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New Jersey Law Revision Commission

FINAL REPORT

relating to

ELECTRONIC RECORDS AND SIGNATURES

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NEW JERSEY LAW REVISION COMMISSION

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Electronic Records and Signatures

Application of old law to new technologies

Over the last several decades, computer and other technologies have significantly changed the way in which our society routinely handles all kinds of transactions. New technologies continually make communications cheaper and faster, and permit ready access to large volumes of information in shorter time periods. Increasingly, private commercial transactions which formerly took place in person or with the use of traditional paper technology are being accomplished “electronically.” Government agencies have also sought to take advantage of the many ways in which computer and related technologies can save time and money, and provide better service to the public.

Historically, the implementation of new technologies has raised questions concerning the application of existing legal principles to what are, or may appear to be, new situations. In recent years, the widespread use of electronic means to accomplish transactions has raised questions concerning the applicability of various statutes and other legal rules to those transactions. As a result, statutes have been enacted to recognize the use of electronic technologies in a wide variety of circumstances, e.g., to redefine the crime of theft to include unauthorized access to computers, N.J.S. 2C:20-25; to provide a civil cause of action for damage to computer systems through unauthorized access, N.J.S. 2A:38A-1; to authorize the judiciary to develop a system for electronic filing and access to court records, N.J.S. 2B:1-4.

The recent explosion in use of the Internet for business and consumer transactions has drawn increasing attention to the subject of “electronic commerce,” as businesses, individuals and governments adjust to this new avenue of communication.

Recently, statutory revision initiatives in various states and at the national and international level have suggested that the states should undertake projects to revise existing statutory law to accommodate or encourage the use of electronic technologies. Legislation has been enacted in a few states, and proposed in a number of others, to redefine the terms “writing” and “signature” to include “electronic documents” or “electronic records” and “electronic signatures.” See, e.g., Electronic Signature Act of 1996 (Florida), codified at Fla. Stat. 282.70-75 (defining the term “electronic signature” and providing that an “electronic signature” may be used to sign a writing and have the same effect as a written signature). The National Conference of Commissioners on Uniform State Laws (NCCUSL) also has pending several projects in which those terms would be defined in the Uniform Commercial Code and generally. See Uniform Electronic Transactions Act (Draft November 25, 1997 (setting forth rules for the conduct of “electronic transactions”). At the international level the Model Law on Electronic Commerce has been promulgated by the United Nations Commission on International Trade Law (UNCITRAL), which provides for legal recognition of “data messages,” establishes a standard for determining whether a “data message” has been signed, and sets

forth other legal rules applicable to “data messages.” See Model Law on Electronic Commerce (with Guide to Enactment 1996, United Nations, New York 1997), <http://www.un.or.at/uncitral/texts/electcom/ml-ec.htm> (February 4, 1998).

The assumption behind these law reform initiatives is that existing statutes impose writing and signature requirements which preclude or inhibit the use of electronic technologies and thus impede the growth of electronic commerce. See, e.g., Daniel Greenwood, Electronic Signatures and Records: Legal, Policy and Technical Considerations, Version 1.0 | Draft: 1/9/97, <http://www.magnet.state.ma.us/itd/legal/e-sig.htm> (August 21, 1997). Still other initiatives urge the establishment of so-called “cybernotaries” to provide the electronic equivalent of document acknowledgments and other security services similar to those provided by notaries public with respect to paper documents. See, e.g., ABA Science and Technology Section, Information Security Committee, “Digital Signature Guidelines” (Aug. 1996)(proposing standards for cybernotary systems which use asymmetric cryptology systems. In addition, the current projects to revise the Uniform Commercial Code are taking into consideration the use of electronic technologies in commercial transactions.

The proposition that wholesale change in statutory law is needed to accommodate electronic technologies is one which the Law Revision Commission is reluctant to accept without close examination of both the need for such change, and the effect that it would have on existing statutory requirements. In considering the issues raised by the increased use of new technologies, the Commission is mindful of the fact that electronic technologies have been widely used for many decades in the form of telephone, telex and telegraph communications, facsimile transmissions, private data exchanges such as Automated Teller Machines, “EDI” (electronic data interchange) and electronic funds transfers. See Benjamin Wright, Electronic Commerce Legislation Frequently Asked Questions, [http://www.magnet.state.ma.us/itd /legal/wright1.htm](http://www.magnet.state.ma.us/itd/legal/wright1.htm) (accessed Aug. 21, 1997). The incorporation of new technologies into the existing legal structure has largely taken place without the need for major statutory revisions.

In addition, in previously-completed projects which dealt with statutory writing and signature requirements, the Commission emphasized the importance of evaluating the purpose and policy behind those requirements on a case-by-case basis. The Commission is hesitant to recommend legislative change which might have unintended effects; for example, requiring state and local agencies to accept information for filing in a form which they are not presently organized to accept, or permitting the use of electronic communications technology by agencies in their communications with citizens before the technology is sufficiently widespread to be an adequate substitute for paper-based communications.

Consideration of whether statutory change is needed, and if so, the extent to which changes should be made, must start with an examination of one of the underlying assumptions that are fueling current law reform projects--whether under current law, and

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to what extent, the terms “writing” and “signature” include electronic records and electronic signatures.

What is a writing?

The starting point for examining whether electronic records and signatures are the legal equivalents of traditional writings and signatures under current, general New Jersey law is the definitions provisions of the New Jersey Statutes. The New Jersey Statutes contain the frequently-overlooked Title 1, which contains definitions and principles of construction applicable to all the statutes. Among the defined terms is “writing.” N.J.S. 1:1-2.4 provides:

Except as to signatures, “writing” includes typewriting and the product of any other method of duplication or reproduction and “written instruments” includes typewritten instruments and instruments so duplicated or reproduced.

This definition originated in an 1898 enactment which apparently came about because the New Jersey Legislature found it necessary to redefine the term “writing” to take into account the “new” (at the end of the nineteenth century) technology of “typewriting.” The language added in 1960 is underlined above. P.L. 1898. c.71 provided: “Except as to signatures, ‘writing’ includes typewriting and ‘written instrument’ includes typewritten instruments.” The 1898 definition was codified in the Revised Statutes of 1937 as R.S. 1:1-2.4. In 1960, the definition was amended to its present form with the addition of the phrases referring to “any other method of duplication or reproduction.” (emphasis added).

The scope of the Title 1 definition is narrow. It is directed at redefining both the mechanical act of “writing” and the product of that act (i.e. a “written instrument”) to account for the use of typewritten rather than hand-written formal documents. An “instrument” is a formal document, usually one intended to accomplish a legal act, and having attendant formal requirements. See Black’s Law Dictionary 408 (Abridged Fifth Edition 1983) (“Instrument” defined as “A written document; a formal or legal document in writing, such as a contract, deed, will, bond or lease.”) Thus, the definition does not encompass everything included in the more general noun form “a writing,” which might include a broader category of less formal documents. See Black’s Law Dictionary, supra, at 828 (stating that “In the most general sense of the word, ‘writing’ denotes a document, whether manuscript or printed, as opposed to mere spoken words.”) Clearly, however, neither the 1898 enactment nor the 1937 revision refers to the product of electronic technologies, which did not exist at the time.

The 1960 amendment to this definition is as narrow as the original definition. Apparently it was enacted as a response to the introduction of document-copying technology such as xerography which was introduced in the late 1950’s. The amendment expands the definition of written instruments to include copies of written instruments,

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presumably, given the technology available at the time, copies which were analog versions of an original document, i.e., “the product of any other method of duplication or reproduction,” and “instruments so duplicated or reproduced.”¹

Because the Title 1 definition of “writing” appears not to define the noun form of the word, it leaves open to question whether a “writing” (as opposed to a “written instrument”) may include an electronic record or document. Under the principles of construction set forth in Title 1, the meaning of the term “writing” must be determined by considering the specific use of the term in its statutory context, “unless another or different meaning is expressly indicated.”² The noun form of the word “writing” is “expressly indicated” in several places in the New Jersey statutes.

One example of a specific definition of the term writing is found in the Evidence Code. N.J.R.E. 801(e)³ provides that “A “writing” consists of letters, words, numbers, data compilations, pictures, drawings, photographs, symbols, sounds, or combinations thereof or their equivalent, set down or recorded by handwriting, typewriting, printing, photostating, photographing, magnetic impulse, mechanical or electronic recording, or by any other means, and preserved in a perceptible form, and their duplicates as defined by Rule 1001(d).” This language expressly included electronic records, both particular kinds of electronic records (e.g., data compilations) and electronic records in general (e.g., “words” or “numbers” “recorded by” “magnetic impulse”). This expansive definition of “writing” makes sense in the Evidence Code. An email message, an electronic database or any other electronic record may be probative evidence in an investigation or dispute, whether or not it has ever been reduced to a traditional paper document.

