



ROI Calculation for Digital Signatures

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 *Keep Your Business Moving*

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Introduction

The purpose of this paper is to help you establish the Return on Investment (ROI) that your organization can expect by deploying a digital signature solution. We do so by using a sample company with 200 employees that sign documents as a part of the organization's policies and procedures for approvals. For this sample organization we will identify and quantify the costs of using paper-based signatures, then propose a template for calculating the costs of implementing a digital signature solution (Total Cost of Ownership). Once these two elements have been established, calculating the ROI and payback period is possible. We also introduce the CoSign® digital signature solution and provide its costs so that its ROI and payback period can be calculated. This paper concludes with a chart summarizing all of the figures you need in order to calculate your own ROI, and we also provide an [ROI calculation template spreadsheet](#).

Investing in Automating Business Processes

Organizations need to constantly seek ways to cut operational costs and gain a competitive advantage - otherwise their competitors will do so, leaving them behind. Some of the ways organizations do this is by automating their workflows using office productivity applications such as an enterprise content management system (ECM). However, for processes requiring formal or regulated approvals, these organizations find that their content management systems do not enable them to remain paperless. Instead, they must revert back to printing out paper documents that must be physically signed, scanned, archived, routed, and are sometimes lost. This brings efficient businesses processes to a grinding halt and at the same time increases operating costs.

Automating Approval Processes

Many aspects of an organization's workflow processes require formal authorizations or approvals. An ideal way to address this need is through an enterprise-wide digital signature solution¹, which can automate approval and authorization processes by allowing the organization to maintain a completely electronic workflow from document creation through approval (signature), archiving, and audits. This solution improves the return an organization realizes on the initial investment it made in business process automation, as the company no longer has to interrupt streamlined electronic processes by reintroducing paper into the workflow. Table 1 outlines samples of typical documents and processes that require formal authorizations or approvals.

¹ Read more about digital signatures at <http://www.arx.com/digital-signatures-faq>.



Table 1. Samples of typical documents that require formal authorization/approval

Executive Management / Board Documents	Board Actions, Corporate Communications and Public Reports, Investor Relations, SEC Documents
HR Documents	Employee Actions, Employee Benefit Changes, Employee On-Boarding Documents, Employee Time Sheets, Employee Training Acknowledgements, Periodic Forms, Performance Reviews, Insurance Claims
Legal Documents	Contracts, Agreements, Work orders, Master Service Agreement Forms, and Sub-contractor Agreements
Finance/Accounting Documents	Lease Agreements, Loan Agreements, Expense Reports & Re-imbusement Approvals, Invoices, Tax Filings, Financial Spreadsheets (Data Collection and Aggregation), Disbursements (Check, Wire Transfer Orders, and ACH Transactions), Journal Entries related to Accounting and General Ledger, Purchase Requests, Gift Records
Customer Service Documents	Customer service change orders
Procurement Documents	Purchase Orders, Contracts with subcontractors
Sales Documents	Sale Proposals, Point of Sale/Service, Contracts with clients
Regulatory Affairs	Applications, Submissions, etc.
Quality control	QC Documents, Standard Operating Procedures, Policies, Work Instructions, and Training Documents, Test Procedures, Field Service, Maintenance, and Calibrations Reports
Other Industry Specific Documents	Designs, Drawings, Plans, Manufacturing Instructions and Reports, HIPAA patient and consent forms, Medical Records, Clinical Documentation, Lab Reports, and Certificates of Analysis



Costs of Paper-Based Signatures

For this analysis, we will examine an organization with 200 employees that sign formal documents as part of their operating procedures. Each of these employees signs 250 documents per year (an average of 1 documents per day)² amounting to **50,000 signed documents** yearly. If the average document consists of 2 pages, the organization generates **100,000 pages** per year. As these documents are currently printed and signed manually, their associated costs include **printing, routing, scanning, archiving and document loss recovery**. These costs are quantified in the following pages.

Printing Costs

The average cost of toner, ink, and paper amounts to 3 cents per page. Printing 100,000 sheets of paper for signing purposes costs the company \$3,000 per year.

Annual Printing Costs: 100,000 pages X \$0.03 = \$3,000

Routing Costs

Once documents have been signed, they often need to be routed throughout the organization and also outside to external partners. For the purpose of remaining conservative, we will only address the company's external routing costs. To calculate these costs, we estimate that 35% of signed documents in the organization require some form of external routing by standard mail, shipping, couriering, and faxing. This breakdown, as well as the various routing costs are outlined below and calculated in Table 2.

