



Eliminating Cost and Waste of Paper Signatures

Saving Money and Accelerating Business with Digital Signatures

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Overview: Digital Signatures Gain Ground

Taking a pen and signing a document is such a basic process that replacing it with technology might like a technological luxury that your business cannot afford.

However, if you look carefully at the true cost of doing business the old, paper-based way, your perspective may change. Particularly in heavily regulated businesses with document-rich processes requiring binding signatures, maintaining paper-based signatures can be very costly over time.

While most businesses have made a concerted effort to streamline and eliminate paper-based processes, signatures are the final hold-out in this link. By moving to digital signatures, you can achieve further cost reductions and process improvements – giving your business a real bottom-line benefit while making processes more efficient.

This paper will help you evaluate the true cost of paper-based signatures, and determine whether a digital signature solution would deliver significant savings and efficiency improvements for your specific business. It describes the TriCipher mySignatureBook digital signature solution, which accelerates signing processes with a simple web-based interface, and supports a wide range of signature credentials (the technology that authenticates you as the person signing the document.)

A quick background

By *digital signatures*, we mean electronic, cryptographically-created counterparts to written signatures that 1) authenticate the identity of a document sender or signer, and 2) validate that the signed document has not been tampered with. To achieve this level of strength, most digital signature solutions rely on Private Key Infrastructure (PKI) technology.

The term *electronic signature* refers more loosely to electronic efforts that may not have the same level of non-repudiation and legal recognition. In regulated businesses, such as health care, pharmaceutical industry, financial services and banking, secure digital signature technology is essential.

Digital signature technologies have advanced considerably in recent years. In the past, several key barriers prevented widespread adoption, including:

- Lack of industry standards
- Legal concerns: is the digital signature non-repudiable?
- Complexity: what is involved in provisioning and training all of the people who need to sign documents?
- Cost: what does it cost to get everyone ready to sign? How big is the deployment project?

Today these barriers are eroding. Industries are agreeing on standards, digital signatures are gaining widespread traction and legal acceptance, and true zero-footprint client options are available, making digital signatures available to a wider range of potential signers.

Who should adopt digital signatures?

The businesses that will get the biggest cost savings digital signatures are those that generate a large number of documents requiring signatures. Often these are businesses in regulated industries, such as pharmaceutical and health care companies. However, all kinds of businesses can benefit.

Many factors will affect your specific benefits:

- How many documents do you produce annually that need signatures?
- How many signatures do those documents need?
- How many of those signatories are distributed in different locations?
- Do you interact with partners or regulatory agencies, and if so, can digital signatures and electronic submission streamline those interactions?

The cost discussion that follows is meant to provide some guidance in estimating the costs of digital signatures. For the purpose of simplicity, we'll work with a sample company to provide the groundwork. You can substitute the values you know to be true for your business to estimate your potential savings.

Calculating the Costs of Manual Signatures

As an illustration, the following example describes a business that processes on average 7,000 signed documents per year. This number is low for many heavily regulated and document-intensive businesses, although companies with much fewer documents can achieve cost savings as well.

In developing the cost basis, we will expose the reasoning and assumptions used to assign costs. You can compare these values to those you know to be true in your own business.

Printing costs

The first place to start is the cost of printing the documents that need signatures. While few offices are truly paperless, the need for signatures compounds the printing requirement, as you typically print copies of the document for various signatories.

The variables include:

- Average number of documents needing signatures per year
- Average number of copies needed of each source document
- Average number of pages of each document
- Per/page printing costs

Our sample business generates 7,000 documents per year requiring digital signatures. Each document is approximately 10 pages long, and on average 3 copies are printed of each to gather signatures – for a total of 210,000 pages printed. With an average cost per page of 2 cents (a low estimate, based on high-capacity monochrome laser printing), the total printing costs for our sample business are \$4,200 a year.

Transmission and transportation costs

Printing costs are just the beginning of the true cost of paper signatures. Next, you have to get the documents to and from the people who need to sign them.

You may ship documents by mail. Signatories may be in the same office or across campus. You may use overnight delivery or even courier services for time-constrained documents. And in some cases, faxed copies may replace or augment paper delivery.

To calculate your transmission and transportation costs, you will need to determine what percentage of the total number of documents you handle using each method. Note that your number could turn out to larger than 100% if the same document must travel both ways at your company's expense.

(One document might incur two Fed Ex charges, for one document, for example.) At the same time, you may group several documents in one overnight or courier package, which would reduce the percentage.

