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ADVANCING DIGITIZATION IN INTELLECTUAL PROPERTY: HOW THE E-SIGN ACT IS FAILING

INTRODUCTION

Technology has played a pivotal role in the development of modern business.¹ Advancing technology has drastically increased the digitization of commerce, including intellectual property.² Some hope that digitization will standardize and integrate systems to increase efficiency,³ while others believe that digitization will provide strategic advantages in commerce that may regulate the creation and loss of value within companies.⁴ An ideal system conforming to digitization would allow for business transactions to be written and signed electronically.

It was only with the turn of the century that the electronic signature came into effect and nations began considering electronic signature regulation.⁵ Electronic signatures have been quickly adopted and indeed are utilized within the intellectual property regime.⁶ However, governments need to continuously adopt new regulations to stay in line with rapidly advancing digitization. With the European Union's 2016 enactment of a new electronic signature regulation, it has become clear that standards in the United States are outdated and inefficient.

Because businesses with technology local to the United States often seek patent protection in international jurisdictions, the patent system is inherently connected across the globe. Accordingly, patent assignment law presents a

¹ See generally Andreas Wiebe, *Perspectives of European Intellectual Property Law*, 8 INT'L J.L. & INFO. TECH. 139 (2000).

² *Id.* at 142. The definition of digitization can vary. The author defines digitization as the conversion of manual business processes to online and computer-supported processes. Thomas Davenport, *What the Heck is Digitization Anyway?*, WALL ST. J. (Nov 12, 2014, 3:54 PM), <http://blogs.wsj.com/cio/2014/11/12/what-the-heck-is-digitization-anyway>.

³ Davenport, *supra* note 2.

⁴ Martin Hirt & Paul Willmott, *Strategic Principles for Competing in the Digital Age*, MCKINSEY Q. (2014), <http://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/strategic-principles-for-competing-in-the-digital-age>.

⁵ Robert Crossley, *Where Are We Up to with E-Signatures*, WALKER MORRIS (2016), <https://www.walkermorris.co.uk/publications/in-brief-walker-morris-legal-update-february-2016/where-are-we-up-to-with-e-signatures/>.

⁶ See USPTO, ELECTRONIC PATENT ASSIGNMENT SYSTEM, <https://epas.uspto.gov> (last visited Nov. 16, 2017).

unique opportunity to compare U.S. electronic signature law to European law. Before making this comparison, however, the difference in patent assignment law between the United States and Europe should be understood. Patent assignments in the United States are unique in that, while they are codified in federal law, they are also bound in property and contract rights and so are governed by both federal and state law.⁷ This results in some underlying confusion on which laws apply—a confusion that may directly affect U.S. electronic signature law. On the other hand, in Europe, independent national law governs patent assignments.⁸ Although this means that patent assignments may vary by nation, because electronic signatures must be enforced consistently across Europe, it is at least clear what law must apply when.

I. ELECTRONIC SIGNATURES

A. *UETA and E-Sign Act in the United States*

In the United States, electronic signatures could not immediately be implemented because of state legislation that granted legal effect to the Statute of Frauds.⁹ To traverse the Statute of Frauds, states had to adopt provisions that specifically included electronic signatures.¹⁰ However, the means by which each state adopted this legislation varied significantly, with some states adopting a higher standard of technology regulation and others adopting a technology neutral law.¹¹ For example, Utah adopted a technology-based approach granting legal recognition to digital signatures but stringently defining the technology that must be used for something to count as a digital signature.¹² On the other hand, California adopted a technology neutral requirement, only defining what the signature must entail and allowing any technology to satisfy the requirement.¹³ In response to these inconsistencies, the federal government enacted the Electronic Signatures in Global and National Commerce Act (E-Sign Act) in 2000.¹⁴

⁷ See 35 U.S.C. §261 (2013); DONALD S. CHISUM, 16 B CHISUM ON PATENTS § 9300, 192 (2015).