Another expansive definition of the term “writing” is contained in the forgery provisions of the Criminal Code. Section 2C:21-1 defines a “writing” as including “printing or any other method of recording information, money, coins, tokens, stamps, seals, credit cards, badges, trademarks, access devices, and other symbols of value, right, privilege or identification.” The phrase “any other method of recording information” is sufficiently broad to include an electronic record. Thus, for example, it is a forgery to alter or change “any writing of another without his authorization” if it is done with a

¹ The wording of the 1960 amendment (“typewriting and the product of any other method of duplication or reproduction”) suggests that typewriting was considered a “method of duplication or reproduction,” as opposed to a method of creating an original document. That would be an extremely narrow construction of the term “typewriting” and it is assumed that this narrow reading is not what was intended.

² Title 1 of the New Jersey Statutes also includes principles of construction, including the following: “In the construction of the laws and statutes of this state, both civil and criminal, words and phrases shall be read and construed with their context, and shall, unless inconsistent with the manifest intent of the legislature or unless another or different meaning is expressly indicated, be given their generally accepted meaning, according to the approved usage of the language. Technical words and phrases, and words and phrases having a special or accepted meaning in the law, shall be construed in accordance with such technical or special and accepted meaning.” N.J.S. 1:1-1.

³ Strictly speaking, the New Jersey Rules of Evidence are not statutes, but court rules adopted pursuant to the Evidence Act, which provides for both legislative and judicial involvement in the process. See N.J.S. 2A:84A-33 to -39.

purpose to defraud or injure under the forgery statute. Presumably, altering the “writing” of another, in the electronic context, would include altering another person’s email message if it was done with the intent to defraud or injure.

Further evidencing the expansive meaning given the term “writing” in the Criminal Code is the definition of the phrase “access device,” which was added in 1997 in connection with amendments to the Code that refined the forgery statute and other Criminal Code provisions relating to certain computer-related offenses. The term “access device” is defined elsewhere in the Criminal Code as including any of several types of “numbers,” e.g., telephone credit card numbers, “or any other data intended to control or limit access to telecommunications or other computer networks in either human readable or computer readable form...” 2C:20-1. Thus, reading these two provisions together, a “writing” for purposes of the forgery statute, may be something as intangible as “data” which controls access to a computer, such as a password.

The term “writing” appears also is defined in the Uniform Commercial Code. Article 1 of the U.C.C., which contains definitions applicable to all articles of the Code, provides that “‘written’ or ‘writing’ includes printing, typewriting or any other intentional reduction to tangible form”).⁴ The requirement of “intentional reduction to tangible form” in the U.C.C. definition has been interpreted by some commentators as not including electronic messages or other electronic and digital records. See, e.g., Joseph I. Rosenbaum, Electronic Commerce: Key Legal & Contractual Issues, http://businesstech.com/law/btlaw6_96.html (accessed May 7, 1998); Public Law Research Institute Report, John Whipple, The Formation and Enforcement of Electronic Contracts, <http://www.uchastings.edu/plri/fall94/whipple.html> (accessed May 7, 1998). However, other commentators disagree, and argue that the term “writing” in the U.C.C. general definition does include electronic records. See Charles R. Merrill, The Digital Notary(tm) Record Authentication System - A Practical Guide for Legal Counsel (1) On Mitigation of Risk From Electronic Records (June 22, 1995), http://www.surety.com/in_news/legalgid.html (accessed May 7, 1998)(suggesting that questions regarding the status of electronic records as a “writing” within the meaning of the U.C.C. have been resolved affirmatively). Thus far, no reported New Jersey case appears to have considered this issue, nor has there been a case considering this issue under the U.C.C. in any other jurisdiction.

The U.C.C. definition of “writing” is extremely important in evaluating the enforceability of electronic transactions. The Article 1 definition controls the meaning of the Statute of Frauds provisions in Article 2 Sales (U.C.C. 2-201(1)) and Article 2A Leases (U.C.C. 2A-201(1) which require a signed “writing” in order for transactions in excess of \$500 and \$1,000 respectively, to be enforceable. Taken together, these two provisions cover a very large proportion of ordinary commercial transactions.

⁴ Parallel definitions appears in other provisions of the Uniform Commercial Code, e.g., Article 2A Leases, see N.J.S. 12A:2A-1-201(46)(“‘Written’ or ‘writing’ includes printing, typewriting, or any other intentional reduction to tangible form”).

What is a signature?

Unlike the term “writing,” the term “signature” is not defined in Title 1 of the New Jersey Statutes. However, some inferences concerning the meaning of the term “signature” may be drawn from the definition of the term “writing.” The Title 1 definition of “writing” expressly excludes “signatures” from the effect of the 1898 definition of “writing” to include “typewriting.” This express exclusion strongly suggests that the term “signature” should generally be regarded as referring to a holographic signature made with traditional paper and ink technology. Note that the exclusion of “signatures” was carried forward in the 1937 Revised Statutes as well as in the 1960 amendment to the definition.

Other evidence supports the view that the term “signature” should be regarded as referring to a holographic signature on a paper document. For example, in *Mutual Benefit Insurance Co. v. Brown*, 30 N.J. Eq. 193, 202-03 (Ch.1878), aff’d, 32 N.J. Eq. 809 (E. & A. 1880), an opinion that is roughly contemporaneous with the 1898 legislation defining the term “writing” to include “typewriting,” the court stated that “A person physically unable or too illiterate to write his name may sign by making a cross, a straight or crooked line, or dot or any other symbol. Simply making a mark by bringing the pen in contact with the paper is sufficient.”

The term “signature” is also defined in specific provisions of the New Jersey Statutes, in a manner consistent with the view that the term generally refers to a holographic signature affixed to a paper document. For example, N.J.S. 46:13-4.2, which defines the term for purposes of the recordation statutes, provides that “a signature includes any mark made on a document by a person who thereby intends to give legal effect to the document”(emphasis added).⁵

The New Jersey Statutes do, however, contain specific uses of the term “signature” that are not limited to a manual signature. For example, Article 3 of the Uniform Commercial Code contains specific provisions concerning the use of signature devices in commercial paper transactions. See N.J.S. 12A:3-401(b) (“A signature may be made manually or by means of a device or machine, and by use of any name, including a trade or assumed name..”).

In addition, as noted above, the Uniform Commercial Code generally defines the term “signed” as “any symbol executed or adopted by a party with present intention to authenticate a writing.” U.C.C. 1-201(39). The official commentary to this provision extends the definition of signature to include such indicia as a letterhead or a billhead. Thus, at least in a commercial transaction governed by the U.C.C. the use of a letterhead in business correspondence may be a sufficient “signature” for certain purposes, even if

⁵ The Law Revision Commission’s Report and Recommendations on Recordation of Title Documents (June 1989) proposed the addition of this definition to Title 46 Property, to more clearly define the meaning of the term as applied to documents of title. The definition was consciously drafted to be applicable to “documents,” a term used to refer to paper instruments submitted to public offices for recordation.

no individual as “signed” the document in the traditional fashion. Presumably, the logic of this expansive definition of signature (a symbol adopted with the intent to authenticate) could extend to a signature line in an email message or the encryption of an electronic document with public-private key pair technology (see further discussion of this technology below). But the reference to authentication of “a writing” ties the definition of “signature” to the definition of the term “writing” under the Code. As noted above, whether or not the term “writing” includes an electronic record is not settled.

Are electronic records and signatures the legal equivalents of traditional writings and signatures under current New Jersey law?

As the above discussion indicates, the answer to this question is a resounding “maybe.” In at least two specific instances, the Evidence Code and the forgery provisions of the Criminal Code, the term “writing” has been expressly defined to include electronic records. At the moment, it is unclear whether electronic records are the equivalent of a traditional writing under the sales and lease provisions of the Uniform Commercial Code. Given the increase in electronic commerce, this may be the area in which clarification of the issue is most needed. Electronic records and signatures are not the legal equivalents of traditional writings and signatures for all purposes, however, but they may be for many purposes, depending upon the relevant statutory context in which a particular writing or signature requirement is imposed, and the import of any additional formal requirements that are imposed in particular instances.