For our sample business, with 3 copies each of 7,000 documents, we will assume the following:

- 40% (or 8,400) of the documents are delivered using internal processes (on-campus distribution) to which we assign no costs. (If you have a cost basis for your internal or campus mail, you can use it to determine costs.)
- 20% of the documents (4,200 total) are sent by US mail to their signatories.
- 20% use overnight shipping (Fed Ex, DHL, etc.). Assuming that on average two documents are sent in every package, we are adjusting this number to 10%. (2,100 shipments total)
- An additional 20% are faxed. (In some cases, documents may be faxed one way and mailed back once signed.)

We have chosen conservative values for printing, courier, shipping and faxing costs.

Delivery mechanism	Percentage of documents*	Average cost/use	Total cost
Internal	40%	\$0.00	\$0
US Mail	20%	\$0.59	\$2,478
Overnight	10%	\$18.00 (depends on carrier, service, zone, weight)	\$37,800
Courier	10%	\$40.00	\$84,000
Fax	20%	\$0.05 (per page cost)	\$2,100
Total transmission/shipping costs			\$126,378

* percentages may total more than 100% because of need to return signed documents.

** documents may be grouped in overnight packages

Your business may be trying to cut costs by reducing overnight shipping and courier expenses. But using slower methods of distributing documents for signature can delay important business processes.

Scanning costs

If your business is using electronic storage and/or submission of key documents, then you have to consider the cost of scanning the signed documents once they are completed. In many cases, the signature gathering is the only manual part of what is otherwise a digital business process, and the scanned documents must be reconnected to a digital record.

An average cost per page for scanning is five cents per page. If our sample business scans every signed document, the total cost for scanning the 21,000 documents (or 210,000 pages) is \$10,500.

The manual processes involved with scanning are costly as well. Someone has to gather the signed documents and scan either the entire document or signature pages to create a digital copy for the

archive. In the process, someone has to connect the paper processes back with the digital business process flow.

Assuming it takes an administrative staff person only 10 minutes per document to do this, and the fully loaded salary is \$15/hour, then the cost of the scanning effort is \$2.50 per document. With 7,000 documents, our sample company would spend \$17,500 per year simply on the manual effort involved in scanning.

Document storage costs

For those companies that have not moved yet to electronic vaulting of signed documents, or who are in transition and currently relying on both paper and electronic versions, paper document storage is another ongoing cost.

If you assume that our same \$15/hour employee takes 5 minutes to file a document, then the per-document filing cost is \$1.25. For 21,000 document copies, the cost per year becomes \$26,250 – not including any document retrieval!

Once those documents are filed, the paper files are then stored. Paper filing storage costs vary per business an industry. Using an average per page storage cost of 1.4 cents, the cost of storage for our sample company (based on 210,000 pages) runs to \$2,940 per year.

Total estimated costs

The total cost for our sample company’s paper-based signature process, based on only printing, shipping/transmission, scanning and storage, comes to more than \$200,000 per year.

Average annual costs	
Printing	\$4,200
Shipping	\$126,378
Scanning	\$63,000
Doc storage/filing	\$29,190
Total costs/yr	\$222,768

Other costs

Some of the less quantifiable costs of paper signatures are significant to business productivity and compliance. For example:

- *Opportunity costs:* Time spent shipping documents for signature and then recalibrating the signed documents may delay essential business processes – particularly in industries like pharmaceutical where time to market is always critical. Retrieving paper copies from secure storage adds costs and delays processes and audits.
- *Productivity:* Digital signature processes are much faster for individuals that have to sign a lot of documents. For example, physicians that need to sign each page of a case study associated with a clinical trial can spend a lot of time signing. Using digital signatures, physicians can sign multiple signature blocks, or even multiple documents, at once.

- *Document retrieval costs:* Retrieving paper documents can take longer than filing them – particularly if there are filing errors. Coopers & Lybrand estimates that companies spend \$120 in labor to find a misfiled document. These costs are highly variable.
- *Lost transactions, failed audits:* With the complex processes of moving from digital sources to paper-based signature back to digital copies, lost transactions are possible, which may result in failed internal or external audits.

Other benefits

- A digitally-signed document makes compliance simpler by encapsulating and time-stamping the signature processes, creating a legally enforceable, auditable electronic document of record.
- Digitally-signed documents may be more secure than paper copies. It's possible to create modified copies of manually-signed documents that look as good as the original. Also, copies of proprietary documents can be intercepted during shipping. Faxed documents may be viewed by anyone walking by the fax machine.
- For regulated businesses, digital signature processes can speed integration with regulatory entities, such as the FDA (using the FDA Electronic Submission Gateway).

Digital Signature Cost Considerations

Digital signature technologies reduce costs by eliminating the manual processes involved with managing paper-based signatures.

However, these technologies themselves have some costs, besides the upfront licensing fees. In the past, client deployment has been a significant barrier to adoption.