⁸ Alexander Schlee, *Ownership Transfer of European Patents and European Patent Applications*, SCHLEEIP, INTELL. PROP. INT'L (2016).

⁹ The Statute of Frauds requires that certain documents be signed and in writing for it to be legally enforceable. Adam Smart, *E-Sign Versus State Electronic Signature Laws: The Electronic Statutory Battleground*, 5 N.C. BANKING INST. 485, 489–90 (2001).

¹⁰ See Unif. Elect. Trans. Act §7 (stating “[i]f a law requires a signature, an electronic signature satisfies the law”); 10 Williston on Contracts § 29:23 (4th ed.).

¹¹ Smart, *supra* note 9, at 491–92.

¹² UTAH CODE § 46-4; Smart, *supra* note 9, at 491.

¹³ CAL. CIV. CODE § 1633; Smart, *supra* note 9, at 491–92.

¹⁴ 15 U.S.C. §§7001–06, 7021, 7031 (2000); Smart, *supra* note 9, at 485.

The E-Sign Act is a U.S. federal law, legislated to facilitate the use of electronic records and electronic signatures in interstate and foreign commerce by ensuring the validity and legal effect of contracts entered into electronically.¹⁵ This Act grants electronic signatures the same legal status as a written signature.¹⁶ An electronic signature is defined as “an electronic sound, symbol, or process, attached to or logically associated with a contract or other record and executed or adopted by a person with the intent to sign the record.”¹⁷ The E-Sign Act follows the school of thought that electronic signatures should be technology neutral, “setting up no minimal requirements for security or confirmation purposes, essentially allowing the parties to a transaction to determine the technologies to be used.”¹⁸

It is crucial to understand that while the E-Sign Act is a federal law, it does not necessarily preempt state law.¹⁹ Congress was careful not to overrule all state laws on electronic signatures by allowing states to enact electronic signature regulations that would not be preempted if certain core requirements were met.²⁰ These requirements include either adopting identical state laws—termed the Uniform Electronic Transaction Act (UETA), approved by a national board²¹—or adopting an alternative law that modifies E-Sign so long as it “sets out the procedures for use and acceptance of electronic records and signatures” and it does “not require or prefer the use of a specific technology” for the signature.²²

UETA has been adopted by forty-seven states along with the District of Columbia, Puerto Rico, and the U.S. Virgin Islands and establishes the legal equivalence of electronic records and signatures with paper writings and manually signed signatures, removing barriers to electronic commerce.²³ The

¹⁵ 15 U.S.C. §7001 (2000).

¹⁶ There are many exceptions and rules existing that may forego the creation of an enforceable contract. *See id.* §7003.

¹⁷ *Id.* §7006.

¹⁸ Smart, *supra* note 9, at 493. The E-Sign Act permits the use of electronic signatures for virtually all types of agreements as long as prior consent of all parties to conduct business electronically is given. 15 U.S.C. §7001.

¹⁹ Smart, *supra* note 9, at 496.

²⁰ *Id.* at 496–97.

²¹ UETA was approved by the National Conference of Commissioners on Uniform State Laws. *Id.* at 496.

²² *Id.* at 497.

²³ UETA – UNIFORM ELECTRONIC TRANSACTIONS ACT, RIGHTSIGNATURE (2011), <https://rightsignature.com/legality/ueta-act>. New York, Illinois, and Washington have not adopted UETA. However, New York and Illinois have adopted comparable provisions. Arati Thaly, *Are Electronic Signatures Legal?*, JENNINGS STROUSS (2015), http://www.jsslaw.com/news_detail.aspx?id=425.

basic provisions of UETA are technology neutral, similar to the E-Sign Act.²⁴ In fact, UETA and the E-Sign Act are intended to be substantially the same with substantially the same outcome.²⁵ The E-Sign Act was implemented to maintain this intent, preempting state law where the laws are not consistent with it (excluding explicit exceptions stated in the E-Sign Act, such as real property transfers), establishing the ceiling that governs restrictions on electronic signatures.²⁶