Writing and signature requirements in the New Jersey statutes

Many of the statutory writing and signature requirements contained in the New Jersey Statutes were formulated prior to the widespread use of electronic technologies, as is clear from the manner in which the requirements are imposed. See, e.g., N.J.S. 46:19-1 (county recording officer required to keep instruments of record “in well-bound books of good paper”).

The statutes which contain writing and signature requirements govern both private and governmental transactions and range from the mundane to the significant: e.g., N.J.S. 4:5-10 (applicant for compensation for animals slaughtered to control disease must “sign a certificate in the presence of a witness”); N.J.S. 10:5-13 (complainant under Civil Rights Law must “make, sign and file ... a verified complaint.”); N.J.S. 19:31A-6 (commissioner of voter registration in registering a voter “shall also require the registrant to sign the signature comparison record....”); N.J.S. 17:12B-14 (requires that incorporators of a mutual association “shall personally sign a certificate of incorporation ...”); N.J.S. 40:69A-186 (specifying signing requirements for certain petitions: “Each signer of any such petition paper shall sign his name in ink or indelible pencil and shall indicate ...”); N.J.S. 39:4-14.31 (requiring a written, signed notification to DMV of removal from state, destruction, theft, discontinued usage of auto).

In addition to explicit writing and signature requirements such as those noted above, there are many other formal requirements imposed by statute which either

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explicitly or implicitly require a paper document or a holographic signature, such as provisions which require a document to be certified, acknowledged or proved, presumably by a notary who must sign the acknowledgment or proof. In addition, requirements that a document be filed “in triplicate” suggest that a paper document is contemplated.

The frequency of occurrence of various terms suggests the ubiquitous nature of these types of formal requirements in the New Jersey Statutes. The word “writing” appears over 2500 times, and the phrase “in writing” accounts for over 1900 of those instances; the word “signed” appears over 1600 times and “signature” over 400 times; “document” appears over 1100 times and “memorandum” appears over 100 times; “handwriting,” “handwritten” and “hand-written” appear 75 times. The related terms “certification” and “verification” appear over 1000 and 400 times, respectively.

Identifying and cataloging the statutes which contain writing, signature and other formal requirements is a virtually impossible task, given the large number of statutes and a great deal of variation in the manner in which these requirements are expressed. Therefore, the Commission found it helpful to divide this multitude of statutes into a number of general categories for the purpose of analysis. While these categories are not air-tight, they do provide a basis for consideration of the purposes served by the imposition of writing, signature and other formal requirements on various kinds of transactions, without examining each one of them separately, at least at this point.

The categories which the Commission identified are 1. public transactions, 2. quasi-public transactions, and 3. private transactions. In each of these categories a number of exemplars are considered, to give an idea of the variety of the formal requirements imposed by the statutes and the purposes that they serve.

1. Public transactions.

Many of the New Jersey statutes, perhaps most, which impose writing and signature requirements apply to public transactions, that is, transactions within government, or between government and citizens. These writing requirements serve many different purposes. For example, the collection of birth, marriage and death records is considered a public function, and thus the State mandates that these records be collected, transmitted and made publicly available in very carefully defined ways. See Title 26 Health and Vital Statistics, Chapter 8 “Registration of Vital Statistics.”

The statutes routinely mandate that government agencies keep internally-generated records in particular ways in order to define the workings of State agencies, to advance the State’s regulatory interests, or to permit the public to have access to information about the workings of government. For example, the Open Public Meetings Act requires state and local government agencies to hold public meetings, to provide notice of them to newspapers, and to take and keep written minutes of their proceedings. See, e.g, N.J.S. 10:4-1.

Also falling within the broad category of public transactions are requirements that certain types of notice be given by government to its citizens, either as a group or individually. For example, the statutes are replete with requirements that citizens receive various kinds of notices “in writing,” either in the form of newspaper publication, certified or registered mail, or personal delivery of a writing. An entire title of the New Jersey Statutes regulates the subject of “Legal newspapers” and “Official advertising.” See Title 35 Legal Advertisements.

Yet another major category within this group of statutes is those governing elections. Title 19 Elections contains numerous requirements governing the conduct of elections in minute detail, including important provisions that mandate the use of handwriting comparison records as a form of identification.

The importance of record-keeping with respect to public transactions is demonstrated by the statutory attention given to the subject. An entire title of the New Jersey Statutes is devoted to the subject of “Public Records,” in particular to defining what constitutes a “public record” for various purposes, including public access to governmental information. N.J.S. 47:3-1 et seq. In addition, the provisions of this Title give authority to the Division of Archives and Records Management in the office of the Secretary of State to regulate the retention and destruction of “State public records,” a broad category that includes most records maintained by local government entities. N.J.S. 47:3-15. DARM has promulgated regulations that govern many aspects of government record-keeping and retention, including standards for microfilming and image-processing public records. N.J.A.C. 15:3-1.1 to -4.9 (see further discussion below).

2. Quasi-public transactions.

Into this category fall various transactions which are usually between private parties, but which are given certain kinds of legal status or effect, typically on the rights of third parties, when they are publicly filed. The State imposes certain formal requirements on these types of transactions that serve a larger public purpose, beyond the interests of any particular individual whose interests are served by the imposition of the requirements.

The primary examples in the “quasi-public” category are deeds and wills. The provisions of the general Statute of Frauds, N.J.S. 25:1-1 to -12, which derive from the original English Statute of Frauds, requires transactions in land to be in writing so that they can be recorded as public notice of the ownership of property. See N.J.S. 25:1-11-12. Transactions in real property which are not reduced to writing (or are reduced to writing, but not recorded) are given limited effect, both to preserve the interests of third parties (i.e., subsequent bona fide purchasers for value) and to make it easier for authorities to impose and collect taxes.⁶ The effect of the system in the protecting the

⁶ The New Jersey Law Revision Commission Report and Recommendations Relating to Writing Requirements for Real Estate Transactions, Brokerage Agreements and Suretyship Agreements (December

rights of individual subsequent bona fide purchasers for value serves the larger public interest in ensuring the integrity of land titles generally. This helps to assure the value of real property, which is a significant source of individual and collective wealth.. The imposition of a writing requirement also serves the interest of the parties to a particular transaction, by providing an reliable record of the transaction and thus avoiding disputes, for example, but the effect in this regard is a collateral one. The writing and signature requirements imposed on wills under the Probate Code fulfill functions similar to those imposed on deeds.

Statutes which permit the filing of documents which create liens of various kinds, including Mechanics' Liens, N.J.S. 2A:44A-1, and U.C.C. Article 9 security interests, also fall into the category of "quasi public," because of the effect that filing has on the rights of third parties. Thus, while a writing is required for the creation of a security interest as between the parties, see N.J.S. 12A:9-203, filing on a specified form is required before the existence of the security interest can have an effect on the rights of subsequent bona fide purchasers. See N.J.S. 12A9-402 (specifying the form for filing) and 12A:9-301 and -302 (effect of filing). Significantly, although these types of transactions are not "governmental" in that they are between private parties, retention of records concerning them falls under the same DARM regulatory provisions as the public transactions outlined above, because they are filed with government agencies, either at the State, County or local level.

3. Private transactions.

These are transactions between private parties, as to which the State has mandated that a writing or other formality be utilized in conducting the transaction even though the State has only a nominal interest in the transaction. Many ordinary sales transactions are subject to "statute of frauds" writing and signature provisions. A writing and signature requirement currently is imposed in Article 2 Sales of the U.C.C. for transactions over \$500. See N.J.S. 12A:2-201. A writing requirement and other consumer-protection provisions regulate many consumer transactions, for example, health club contracts, see N.J.S. 56:8-42. New Jersey's general Statute of Frauds also contains provisions which require a writing in the case of a suretyship agreement, i.e., "a promise to be liable for the obligation of another person," N.J.S. 25:1-15, and in the case of agreements to pay a fee to real estate and business brokers. N.J.S. 25:1-16.

Meeting the writing requirement in private transactions is usually a prerequisite to enforcement of a contract in court. If parties are not concerned with judicial enforcement they are free to ignore the requirements. Thus, the law may require contracts between health clubs and their customers to be in writing, but an individual is free to without a written contract, and honor the agreement made with the health club. Whether or not a particular kind of private transaction is required to be in writing in order to be enforceable is completely unimportant if the parties themselves choose to do business without committing their transaction to a writing, and no disputes arise between them over the

1991), substantially enacted into law as P.L.1995, c.360, discusses the reasons underlying these requirements in depth.

transaction. Generally speaking, the State is unconcerned if parties enter into and honor these agreements even if the formal requirements it imposed are not satisfied.

