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Court Reporting: Can It Keep Up with Technology or Will It Be Replaced by Voice Recognition or Electronic Recording?

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What do actresses Michelle Pfeiffer, Kim Delaney, and the author Charles Dickens all have in common? Court reporting. Charles Dickens' early days as a court reporter in England's Parliament became a subplot in his novel David Copperfield; and before becoming actresses, both Michelle Pfeiffer and Kim Delaney studied to become court reporters ("Betcha Didn't Know," n.d.).

History's first recorded shorthand reporter is Marcus Tullius Tiro. After he was freed from slavery, he became Cicero's secretary. In the year 63 B.C., he used a metal stylus to report a speech by Cato ("History of Court Reporting", n.d.). His system was simple and consisted of abbreviations of well-known words. He omitted words he felt he could easily recall by memory or by context ("History of Court Reporting", n.d.). The statesmen of his day often repeated themselves in a particular manner, so he was able to devise a shorthand system in which a single sign represented an entire sentence. The ampersand is the only sign that remains, and it holds the same meaning in several hundred languages ("History of Court Reporting," n.d.).

Court reporting has come a long way since then. Court reporters no longer write on stone tablets, but on shorthand machines. Court reporters also report by using a mask and voice recognition software. There are even some instances currently where court reporters are not used at all, but an electronic recording system is used instead. With technology growing and developing so fast, many people wonder about the future of court reporting. The most commonly held belief is that human court reporters will eventually become archaic and be replaced by tape recorders or by voice recognition technology.

There are three different methods of court reporting: stenographic, stenomask/voice writing, and electronic recording. This paper will look at the three different fields of court reporting and examine the aspects of each. The paper will discuss what the different methods are, how they work, where they are used, and whether any specific method of court reporting is in danger of being replaced by another method.

What Is A Stenographic Court Reporter?

The first method of court reporting is the most known and most commonly used: stenographic court reporting.

A stenographic court reporter is the person sitting silently in a courtroom or in a conference room taking down what is being said verbatim on a steno machine. He or she does this with a special type of shorthand that will later be produced into a true and accurate transcript, the official record. Stenographic court reporters not only work in the legal field, but they also are hired to take verbatim records for the House of Representatives as well as congressional sessions, town hall meetings, business meetings, or any other event where a true and accurate record of the spoken word is required for a record or legal proof (Bureau of Labor, 2004). Stenographic court reporters also provide much of the closed-captioning for television as well as provide CART services for the deaf and hard of hearing. CART stands for "Computer-Assisted Realtime" (Robson, 1997). CART is similar to closed-captioning; however, CART is done in person at live events such as in schools and meetings (Robson, 1997). For the purpose of this paper, the research is confined to reporting in the courtroom only.

Reading And Writing

The job of a court reporter can be broken down into two main categories: writing and reading (Knapp, 2003). To "write" a proceeding, stenographic court reporters use a shorthand machine, or a steno machine, which consist of 24 keys and a number bar (see Figure 1).

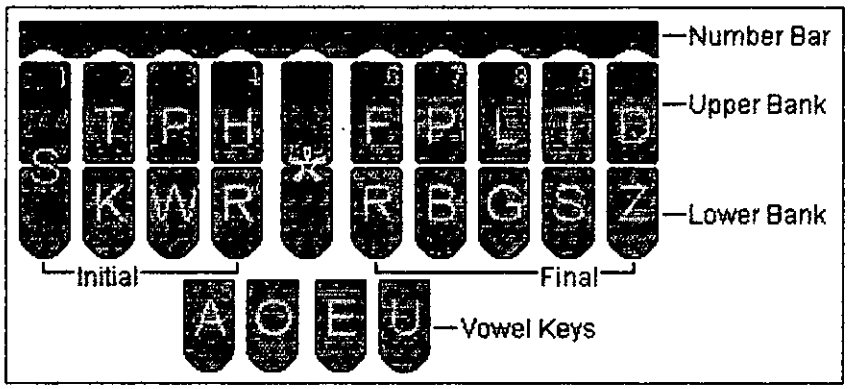

Figure 1

To write, the court reporter presses one key or a combination of keys which produce English letters on a continuous-feeding paper tape, which is fed through the steno machine (Knapp, 2003). However, one will notice that not all letters of the alphabet are represented while some letters are repeated. For the letters that are not represented on the keyboard, combinations of letters are used. For example, the letter "C" is not represented. In order to produce the letter "C", the reporter presses the letters "K" and "R" at the same time on the initial or left-hand side of the steno machine. On the paper tape, "KR" appears. The reporter, through training, recognizes this as the letter "C." These combinations of letters are often located very close together so it takes the reporter no longer to strike four keys than it does to strike one. For example, to write the

word "cell," the reporter presses initial "K" and "R" along with the vowel "E" as well as the final "L." This produces "KREL" on the paper tape representing the word, "cell." The compactness of the keyboard helps alleviate strain on the reporter by requiring little side-to-side hand motion.

How does the reporter write everything that is being said, and with accuracy? All shorthand theories, or methods of writing shorthand, are for the most part based on phonetics; that is, the reporter listens to what is said and then breaks the words down into syllables by sound. While a reporter is capable of spelling out words on the machine, many of the key combinations stand more for sounds than they do a specific letter (Atkinson-Baker, n.d.). For example, on the final side of the keyboard, combining the letters "P", "B", "L", "G", represents the "J" sound as in the end of the word "barge." Generally, there is one stroke or downward motion of the hands for each syllable in a word or phrase (Atkinson-Baker, n.d.).

Reporters are also able to write numbers into the transcript through the use of the number bar located at the very top of the keyboard. In order to produce numbers on the paper tape, the reporter must depress the number bar with the corresponding letter key. For example, to write the number "1," the reporter would press the number bar while simultaneously pressing the initial "S." On the paper tape would appear the number "1." To write a large number such as "149," the reporter would press the number bar along with the initial "S," "H," and final "T." This would produce "149" on the paper tape.

Punctuation may also be created with the keyboard. A period is produced by striking the four-key combination "FPLT" on the upper right bank. A comma is denoted

by stroking "RBGS" on the lower right bank, just below the period (Atkinson-Baker, n.d.). Other punctuation may be written as follows in Figure 2.

Exclamation	!	Initial STKPWHR together with Final FPLTD
Colon	:	Final FRPLTD
Semicolon	;	Final FRBGSZ
Question Mark	?	Initial STPH
Open Parenthesis	(	Initial STPH together with Final FPLT
Close Parenthesis	)	Initial STPH together with Final FPLD
Open Quotation	"	Initial KW together with Final T
Close Quotation	"	Initial KW together with Final TS
Slash	/	Initial SHR together with Final RB
Dash	–	Initial TK together with Final RB

Figure 2

Reporters also use many abbreviations for both single words and phrases (Atkinson-Baker, n.d.). These are referred to as briefs and phrases, and a reporter collects quite a few of them over the years. Some of the more common briefs and phrases can be found in Figure 3.