However, it is common for states to adopt UETA with additional provisions, perhaps defeating the automatic safeguard that is provided by the E-Sign Act.²⁷ For example, in some states, UETA allows consumers to contract around its provisions, providing less consumer protection than the E-Sign Act.²⁸ Delaware, as an example, includes many differing provisions in its adoption of UETA that are not mentioned in the E-Sign Act, including choice of forum provisions.²⁹ The E-Sign Act allows for this addition of rules as long as the rules remain consistent with the policies of the E-Sign Act.³⁰ However, the determination of what is “consistent” remains a difficult question. While including choice of forum provisions seems to be only an extension of the E-Sign Act, when applied in practice, it is entirely possible that consumers may be stripped of various protections by businesses choosing a forum with favorable corporate laws.³¹ These obscure provisions that do not relate directly to the E-Sign Act would create uncertainty in the validity of the regulation.³²

²⁴ 15 U.S.C. §7006; Patricia Fry, *A Preliminary Analysis of Federal and State Electronic Commerce Laws*, 47 No.1 U.C.C. Bulletin 1 (2017).

²⁵ See generally William Denny, *Electronic Contracting in Delaware: The E-Sign Act and the Uniform Electronic Transactions Act*, POTTER ANDERSON COOPER PUBL'N (2004).

²⁶ Smart, *supra* note 9, at 496; Rachel Stoermer, *Sign Here: Electronic Signatures and the In-House Counsel*, 33 No. 2 ACC DOCKET 26, 29 (2015). The E-Sign Act was implemented to overcome the inconsistencies that resulted from states adopting legislation under their own provisions. *Metro. Reg'l Info. Sys., Inc. v. Am. Home Realty Network, Inc.*, 722 F.3d 591, 601 (4th Cir. 2013).

²⁷ Stephanie Lillie, *Will E-SIGN Force States to Adopt UETA?*, 42 JURIMETRICS J. 21, 25–28 (2001); Smart, *supra* note 9, at 522.

²⁸ Lillie, *supra* note 27, at 28–29.

²⁹ See Denny, *supra* note 25.

³⁰ Mike Watson, *E-Commerce and E-Law: Is Everything E-Okay? Analysis of the Electronic Signatures in Global and National Commerce Act*, 53 BAYLOR L. REV. 803, 822 (2001).

³¹ As an example, Delaware maintains a statute of limitations of only three years on written contracts versus a statute of limitations of six years in Georgia. *Compare* DEL. CODE ANN. tit. 10, § 8106 (2014), *with* GA. CODE ANN. § 9-3-24 (2017). Where Delaware's UETA specifically excludes the alternative entity law that requires all elections to be held by written ballot, this precise law would clearly be preempted by the E-Sign Act because no electronic signature can be denied legal effect. 15 U.S.C. §7001.

³² Denny, *supra* note 25.

Generally, because contracts are governed by state law, the state law regarding electronic signatures will have to be considered first. At that point, an assessment of whether any of the provisions of the state law (most likely UETA) are preempted by the E-Sign Act can take place. This method raises concerns over how each statute differs and is interpreted, increasing workloads for the courts and perhaps defeating the purpose of creating uniformity.³³ However, because there is substantial similarity in the provisions of the state law and the E-Sign Act, it seems unlikely that any substantial issues will come forth where electronic signatures are directly applied to patent assignments.³⁴ Potentially of greater concern is what qualifies as an electronic signature in the United States versus Europe.