Can electronic technologies replace paper-and-ink?

An important question to be asked with respect to the use of electronic technologies is whether they are an acceptable substitute for paper-and-ink, where a writing, signature or other formality is required by statute. While this is ultimately a question that must be answered with specific reference to the particular writing or signature requirement in question, some generalizations can be made, at the risk of stating the obvious.

Paper and ink technology is very old, and very familiar. We learn to read and write at an early age, and we assume that others with whom we wish to communicate can do so as well, without any special equipment. We also are comfortable with the notion that while paper documents can be damaged or destroyed, they are sufficiently permanent for the purposes for which they are typically used. We routinely recognize the difference between an original signature on a document and a copy of a signed document, although reproduction technology is making that more difficult to discern. We readily rely on our ability to recognize another individual's signature and distinguish it from those of others, even though we are aware that a signature can easily be forged.

The very qualities which make electronic technologies so useful and indeed superior to paper-and-ink technology in many ways, often are the same qualities that render their use problematic in comparison to traditional technologies. For example, reduction of information to digital form makes it possible to store vast quantities of information in very small spaces, and to access the information very quickly. Doing so, however, usually requires proprietary hardware and software. The proprietary technologies which make the digitization of information possible change rapidly, making existing versions of the technology obsolete and unusable, sometimes within a very short period of time. In the field of personal computers, for example, the 5-1/4" floppy disk, which was the standard media used for data input and storage starting in the 1980's, is now obsolete; these disks currently are difficult to obtain, and most computers manufactured in the last several years do not have disk drives that will read them. As the technology advances, the phenomenon of continuing hardware obsolescence can be expected to continue. Software becomes obsolete as well, and data that is formatted for use on one proprietary system may be difficult to use with other software.

Electronic storage media has questionable longevity. The magnetic media utilized to store most computer data is much more volatile than most users realize. Not only is magnetic media subject to loss from accidents such as inadvertent exposure to magnetic fields, the physical components of the media gradually degrade, resulting in data loss and inaccessibility, sometimes in a relatively short period of time. And, as distinguished from paper documents, the loss of even very few bits of information can render a document or large number of documents completely inaccessible. See, e.g., "Archival Stability of

Digital Storage Media,” Chapter 11, 1994 Technology Assessment Final Report, <http://www.rlg.org/ArchTF/tfadi.challeng.htm> (Feb. 26, 1998); Gerd Meissner, “Unlocking the Secrets of the Digital Archive Left by East Germany,” *The New York Times*, D6, column 1-2 (Mon. Mar. 3, 1988). Similar problems are presented by optical technologies as well. As a result, the computer user who wishes to archive data for a long period of time must provide for the upkeep and preservation of the storage media, and the hardware necessary to access the data and the related software, or consider transferring the data (“migrating”) to another form of data storage, a process that itself presents significant technical, and sometimes legal, issues.

The fact that the media used to store electronic documents is vulnerable to loss does not mean, however, that paper documents are necessarily superior to electronic ones in all applications or under all circumstances. Paper documents are as vulnerable to certain forms of destruction (e.g., fire) as electronic documents, and the fungibility of electronic documents may make it easier to create backup copies as a hedge against destruction. Therefore, it is entirely possible that with respect to information of no particular archival value, storage on electronic media is as good as, or better than, retention of paper copies, and that with respect to archival documents, existence of an electronic copy of a paper document provides the best assurance of permanence.

The very nature of digital information, i.e., information which has been reduced to a series of electronic signals, presents additional issues. Once information has been converted to digital form, it can usually be duplicated endlessly, in fungible, indistinguishable copies. This is a very useful quality in certain applications such as the distribution of large quantities of data to multiple recipients, and it is the very foundation of the Internet phenomenon the “World Wide Web,” which involves the creation and downloading of copies of electronic documents by computer users far distant from the physical source of the “original” electronic document.⁷ The quality of fungibility has presented challenges for the law of intellectual property, as it has become virtually impossible to prevent the illegal duplication and sale of digital media such as music cassettes and CD’s, and videotapes, or the widespread, virtually instantaneous distribution of unauthorized copies of software and music by computer.

In addition, because electronic documents are completely fungible, it is usually impossible to recognize a particular electronic record as having been generated by a particular individual, at least on its face. Thus, it is extremely easy for someone with a will to do so to undetectably “spoof” an electronic message or document, making it difficult for the recipient of an electronic document to rely on either the purported source

⁷ In its simplest form, to utilize the “World Wide Web” a computer user uses a program called a “browser” to create an image, much like a page in a magazine or newspaper, on the user’s computer by accessing information on remote computers through the Internet computer network. The browser reads the commands and files on the remote computer and recreates the integrated document consisting of text and often images as well (sometimes called a “home page” or a “web site”) exactly as it appears on the remote computer. In performing this operation, the browser creates exact duplicates of the computer files on the remote computer.

or contents of the document. While it is true that paper documents can also be altered and forged, we tend to share a series of assumptions about the reliability of paper documents generally against which we judge the reliability of a particular paper document for a particular purpose. These range from the common assumption that a envelope received in the mail which contains a particular return address probably came from that address, to legal presumptions created by undertakings such as the acknowledgment or witnessing of a holographic signature. We also assume (whether correctly or not) that a forged document can reliably be detected by a discipline such as handwriting examination.⁸ Such commonly-accepted standards for assessing the reliability of paper documents, however ill-founded they may be⁹, do not yet exist for electronic documents, making it difficult to articulate legal rules upon which parties may rely in undertaking transactions electronically. While technologies are being developed to deal with these issues (see the discussion below on “digital signatures”), the infrastructure necessary to fully implement them does not yet exist.

The current reliability of electronic communications as compared to ordinary mail is also in question. Some commentators have suggested that a large percentage of the electronic mail sent over the Internet evaporates into cyberspace without a trace. Even assuming that this performance is no worse than ordinary U.S. Mail, currently there is no system for assuring the delivery of email that is comparable to the certified and registered mail services of the U.S. Postal Service, or even the FedEx delivery receipt. Although it is technologically possible to create an electronic mail delivery system at least as good as, and possibly better than, the U.S. Postal Service, the infrastructure to do so has not yet been created. See Barry Leiba, “Standardizing Delivery: Email Security on the Internet” (Mar. 3, 1998).¹⁰ In addition, access to email is not as universal as regular mail, or even telephone service. Note that even though a telephone call may be cheaper and faster than a mailed notice, the advent of the telephone as a common household device did not supplant the use of mail as the primary medium for giving important notices. Even in those households that have computers, many do not yet have routine access to email and the Internet. Thus, while we assume that everyone has a regular mail address, we cannot assume that everyone has an email address, or access to the World Wide Web to obtain information. Similarly, we cannot assume that everyone has a depository through which they can accept electronic funds payments. Thus, while dispensing with print advertising or printed documents sent by mail may save government funds, consideration must be given to whether the intended recipients of the information are able to cope with new

⁸ The reliability of the discipline of handwriting analysis in determining the authorship of documents recently has been challenged by legal scholars. See Risinger, Denbeaux & Saks, “Exorcism of Ignorance as a Proxy for Rational Knowledge: the Lessons of Handwriting Identification ‘Expertise,’ 137 U.Pa. Law Rev. 731(1989)(examining the lack of independent scientific testing of the reliability of the discipline of handwriting identification expertise).

⁹ Traditional paper-and-ink communications are not particularly secure or reliable, even though we readily rely on them. For example, we assume that the return address on a letter truthfully identifies its source, even though the actual sender of a mailed letter can easily use a false return address -- or no return address at all. The ever-increasing quality of copying machines makes it extremely easy to alter a document or a copy of a document, or to produce a duplicate that is virtually indistinguishable from the original.

¹⁰ <http://www.alphaworks.ibm.com/ivisions.nsf/system/articles/42D06B0B430D1046882564A40074EF4F>.

methods of undertaking transactions. See J. Scott Orr, “The poor can’t bank on new direct deposit system,” *The Star Ledger* (Mon. Feb. 16, 1998, Final Edition)(page one, column one) (detailing U.S. Treasury Department plan to convert to electronic funds deposit for all federal payments, and the impact on low-income recipients who do not have bank accounts).

These limitations have important implications for the idea that electronic records and signatures can routinely be considered legal equivalents of traditional documents and signatures for all purposes. The question must be asked whether electronic records and signatures can fulfill the same purposes as traditional documents and signatures, considering the reasons for which any applicable writing, signature, or other formal requirement has been imposed.