- » 5% (1/signer/month) of the documents are routed by US mail at a cost of \$0.83 per envelope³
- » 5% (1/signer/month) of the signed documents are couriered at a cost of \$42.55 per package for overnight couriering⁴
- » 5% (1/signer/month) of the signed documents are shipped at a cost of \$26.11 per package for 2nd day shipping⁵
- » 20% (1/signer/week) of the signed documents are faxed at a cost of \$.03 per faxed page

² The actual average usage figure, based on CoSign digital signature customer log data, is 250 signatures per user annually. Companies contemplating enterprise wide rollout can expect fewer signatures per employee per year.

³ Based on [USPS price](#) for sending a large envelope-sized letter weighing 1 ounce across the US for three day delivery.

⁴ Based on [FedEx Standard Overnight fee](#) for a package weighing 0.10 pounds.

⁵ Based on overnight [USPS Express Mail](#) flat rate fee.



Table 2. Estimated yearly cost of routing signed documents⁶

Routing Type	Documents Routed per Year	Calculation of Routing Costs	Total Routing Costs per Year
US Mail	2,500 (5%)	2,500 x \$.83	\$2,075
Courier (overnight)	2,500 (5%)	2,500 x \$42.55	\$106,375
2 nd day delivery	2,500 (5%)	2,500 x \$26.11	\$65,275
Fax	10,000 (20%)	10,000 x 2 pages x \$.03	\$600
Total per Year	17,500	--	\$174,325

Scanning Costs

Signed documents need to be archived either digitally or in paper form. Paper documents that are to be archived digitally need to be scanned. We'll assume that 50% of the signed documents are archived digitally and require scanning (25,000 documents and 50,000 pages).

- » The hourly wage for the employee responsible for handling the scanning is \$10 an hour
- » It takes the employee 3 minutes to scan and save each document. At this rate, 20 signed documents can be scanned in an hour

$\$10 \text{ hourly wage} \div 20 \text{ documents} = \$0.50 \text{ per scanned document}$

Annual Scanning Costs: 25,000 documents scanned X \$0.50 = \$12,500

Paper Archiving Costs

In the previous section we assumed that 50% of the signed documents in the company need to be archived digitally, while the other 25,000 documents are archived in paper form. The calculation of the archiving costs is based on the following assumptions:

- » The hourly wage for the employee filing documents is \$10 an hour
- » Filing each document takes an average of 5 minutes. At this rate, 12 documents are filed each hour

$\$10 \text{ hourly wage} \div 12 \text{ documents} = \$0.83 \text{ per document}$

Annual Paper Archiving Costs: 25,000 documents X \$0.83 filing costs per document = \$20,750

⁶ The figures in Table 2 represent only one direction of document routing. In many cases, multiple destinations and return routing are necessary.

Document Loss and Reproduction Costs

Inherent with a paper-based workflow is the reality that documentation can be lost, misplaced, or damaged. According to PricewaterhouseCoopers (PWC)⁷, 7.5% of all documents in an organization are lost. Of these lost documents, 80% are found and 20% are not, and therefore need to be reproduced. In the same study, PWC estimates the average costs in labor to find a misfiled document at \$120 and the average cost in labor to reproduce a lost document at \$220. Being more conservative, we used 5% as the percentage of documents lost. The calculations of finding and reproducing lost documents are based on the following assumptions:

- » 2,500 (5%) of The Organization's 50,000 printed and signed documents are lost
- » 80% of these lost documents are found and 20% are not and therefore need to be reproduced
- » For the purpose of remaining conservative, we will estimate the cost of finding a misplaced document at \$20 and a figure of \$40 for the cost of replacing the documents that are not found

Annual cost of lost and found documents:
 $(80\% \times 2,500 \text{ lost documents}) \times \$20 \text{ of finding each lost document} = \$40,000$

Annual cost of reproducing lost documents:
 $(20\% \times 2,500 \text{ lost documents}) \times \$40 \text{ of reproducing each document} = \$20,000$

Total annual cost of loss and retrieval of documents: $\$40,000 + \$20,000 = \$60,000$

Additional, Indirect Costs

- » Environmental costs of using paper: ¼ of a tree, 3/8 of a barrel of oil, and 75 pounds of carbon emissions per signer, per year
- » Costs incurred by lost business due to delays in signing agreements
- » Damage to the organization's reputation due to lost documentation or documentation that cannot be authenticated
- » Failure to realize the full potential of an organization's investment in its content management system

The summary of quantifiable costs for the organization (with 200 authorized signers and 50,000 signed documents annually) is detailed in Table 3.