Word	**Stroke**
It was	Initial T together with Final FS
The	Initial T
Are	Initial R
Are the	Initial R together with Final T
Ladies and gentlemen of the jury,	Initial HR A EU together with Final R PBLG

Figure 3

After writing the proceeding, the court reporter must read it and produce a transcript. This can be done in two ways. The first way is to simply tear off the paper tape, read it, and retype the shorthand notes into a word processing program. The second way is to use a computer-aided transcription software package commonly referred to as CAT software ("Technology & Court Reporting", n.d.). Using this method, the reporter connects his or her shorthand machine to a computer: and as the reporter writes, the notes

are instantly translated from shorthand into English onto the computer screen. This method is also referred to as realtime writing and translation (Knapp, 2003).

In order to write realtime, a reporter must have a computer, usually a laptop, with installed CAT software which recognizes the reporter's shorthand notes and translates them into English. In order for the CAT software to recognize the reporter's notes, the reporter must first create and maintain a dictionary that is used to translate the shorthand strokes into written English text. This dictionary may be customized by the court reporter according to the writing theory learned, as well as to terminology specific to their job (Bureau of Labor, 2004).

Once the proceeding is written, the court reporter must edit or transcribe the file. This includes correcting any grammar as well as correcting the spellings of names and places. The reporter also corrects any untranslates. Untranslates are strokes that were misstroked or were stroked correctly, but did not translate into the CAT software because it is a proper name that is not yet entered into the dictionary so, therefore, is not recognized by the software.

After the transcript is proofread, corrected, and researched for accuracy of terms, it is bound into booklet form. It is then copied, if needed, and distributed to the lawyers, courts, counsel, and the public upon request (Bureau of Labor, 2004).

Realtime reporting's popularity is growing in today's legal field because it gives the Court and the attorneys the ability to quickly search the transcript for key words and phrases, enhancing the ability to cross-check witnesses' testimony for inconsistencies ("Technology & Court Reporting", n.d.). Realtime translation also provides a faster transcript delivery as well as assists hearing-impaired individuals by giving them the

same ability to know what is going on in the courtroom ("Technology & Court Reporting, n.d.).

How To Become A Stenographic Court Reporter

How does one become a court reporter? First, one must have the interests and skills required of a reporter. A court reporter must be able to work quickly and accurately (Learndirect, 2004). In order to be a certified reporter, he or she must be able to write a minimum of 225 words per minute with at least 95% accuracy. This is the industry standard. However, most stenographic court reporters are able to write at speeds well above this standard.

A stenographic court reporter must have a good standard of English grammar in order to provide a clean and accurate transcript (Learndirect, 2004). A reporter must be confident and have a clear speaking voice when called upon by attorneys or judges to read back testimony (Learndirect, 2004). A reporter must be able to sit and concentrate for long periods of time because at times, depositions or court hearings can last for several hours without an intermission (Learndirect, 2004).

A reporter must be a good listener in order to accurately take down verbatim all that is being said (Learndirect, 2004). It is also required that a reporter be computer literate in order to produce the transcript (Learndirect, 2004). Even if one does not provide realtime translation, computer knowledge is a must because the shorthand notes will still need to be put into a word processing program and printed out.

A reporter should also have an interest in law (Learndirect, 2004). Having this interest will make the research portion of producing the transcript more enjoyable, thus making it easier and faster.

Lastly, court reporters should be able to meet deadlines as well as work well under pressure ("Training, Certification," n.d.). Writing at high speeds with the expectation of such a high rate of accuracy is a stressful situation. A reporter must be able to cope with this stress. Then, because of the expeditious expectations placed upon lawyers by their clients, lawyers many times want the transcript as soon as humanly possible, sometimes as quickly as the same day or the next. Even without an "expedited" transcript, the turn around time is usually within the scope of two weeks. This causes stress as well, depending on how many other transcripts of other depositions or hearings the reporter is working on at the same time.

After one decides that court reporting is a viable option, training programs are offered by about 160 postsecondary vocational and technical schools and colleges across the country (Bureau of Labor, 2004). The National Court Reporters Association, NCRA, has approved about 82 of these programs. With an NCRA-approved program, the student can expect to learn how to use CAT programs as well as learn how to write shorthand for realtime transcription.

The length of time it takes to earn a degree or certificate varies. The minimum length of time one can expect to be in school is two years. However, this time frame can stretch out to six years or even more. The time it takes to get through school depends on several factors. One factor is the type of school you select. If a person attends a technical or community college full time, it can take a minimum of two years. However, if that person chooses to attend a four-year institution full time, the minimum would go up to four years. If one attends only part time, the amount of time required will, of course, increase.

In addition to the type of school an individual selects and whether to attend full- or part-time, the amount of time it takes a student to graduate also depends on how much effort and time outside of class one is willing to devote to practice and study.

One last factor to consider is that some people have more of a natural ability to write shorthand and achieve the high speeds faster. Some also learn the theory faster than others (Knapp, 2003). This also contributes to amount of time it takes to graduate.

Court reporting students should expect to do college level work, and the work required to earn a court reporting certificate or degree is equivalent to the amount of work required for a college degree. In fact, students take courses such as civil and criminal law, legal terminology, grammar, anatomy and physiology, medical terminology, and computer technology ("Training, Certification," n.d.).

Of course the most essential element taught in any program is how to write machine shorthand. The student first learns the shorthand theory; and once that skill is mastered, the student moves on to master speed and accuracy ("Training, Certification," n.d.). In order to graduate, the student must be able to write dictated material they have never heard before at 225 words per minute with a minimum of 95 percent accuracy ("Training, Certification," n.d.). In addition, some states require reporters to pass a state certification test which tests speed as well as written knowledge ("Training, Certification," n.d.).

There are several certification tests offered through NCRA. One such certification test is the Registered Professional Reporter, or the RPR. This test is given twice a year at more than 100 sites throughout the country as well as abroad. To obtain this certification, a reporter must pass a written knowledge portion along with a skills

portion with speeds dictated up to 225 words per minute ("Training, Certification," n.d.). The written knowledge portion of the exam must be passed with a 70 percent or better, and the skills portion must be passed with at least 95 percent accuracy ("Education & Certification, n.d.).

Another certification test offered by NCRA is the Registered Merit Reporter, or the RMR. This test is similar to the RPR; however, it is slightly more challenging with dictated speeds up to 260 words per minute ("Training, Certification," n.d.).

The Registered Diplomate Reporter, or RDR, is the highest certification offered by NCRA. In order to obtain this certification, the reporter must have either five consecutive years experience as an RMR or be an RMR and hold a four-year baccalaureate degree (Bureau of Labor, 2004).

The Certified Realtime Reporter (CRR) is also offered. With this certification, the reporter must write at 180 words per minute, but 96 percent or better must be achieved without any editing. These are only a few of the certification tests offered.

In order to maintain certification, court reporters are required to earn continuing education credits through NCRA. There are several ways this can be done. One way is to attend NCRA or state conventions and attend seminars. A court reporter can also contact NCRA and request a home-study packet which contains a list of books and articles to read followed by a written test to be mailed into NCRA upon completion. NCRA can also provide a list of approved local adult seminars on subjects such as CPR that the reporter may attend. The reporter may also sign onto NCRA's web site to attend an "e-seminar." NCRA's magazine also periodically includes continuing education

articles which the reporter can read, take the test, and mail into NCRA. Any one or combination of methods is acceptable to earn credits to maintain certification.