B. Electronic Identification and Trust Services Regulation in Europe

Europe instituted electronic signature regulations to help regulate the practice and encourage harmonization. The Directive on Electronic Signatures³⁵ (created in 1999) required member states to ensure that an electronic signature is not denied legal effectiveness and admissibility as evidence in legal proceedings solely because it is (1) in electronic form, (2) not based upon a qualified certificate, (3) not based upon a qualified certificate issued by an accredited certification service provider, or (4) not created by a secure signature-creation device.³⁶ This Directive, similar to the adoption of the E-Sign Act, was drafted under the prevailing theory of technology neutrality.³⁷ However, as a directive, European states had the ability to interpret the laws as each saw fit, which ultimately resulted in inconsistent laws with widely varying degrees of what was considered a reasonable signature—with many states mandating very strict signature requirements.³⁸ Indeed, the European Commission “observed that the Directive . . . made it . . . de facto impossible to conduct cross border electronic transactions.”³⁹

³³ Smart, *supra* note 9, at 522.

³⁴ 15 U.S.C. §7001; GA. CODE ANN. § 10-12-7 (2009).

³⁵ Council Directive 1999/93, of the European Parliament and of the Council of 13 December 1999 on a Community Framework for Electronic Signatures 2000 O.J. (L13/12) 1, *available at* http://europa.eu.int/eur-lex/prl/en/oj/dat/2000/l_013/l_01320000119en00120020.pdf.

³⁶ *Id.*

³⁷ D. Casey Flaherty & Corey Lovato, *Digital Signatures and the Paperless Office*, 17 No. 7 J. INTERNET L. 3, 8 (2014).

³⁸ Marshall Nam, *The New eIDAS Regulation in Europe and Its Impact on North America*, INT’L NEWS (2016), <https://www.docusign.com/blog/the-new-eidas-regulation-and-its-impact-in-north-america/>.

³⁹ *Id.* It may also be of significance that the Directive was created before advancement in electronic signatures had necessarily taken place. *Id.*

This inconsistency resulted in the adoption of the Electronic Identification and Trust Services Regulation (eIDAS).⁴⁰ Unlike a directive, a regulation does not give member nations flexibility in enforcement.⁴¹ eIDAS went into effect in July 2016, repealing the Directive on Electronic Signatures and, thus, repealing all current laws inconsistent with eIDAS.⁴² It provides “a common foundation for secure electronic interaction between citizens, businesses and public authorities, thereby increasing the effectiveness of public and private online services, electronic business and electronic commerce in the Union.”⁴³ The goal of this regulation is to create a “digital single market” that will enhance public and private online services in individual countries, as well as create a stronger cross-border framework for the digital market.⁴⁴

This regulation attempts to balance the benefits of technology neutrality with the use of advanced signature methods “by acknowledging that some types of electronic signatures are more secure than others, but all may be legally used.”⁴⁵ eIDAS holds two core components, the first ensuring identification of all signatories, and the second providing trust services.⁴⁶ The identification component standardizes the signature types that can be used across European nations, while the trust services provide a method for giving substantial protection to documents.⁴⁷

C. Comparison of E-Sign Act and eIDAS

Unlike eIDAS, the E-Sign Act consists of minimalist laws that permit the use of electronic signatures for virtually all types of agreements.⁴⁸ It explains four major components that may be affected by the signature being electronic instead of written: (1) intent to sign; (2) consent to do business electronically; (3) acknowledgement or notarization of signature; and (4) record retention.⁴⁹ Acknowledgement of the signature requires that the system used to capture the transaction keep “an associated record that reflects the process by which the

⁴⁰ Regulation 910/2014, of the European Parliament and of the Council of 23 July 2014 on Electronic Identification and Trust Services for Electronic Transactions in the Internal Market and Repealing Directive 1999/93/EC, 2014 O.J. (L257/73) 1 [hereinafter Regulation of the European Parliament and Council], available at <http://eur-lex.europa.eu/eli/reg/2014/910/oj>.

⁴¹ See *id.*

⁴² *Id.*

⁴³ *Id.*

⁴⁴ *Id.*

⁴⁵ Flaherty & Lovato, *supra* note 37, at 7.

⁴⁶ Regulation of the European Parliament and Council, *supra* note 40.

⁴⁷ *Id.*

⁴⁸ See 15 U.S.C. §7001.