- Solutions that use smart cards incur the cost of smart card readers, and restrict the number of machines that individuals can use to sign documents, essentially restricting access.
- Solutions that rely on tokens incur the significant costs of deploying and managing those tokens, including token replacement, resynchronization, and ongoing support.
- Some solutions require that every client system used for signing have expensive client software (such as Adobe Acrobat Pro). With hundreds of individuals signing documents, these costs add up quickly.

In selecting and comparing digital signing technologies, you need to consider not only licensing costs, but also the cost involved with authenticating the document signers.

TriCipher mySignatureBook: Digital Signatures Made Practical

mySignatureBook is a powerful and flexible digital signature solution. It gathers signatures on Adobe PDF documents and creates a digitally-signed version of the completed documents, as well as 'flattened' PDF documents with signature information, suitable for distribution.

mySignatureBook offers an easy-to-use web interface. Those responsible for documents and those that have to sign them can easily access the application from the web, request signatures, sign documents, and track progress. mySignatureBook also offers Web Services interfaces for easy integration with other applications within your business, such as document management systems or repositories.

mySignatureBook interface

mySignatureBook offers a simple web-based interface for distributing documents for signatures and for signing those documents online.

mySignatureBook accelerates and manages the workflow associated with collecting signatures:

- Document owners can assign signature policies for each document, or use predefined templates to speed the process of requesting signatures.
- mySignatureBook notifies document signers when there is a document requiring their signature.
- If necessary, mySignatureBook enforces signature order, requesting each signature in turn.
- It notifies the document owner when the signature process is complete and automatically creates both a digitally-signed document with signature blocks and a 'flattened PDF' for distribution.

Credentials

mySignatureBook supports a wide range of credentials, letting you balance credential strength, portability, cost and access to best meet your business requirements. Supported credentials include:

Credential	Description
SAFE	A medium assurance software credential, using standards developed by the SAFE-BioPharma association, and accepted across the global biopharmaceutical environment
TriCipher ID Tool	A plug-in component of the TriCipher Armored Credential System (TACS) that supports a range of authentication factors including passwords, browser cookies/certificates, PCs, portable devices, tokens, smart cards and biometrics.
TriCipher ID Tool ToGo	A multifactor authentication solution that works with USB smart drives. It can be used with the SAFE credential for a federally accepted "roaming" credential, allowing users to authenticate and sign

	documents from any Internet-connected computer with a USB port.
TriCipher Zero-footprint client credential	Enables multi-factor authentication using any computer with a web browser.
Any PKCS#11 credential	A cryptographic token interface standard; many hardware providers conform to this standard for token devices.

Your business might use credentials of varying strengths for different purposes. Credential strength is one of the factors in the ‘signature policy’ associated with a document or group of documents.

For example, a pharmaceutical business might require SAFE credentials for the documents that will be submitted to the FDA, but accept zero-footprint client signatures for internal process documents that reach a broader audience of signatories. In this situation, anyone with an Internet-connected computer and web browser can access and sign documents.

Comparing Paper and Digital Signature Costs

The first section of this paper referenced a sample company signing 7000 documents per year. Comparing their costs with mySignatureBook, we can see that the mySignatureBook investment pays back very quickly:

	Paper processes	MSB
Year 1	\$222,768	\$40,000
Year 2	\$233,906.40	\$7,200
Year 3	\$245,601.72	\$7,200
Total 3-yr	\$702,276	\$54,400

- These figures assume a 5% growth in basic costs per year for paper processes.
- mySignatureBook cost includes the TriCipher Authentication Gateway appliance and a mySignatureBook license for up to 500 users.

Your specific business costs will vary; this paper should provide you with some of the background you need to construct a potential cost savings case for your own business.

Summary

This paper has looked solely at the straightforward economic benefits of adopting mySignatureBook digital signatures for essential business processes. And using this economic model, the cost benefits are compelling.

Digital signature solutions like TriCipher mySignatureBook deliver other benefits as well. Reducing paper signatures lessens the environmental impact of your business in terms of paper used and fuel consumed for delivery. And optimized online signing will accelerate business processes, potentially resulting in a faster time to market for your business.

About TriCipher

TriCipher, Inc. provides a unified authentication infrastructure available on demand or on premise to protect web applications and enterprise portals, the people that use them and the business processes that flow through them against fraud and identity theft. Our solutions allow companies to deploy adjustable credentials from a single infrastructure to defeat new threats and to meet regulatory requirements, maximizing convenience and strength and minimizing change.

The TriCipher Armored Credential System™ is our on-premise solution implemented by many leading banking and health care service providers. The myOneLogin service combines the TriCipher authentication infrastructure with single login capabilities in an on-demand service for SaaS customers as well as SaaS providers and SaaS platform providers.

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