Earnings

The earning potential of stenographic court reporters varies depending on their location, the type of work they perform, the experience of the individual reporter, and the level of certification achieved. However, according to the 2004-05 edition of the Occupational Outlook Handbook, in 2002, the average income of court reporters was $41,550 (2004). The middle 50 percent of those earned between $29,770 and $55,360 with the lowest 10 percent earning less than $23,120. The highest paid 10 percent earned more than $73,440. The average income for court reporters working in local government in 2002 was $40,720. Official court reporters, those working for a court of law, earn a salary as well as a per-page fee for transcripts. Again, these fees vary by location.

What Is Voice Recognition?

Voice recognition is the process of using the spoken word as an input to a computer program (Baumann, 1993). It is also the "technology by which sounds, words or phrases spoken by humans are converted into electrical signals, and these signals are transformed into coding patterns to which meaning has been assigned" (Baumann, 1993). Within the category of speech recognition, there are several broad classifications.

Discrete speech recognition requires that each word be an individually identifiable unit (Robson, 1995). However, this is a problem because during normal conversation, humans typically run words together. For example, "going to" sometimes becomes "gonna." In order to make this type of speech recognition work, many systems require a pause of about 100 milliseconds between each word (Robson, 1995). It takes a person

about 2/10 of a second to say a word, which puts a theoretical maximum of 200 words per minute on discrete speech recognition (Robson, 1995).

Continuous speech recognition is the technology that allows each word to be recognized exactly as it is spoken, slurs and all (Robson, 1995). With this type of speech recognition, words are separated into individual sounds and then reassembled into words (Robson, 1995).

Speaker-dependent systems are trained for a single voice (Robson, 1995). This system is able to run more efficiently and accurately because it is trained to understand pronunciations, inflections and accents. In other words, it is tailored to the speaker (Robson, 1995). In order to train the system, the user must engage in training sessions. During each session, the program displays a word or phrase on the computer monitor. Then the user speaks this word or phrase several times into a microphone. The program then takes the word or phrase, composes a statistical average of how it was spoken, and stores the average sample as a template (Baumann, 1993). Because of this, speaker-dependent systems are limited to the user who trained the system. After the training session is complete, the system has a vocabulary that is limited to a few hundred words and phrases used in the training session and can have a recognition accuracy of about 98 percent (Baumann, 1993).

Speaker-independent systems are designed to deal with anyone, as long as they're speaking English (Robson, 1995). This system does not need to be trained by each new user and is a more general form of voice recognition. Instead of trying to find an exact or near-exact match between the voice input and the stored template as in the speaker-dependent system, this method processes the voice input and then attempts to find

similarities (Baumann, 1993). In order for this to work, scientists had to figure out what parts of speech are generic and which ones vary from person to person (Robson, 1995). The recognition accuracy for this system is around 90 to 95 percent (Baumann, 1993).

Context-sensitive systems anticipate or limit what can be said at any given time (Robson, 1995). Because of this, accuracy is increased significantly. These systems are different from speaker-dependent and speaker-independent systems in that context-sensitive systems have a limited vocabulary and are computer programmed instead of user programmed to recognize voice. An example of this technology is calling for a hotel wake-up call. When an individual phones to request a wake-up call, the system asks for the time the individual would like to be awakened. It then can be assumed that whatever is said will represent a time of day. If the individual says anything else, the system will not be able to recognize it (Robson, 1995). These systems may have a large vocabulary, but only a small portion of it will be able to be used at a time (Robson, 1995).

Court Reporting And Speech Recognition

It is a widely-held belief that the court reporting profession will soon be obsolete because of the fast-growing field of voice recognition technology. This belief causes prospective court reporting students to question whether or not to enter court reporting school and causes existing students to wonder whether or not to stay (Robson, 1995). However, out of the eight categories and classifications of voice recognition, only one category pertains or relates to court reporting. Speaker-dependent voice recognition, which is trained for a single voice, is used by stenomask or voice writer court reporters.

What Is A Stenomask/Voice writer Court Reporter?

Like stenographic machine court reporters, stenomask or voice writer court reporters sit in a courtroom or conference room taking down what is being said. However, there is one noticeable difference. Stenomask or voice writers hold a funny-looking mask right below the nose covering the whole mouth. Instead of writing down what is being said on a steno machine, they repeat what is being spoken into the mask in order to make an analog tape recording of the proceeding. Because of the special type of mask used, no one is able to hear the court reporter. However, it has been reported that this is not always the case.

Stenomask reporters work in the same environments as steno reporters. They are also branching out into the closed-captioning and CART fields.

The terms "stenomasker" and "voice writer" are often used interchangeably. The National Verbatim Reporters Association identifies all those who provide a record using their voice as "voice writers,' whether or not they are providing realtime ("Blue Ribbon," 2003). For the purpose of clarity, stenomask reporting is the traditional method in which no voice recognition or realtime technology is used. The stenomask reporter simply dictates onto an audio track to listen to at a later time and manually transcribes it. However, a voice writer employs the use of voice recognition software ("Blue Ribbon," 2003).

Voice writing takes two forms. One form is nonrealtime voice writing. In this form, voice recognition software is utilized to create a rough draft for the reporter to review and edit at a later time. In this form, there is no realtime display output ("Blue Ribbon," 2003). However, when performing realtime voice writing, voice recognition

software is again used, but this time a stream of text is created for a realtime display ("Blue Ribbon," 2003).

Reading And Writing

Unlike traditional stenographic court reporters, voice writers do not write but speak. The voice writer reporter speaks directly into the hand-held speech silencer, which prevents the reporter from disturbing the proceeding while repeating everything that occurs during testimony, including unspoken answers, gestures and reactions ("We are the Voice," n.d.). Voice writers not only repeat every word stated by the attorneys, witnesses, judge, and parties to a proceeding, but they also verbally identify each speaker, and describe activities as they take place ("We are the Voice," n.d.).

The traditional stenomask reporter also creates an audio recording. Later in the transcription process, the reporter plays back the recording, and through his or her training can interpret the audio, and then type up the transcript. This method is comparable to a nonrealtime stenographic writer typing up the transcript from his or her paper notes. On the other hand, a voice writer using voice recognition technology also has the audio; but in addition, like the realtime stenographic reporter, he or she also has a rough draft of the transcript on his or her computer.

Before a voice writer can employ voice recognition technology, he or she must train the software to recognize his or her voice. Speech recognition is a single-user, voice-to-text technology, which means only one person can create each voice file ("For Future Court Reporters," n.d.). Also because the technology is single-user, it cannot recognize multiple voices at once, so it will only transcribe the voice of the reporter ("For Future Court Reporters," n.d.).

In order to train the voice recognition system, the voice writer reporter collects typical transcripts for that job and scans them into the program. After the documents are scanned, the program then creates a list of words that are not in its universal dictionary. From this list, the reporter can then select a word to be added to the dictionary, at which time the reporter is prompted to pronounce the word. The program then creates something similar to a stenotypist's job dictionary file ("Blue Ribbon," 2003).

The voice writer reporter must also run an audio setup test prior to every proceeding so the system can gauge the ambient noise in the room so it will know what background noise to ignore while translating. This audio test also trains the system to recognize the individual's voice at that particular time to ensure higher rates of translation accuracy ("Blue Ribbon," 2003).