The Commission Recommendations

As the above survey of statutes indicates, the number and nature of formal requirement imposed by the New Jersey Statutes on transactions make it difficult to articulate a general rule which would identify those statutory requirements as to which a redefinition of the term “writing” and “signature” to include “electronic record” and “electronic signature” would be appropriate. The Commission does believe, however, that current law can be clarified, and state agencies should be given broader authority to adopt electronic technologies, subject to regulatory review.

a. Expanding executive authority

Given the important public purposes served by the imposition of formal requirements on public and quasi-public transactions, it appears that any statutory change which would presumptively redefine the terms “writing” and “signature” to include electronic documents and signatures is least appropriate in this category of transactions, for numerous reasons.

Many public and quasi-public transactions are subject to a variety of formal requirements that go beyond a simple “writing” or “signature.” Thus, merely re-defining those terms to include electronic equivalents would leave in place additional requirements, the continuance of which would negate the use of those electronic equivalents or create questions about the applicability of the redefined terms. For example, it is unclear how an “electronic signature” can be acknowledged, or how a notary’s jurat can be attached to an affidavit that is embodied in an “electronic document.” E.g., N.J.S. 2A:44A-6 (municipal mechanics lien claim “shall be signed, acknowledged and verified by oath”); N.J.S. 21:1A-135 (plans of explosive manufacturing plants be filed “in triplicate”); N.J.S. 40A:14-59 (exempt firemen’s certificates be filed “in triplicate”).

Conversion to electronic technologies in government record-keeping cannot be accomplished overnight, even if any statutory barriers to the use of electronic

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technologies are removed. Most of the systems of government record-keeping are, at present, designed to handle traditional paper-based documents, regardless of whether the statutes which regulate them require a traditional “writing” or a “signature.” Conversion to electronic technologies usually involves significant cost in equipment and training of personnel. In fact, it seems likely that the most significant constraint on the ability of government agencies to utilize electronic technologies is fiscal rather than legal. See, e.g., N.J.S. 2B:19-1 (allocating a portion of certain fines to fund the “CAPS” computer system); A1374 (1998-1999 Sess.)(appropriates \$890,000 to the Election Law Enforcement Commission for computerization and public access to campaign finance reports); A242 (1998-1999 Sess.)(imposes fee on payment transaction by health care facilities to be paid into a technology development fund).

There are also significant technological issues to be considered in conversion of public record-keeping to electronic technologies. The Division of Archives and Records Management in the office of the Secretary of State is concerned with these issues because it has authority over retention and destruction of public records. See N.J.S. 47:3-1 to -32. In particular, destruction of public records in paper form must be approved by DARM, see N.J.S. 47:3-17. Pursuant to its authority DARM has promulgated regulations which govern all aspects of public records retention, including the creation of archival substitutes, see N.J.S. 47:3-26. Even a cursory review of the DARM regulations reveals that the issues presented by the use of non-paper based technologies are extremely complex. For example, very specific requirements are set forth for the use of microfilm and microfiche technology, N.J.A.C. 15:3-2.13 to -2.22, and a recent amendment to the regulations governs “image processing” of public records.

While statutorily-imposed formalities should be retained if they serve important purposes, the persistence of unnecessary, archaic statutory requirements should not constrain public agencies from converting to new technologies where they can do so without unduly compromising other goals such as maintenance of appropriate privacy standards, access to public records and long-term preservation of public records of archival value. The complexity of the considerations involved in conversion of public record-keeping to electronic technologies suggests that current statutory requirements which may impede that conversion should be examined on a case-by-case basis, and include consideration of whether those requirements are essential to the governmental process in question or may be dispensed with.

The Commission recommendation with respect to public and quasi-public transactions is that executive agencies be given expanded authority to define how the writing, signature and other formal requirements will be met with respect to transactions within their respective areas of operation. This authority will permit these agencies to consider the statutory requirements according to which they operate and determine whether conversion to electronic technologies is desirable. They may then define how the various formal requirements imposed by statute may be met.

b. Amending the Uniform Commercial Code

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The same concerns applicable to public and quasi-public transactions (e.g., long-term preservation and accessibility of public records) are not involved in the case of purely private transactions. However, other concerns are relevant in purely private transactions. A statute which requires a writing as a prerequisite to enforceability of private contracts may proceed from any one of a number of reasons. Most such statutes are based on a desire for clear proof of the existence of the agreement and its terms before the agreement will be enforced by a court. Others impose a writing requirement to slow formation of binding a contract to allow a party to have second thoughts about its desirability. Still others may require a writing so that the consumer can have a relatively permanent record of important terms. As with public and quasi-public transactions, the decision as to whether electronic records, or some form of electronic records will serve the purpose of a particular writing requirement necessarily involves consideration of the basis for that particular requirement.

One category of writing requirements which the Commission believes should be retained without modification is those which govern certain types of consumer transactions. For example, Title 56 contains a number of provisions governing particular kinds of consumer transactions, including health club contracts. Health club contracts are required to be “in writing,” and a copy of the contract must be given to the buyer when the buyer signs the contract. N.J.S. 56:8-42. The statute also requires certain provision of a health club contract to be stated in “at least 10-point bold-faced type.” Both of these requirements suggest that the writing requirement should be interpreted to mean a paper document rather than an electronic record. In addition, the statute requires a health club contract to contain certain required provisions, including a three-day right to cancel, and limits on the term of such contracts. The statutory requirements, taken as a whole, make it clear that health club contracts are disfavored. The reasons for imposing a writing requirement are apparent from the limitations and mandatory provisions imposed by statute, and they include all of the reasons identified above. Re-defining the term “writing” to include electronic records in the context of consumer health club contracts makes no sense. The legislative policy apparent in these provisions is to impede these types of transactions, not to encourage or facilitate them. Requiring them to be concluded in a traditional written form rather than electronically is consistent with this legislative policy.

The types of very particularized consumer protection concerns apparent in the health club contract statute are not implicated in the statute of frauds provisions in Articles 2 and 2A of the Uniform Commercial Code. These provisions impose a writing and signature requirement on transactions in excess of \$500 and \$1,000 in sales and lease transactions, respectively. Taken together, they apply to a vast range of consumer and business transactions.

The reasons supporting the writing and signatures requirements in the U.C.C. are stated in the Official Comment to the original version of Section 2-201 as the prevention of “fraud.” Accordingly, paragraph 1 of the comment provides: “The required writing

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need not contain all the material terms of the contract and such material terms as re stated need not be precisely stated. All that is required is that the writing afford a basis for believing that the offered oral evidence rests on a real transaction.” Further, the comment indicates that the writing may be an extremely informal one (a penciled note on a scratch pad) and it need not even contain a holographic signature, but merely “any authentication which identifies the party to be charged.”

Given the low standard imposed by the Code for a signed writing, it appears that an electronic document could easily provide the same level of assurance of a “real transaction” as a penciled note on a scratch pad. Thus, the Commission recommends that the sales and lease provisions of the Uniform Commercial Code be amended to provide that the term “writing” may include an electronic record.

The Commission is aware that this single change in each of these two provisions does not answer all questions regarding the conduct of sales and lease transactions by electronic means. Neither does the Code, however, answer all questions regarding the conduct of paper transactions. For example, whether or not a particular paper writing constitutes an agreement between the parties depends on many collateral factors as to which the Code gives general guidance. Thus, questions will remain to be answered with reference to other Code provisions, such as whether a particular electronic record is or is not the final written expression of the parties (see U.C.C. 2-202) and how offer and acceptance of contract terms is undertaken in an electronic environment (see U.C.C. 2-206).

It should be noted that the Commission’s recommendations in this Report are limited to Article 2 Sales and Article 2A Leases. The Commission believes that is not appropriate to modify the general definition of “writing” as it currently appears in Article 1 of the U.C.C., as such a change, without more, would merely create questions about the interpretation of provisions in other articles of the U.C.C. which involve systems that are built upon, and assume, the exchange of paper document. See, e.g., Article 3 Commercial Paper, Article 4 Deposits and Collections and Article 5 Letters of Credit. It may be that the provisions of these articles require reconsideration in light of the increased availability and use of digital and electronic processes for these types of transactions, but such a reconsideration is beyond the scope of this limited project.

