validity process called transcript review, where you will verify the accuracy on your interview transcript that will be emailed to you at a later date after the interview has been completed and the interview has been transcribed, and provide your feedback by phone or email. This process will take approximately 25 minutes.

Here are some sample questions:

1. What are your experiences with using courtroom technology?
2. What are your experiences about courtroom technology training?
3. What are your experiences about the usefulness of courtroom technology during court proceedings?
4. What are some of the factors that contribute to the limited use of information technology in state courtrooms?

Voluntary Nature of the Study:
This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study:
Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as stress or emotional upset. Being in this study would not

pose risk to your safety or wellbeing. Therefore, it is unlikely that participation will arouse any acute discomfort.

Anticipated benefits include benefits to attorneys, judges, courtroom administrators, and other legal practitioners during their legal practices. The findings from the study may assist law practitioners with the adoption on courtroom technology; hence, help in expediting courtroom processes in an efficient and effective manner.

Payment:
Participants will receive a $5.00 Dunkin Donut gift card prior to data collection.

Privacy:
Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept secure by being locked in the researcher's file cabinet and password protected computer where only the researcher has access to the records. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via phone and email at XXXXXXX or XXXXXXX. The researcher's dissertation chair is Dr. David Gould who can be reached at XXXXXXX or XXXXXXXX. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is XXXXXX. All participants will be emailed a summary report of the study's findings after the study is complete.

Please print or save this consent form for your records.

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. I understand that I am agreeing to the terms described above. By replying to the e-mail with the words ***I Consent*** you are agreeing to participate.

Appendix C: Interview Guide

Interview Guide

Introduction

- Welcome participant and introduce myself.
- Explain the general purpose of the interview and why the participant was chosen.
- Discuss the purpose and process of interview.
- Explain the presence and purpose of the recording equipment.
- Outline general ground rules and interview guidelines such as being prepared for the interviewer to interrupt to assure that all the topics can be covered.
- Review break schedule and where the restrooms are located.
- Address the assurance of confidentiality.
- Inform the participant that information discussed is going to be analyzed as a whole and participant's name will not be used in any analysis of the interview.

Discussion Purpose

The purpose of this study is explore and describe the experiences of attorneys and judges in the State of Virginia about some of the factors that contribute to the limited use of information technology in state courtrooms.

Discussion Guidelines

Interviewer will explain:

Please respond directly to the questions and if you don't understand the question, please let me know. I am here to ask questions and answer any questions you might have.

If we seem to get stuck on a topic, I may interrupt you. I will keep your identity, participation, and remarks private. Please speak openly and honestly. This session will be tape recorded because I do not want to miss any comments.

General Instructions

When responding to questions that will be asked of you in the interview, please exclude all identifying information, such as your name and names of other parties. Your identity will be kept confidential and any information that will permit identification will be removed from the analysis.

Interview Questions

1. What are your experiences with using courtroom technology?
2. What courtroom technology have you used or seen used during your courtroom proceedings?
3. What are your experiences about the ease of use courtroom technology?
4. What other courtroom technology would you like to use or see used during future courtroom proceedings?
5. What are your experiences about courtroom technology training?
6. What are your thoughts about the implementation of courtroom technology?
7. What are your experiences about the usefulness of courtroom technology during courtroom proceedings?
8. What are some of the factors, from your experience, that contribute to the limited use of information technology in state courtrooms?

9. What are your recommendations about the use of courtroom technology in court proceedings?

Conclusion

Discuss the member checking process with each participant, answer any questions, and thank the participant for his or her time.

Appendix D: Exploration of Text

Research Question 1: What are the lived experiences of attorneys and judges in the State of Virginia about some of the factors that contribute to the limited use of IT in state courtrooms?

Theme 1: Presentation software, video, overhead projectors, and evidence cameras are the most often used courtroom technologies by attorneys and judges.

Participant #1 stated:

> Evidence cameras, Presentation software, Digital projector, Audio system, System controls, Electronic whiteboard, integrated lectern, Video conference equipment, Real- time court reporting.