Voice recognition software is designed to translate based on variables. First, it looks at a general vocabulary of approximately 250,000 words. Then the program narrows down the spoken words to the variables that are built on continued use and artificial intelligence learning patterns ("Blue Ribbon," 2003). Voice recognition uses many different calculations to determine what word to display based on the voice writer's spoken input. To do this, the system uses artificial intelligence like stenographic software and makes a judgment based on the acoustics of the reporter's voice and context to choose the word it displays ("Blue Ribbon," 2003). However, unlike stenographic CAT software, voice recognition software uses grammatical or contextual models that are more accurate in translating whole phrases as opposed to recognizing the context on a word-to-word basis ("Blue Ribbon," 2003). This is a curse and a blessing because this means the software will ultimately return a phrase based on the probability that "this

word usually follows that" ("Blue Ribbon," 2003). So the program may actually return an output that is incorrect even if the reporter dictated the actual words correctly. The speech recognition program will always return an output regardless of whether it is correct or not ("Blue Ribbon," 2003).

The most commonly used voice recognition platforms are ScanSoft's Dragon NaturallySpeaking Professional or Preferred and Audioscribe. These programs have the capacity to effectively recognize speech at 160-180 words per minute with up to 95 percent accuracy ("Blue Ribbon," 2003). However, it is possible for the voice writer to train the software to recognize his or her voice at higher rates of speed of 200-225 words per minute, but it stretches the limits of the system. The translation accuracy decreases significantly at speeds exceeding 225-250 ("Blue Ribbon," 2003). In 1998-99, the State Justice Institute performed a study in Missouri, which indicated "almost flawless" translation at speeds below 200 words per minute, but that "the rate of recognition drops in direct relation to rates of speed in excess of 200 words per minute" ("Blue Ribbon," 2003). This makes sense because the faster a person speaks, the more likely it is that his or her words will be run together and slurred, thus contributing to less accurate translations.

In order to use effectively a system that has been trained for higher speeds where the rate of speech decreases, the reporter must use pause dictation. To do this, the reporter holds back words in order that he or she can dictate whole sentences or phrases at a time into the program at the higher rate of speed for which the software is trained. In order to provide quality realtime, the voice writer is trained to dictate at a constant word-per-minute rate regardless of the speed of the speaker ("Blue Ribbon," 2003).

Although voice recognition software can be trained to recognize faster rates of speech, it comes at a cost. Besides decreased translation accuracy, time lags occur. Due to the storage demands of the .wav and other files associated with voice recognition, long sessions without breaks create large files on the computer. The larger the files become, the longer it takes for the computer to process the text and display it on the monitor ("Blue Ribbon," 2003). Some voice writers have reported that there could be a delay of 20 minutes or more from the time the words were dictated to their being shown on the monitor ("Blue Ribbon," 2003).

Other challenges that face the quality of the realtime translation are the physical conditions of the voice reporter such as voice fatigue, sickness, posture, etc. ("Blue Ribbon," 2003). Any condition that differs from what the system has been trained for will decrease the accuracy in the voice recognition ("Blue Ribbon," 2003). However, just as voice writers are able to retrain their system to accommodate faster speech, they are also able to retrain the system to meet their current physical situation. For example, the reporter can create new voice files to compensate for the changes in his or her voice due to fatigue or cold ("Blue Ribbon," 2003).

According to the National Verbatim Reporters Association, not all voice writers wish to dedicate the necessary time and energy to perfect their voice files to the degree required to perform realtime ("For Future Court Reporters," n.d.). However, according to research conducted by the National Court Reporters Association, most voice writers define realtime as being an application solely for their own use in order to improve their efficiency in producing a transcript rather than providing it as a service to others such as attorneys and judges ("Blue Ribbon," 2003).

Regardless of whether the reporter intends to perform realtime for themselves or for others, in order to make the voice recognition software work efficiently and correctly, the reporter must continually train his or her computer and work with his or her audio files. As one voice writer states, "It is a constant upgrade because the vocabulary is so large. If you don't update and train your computer constantly, you will spend all of your time retyping the work" (Gillette, 2004).

How To Become A Stenomask/Voice Writer Court Reporter

How does one become a stenomask or voice writer? Like that of their stenographic writer counterparts, stenomask and voice writers must be able to work quickly and accurately. In order to become a certified stenomask or voice writer reporter, one must be able to speak 250 words per minute with an accuracy of 95 percent ("NVRA Certifications, n.d.).

Since stenomask and voice writers work in identical environments, but just perform a different method of producing a transcript, many of the same skills and interests are required.

Stenomask and voice writers must possess excellent English grammar, be able to sit for long periods of time without a break, be computer literate, have an interest in law, be able to perform well under pressure, and be able to cope with stress. Stenomask and voice writers must be able to not only listen well, but must also learn to listen while speaking at the same time, while also identifying speakers and describing peripheral activities in the room ("For Future Court Reporters," n.d.).

According to the National Verbatim Reporters Association, a good voice writer must possess three difficult skills. The first skill is speed. As previously stated, a

stenomask or voice writer must be able to speak very quickly. They must not only be able to repeat what is being said very quickly, but they must also be able to verbally identify speakers and describe peripheral activities ("For Future Court Reporters," n.d.).

Second, since speech recognition relies on contextual models and speech patterns, the reporter must be able to overcome the contextual model in favor of context ("For Future Court Reporters," n.d.). In other words, when the word "to" is spoken, the reporter must be able to differentiate between "to," "too," and "two."

Lastly, stenomask and voice writers must have a large vocabulary. In order to maintain higher accuracy levels of translation, the voice recognition dictionary must contain entries that cover a wide range words covering a wide range of subject matter and technology ("For Future Court Reporters," n.d.).

Once an individual decides to commit to learning stenomask or voice writing, the options for schools are not as widespread as that of stenographic schools simply because there are only a few voice writing schools that exist throughout the country ("Blue Ribbon," 2003). In fact, the National Verbatim Reporters Association only approves seven programs throughout the country, and those school are only located in the South and in the East. Some of these training programs are provided in school settings while others permit home study or internet classes ("Blue Ribbon," 2003). If one wishes to become a traditional stenomask reporter and not use voice recognition technology, he or she probably would not even attend a school, but would most likely learn from another stenomasker, as this is the most common training method ("Blue Ribbon," 2003).

If one attends a voice writing school, the full program generally consists of 26 weeks of instruction ("Blue Ribbon," 2003). The program teaches students vocabulary in

the fields of legal, medical, and general business. The instruction also consists of teaching reporting skills such as proper breathing techniques and proper dictation techniques. Students are also taught transcription skills.

According to the National Verbatim Reporters Association, students who attend full time can complete the full course of study within one school year. However, NVRA states that those individuals who wish to learn only how to use the very basic equipment instead of the newest technologies can be trained in six to eight months ("For Future Court Reporters," n.d.). NVRA also claims that for those already skilled in stenotype, one could learn the process itself in only a matter of weeks; however, becoming proficient in the voice writing method would take approximately six months ("For Future Court Reporters," n.d.). In contrast, a university spokesman stated, as with steno, the students' ability to learn the system depends on the amount of time spent practicing and interacting with the technology ("Blue Ribbon," 2003).