⁴⁹ *Id.*

signature was created, or generate a textual or graphic statement (which is added to the signed record) proving that it was executed with an electronic signature.”⁵⁰ This must adhere to the Digital Signature Standard set by the National Institute of Standards and Technology.⁵¹ The E-Sign Act does not specify that any advanced electronic signature method is required.⁵² In fact, the E-Sign Act is intentionally neutral with regard to the technology utilized for signatures, not allowing discrimination between electronic signatures.⁵³ Similarly, under UETA, a signature may be attributed to a person if she demonstrates that the signature was constructed under her own act in “any manner, including a showing of the efficacy of any security procedure applied to determine the person to which . . . the electronic signature belongs.”⁵⁴

An interesting consideration is how the United States Patent and Trademark Office (USPTO) implements electronic signatures in its patent assignment system. The USPTO allows for the use of handwritten signatures, copies of the handwritten signatures, and S-Signatures for correspondence for “a patent application, patent, or a reexamination or supplemental examination proceeding in place of hand-written signatures.”⁵⁵ By allowing only these signatures, the USPTO, a federal agency, is placing stipulations on what types of technology qualify a signature as an electronic signature.⁵⁶ On its face, this appears to be a violation of the E-Sign Act. While perhaps more efficient, by stating certain methods of signature acceptance, the USPTO is failing to recognize other possible signatures where intent between the parties was realized. For example, more advanced signature methods may be used, such as directly attaching information of the signor with the signature via an encryption.⁵⁷ As businesses begin to use more advanced signature services,⁵⁸

⁵⁰ DOCUSIGN, *UETA and E-SIGN Act*, <https://www.docusign.com.au/esign-act-and-ueta> (last visited Nov. 16, 2017).

⁵¹ DEP’T OF COMMERCE, NAT’L INST. OF STANDARDS AND TECH., DIGITAL SIGNATURE STANDARD, FIPS Pub 186-4 (2013). There is a difference between the term “electronic signatures” and “digital signatures.” Stoermer, *supra* note 26, at 32. Electronic signatures are more frequently associated with the E-Sign Act’s definition in that it can be any process that performs the function of a signature (which may include checking a box acknowledging agreement). *Id.* Digital signatures, on the other hand, are more advanced and rely on cryptographic technology. *Id.*

⁵² 15 U.S.C. §7001.

⁵³ Stoermer, *supra* note 26, at 32.

⁵⁴ Lillie, *supra* note 27, at 26.

⁵⁵ 37 C.F.R. §1.4(d)(2) (2013).

⁵⁶ *See id.*

⁵⁷ Regulation of the European Parliament and Council, *supra* note 40; David Luyt, Electronic Signatures and Cryptography, MICHALSONS, <https://www.michalsons.com/blog/electronic-signatures-and-cryptography/12715> (last visited Nov. 16, 2017).

⁵⁸ *See e.g.*, DOCUSIGN, <https://www.docusign.com> (last visited Nov. 16, 2017).

the need to use more advanced and secure signature methods seems likely. The USPTO applying its own standards of acceptable signature types seems like a reasonable consequence of the E-Sign Act.

Unlike the E-Sign Act, eIDAS regulation dictates three specific types of electronic signatures—simple, advanced, and qualified—that may be utilized for varying objectives.⁵⁹ Mutual recognition of these differing signature standards between EU Member States is required when it is a recognized electronic signature means, the assurance level is equivalent or higher than the relevant public sector in the first nation, and the relevant public sector body uses the assurance level equal or higher than what is necessary to access the service online.⁶⁰ Simple electronic signatures shall not be denied legal effect and admissibility as evidence in legal proceedings solely based on the fact that it is in electronic form.⁶¹ Simple electronic signatures include methods such as check boxes and copies of handwritten signatures.⁶² Advanced electronic signatures, on the other hand, allow unique identification and authentication of the signor of a document and enables the verification of the integrity of the signed agreement.⁶³ This requirement is typically met with a digital signature.⁶⁴ Qualified electronic signatures are based on qualified certificates that can only be issued by a certificate authority that has been accredited and meets the requirements of eIDAS.⁶⁵ Qualified certificates must also be stored on a qualified signature creation device such as a smart card, a USB token, or a cloud-based hardware security module.⁶⁶ These are important because they are the only signature types that will ensure mutual recognition of its validity by all the EU Member States, which is crucial for the creation of the single digital market across the entire European Union.⁶⁷ The specificity that eIDAS provides may provide more uniformity across the entire European Union.