Table 3. The sample organization's total annual paper-based signing costs.

Printing costs	\$3,000
Routing costs	\$174,325
Scanning costs	\$12,500
Archiving costs	\$20,750
Costs of finding and reproducing lost documents	\$60,000
Total annual cost of paper-based signatures	\$270,575

⁷ <http://www.articlesbase.com/software-articles/document-management-what-is-it-and-why-do-you-need-it-331794.html>.

The Average Cost per Paper-Based Signature = $\$270,575 \div 50,000 =$
 $\$5.41/\text{signature}^8$

The Annual Paper Signing Cost per Signer = $\$5.41 \times 250 = \$1,352$

Calculating the TCO of a Digital Signature

When calculating the ROI of a digital signature solution, it is also necessary to calculate the Total Cost of Ownership (TCO) that employing and maintaining the solution would require. Table 5 provides elements that must be accounted for when determining the TCO of a digital signature solution.

Table 5. Metrics for determining the TCO of a digital signature solution.

Metric	Description
Initial system cost	The initial cash outlay of your vendor of choice
Cost of implementation and integration	The cost of internal IT resources, and the cost of external professional services needed in order to implement and integrate the solution.
Annual vendor fee	The annual fees required by the vendor for maintenance, support, etc.
Annual internal maintenance cost	The annual, internal IT labor that will be required to maintain the solution, which includes managing credentials for employee turnover.
Additional Costs	Any additional costs that will be directly related to the digital signature solution

⁸ Pfizer estimates the cost at \$30 per signature
www.cio.com/article/122803/How_Pfizer_Did_ID_Management_Right_?page=3&taxonomyId=1419



Calculating Your Organization’s Payback Period and ROI

Use Table 4 below and the [accompanying spreadsheet](#) to calculate your organization’s ROI and TCO.

Calculating Organization’s Cost of Using Wet Signatures

Table 4. Calculating your organization’s annual paper-based signature costs.

Metric	base scenario	Your Costs
# of signers	Use your actual figure	
# of documents per signer per year	Use your actual figure (if you don’t know your organizations actual figures, use 250 per signer)	
# of pages per typical signed document	Use 2 pages as default (if you know actual figures for your organization, use those)	
Printing Costs	\$.03 per page	\$.03 x (pages /year)
Pages Mailed	\$.59 per mail (or use your actual costs)	\$.0.83 x (Your percentage mailed-typically 5%)
Pages Couriered	\$42.55 per courier (or use your actual costs)	\$42.55 x (Your percentage couriered-typically 5%)
Pages Shipped 2 nd Day	\$26.11 per shipment (or use your actual costs)	\$26.11 x (Your percentage shipped-typically 5%)
Pages Faxed	\$.05 per fax	\$.05 x (Your percentage faxed-typically 20%)
Scanning Costs	\$0.50 per document	\$0.50*50%*(docs/year)
Archiving Costs	\$0.83 per document	\$0.83 x (Your number of archived documents-typically 50% of total signed docs)
Lost Documents	5% lost \$20 to find (80%) \$40 to replace (20%)	5% x total signed docs x (80% x \$20+20%*\$40)



Calculating the ROI and payback period of a Digital Signature Solution

Once you have calculated your organization's wet signing cost and TCO for a digital signature solution, you can use the formulas below to calculate the expected ROI and Payback period:

$$\text{ROI} = (\text{Total paper-based costs} - \text{digital signature TCO}) \times 100\% \text{ TCO}$$

$$\text{Payback period (simplified formula, in months)} = \text{Initial outlay} \div \text{Annual cost of using wet signatures}$$

[Download Excel ROI Template](#)

The CoSign Digital Signature Solution

ARX's CoSign digital signature solution is the only digital signature solution that is seamlessly integrated with Microsoft® SharePoint® and other popular DM/ECM solutions. CoSign automates approval processes affordably in a compliant manner, allowing organizations to go paperless, expedite business processes and save costs. CoSign signatures are globally accepted by external partners without the need for proprietary-validation software, and CoSign supports all major documentation formats including Microsoft Word, Excel®, Outlook® and PDF. In addition, CoSign is centrally-managed through the organization's own user directory for reliable control of signature privileges, and ease of use and administration.