A study conducted by the National Court Reporters Association pointed out that it appears that most of the traditional stenomask training programs are not teaching realtime voice writing, but seem to be teaching courses in traditional stenomask reporting in which the reporter dictates onto an audio tape for later transcription ("Blue Ribbon," 2003). The study also points out that none of the voice writing schools are accredited by a body recognized by the US Department of Education nor are they eligible for participation in Title IV funding ("Blue Ribbon," 2003). Title IV funding establishes federal financial aid programs such as Pell Grants and Stafford loans for students attending postsecondary institutions (National Center for Education Statistics, n.d.). The effect of this lack of

eligibility for funding means that a student will not be able to apply for any federal financial aid if attending one of these schools.

Once the student completes the voice writing program, he or she may be required to pass a certification test in order to work. The National Verbatim Reporters Association offers three certification tests.

The entry level certification test is the Certified Verbatim Reporter or the CVR. In order to obtain this certification, the reporter must attend a basic workshop, which covers the use and care of the court reporting equipment, silence testing, read-back, and basic courtroom procedures ("NVRA Certifications," n.d.). A written test is also given. This test covers punctuation, spelling, grammar, legal terminology, definitions and more ("NVRA Certifications," n.d.). To pass the written test, the reporter must score 75 percent or better. In addition to the written test, three five-minute tests are administered: a 200 word-per-minute literary, a 225 word-per-minute jury charge, and 250 word-per-minute question and answer. Accuracy of 95 percent or better is required on each of the three ("NVRA Certifications," n.d.).

The next certification test offered is the Certificate of Merit or the CM. In order to be able to sit for this test, the CVR must first be passed ("NVRA Certifications," n.d.). There is no written knowledge portion, but only a skills portion. Again, three five-minute tests are given: a 225 word-per-minute literary, a 250 word-per-minute jury charge, and a 300 word-per-minute question and answer. An accuracy of 97 percent is required on each of the three to pass ("NVRA Certifications," n.d.).

The third and final certification that may be obtained from NVRA is the Realtime Verbatim Reporter or the RVR. To be eligible to attempt this test, one must first pass the

CVR. This test only consists of one five-minute, two-voice question and answer. The speeds vary from 180 to 200 words-per-minute. Since this is a realtime certification, voice recognition software must be utilized and a realtime display must be performed. The reporter may not interact with or edit the text at all, either during or after the test. After the dictation is complete, the reporter downloads the voice-generated text to a floppy disk and submits it to the test monitor. The grader then prints out the text and scores the unedited text ("NVRA Certifications," n.d.).

Like the National Court Reporters Association, the National Verbatim Reporters Association also requires that reporters maintain their certifications through obtaining continuing education credits ("NVRA Certifications," n.d.). In order to obtain these credits, NVRA mandates reporters must attend voice writer education courses, continuing legal education or college courses ("NVRA Certifications," n.d.).

Earnings

Because stenomask and voice writers work in the same environments as well as perform the same service as stenographic writers, just by a different method, the earnings potential of stenomask and voice writers is the same (National Court Reporters Association, n.d.). In fact, the Occupational Handbook defines all who provide the official record as being court reporters, regardless of whether it is by voice or by steno (Bureau of Labor, 2004).

Will Voice Recognition Replace Court Reporters?

The biggest concern among stenographic reporters seems to be whether stenomask or voice writers will replace or compete with steno writing reporters (Poss, 2004). To help answer this question, the National Court Reporters Association

assembled the Blue Ribbon Commission, which was composed of senior stenographic court reporters. The purpose of this commission was to engage in a fact-finding project in order to formulate a clear, solid understanding of the true state of the art in voice realtime ("Blue Ribbon," 2003). The Commission investigated the claims of voice realtime capability by reviewing available studies and other literature, viewing demonstrations in controlled environments, observing applications in actual working environments, and engaging in primary research and direct data collection. The Commission also conducted intensive interviews with individuals knowledgeable in stenomask and realtime voice writing, experts in reporting technology, stenographic reporters retraining to become voice writers because of repetitive stress or carpal tunnel injuries, and individuals from NCRA-approved programs that teach stenographic reporting as well as realtime voice writing. The Blue Ribbon Commission also conducted phone interviews with traditional stenomask schools and schools teaching voice realtime (2003).

After all of this research was conducted, NCRA published a final report of their findings. In the end, NCRA's Blue Ribbon Commission made conclusions in seven areas: quality, speed, accuracy, education and training, technology, reporter proficiency, and physical factors (2003).

In the area of quality, the commission reports that because voice realtime technology is still in its very early stages of development, the realtime output has not yet reached the quality and accuracy demanded and expected of realtime steno and is of a lesser quality than the average stenographical realtime output ("Blue Ribbon," 2003). The commission states that at this time, the best realtime comes from stenographic

writers; however, they concede that voice realtime offers a real potential as a voice-to-text method; and as the voice realtime technology improves, so will the quality of voice realtime output.

The commission concludes that where speed is concerned, although realtime voice writers are able to master lower speeds faster than stenographic writers, realtime voice writers are currently unable to consistently match the stenographic writer's accuracy at those faster speeds ("Blue Ribbon," 2003). Speed is also a differentiating factor in the area of software. Where a steno writer's software is stable and functions properly at speeds exceeding 225 words per minute, the accuracy of the voice writer's software begins to deteriorate when it is pushed over 200-225 wpm ("Blue Ribbon," 2003). Again, however, one must remember that stenographic realtime software has been around for 20 years, whereas the voice realtime software has only just begun to develop.

Because traditional stenomask reporters do not use voice recognition software, and therefore cannot provide realtime, they are unable to pose any real technological threat to realtime stenographic writers, although they can compete with nonrealtime stenographic writers. Even though present-day voice writing systems are questionable and are not able to compete with the accuracy and stability of stenographic software, new versions are continually under development ("Blue Ribbon," 2003). Because of this, voice writers show a real potential for further development in technology and demonstrate great promise for the future of realtime voice writing ("Blue Ribbon," 2003).

The Blue Ribbon Commission was unable to provide a clear answer on the accuracy of realtime voice writers because no realtime voice writing software has the ability to measure the percentage of accuracy (2003). With realtime stenographic

software, when a reporter misstrokes a word, in place of the English word, the steno appears in red on the computer monitor. Each misstroke, or untranslate, is logged and an untranslate rate is calculated. However, this is not so with voice writer software. Since all voice writing software will always return a word regardless of whether or not it is correct, this means that voice writers never have any untranslates on their computer screen. In order to obtain an accurate percentage of accuracy, the realtime output must be manually compared to the original source such as the audio recording ("Blue Ribbon," 2003).

It is the Commission's position that upon a voice writing student's graduation, he or she will not be able to immediately provide quality realtime or closed captioning ("Blue Ribbon," 2003). This is because, like stenographic writers, recently graduated voice writers need a period of apprenticeship. Because experience plays a critical role, regardless of methodology, this additional training is critical to the reporter becoming competent ("Blue Ribbon," 2003).

The Blue Ribbon Commission also asserts that the claim made by some software vendors as well as other individuals involved in voice writing that one can achieve realtime proficiency in three to six months is also false. The commission acknowledges the skill and difficulty in becoming a realtime voice writer and points out that the estimated time required to properly train the voice recognition system alone is three to six months ("Blue Ribbon," 2003). So to say that a person can master the proper breathing and speaking techniques required of a voice writer as well as properly learn and train the voice recognition system in three to six months is a falsehood.