Participant #2,

> Trial director, overheads, projectors, power point, doc cameras (ELMO)

Participant #4,

> I've used video teleconferencing for out of state expert testimony, laptops connected to projectors to display videos

Participant #5,

> I used overhead video/document projector, video playback (DVD), PowerPoint projection.

Participant #6,

> I mostly used overhead projectors, tape recorders, easels, videos, and photographs. I have seen PowerPoint presentations used and computer generated simulations.

Participant #7,

> I have experience using real time transcription and power point presentations, videotape.

Participant #9,

> Overhead projector. Video player. Judges using computers to prepare pretrial orders and printing them for counsel.

Participant # 13,

> I have used and seen phone hearings, video hearings, PowerPoint slides during trials.

Participant #17,

> I've seen showing of videos; power point presentation, use of computers by court clerks to speed up the transfer of information from the court to the clerk's office.

Participant #19,

> I've used Trial Director to delivery trials and sometimes PowerPoint presentation from my computer hooked into an overhead projector. I've also use showed video and used video recording for depositions.

Participant #22,

> I've used ELMO, PowerPoint presentations and Overhead projectors.

Theme 2: Most attorneys and judges did not receive training regarding the use of courtroom technologies.

Participant #9 spoke about not receiving any kind of training regarding the use of courtroom technologies,

> I have not had any training for using courtroom technology. I'm not sure where to receive formal or standardized training for courtroom usage.

Participant #12 believed that basic understanding of technology is necessary, but reported not being exposed to any type of training involving courtroom technologies,

> I believe everyone in the courtroom that will be using the technology needs a basic understanding of how it works nothing beyond. No, I have not received any training.

Participant #18 also did not receive any training, relying instead on IT support,

> I have not had any training because the technical staff is available to set up equipment or attorney will bring their own technical people.

Theme 3: Most of the attorneys and judges believed that basic courtroom technologies are easy to use.

Participant #21 believed that basic courtroom technologies are relatively easy to use.

> My experience with video recording was not hard to learn and relatively easy to use.

Participant #16 concurred with this perception,

> The various technologies used in the courtrooms by the attorneys appear to be easy to use.

Participant #1 believed that courtroom technologies are easy to use, but wondered if training contributed to this experience,

> I have found most court technology fairly simple to use. However, I have more than average experience and training in that regard.

Similarly, Participant #5 also believed that courtroom technologies can be easy to use with training and practice,

> I have found that with sufficient training, the technology is generally fairly easy to use. But it does require practice to make it a flawless presentation.

Participant #19 explained how other attorneys and judged can be threatened by technologies, but found that they are relatively easy to use,

> I think there is a natural fear to using technology when it has to be used in conjunction to your performance. Overall, I find that most technology is easy to use. When and how to apply it in the court room is difficult for most attorneys and judges.

Theme 4: Attorneys and judges perceived that the use of courtroom technologies is expanding.

Participant #19 perceived that the use of courtroom technologies should continue to expand,

> I think courtrooms should invest in courtroom technology so all clients can have access to technology at trials. The cost should be the responsibility of the state not the individual client.

Participant #22 explained that the expansion of courtroom technologies is unavoidable,

> It is unavoidable, I think jurors expect and appreciate being able to see exhibits and deposition transcripts as they are referred to during the trial.

Participant # 1 also spoke about how the use of courtroom technologies continues to expand,

> I think the situation is improving. I think the next frontier for technology and law is in e-discovery or the discovery of electronically stored information (for instance, information stored in the cloud or on mobile devices). That is changing the nature of how civil law is practiced.

Participant #3 also spoke about the emergence of the digital age,

> I think that it is crucially important, the rest of the world has gone digital and courtrooms have a lot of work to do to catch up and keep pace.

Theme 5: Attorneys and judges perceived that courtroom technologies are useful when properly implemented.

Participant #2 perceived that courtroom technologies are useful when properly implemented,

> I think it can be extremely useful when used effectively.