Calculating Costs of the CoSign Digital Signature Solution

The CoSign Enterprise package⁹ is priced at \$12,000. The Enterprise Package includes the CoSign Enterprise hardware appliance, 25 user licenses, server software and E-Pad. Licenses for blocks of 25 additional signers cost \$3,500¹⁰. A CoSign Enterprise server with 200 licenses is priced at \$36,500. Support and maintenance costs are set at 20% per year.

Additional costs associated with the implementation of CoSign are as follows:

- » IT installation time is estimated at 10 hours or less¹¹.
- » IT annual maintenance time is estimated at 10 hours or less.
- » Electricity costs are estimated at less than \$100 a year.
- » Server storage cost is negligible.

⁹ Enterprise servers with advanced features required by some customers are also available

¹⁰ Discounts are available for larger quantities.

¹¹ One of CoSign's main advantages is its quick deployment and minimal ongoing management requirements.

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Calculating CoSign TCO, ROI, and Payback Period

Table 6 calculates the Total Cost of Ownership (TCO) and ROI of CoSign over a 4 year period.

Table 6. TCO and ROI calculations for CoSign digital signatures over a 4 year period.

Subject of calculation	Formula	Calculation	Total
CoSign Enterprise pack TCO (for 200 signers)	Cost of CoSign package + (No. of years X maintenance costs)	$\$36,500 + (4 \times 20\%) \times 36,500$	\$65,700
Total IT time (for installation and maintenance)	No. of hours for installation + No. of years x annual maintenance hours	$10 + 4 \times 10$	50 hours
Total IT labor costs (at \$50 per hour for IT personnel)	No. of hours X Hourly IT personnel wage	$50 \times \$50$	\$2,500
Total electricity costs	No. of years X Annual electricity costs	$4 \times \$100$	\$400
CoSign TCO over 4 years	CoSign TCO + Total IT labor costs + Total electricity costs	$\$65,700 + \$2,500 + \$400$	\$68,600
ROI as percentage return on investment	$\frac{(\text{Total paper-based costs} - \text{CoSign TCO}) \times 100\%}{\text{CoSign TCO}}$	$\frac{(4 \times \$275,575) - \$68,600}{\$68,600} \times 100\%$	1,478%

Payback period in months

- » Annual cost of using wet signatures: \$270,575
- » Annual CoSign TCO over 4 years: $\$68,600 / 4 = \$17,150$
- » Payback period: Annual CoSign TCO / Annual cost of using wet signatures / 12 = 0.76 months

Payback period of implementing Cosign is less than 1 month¹²

¹² This figure assumes complete rollout from day one. This is not usually the case, as end users normally take time to change their working habits. Customers typically report 3-6 months to return their investment of purchasing and implementing CoSign.



Conclusion

In the current fiscal economy, organizations find themselves evaluating all conceivable means to reduce operational costs and gain competitive advantages. Transferring to an automated workflow that includes formal and legally compliant approval processes is one of the key ways to accomplish these goals.

Each paper based signature that an organization produces amounts to \$5.40 in printing, routing, scanning, archiving and document loss recovery costs. The typical authorized signer signs around 250 documents a year (just over two per workday), costing the organization \$1,350 a year in paper-related costs. As such, an organization with 200 signing employees typically spends around \$270,000 a year on the costs associated with paper-based signatures. Implementing the CoSign digital signature solution enables that same organization to reduce more than \$250,000 from their annual operational costs, see a return on their investment in less than a month, and realize a four year ROI of over 1,000%

For a personalized demo and tailored quote that you can use for your actual TCO and ROI calculation, [contact us](#).

About ARX – The Digital Signature Company

ARX (Algorithmic Research) is a global provider of cost-efficient digital signature and data security solutions. ARX engineers and scientists have more than 20 years of experience in security and standard digital signature applications. ARX help businesses secure, streamline, and scale their processes and transactions with the proper controls required by legislation, regulation, and industry best practice.

ARX's CoSign® digital signature solution automates approvals affordably in a compliant manner, allowing organizations to go paperless, expedite business processes, and reduce costs. CoSign is the only digital signature solution that is seamlessly integrated with Microsoft SharePoint and other popular DM/ECM solutions. Further, CoSign signatures are globally accepted by external partners without the need for proprietary validation software. Learn more about the CoSign digital signature solution at www.arx.com.

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