For one to become a proficient reporter, one must possess dedication, a strong work ethic, and pride in the quality of the output. The Blue Ribbon Commission found that proficient realtime voice writers demonstrated these qualities (2003). The success of a reporter is determined by an individual's skill, passion for constant improvement, and a willingness to take the time for self-improvement. A reporter's success is not wholly determined by method of reporting.

The physical factor that is a point of concern for the Blue Ribbon Commission regarding voice writers is fatigue (2003). This is because as a voice writer becomes fatigued, the voice changes, thus affecting the accuracy of the output ("Blue Ribbon," 2003). However, the same argument can be made for fatigued stenographic writers. As a stenographic writer becomes fatigued, the brain is less able to function at its highest level and accuracy decreases.

In conclusion, voice writing is not a threat to steno writers, but an opportunity to partner in order to help alleviate the court reporter shortage that exists. However, there is room for improvement in the areas of voice writer schooling and certification in the sense that there needs to be more consistency and standardization. At present, no voice writing school is held to any educational standard or review process ("Blue Ribbon," 2003). In order to ensure consistency and excellence of voice writing education, all voice writing schools need to have educational standards and a review process of courses similar to those required of stenographic schools. This is especially true for voice writing schools teaching realtime.

The National Verbatim Reporters Association's exams could also improve. The exams administered by the National Court Reporters Association are developed from a

Job Analysis prepared under the observation of Professional Education Services of New York, an independent testing corporation. At this time NVRA exams are not subject to any independent, outside evaluation ("Blue Ribbon," 2003). If voice writers and steno writers can be taught under and held accountable to the same standards, then there could be no cause for doubting or questioning a stenomask or voice writer's skill, competency, or ability to provide an accurate record. Then there would also be no fear of competition or takeover, but a feeling of unity and allegiance in combating the use of electronic recording in the courtroom.

What Is Electronic Recording?

Electronic recording is an alternate method of court reporting which uses digital audio recording equipment in place of human court reporters to capture every verbal action in the courtroom, saving it for later playback and transcription. Many court systems are choosing the electronic recording method because of a nation-wide court reporter shorter and because of budget crises. Many courts believe electronic recording will provide a cheaper alternative to court reporters ("Electronic/Digital," n.d.). However, there are some serious concerns as to whether electronic recording actually provides a true advantage over court reporters or if it is only an expensive method for producing a simple audio tape (Gruen, n.d.). There are also several problems that arise when using recording devices, which raise important and unanswered questions about the integrity of the record (Franzen, 2004).

How Does It Work?

Two digital court audio recording system vendors dominate the market, Dictaphone and CourtSmart (Gruen, n.d.). There are several other companies that are

also working on digital audio recording systems, but they are not presently on the market (Gruen, n.d.).

The Dictaphone system is called "For the Record" (Gruen, n.d.). This system uses microphones placed throughout the courtroom, which are connected to a mixing device. This mixing device sends the audio signal from the microphones to both the room sound reinforcement and to a central recording room (Gruen, n.d.). In this central recording room, the audio is converted into digital format and stored on a SCSI hard drive and a RAID controller for backup (Gruen, n.d.). During the recording session, a "monitor" keeps a log of all the activities that occur during the trial. These notes are referred to as annotations (Gruen, n.d.). These annotations are then placed in the data base along with time stamps, which are automatically placed by the system (Gruen, n.d.). These time stamps and annotations are vital to utilizing the system's ability for random access of material used during readbacks and later retrieval (Gruen, n.d.). For the Record is designed to allow the digital material to be accessed for transcription through a local or wide area network. This provides digital quality audio and the annotations at the transcribing station (Gruen, n.d.).

The CourtSmart system is Windows based and functionally is similar to Dictaphone's For the Record. The major difference between the two systems is in the hardware and software used (Gruen, n.d.).

Why Is It Being Used?

A budget crisis as well as a nationwide court reporter shortage in many of the nation's courts has increased the pressure to use alternative record-making methods in place of qualified court reporters ("Electronic/Digital," n.d.).

Does It Work?

While electronic digital recording has saved many cash-strapped courthouses millions of dollars a year, it has many flaws which have caused headaches as well as legal quandaries (Franzen, 2004). The flaws of electronic recording can be broken down into four main categories: audio quality, equipment malfunction, the quality of the transcript, and hidden costs to the courts.

Audio Quality

According to Martin Gruen, both the For the Record and the CourtSmart system provide a good quality audio recording as well as offering excellent possibilities for a high-quality record of the proceeding. However, there is a weakness in the audio of these systems. "Long audio sessions are prone to digital loss, interferences, and other such problems. Even proper balanced lines can be affected under certain circumstances" (Gruen, n.d.).

Another problem with the audio quality is inaudible portions. Because electronic recording systems depend on the microphones placed throughout the courtroom to record the proceedings, what the system records depends on what the microphones pick up. Inaudibles occur when something is not within the microphone's range or when background noise overpowers and drowns out the testimony. For example, sometimes during a proceeding lawyers walk over to the jury in order to make a dramatic point. When they do this, they often walk out of the microphone's range, thus making the audio too soft for a transcriptionist to hear (Franzen, 2004). Lawyers also frequently talk over one another; and without a live court reporter in the courtroom to stop them, the audio

becomes garbled in a way that a transcriptionist can't always decipher the testimony (Franzen, 2004).

Another example of how an inaudible can occur is when a thirsty lawyer pours himself a glass of water near a live microphone. Transcriptionists say when lawyers do this, it sounds like Niagara Falls and it obliterates the testimony (Franzen, 2004). The audio quality is also diminished by rustling paper, whirring of fans, and as one transcriptionist describes them, occasional strange "Martians-are-landing" noises (Franzen, 2004). All of these instances create inaudibles on the digital recording causing the transcriptionist to be unable to transcribe portions of the testimony. These inaudibles create gaps or blank portions in the official record, which calls into question the integrity of the record.

In addition to gaps in the record, the microphones can at times record private conversations between defense lawyers and their clients (Franzen, 2004). This means that the sanctity of attorney-client privilege can no longer be guaranteed because for $10, anyone can purchase a copy of the public record and eavesdrop on these private conferences (Franzen, 2004).

Equipment Malfunction

Not only are there problems concerning the quality of the audio of electronic recording systems, but the equipment has its own set of problems and concerns. Sometimes the equipment itself is flawed, but sometimes the flaw is due to human error. Either way, instances of recording equipment failing without anyone noticing until the end of the proceeding occur much too frequently which increases the heavy burden on the justice system ("Digital Audio Recording," n.d.).

Because of a recording glitch in one court case, the case had to be retried (Franzen, 2004). In Hawaii, a court suffered a disastrous loss of nearly 100 Grand Jury indictments because of an equipment malfunction ("Courts Go Back," n.d.). In Multnomah County, Oregon, the courthouse is so old that sometimes the wires act as a radio antenna. One day, the digital recorder picked up advice from "Dr. Laura" along with what was happening in court (Franzen, 2004). In another trial, this time a murder trial, about an hour of key testimony was missing because someone forgot to turn on the machine (Franzen, 2004). Steve Townsend, president of Dictaphone's For the Record, says his machines provide a good record at a far lower cost, but he acknowledges that the machines can't record if no one turns them on (Franzen, 2004). These equipment problems, as well as the audio quality problems, then lead to problems in the quality of the transcript.

