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From the July 2005 Update:

Voice Signatures

A persistent question in e-commerce is how to sign legal documents. Like that of many other countries, American law is flexible in its definition of what can be the signature for an electronic legal transaction. Under the Electronic Signatures in Global and National Commerce (E-Sign) Act of 2000, a signature is any symbol or process that a person adopts to sign or approve a record. That liberal theory of a signature embraces typewritten names, mouse clicks, PINs, cryptographic symbols and other things.

But the theory has been hard to apply in legal practice. As a practical matter, a signature needs to link a particular person to certain words (such as the words of a contract) in a way that shows the person's intention to be bound to the words. In an attempt to achieve this practical goal, technologists in the 1990s employed cryptographic "digital signatures," but digital signatures require clumsy procedures, most notably the assignment of secret keys to people who are then expected to manage and protect the keys. Digital signatures failed to win popularity.

The consequence of this failure is striking. Today, a full decade into the Internet epoch, business offices still sport fax machines, a key reason for which is to transmit handwritten signatures on contracts and other legal documents. Robert Johnson, "The Fax Machine: Technology That Refuses to Die," *The New York Times*, March 27, 2005.

[See also, "Electronic Signatures - they do exist don't they?" by David Fishel Editor, PDFforLawyers.com July 06, 2005, which observes that even tech-savvy lawyers still expect clients to sign documents with ink or fax because known e-signature methods have failed to catch on.]

In the age of e-mail and instant messages, a primitive technology (fax) clings to life because no one has devised a convenient, effective way to sign contracts memorialized in common formats like Microsoft Word or Adobe PDF. But for this problem a company named Voice Signature LLC has an elegant new (patent-pending) solution. It enables people to sign electronic contracts simply by calling a telephone number and speaking a script. Example of the script: "I Jane Doe hereby sign the non-disclosure agreement with Ralph Smith, November 5, 2005. . . ." The emphasis is on making the signature easy for the signer – which is what digital signatures failed to do.

Voice Signature's technology, known as "VoiceBond," provides tools that link the voice record with the words being signed and that make a self-explanatory archive of the signing event. The result is an archive analogous to a signed paper record; the archive contains all the information necessary for a forensic investigator to assess the authenticity of the signing event.

VoiceBond does not require anyone to engage in the expensive enterprise of storing things like a record of how a cryptographic key was assigned to Jane (the digital signature approach requires a so-called "certification authority" to store this type of information for as long as the signature is legally effective). Nor does it require storage of samples of Jane's voice for automated biometric verification purposes. VoiceBond's approach avoids automated voice verification, just as traditional paper and ink signatures avoid automated handwriting verification. VoiceBond simply captures the voice record, binds it to the words being signed, and leaves the collection of voice samples for verification purposes to a future forensics investigator, if and when his services are needed to resolve a dispute. In most cases, his services will never be necessary.

From the August 2005 Update:

Behavioral Signatures vs Transferable Signatures

A New York Times article re-affirms the value of a signature that is personal to an individual, as a voice or handwritten signature is, compared to a signature that is transferable from one person to another, as a PIN or key-based signature is. As the closing for a \$6 million real estate loan was unfolding, a lawyer for the title company became suspicious of the handwritten signatures on the paper documents being assembled. Despite the pervasiveness of the Internet today, most larger financial transactions are still handled with paper that is signed the old-fashioned way, with ink. In this particular closing, most of the signatures had been collected remotely and then delivered via overnight courier to the office where the closing was officially transpiring. Thus the borrower and other principals were not physically present in the office.

The title company lawyer, who was in the office, noticed that the signature of one person – the officer of a bank that was purporting to release a lien on a parcel of land – bore an unsettling similarity to the signature of the borrower, a rich real estate investor named Andrew M. Kissell. "One look at the loops in his signature made [the lawyer] nauseated, she said, because it resembled the signature of a bank official that appeared on the Astoria Federal release." On the basis of this discomfort with the manual signatures, the title company withdrew from the closing.

This failed transaction caused Mr. Kissell's real estate business to fold like a house of cards. Within 6 weeks federal authorities arrested him for fraud. "Among the allegations were that Mr. Kissell had built his real estate empire using sham appraisals, bogus mortgage releases and forged consents to sales of jointly owned property." Alison Leigh Cowan, "Lawyer's Hunch Fueled Inquiry That Grounded a High-Flying Real Estate Investor," New York Times, August 7, 2005, p. 23.

Handwritten and voice signatures share the same foundation -- the unique behavior of an individual. In the case of a handwritten signature, the unique behavior is the way a person writes with an ink pen. In the case of voice, the unique behavior is the way a person speaks. Behavioral-based signatures leave behind forensic clues that transferable signatures do not.

No such forensic clues are left behind when a PIN or a cryptographic key (as with a so-called "digital signature") is used to create an electronic signature. With transferable signatures, the electronic evidence shows simply whether the numeric PIN or key was used or not. So if a crook like Mr. Kissell succeeds in stealing someone's PIN, or in tricking a relative or business associate into compromising her key, a watchdog like the title company lawyer has no clues to tip her to the forgery.

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