⁵⁹ Regulation of the European Parliament and Council, *supra* note 40.

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² Stoermer, *supra* note 26, at 28.

⁶³ Regulation of the European Parliament and Council, *supra* note 40.

⁶⁴ Stoermer, *supra* note 26, at 28.

⁶⁵ Regulation of the European Parliament and Council, *supra* note 40.

⁶⁶ *Id.*

⁶⁷ *Id.*

II. INTERPRETATION OF ELECTRONIC SIGNATURE LAWS IN THE UNITED STATES

Application of the differing regulations in the United States may create further confusion. Because electronic signature laws in the United States are governed by federal and state law, there is great room for variation. On the other hand, eIDAS clearly dictates that all EU Member States must follow those regulations regardless of jurisdiction, clearing up uncertainty as to when to apply the laws on electronic signatures and to what extent.⁶⁸

The judicial system in the United States has not directly addressed electronic signatures and patent assignments; however, courts have addressed copyright assignments. When considering whether the E-Sign Act governs the assignment of copyrights, the Southern District of Florida in *Hermosilla v. Coca-Cola, Inc.* held that a copyright assignment completed electronically via email was a valid assignment.⁶⁹ While the court admitted that this was an unsettled area of law, it claimed that it was unreasonable to think that the court “would rule any other way than that [an] email assignment of copyright interest was valid.”⁷⁰ The court made its argument using judicial precedent and then supported this argument by reciting the standards of the E-Sign Act.⁷¹ It was only in the holding that the court mentioned that there was a Florida statute that explicitly granted legal effect to electronic signatures.⁷²

Addressing a similar issue, the Fourth Circuit held in *Metropolitan Regional Information Systems, Inc. v. American Home Realty Network, Inc.* that the Copyright Act’s requirement—that transfers of copyright interests be “in writing and signed by the owner of the rights conveyed”—can be satisfied by electronic means.⁷³ The court in this case reasoned that “invalidat[ing] copyright transfer agreements solely because they were made electronically would thwart the clear congressional intent embodied in the E-Sign Act.”⁷⁴ Here, contrary to the Southern District of Florida, the court almost entirely relied upon the E-Sign Act to make its determination.⁷⁵ The court explicitly mentioned the listed exceptions of the E-Sign Act and concluded that

⁶⁸ Regulation of the European Parliament and Council, *supra* note 40.

⁶⁹ *Hermosilla v. Coca-Cola, Inc.*, 2011 WL 9364952 1, 6 (S.D. Fla. 2011).

⁷⁰ *Id.* at 6.

⁷¹ *Id.* at 5–6.

⁷² *Id.* at 6.

⁷³ *Metro. Reg’l Info. Sys., Inc. v. Am. Home Realty Network, Inc.*, 722 F.3d 591, 600, 602 (4th Cir. 2013).

⁷⁴ *Id.* at 602.

⁷⁵ *Id.* at 601–02.

“agreements to transfer exclusive rights of copyright ownership are not included in these exceptions.”⁷⁶ The court further stated that no catchall existed in the statute and that it would not take the opportunity to create one.⁷⁷

The fact that both the Southern District of Florida and the Fourth Circuit failed to immediately turn to state statutory provisions to consider these contract disputes indicates that there exists confusion amongst the courts in applying these electronic signature laws. This is an erroneous methodology that preempts state law.⁷⁸ Because the E-Sign Act allows states some ability to modify their electronic signature standards, an appropriate assessment would first consider state law and, then, validate that the major factors of the E-Sign Act are met. While there still exists varying standards under UETA compared to the E-Sign Act,⁷⁹ these variations do not appear to result in substantial confusion related to patent assignments in particular. However, because eIDAS clearly defines electronic signature law that all Member States must follow, businesses within the European Union understand what measures are both available for use and necessary to follow the regulation. This provides greater uniformity in Europe, likely increasing efficacy of business transactions and reducing party confusion.