Participant #16 explained:

> It can be good or bad, depending upon the ease of use and whether it helps the trier of fact to understand something.

Participant #4 provided details on how courtroom technologies can be useful,

> I believe extremely useful: I believe courtroom technology aides in the use of demonstrative evidence, which in my opinion brings to life, conflicts. Jurors often

> try to make the best of testimony but have little basis outside of what someone is saying. Courtroom technology can aid the ease and expansion of the kind of video or audio evidence available to a trier of fact, it could also assist attorneys and judges in communicating with necessary third parties outside of the courtroom

Participant #5 also spoke about the importance of proper use of courtroom technologies,

> I think it is a useful tool, but can be distracting if relied upon too heavily by the attorney. It should be complementary, but not overbearing.

Theme 6: Cost and lack of acceptance were perceived by attorneys and judges as the reasons for the limited use of courtroom technologies.

Participant #12 perceived that cost was the main reason for the limited use of courtroom technologies,

> Courtrooms experience the limited use of technology because of the cost involved with such a venture. Courtroom have to find ways to absorb the cost without raising taxes".

Participant #1 spoke about why cost limits the use of courtroom technologies,

> States need to find a way to fund technology use in the courtroom that doesn't not require much taxpayer money or much involvement by state government bureaucracy. A few courts are funded by the local bar which allows local attorneys to have more direct input into the design of the system that they will be using.

Participant # 15 said:

> Cost is the major factor when it comes down to implementing technology in courts.

Participant #13 also spoke about how cost plays a major role on why courtroom technologies are not widely used in courts,

> Budget constraints are the biggest factor contributing to the limited us of information technology. I would love to introduce more technology into my courtroom; however, our county is small and our budget is small. If I could find a way without it raising taxes, I would be all for it.

Participant #19 spoke about cost and resistance to embrace new technologies as factors contributing to the limited use of courtroom technologies in Virginia,

> Resistance to change by many judges that I know, but budget constraints is probably the biggest hurdle that state courts have to overcome and resolve before all courts can have the High Tech court experience.

Participant #20 perceived that lack of acceptance among attorneys and judges as a reason for the limited use of courtroom technologies.

> I think resistance to change is the biggest contributor.

Participant # 5 also spoke about the challenge of attorneys not willing to embrace new technologies,

> Attorneys who are set in their ways and don't want to learn new tricks".

Participant #20 expressed how technologies are wastes of time,

> I was in court with five other attorneys and I said we needed to pick a date for the next hearing. One attorney and I opened our (paper) calendars and just looked at each other while five attorneys were pecking away at little digital devices trying

> to get to their calendar screens and flicking back and forth between pages and months or weeks or whatever and checking the other calendar and what not. That pretty much sums up my impression of digital tools. Technology can be cumbersome and a waste of time.

Theme 7: Attorneys and judges recommend the careful and balanced implementation of courtroom technologies.

Participant #16 recommended for the careful and balanced implementation of courtroom technologies,

> Technology should only be used if it has a good chance of assisting the trier of fact; otherwise, it's just subterfuge.

Participant #17 also recognized the important of technologies in courtrooms, but cautioned that the real focus should remain on the case presentation,

> I recommend that any useful technology that will add to the proceedings be used; but not in place of well-argued presentations, and certainly not where the technology might distract from the case presentation.

Participant #18 added:

> Occasional use of courtroom technology is acceptable, as long as attorneys can show that the technology will make a difference in the trial.

Participant #20 also spoke about balancing the use of technologies in courtrooms,

> I don't think the courts need to be over saturated with courtroom technology. However, I believe that there are some technologies that every courtroom could benefit from having.

Participant #3 spoke about the importance of ensuring that everyone understands how technology works within the context of a court trial,

> Be very careful to ensure that all participants in the trial are competent in the use of trial technology, especially jurors. If jurors don't understand or are distracted by the technology it may have a detrimental rather than beneficial impact on the pursuit of justice.