Quality Of The Transcript

At times, it has been implied that electronic recording systems are voice-to-text systems. This is incorrect (Gruen, n.d.). They are simply a form of audio recording in a digital format ("Digital Audio Recording," n.d.). In order to convert the recording into text, a person must listen to the audio and type it into a word processing system (Gruen, n.d).

The transcription work is accomplished at a workstation using the software designed for this purpose (Gruen, n.d.). Each workstation has the complete functions of a traditional transcribing system which include: four track separation, speed control, volume control, and function buttons (Gruen, n.d.). The four track separation means that there are four microphones placed throughout the court room: one for each judge, defense

attorney, prosecutor, and witness (Swink, 1998). These microphones record onto a two-audio-tape deck recording machine so that if more than one person speaks, the voice can be separated. This two-way division of the four tracks creates a more true-to-life listening experience for the transcriptionist (Gruen, n.d.). However true to life the recording is, it can never be as true as the transcriptionist being in the courtroom; and this makes a very significant difference in the accuracy and quality of the transcript.

The most important attribute a transcript must have is accuracy. When using electronic recording systems, this cannot always be guaranteed because of several reasons. The most obvious reason accuracy cannot be guaranteed by using electronic recording systems is that the transcriptionist is not in the courtroom. As mentioned before, when several parties of the trial are speaking at once or if there is a great deal of background noise, inaudibles occurs. Inaudibles create gaps in the record, and gaps cause the record's value and integrity to diminish. However, when realtime court reporters are present in the courtroom, they are able to stop the proceedings. They are able to get one party to speak at a time, which ensures an accurate record is made ("Electronic/Digital," n.d.). When present, court reporters also have the ability to ask a speaker to clarify what was said or ask the party to speak up if he or she is mumbling ("Digital Audio Recording," n.d.).

According to Linda Lashbrook who wrote a letter to the editor in New Jersey Lawyer, "The worst 'court reporter transcript' I ever saw was better than the best 'tape recorder transcript'" because a live court reporter has the ability to stop people from talking simultaneously, to get them to slow down and to get repetitions from witnesses

with accents, obtain proper spellings of proper names, unfamiliar words and case citations, and generally keep order and reason in the record-making task (1998).

It is also important that court reporters be present during the proceeding because they are able to discriminate between the testimony and the other background noises the microphones may pick up ("Digital Audio Recording," n.d.). Because the court reporter is present during the proceeding, he or she can certify as to the accuracy and integrity of the record and may also testify to those points if necessary ("Digital Audio Recording," n.d.). A transcriptionist cannot.

Judge Edward C. Prado of San Antonio, Texas, states he tried electronic recording, but after finding "inherent problems with the transcription of the tapes," he switched back to a realtime court reporter ("Courts Go Back," 1997). He goes on to explain, "Since the typists who were transcribing the tapes were not present during the proceedings, they could only put in what they thought they heard, and the accuracy of the tape transcripts suffered" ("Courts Go Back," 1997).

When using electronic recording, the data can be divided by the transcribing administrator in order that several transcriptionists can work on each section of recording for greater speed in transcription production. The separate works can then be re-assembled by the administrator and the entire transcript printed out (Gruen, n.d.). However, due to the variations in transcriptionts' background, education, training, diligence, and other individual factors, transcripts prepared by different transcribers from the same recording will be different. These differences may or may not be resolvable by listening to the recording ("Why Are Court Reporters," n.d.).

Unlike electronic recording systems, court reporters do not inadvertently record attorney-client exchanges ("Why Are Court Reporters," n.d.). According to Paul Rothstein, a Georgetown University law professor, court reporters are preferable because everything said in court is "filtered through someone's brain" and private talk isn't captured (Franzen, 2004).

Yet another factor that affects a transcript's accuracy and integrity is the equipment. If electronic recording systems are not turned on or simply fail to record the proceeding, obviously, a transcriptionist cannot transcribe a blank tape. As stated earlier, this happens much too frequently ("Digital Audio Recording," n.d.). These botched trial transcripts can pose serious problems because a defendant appealing a verdict needs a complete record of the case (Franzen, 2004). Defense attorneys who handle criminal appeals say missing words and phrases can compromise a defendant's ability to appeal (Franzen, 2004). The stakes are particularly high in death penalty cases. Richard L. Wolf, a defense lawyer states, "Some of my clients' actual lives depend on the availability of an accurate and manageable court transcript" (Franzen, 2004).

Many lawyers involved in important civil and criminal cases throughout the country have been concerned enough that they've hired their own court reporters in settings where court reporters have been replaced by electronic recording (Franzen, 2004). These lawyers have done so for very important reasons. If the transcript produced from the proceeding recording is spotty, then it is the defendant's burden to show that he or she has done everything possible to re-create the missing events from the collective memories and notes of those present and that the missing portions are material to the case (Franzen, 2004).

Prosecuting attorneys are also concerned about the common occurrence of gaps in the record because they fear those gaps may undermine the convictions won by their office (Franzen, 2004). According to Norm Frink, a chief deputy district attorney, if digital audio remains the only record, gaps and inaudible phrases are "the type of thing we are going to see more of" (Franzen, 2004).

Court reporters, on the other hand, are able to guard against this equipment failure that threatens accuracy and quality of the transcript ("Digital Audio Recording," n.d.). This is because court reporters have four levels of redundancy built into their realtime system. Level one is in the form of the realtime text appearing on the computer screen. This text is saved to the computer's hard drive ("Digital Audio Recording," n.d.). It can also be saved to a computer disk. The next level is that same text is being saved to the steno machine ("Digital Audio Recording," n.d.). As a final backup, the court reporter has the paper notes ("Digital Audio Recording," n.d.).

Hidden Costs

Senator Vicki Walker from Eugene, Oregon, has worked as a court reporter for over 20 years, and she considers digital recording a big step down from court reporter transcripts. She states, "I've gone through audio transcripts, and they're awful" (Franzen, 2004). She goes on to say that when gaps in the transcripts occur, "it's a tragedy and it ends up costing taxpayers more in the long run" (Franzen, 2004). In private, others worry that even a handful of retrials could seriously cut into the cost-savings derived from electronic recording (Franzen, 2004). This is only one hidden cost of electronic recording in the courtroom.

Even those in favor of electronic recording in the courtroom note that the initial investment for the equipment is considerable. In fact, digital systems cost $25,000 or more in groups of four courtrooms and the cost is higher per courtroom in smaller configurations (Gruen, n.d.). However, those in favor of digital recording state it is offset by the reduced salaries and benefits for tape monitors ("Electronic/Digital," n.d.). However, many courts fail to recognize the hidden costs, such as maintenance fees for the system as well as the cost of transcription ("Electronic/Digital," n.d.).

As stated before, digital recording is not a voice-to-text technology and must therefore still be listened to and manually transcribed. In most instances transcript costs are similar regardless of the method used to take the record. However, electronically recorded transcripts generally take up to two times as long to be compiled, edited, and returned as a final document ("Electronic/Digital," n.d.). This burdensome task results in an additional cost to the courts and litigating parties and can delay the production of the record ("Digital Audio Recording," n.d.).

Another cost courts must consider is the cost of providing their transcriptionists with the transcribing system. The court can require transcriptionists to have their own equipment, but that could be a contractual problem and many courts are not willing to pursue it. It would also present the transcribers with an expensive work requirement (Gruen, n.d.). However, realtime court reporters already provide their own equipment, thus providing the courts with sophisticated digital technology; and this is not at the court's expense ("Why Are Court Reporters," n.d.).