In addition, it does not appear that any change is necessary in the U.C.C. definition of “signed” to effectuate the change intended with respect to the term “writing.” U.C.C. 1-102(39) defines “signed” as “any symbol executed or adopted by a party with present intention to authenticate a writing.” Any “symbol” used on an electronic document “with the present intention to authenticate” will constitute a sufficient signing. The Code permits wide latitude in the interpretation of the term “signed” in Article 1 (e.g., a billhead or letterhead may constitute a “signature”), provided the requirement of “intention to authenticate” is met. The same requirement of “intention to authenticate” must be met with a “symbol” used on an electronic document.

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c. Repealing an archaic definition

As noted above, there is a definition of the term “writing” in Title 1 of the New Jersey Statutes which is presumptively applicable to all of the titles of the statutes in the absence of a more specific definition. This definition was added in the late nineteenth century to make it clear that the term “writing” includes “typewriting,” and again in the 1960’s to make it clear that the term includes mechanical duplicates. N.J.S. 1:1-2.4 provides:

Except as to signatures, “writing” includes typewriting and the product of any other method of duplication or reproduction and “written instruments” includes typewritten instruments and instruments so duplicated or reproduced.

The Commission believes that the definition of writing in Title 1 has been effectively superseded by technological developments. The principles of construction embodied in Title 1 indicate that words should be read and construed in their context, and given their ordinary and usual meaning unless there is a specific definition supplied within that context or unless the ordinary and usual meaning is “inconsistent with the manifest intent of the legislature.” N.J.S. 1:1-1. At this point in time it is doubtful that anyone would find that the ordinary meaning of the term “writing” does not include “typewriting” or a copy of a document, rendering this definition unnecessary. However, the definition, read narrowly, might not include a laser-printed document, which is neither “typewritten” nor, arguably, the product of a method of duplication or reproduction. This is clearly an absurd result. In most offices today, both manual and electronic typewriters have been replaced almost exclusively by laser and other printers which are the current functional equivalents of typewriters.

Repealing the definition of “writing” will leave the construction of this word to the principles set forth in N.J.S. 1:1-1. Thus, particular definitions of the term will control over the ordinary meaning. Thus, for example, if the Commission recommendation concerning the amendment to the definitions of “writing” in Articles 2 and 2A of the Commercial Code are adopted, the definition of “writing” as expressly included an electronic record will control over the ordinary meaning of the term, to the extent that the ordinary meaning does not include an electronic record. Whether the ordinary meaning of the term “writing” generally includes electronic records is doubtful at this point in time. The ordinary meaning of the term may come, in time, to include electronic records as the use of electronic technologies becomes more familiar and ordinary. Removing this archaic definition, however, will help the meaning of the term to develop over time to include, to the extent appropriate in context, electronic records. In addition, it will remove any unintended negative implication concerning electronic records in situations in which they can be the functional equivalents of paper documents.

Furthermore, the term “signature” is not defined in Title 1, yet the exclusion of the term from the definition of “writing” leaves the implication that presumptively, the term

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“signature” means a holographic signature affixed to a paper document. This, too, is an archaic limitation on the meaning of a term which should be left to contextual interpretation.

Is there a need for comprehensive legislation equating electronic and paper transactions?

The Commission believes that there is no need for legislation that would declare electronic records and signatures the legal equivalents of traditional writings and signatures in private transactions. Broadly written legislation may have unintended effects on transactions which should continue to be undertaken in a traditional fashion, for any number of practical and policy reasons. For example, in the statute referenced above which governs health club contracts, the question would immediately arise whether such a contract could be concluded electronically, and if so, how the requirement that certain contract provisions be written in ten-point bold-face type would be satisfied, among other things.

The Commission also believes that there is less need in New Jersey for a re-definition of terms than might be the case in other jurisdictions. A major source of writing and signature requirements applicable to private transactions is the general Statute of Frauds, a version of which is part of the law of every state. In most states, these statutes continue to require a writing and signature in broad categories of private transactions. However, the Commission’s own Statute of Frauds project, enacted into law in New Jersey in 1995, substantially narrowed the writing and signature requirements in the general Statute of Frauds to apply almost exclusively to transactions which would involve filing in the land records. The remaining provisions in New Jersey’s general Statute of Frauds were modified to require that in the absence of a writing, there be “clear and convincing evidence” of the existence of an agreement between the parties. This clear and convincing evidence standard probably would be satisfied by an electronic record in most transactions. See N.J.S. 25:1-5 to -16. Thus, it is unclear under what remaining provisions of New Jersey law, aside from the UCC Statute of Frauds provisions recommended for amendment, continue to impose writing and signature requirements on private transactions in a manner that would preclude or impede the use of electronic technologies in situations in which they should be permitted or encouraged.

The Commission believes that the better approach to eliminating formal requirements which may impede electronic commerce is to identify remaining signature, writing and other formal requirements that apply to private transactions on a case-by-case basis, and recommend changes in their provisions when appropriate.

Is there a need for legislation recognizing digital signatures?

The Commission believes that there is no need for legislation recognizing digital signatures, beyond the proposal which would empower state agencies to adopt regulations concerning their use. As mentioned above, electronic documents are fungible and readily

altered, and there is currently no method of “signing” an electronic document that is comparable in its general acceptability as the holographic signature affixed to a paper document. As a result, both senders and recipients of electronic documents are uncertain whether their electronic interactions are sufficiently reliable to form the basis for important transactions. While parties are free to agree that their electronic transactions will be binding even if they do not satisfy statutory writing and signature requirements for enforceability, the various stakeholders in the field of electronic commerce have sought the means to bring more certainty to those electronic transactions through the development of technologies that can assure both the source and integrity of electronic communications. One set of technologies is called “digital signatures.”

Traditional signature requirements serve many purposes. They identify the signer with the signed document by providing an indicia of identity; they are a reminder of the important legal consequences of a transactions; they serve as an indicator of the signer’s assent to the terms of the transaction embodied in a document. See “Digital Signature Tutorial,” <http://www.commerce.state.utah./digsig/tutor1.htm> (accessed Mar. 13, 1998). The particular form that a signed document takes, or the manner in which it was transmitted and received, may provide certainty, or at least sufficient surety, that a document has not been altered since it was signed, and that is truly the act of the person who purportedly signed it. The ease with which electronic documents can be altered without detection, as well as the lack of an existing infrastructure to guarantee the source of electronic documents, can be mitigated technologically through the use of digital signatures.

There are a number of current technologies for the affixation of digital signatures to electronic documents. Perhaps the most complex terminology involves the use of encryption, or data-scrambling techniques, to create a unique document that is capable of being identified to a particular source. Certain usages of this technology also permit electronic documents to be processed in such a way that unauthorized alterations are immediately detectable. This technology generally is referred by a number of terms, including “asymmetric cryptography,” “Public-Private Key Encryption,” “PKI” (Public Key Infrastructure) or “public key cryptography.”

“Public key cryptography” is a system which uses the mathematical properties of large prime numbers to generate a unique set of computer data called a “key pair.” The “private key” of a key pair is closely held by its user, and is used as part of a computer software program to encrypt a document so that it cannot be read, or to create a “digital signature” (a series of meaningless characters) that can be affixed to the document in such a way that any alteration of the document is detectable by testing the document against the “public key” part of the key pair. The “public key” of a key pair is given by the user to anyone whom the user wishes to be able to unencrypt the document, or test the validity of the “digital signature” which is a part of the document. The unique nature of the technology which generates the public-private key pair is such that the public key can’t be used to “reverse engineer” and obtain the private key. Thus, the proper use of such a key pair can enable users to communicate with an high degree of reliability as to their identity

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and the integrity of the documents they exchange. If the users encrypt their communications, this technology can also give an extremely high level of privacy to their computer communications.

Utilizing currently available technology, users may exchange key pairs and communicate in this manner, and many do, through the private exchange of keys on a one-to-one basis. There is a perceived need, however, for a means of issuing public keys upon which remote parties may rely. A number of companies have set themselves up as “cybernotaries,” to bridge this gap. These cybernotaries, for a fee, issue key pairs and perform the service of verifying the identity of the parties to whom they issue the keys, so that third parties are willing to rely on a published public key as the actual key of a particular user.

Legislation has been widely proposed, and adopted in Utah, to create a governmental infrastructure to license these “cybernotaries.” The Utah Digital Signature Act, adopted in 1996, in particular has been proposed as a model for other states interested in establishing such an infrastructure. A call to the office of the Legislative Analyst in Utah yielded the information that the fiscal note accompanying the legislation projected a first year cost of about \$160,000, including the hiring of a consultant to design the licensing scheme. Some of that expenditure is expected to be recouped from licensing fees.