III. TRANSLATION OF PATENTS ASSIGNED IN THE UNITED STATES TO EUROPE

The stark differences between the E-Sign Act and eIDAS that remain are the classification given to signatures and the trust services offered by eIDAS.⁸⁰ The E-Sign Act grants equal weight to any electronic signature as an equivalent of a hand-written signature in ink.⁸¹ This means that a signature at the end of an email may be given equivalent weight to that of a highly encrypted signature.⁸² eIDAS, on the other hand, has three classifications of signatures with varying levels of enforcement. While eIDAS specifies that all electronic signatures must be given legal effect similar to the E-Sign Act, these varying levels of electronic signature allow for more protection in certain

⁷⁶ *Id.* at 601.

⁷⁷ *Id.*

⁷⁸ In *Metropolitan*, UETA governed contracts in Maryland at the time of the case and so should likely have been considered by the court. *Id.*

⁷⁹ Smart, *supra* note 9, at 522.

⁸⁰ 15 U.S.C. §7001; Regulation of the European Parliament and Council, *supra* note 40.

⁸¹ Flaherty & Lovato, *supra* note 37, at 7.

⁸² *Id.* at 8.

instances.⁸³ As such, countries may dictate which of these signature types must be used for certain industries.⁸⁴

Because patents are typically assigned privately, private parties have the ability to dictate what signature must be used (unless a nation regulates the transfer of intellectual property rights otherwise). As both eIDAS and the E-Sign Act allow for all electronic signatures to be given legal effect, theoretically, there could be a seamless transition between the United States and a European nation.

However, the infrastructure that eIDAS provides may enhance the E-Sign Act. Under eIDAS, even the simple signature would likely qualify under the components of the E-Sign Act. If an EU Member State, via the private company itself or as a regulated industry, requires that a qualified signature be used for a patent assignment, companies in the United States likely will not be as readily equipped to comply. The infrastructure of eIDAS encourages the development of an entire market of qualifying signature services that make it easy to ensure that a qualified electronic signature can be easily given.⁸⁵ However, in the United States, there exists the risk that a person assigning a patent is not aware that different standards of signatures exist in Europe. While this can be easily solved by obtaining legal representation in the other nation, this is an inefficient solution that does not capitalize on new developments in technology.

Furthermore, because many of the largest corporations in the United States are international companies, it is likely that these organizations will have to adopt the standards of the European Union. Adopting standards that do not further limit the use of electronic signatures in the United States but still allow for integration of the use of electronic signatures throughout Europe remains the most prudent solution. The risks of misappropriating a patent assignment remain very high when the burden of ensuring a proper assignment is so low.

CONCLUSION

The emerging framework for international e-commerce will not work without an infrastructure for electronic signatures. With eIDAS, the European Union now has acted to implement legislation to create such an

⁸³ Regulation of the European Parliament and Council, *supra* note 40.

⁸⁴ *Id.*

⁸⁵ *Id.*

infrastructure.⁸⁶ The United States, which at one point had the most advanced electronic signature regulations in place, needs to take an affirmative step to capitalize on the developments of technology to increase the efficiency of international e-commerce. Taking this step will guide the United States' advance of digitization in the same direction as that of other nations to ensure that international commerce remains viable. Keeping the current regulations in place while adding clarification to varying electronic signature standards similar to the European regulation will allow businesses and agencies to adopt a uniform signature standard for patent assignments that will increase efficiency in the workplace.

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⁸⁶ Wiebe, *supra* note 1.

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