Courts must also consider the potential expense involved if a litigant decides to sue because of missing testimony in a case. For example, a complex civil environmental

case in 2002 had to be retried because of a recording glitch; and the litigants sued the state in order to recover costs (Franzen, 2004).

Not all of the hidden costs are monetary. In Oregon, many court reporters have been replaced by electronic recording systems, even in high-stake trials. Some lawyers are so concerned about this that they have hired their own court reporters for their important civil and criminal cases (Franzen, 2004). However, this places an added cost and burden on the litigant. Most of Oregon's criminal defendants, as well as other defendants across the country, cannot afford the added expense of hiring their own court reporter, and this creates an inequitable system (Franzen, 2004). The United States justice system is a system based on justice for all, not justice for only those who can afford it. Every individual has the right to have the most accurate transcript of his or her case, and because of the aforesaid problems and flaws of the electronic recording system, the most accurate transcript does not come from electronic recording systems. By eliminating court reporters in the courts, especially for high-stake criminal and civil trials, the courts are stripping away an individual's right to the most accurate transcript if that individual cannot pay for a court reporter. Our justice system can no longer be considered fair and equitable if one defendant is afforded the best transcript because he or she can afford to pay for a court reporter, yet another defendant is only afforded a substandard transcript because he or she is indigent. If the United States court system can no longer be considered fair and just, then the courts have a larger problem than a budget crisis or a court reporter shortage.

Judge Edward C. Prado of San Antonio believes that using realtime court reporters in place of electronic recording systems can even save money. He says,

"Realtime also helps to save money during expert witness testimony—instead of having experts sit in court for several days, the witnesses can just review the transcript the day before they testify" ("Courts Go Back," 1997).

For courts who are considering electronic recording, but are not sure, the National Court Reporters Foundation funded a study conducted by the Justice Management Institute ("Electronic/Digital," n.d.). This study led to the development of the two-volume, How to Conduct an Assessment of Your Court's Record-Making Operations: A Systemic Approach ("Electronic/Digital," n.d.). This study helps courts to run more efficiently by determining how to better use court reporters as well as other methods of making the record.

Monitors

Another concern in the area of electronic recording comes in the form of the court monitor. The court-employed monitor annotates the trial activities in order to create a log, which allows attorneys and judges to quickly find a portion of the record ("Caution Advised to Courts," 1998). However, the problem is that it is common practice for the monitor to be stationed in a central room where he or she monitors up to four courtrooms on a screen at a time (Gruen, n.d.). While this may save the court money on monitor salaries, only 25 percent of any hour can be spent on each proceeding by a monitor. During the other 75 percent of the hour, absolutely no annotations are being made (Gruen, n.d.). This then means three-quarters of any one proceeding's record is not searchable because the monitor is making annotations for the other three proceedings ("Caution Advised to Courts," 1998). Since the search engine of the system is dependent on the annotations, the lack thereof severely decreases the usefulness of the digital

system's annotations feature. Also, because the activities and events logged rely on the monitors, the quality and consistency of the annotations can easily be called into question ("Caution Advised to Courts," 1998).

The second concern is that no special schooling is required to become a court monitor (Swink, 1998). However, a typing proficiency test is required with a proficiency level of 50 words per minute (Swink, 1998). Court monitors receive on-the-job training by watching and learning from other monitors (Swink, 1998). Upon completion of training, there is no certification nor are there requirements for continuing education ("Digital Audio Recording," n.d.). Court reporters on the other hand, undergo a minimum of two or more years of academic and skills training; and those reporters who become certified must demonstrated that they update their knowledge by earning continuing education credits ("Digital Audio Recording," n.d.).

Conclusion

When one court administrator was asked what advantages digital audio recording provided, he replied, "Nothing" (Gruen, n.d). The preference for realtime court reporters over digital recording can be seen across the country. In the Oklahoma City bombing case of Timothy McVeigh, the judge and counsel decided to forego the courtroom recording system normally used for trials, and relied on court reporters instead ("Courts Go Back," 1997). After years of unexpected cost, frustration and backlog cases at the appellate level, New Mexico reversed its decision to use electronic recording and returned to using realtime court reporters stating that the tape systems resulted in great increases of time and additional personnel costs ("Courts Go Back," 1997). Nevada's federal courts, as well as their Gaming Control Board and Gaming Commission have all

returned to using realtime court reporters after having tried tapes for three years and incurring higher costs and receiving inferior service ("Courts Go Back," 1997). Hawaii's trial courts now rely exclusively on court reporters after tape recorder malfunction lost nearly 100 grand jury indictments ("Courts Go Back," 1997).

Court reporters have been the forerunners in applying computer technology in the legal system with computer-aided transcription and performing realtime translation. Reporters also have the capability to provide all case information in digital format to the judges and attorneys, produce transcripts that can be researched, corrected, telecommunicated, and stored on CD-ROM or other computer media with the capacity to integrate the data with a videotape. The data can also simply be printed out in a conventional or condensed format ("Courts Go Back," 1997). These reporter-based technologies enhance the function of our legal system in both big-ticket trials as well as in everyday cases ("Courts Go Back, 1997). In short, when the record matters most, court reporters are getting the call.

Although court reporters are the way to go when it comes to ensuring a fast, cost-effective, and accurate record, with the court reporter shortage and growing budget crunches facing the courts, sometimes the decision to replace reporters with electronic recording is purely budgetary and no amount of information will make a difference (Nagy-Baker, 2004). While it is not foreseeable that electronic recording systems will completely replace court reporters, they do have a potential to save courts money. However, they should be used only under appropriate circumstances such as in traffic court and other courts that oversee minor proceedings or hearings in which a transcript is

not necessary. Whether or not to use electronic recording should be carefully considered and weighed.

While there is clearly a desire to maximize technology in the courtroom, sometimes it is to the detriment of the record (Franzen, 2004). Court reporters can provide that technology now more than ever, and the system ought to be figuring out how to make the best use of them, not how to eliminate them (Lashbrook, 1998).

In the present day, court reporting comes in so many forms: traditional stenographic writers, realtime stenographic writers, traditional stenomask, realtime voice writers, and electronic recording systems. With technology growing so fast, one can get caught up in the horse race as to which group of court reporters is going to get ahead the fastest or who is going to take over or replace the other: Are voice writers using voice recognition software going to replace stenographic writers or is digital electronic recording technology eventually going to replace court reporters altogether? People should not be focusing their attention on what method is going to win out and replace the other, but they should be focusing more on what is the best way to provide the most accurate official record.

It is evident that using electronic recording systems in high-stake trials is not the best method of providing an official record where the very lives of individuals depend on the outcome of not only the trial itself, but on the accuracy of the transcript. However, electronic recording systems do have their place in courts that preside over minor cases such as traffic court.

Court reporters, on the other hand, are the best method of providing the most accurate official record. The method of court reporting doesn't matter, whether it is

traditional stenographic or stenomask, realtime stenographic or realtime voice writing. All court reporters need to realize their similarities and come together as one profession to fill reporter-vacant courtrooms. This country needs more court reporters; not inaccurate, malfunctioning electronic recording systems.

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