It is completely unnecessary to the functioning of a PKI system that cybernotaries be licensed by governmental authority. Individuals who wish to use PKI may do so through the exchange of keys in a manner that satisfies their individual needs for security and reliability. What is ultimately sought from the enactment of PKI legislation is a change in the legal presumptions applicable to transactions undertaken with keys issued by licensed cybernotaries. See, ABA, Information Security Committee, Science and Technology Section, “Digital Signature Guidelines,” 1.20 Nonrepudiation (Aug. 1996)(defining “nonrepudiation” as a quality of a “trustworthy system,” and stating that “Nonrepudiation as defined in this Guideline 1.20 is intended to express a legal conclusion something less than a final determination by a court of last resort, but something more than a naked rebuttable presumption as now provided by simple e-mail.”) Some commentators have gone so far as to say that the absence of legal scheme regulating electronic or digital signatures “may prove to be a large impediment to the development of reliable electronic commerce.” Froomkin, “The Essential role of Trusted Third Parties in Electronic Commerce,” 75 Oregon L. Rev. 49 (1996). The Utah digital signature legislation seeks to provide certainty in the legal relationship between cybernotaries and the parties to a transaction; it provides that if a key pair issued by a Utah licensed cybernotary is utilized to sign an electronic document, certain presumptions attach to the document. At the same time, the statute limits the liability of the key-issuing authority in the event of an error in the performance of the key-issuing function. Recently, this kind of detailed, technology-specific legislation has been criticized on numerous grounds, including the limitation of liability which favors the key-issuing

authority. See State Government Electronic and Digital Signature Legislation, <http://www.magnet.state.ma.us/itd/legal/sigleg7.htm>.

There are other technologies currently available and being developed for the signing of electronic documents as well. One methodology, the "Pen Op" system, involves the generation of a "biometric token" which can reliably be associated with a particular individual and be affixed to an electronic document as an indicia of its source. The Pen Op technology currently is approved for use by the IRS in the electronic submission of tax forms. Electronic signing technology such as the Pen Op system may not be as technologically secure as a correctly used public-private key system, but its proponents point out that not all "signing" technology need be as secure as a public-private key system to adequately serve the signing function in most situations. There are also other forms of electronic signing and writing technologies being developed, and more can be expected to emerge.

With the prospect of technology development in mind, more recent legislative initiatives has turned from the Utah approach, and avoid the specification of particular digital signature technology in favor of a definitional approach. One recent example is the enactment of digital signature legislation in Texas in June 1997. The Texas legislation defines an "digital signature" as "an electronic identifier, created by a computer, intended by the party using it to have the same force and effect as the use of a manual signature." The legislation affords legal equivalence to electronic communications with state agencies, provided that the technology used satisfies regulations adopted by the Department of Information Resources. The regulations issued February 5, 1998, recognize both PKI technology and "signature dynamics" and leave the door open for the recognition of other technologies. See McBride, Baker & Coles, "Summary of Electronic Commerce and Digital Signature Legislation," <http://www.mbc.com/legis/texas.html> (accessed Mar. 13, 1998). The Texas approach is similar to the approach taken by the Law Revision Commission in the Tentative Report, which would authorize state agencies to adopt regulations giving equivalence to electronic communications.

The Law Revision Commission believes that New Jersey should not, at least at this time, adopt legislation similar to that adopted in Utah which establishes a licensing authority and sets forth rules of liability governing the use of certain digital signatures. The Law Revision Commission is not convinced that it is necessary to the development of electronic commerce that the use of digital signature technology be given any special legal recognition or regulation, above all other forms of communications technology which might be utilized in electronic commerce. Private parties may continue to use any signature technology they wish including, PKI technology, pursuant to private agreements defining the rights and responsibilities of the parties.

The proposed statute set forth below does, however, afford recognition to digital signatures. State and local government entities are permitted to use any form of digital

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signature technology suitable to their functions, provided that state standards are met, including standards governing the maintenance of public records.

Electronic records and signatures recognition act

a. Whenever a statute requires or permits documents or information to be prepared by or submitted to a state agency or to local government entities, the head of the state agency or the Commissioner of the Department of Community Affairs in the case of local government entities, may permit the documents or information to be prepared by or submitted to the agency or entities in electronic or digital form. Submission in electronic or digital form may be permitted pursuant to this section even if a statute requires information to be written or to be submitted in writing, specifies that a document containing the information be signed, certified, verified or witnessed, or imposes any other formal requirements which explicitly or implicitly require documents to be prepared or submitted on paper or in written form.

b. The head of the agency or the Commissioner in the case of local government entities shall adopt regulations specifying how the signature, verification, certification, witnessing or other formal requirements shall be met with respect to documents or information prepared or submitted in electronic or digital form pursuant to this section. Regulations adopted pursuant to this section may permit the use of digital signature technology for the signing of documents and other appropriate purposes.

c. The Division of Archives and Records Management shall adopt regulations setting forth standards for the preparation and submission of documents and information in electronic and digital form pursuant to this section.

d. Regulations adopted by state agencies and the Commissioner pursuant to this section shall not be effective until they have been approved by the State Records Committee established by L.1953, c.410 and found to be in compliance with the regulations adopted by the Division of Archives and Records Management pursuant to this section, and any other applicable regulations governing public records. The head of the agency and the Commissioner in proposing regulations, and the State Records Committee in approving regulations shall consider the purpose for which the signature, verification, certification, witnessing or other formal requirement has been imposed by statute and whether the preparation or submission of information in electronic or digital form can adequately fulfill those purposes.

e. For purposes of this section the terms “state agency” and “head of a state agency” shall have the same meaning as those terms are defined in the Administrative Procedure Act in Title 52 State Government of the New Jersey Statutes, as amended.

f. This section shall not apply to statutes governing any national, state, county, and municipal elections, including school board elections, but it shall apply to the New Jersey Campaign Contributions and Expenditures Reporting Act, P.L.1973, c.83 (C.19:44A-1 et seq.), as amended..

Comment

This section authorizes state agencies and the Commissioner of the Department of Community Affairs to adopt regulations defining how documents and information required by statute to have a signature or satisfy other formal requirements may be prepared by state agencies and local government entities or submitted to them in electronic or digital form. This section retains the concept of the provisions outlined

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in the Law Revision Commission's November 1997 Tentative Report on Electronic Records and Signatures, but is entirely rewritten to be more consistent with existing public records laws. The philosophy underlying the Commission proposal is that agencies, or the Commissioner in the case of local government entities, are in the best position to evaluate the statutory requirements pursuant to which they operate, and to determine the desirability of utilizing available electronic and digital technologies to fulfill those requirements. The determinations of the agencies and the Commissioner in this area are then subject to review by the State Records Committee, to assure that the requirements of the state public records laws are satisfied, and that electronic and digital technologies can adequately serve the same purposes as traditional, paper-and-ink technologies.

The first sentence of subsection a. states the general rule that agencies and the Commissioner have the authority to use electronic and digital processes in preparing or receiving "documents or information." This phrase does not distinguish between documents or information that would constitute "public records" within the meaning of the public records statute in Title 47 (see N.J.S. 47:3-16), and documents or information that would not fall within either the statutory or common law definition of a public record. The second sentence of subsection a. effectively permits agencies and the Commissioner to evaluate current statutory requirements that information be prepared or submitted "in writing" or that documents be "signed" or satisfy other formal requirements and determine how those requirements may be met using electronic or digital technologies. Note that state agencies and local government entities already utilize electronic and digital technologies in carrying out their work. The purpose of this statute is to authorize those agencies and entities to use electronic and digital technologies in cases where formal requirements imposed by statutes may be an impediment to the full use of those technologies.

Subsection b. directs the agencies and the Commissioner to adopt regulations permitting the preparation or submission of information or documents in electronic form. This subsection also expressly permits the use of digital signature technologies. Currently there are at least two widely available, generic digital signature technologies, "public key cryptography" and "signature dynamics." Public key cryptography is a system which uses encryption technology to produce a set of electronic identifiers (a "private key" and a "public key") that is capable, of properly used, of associating an electronic document with a particular individual or entity with a high degree of reliability. "Signature dynamics" refers to technology which electronically captures numerous features of an individual's manual signature, and converts them to a highly individual "biometric token" which can be associated with a particular electronic record. The field of digital signatures is a complex technical area in which rapid development of new methods and technologies may be expected. This subsection is drafted accordingly, permitting the specification of any technology which is suitable for the purpose for which it is used. This means that in situations in which the high degree of security available with public key cryptography is appropriate to the purpose for a signature requirement is imposed, that technology may be used. Simpler technologies may also be used, if they adequately fulfill the purpose for which the relevant requirement was imposed by statute.

Subsection c. directs the Division of Archives and Records Management in the Office of the Secretary of State ("DARM") to promulgate regulations setting forth standards for the preparation and submission of documents and information in electronic and digital form. This authority overlaps with the existing authority of DARM to promulgate regulations governing the maintenance of public records, see N.J.S. 47:1-12 and 47:3-26, especially as modified by L.1994, c.140 (adding language covering the "data processing and image processing" of public records).

Subsection d. requires review and approval of any regulations by the State Records Committee. Requiring the agencies and the Commissioner to act by regulation assures that there will be an open process for the consideration of relevant issues, and a mechanism by which the appropriate state-wide authority, the State Records Committee, can scrutinize regulations for compliance with the requirements of the public records regulations and the standards promulgated by DARM. This means, for example, that even if a technology sought to be implemented by a state agency may be faster and cheaper in terms of immediate handling of the information, the use of the technology need not be approved by the State Records Committee if it would result in the generation of records which couldn't be properly archived or made

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available for public inspection under the public records law, or fails to satisfy DARM standards adopted pursuant to this statute.

Subsection e. cross-references the definitions of the terms “state agency” and “head of the state agency” to the definitions in the Administrative Procedure Act.

Subsection f. excepts election statutes from the operation of the proposed statute. Even if the proposed statute by its terms might apply to some phases of the election process (e.g. N.J.S. 19:31-6.4 (specifying the format of the voter registration form submitted “submitted to” the appropriate state agency or local government entity)) the Commission believes that technological change in the manner of conducting elections should be considered as a separate project. Campaign contribution reporting and related matters governed by the N.J. Campaign Contributions and Expenditures Reporting Act, are, however, covered by the provisions of this proposed Act, as expressly provided in subsection f. Note that the Election Law Enforcement Commission established by the cited Act has recently been appropriated funds for the express purpose of establishing a system of electronic filing of election campaign reports.

The express exceptions in the November 1997 Tentative Report for the titles governing the execution of wills and filing of title documents have been eliminated from the exceptions provision, however. The proposed statute has no effect on the current formal requirements for valid wills and deeds in Title 3B Probate Code and Title 46 Real Property. The proposed statute does, however, give agencies and local government entities the authority to permit the electronic or digital submission of these kinds of documents if appropriate regulations are proposed, approved and adopted. Thus, as appropriate technologies for the electronic filing and indexing of deeds, wills and similar documents are developed, this proposed statute permits them to be used subject to the safeguard of review by DARM for compliance with records retention and preservation requirements.

Note that the term “electronic or digital form” is not defined in this section, leaving the broadest possible scope of application to the term consistent with its dictionary definition. The dictionary definition of “electronic” includes “of or relating to electronics; esp. utilizing devices constructed or working by the methods or principles of electronics.” Webster’s Third New International Dictionary 733 (Merriam-Webster, Inc., Springfield, Mass 1986). The term “digital” includes “of or relating to the representation of data by numerical digits or discrete units.” Id. at 632. Taken together, the common meaning of these terms should include all technological processes currently in use and likely to be developed in the foreseeable future for the acquisition and processing of data.

12A:2-201. Formal requirements; statute of frauds.

(1) Except as otherwise provided in this section a contract for the sale of goods for the price of \$500 or more is not enforceable by way of action or defense unless there is some writing sufficient to indicate that a contract for sale has been made between the parties and signed by the party against whom enforcement is sought or by his authorized agent or broker. For purposes of this Subchapter, writing includes an electronic or digital record that can be reduced to tangible form. A writing is not insufficient because it omits or incorrectly states a term agreed upon but the contract is not enforceable under this paragraph beyond the quantity of goods shown in such writing.

(2) Between merchants if within a reasonable time a writing in confirmation of the contract and sufficient against the sender is received and the party receiving it has reason to know its contents, it satisfies the requirements of subsection (1) against such party unless written notice of objection to its contents is given within ten days after it is received.

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(3) A contract which does not satisfy the requirements of subsection (1) but which is valid in other respects is enforceable.

(a) if the goods are to be specially manufactured for the buyer and are not suitable for sale to others in the ordinary course of the seller's business and the seller, before notice of repudiation is received and under circumstances which reasonably indicate that the goods are for the buyer, has made either a substantial beginning of their manufacture or commitments for their procurement; or

(b) if the party against whom enforcement is sought admits in his pleading, testimony or otherwise in court that a contract for sale was made, but the contract is not enforceable under this provision beyond the quantity of goods admitted; or

(c) with respect to goods for which payment has been made and accepted or which have been received and accepted (12A:2-606).

Comment

Article 2 Sales of the Uniform Commercial Code governs most sales transactions, between merchants and customers as well as merchant to merchant. The language used in most provisions of Article 2 Sales of the Uniform Commercial Code are flexible enough to encompass the use of digital and electronic processes in undertaking transactions. For example, Section 2-204 of the Code provides that a "contract for sale of goods may be made in any manner sufficient to show agreement, including conduct by both parties which recognizes the existence of such a contract." N.J.S. 12A:2-204. Under this provision, "conduct" consisting of an exchange of email messages might be sufficient to show an agreement between parties to a contract.

On the other hand, the Statute of Frauds provision in Article 2 of the U.C.C. may be interpreted to limit the enforceability of electronic transactions. U.C.C. 2-201(1) states: "Except as otherwise provided in this section a contract for the sale of goods for the price of \$500 or more is not enforceable by way of action or defense unless there is some writing sufficient to indicate that a contract for sale has been made between the parties and signed by the party against whom enforcement is sought or by his authorized agent or broker." Article 2A Leases contains a parallel provision (see U.C.C. 2A-201(1)). These provisions must be read together with the definition of "writing" contained in Article 1 of the U.C.C. which provides that "Written" or "writing" includes printing, typewriting, or any other intentional reduction to tangible form." N.J.S. 1-102(46). The requirement of "intentional reduction to tangible form" has been interpreted by some commentators as not including electronic messages or other electronic and digital records. Despite questions concerning the interpretation of this provision of the U.C.C., electronic sales transactions continue to increase dramatically. Given this increase, it appears to be the case that individuals and businesses wish to bind themselves to transactions concluded electronically, without a physical piece of paper transmitted between the parties.

With this single recommended change in each Article, the use of electronic processes is given the same status as paper processes in transactions to which either U.C.C. 2-201(1) or 2A-201(1) apply (that is, sales transactions of \$500 or more or lease contracts involving payments of \$1,000 or more). Thus, if U.C.C. 2-201(a) or 2A-201 requires a "writing," the "writing" may be on paper or in the form of an electronic record.

12A:2A-201. Statute of frauds.

(1) A lease contract is not enforceable by way of action or defense unless:

(a) the total payments to be made under the lease contract, excluding payments for options to renew or buy, are less than \$1,000; or

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(b) there is a writing, signed by the party against whom enforcement is sought or by that party's authorized agent, sufficient to indicate that a lease contract has been made between the parties and to describe the goods leased and the lease term. For purposes of this Subchapter, writing includes an electronic or digital record that can be reduced to tangible form.

(2) Any description of leased goods or of the lease term is sufficient and satisfies subsection (1)(b), whether or not it is specific, if it reasonably identifies what is described.

(3) A writing is not insufficient because it omits or incorrectly states a term agreed upon, but the lease contract is not enforceable under subsection (1)(b) beyond the lease term and the quantity of goods shown in the writing.

(4) A lease contract that does not satisfy the requirements of subsection (1), but which is valid in other respects, is enforceable:

(a) if the goods are to be specially manufactured or obtained for the lessee and are not suitable for lease or sale to others in the ordinary course of the lessor's business, and the lessor, before notice of repudiation is received and under circumstances that reasonably indicate that the goods are for the lessee, has made either a substantial beginning of their manufacture or commitments for their procurement;

(b) if the party against whom enforcement is sought admits in that party's pleading, testimony or otherwise in court that a lease contract was made, but the lease contract is not enforceable under this provision beyond the quantity of goods admitted; or

(c) with respect to goods that have been received and accepted by the lessee.

(5) The lease term under a lease contract referred to in subsection (4) is:

(a) if there is a writing signed by the party against whom enforcement is sought by that party's authorized agent specifying the lease term, the term so specified;

(b) if the party against whom enforcement is sought admits in that party's pleading, testimony, or otherwise in court a lease term, the term so admitted; or

(c) a reasonable lease term.

Comment

See comment to 2-201.