# BLOCKCHAIN

# *eSignum*
# Digital Signatures

## Sign and Notarize all Documents, Data and Transactions using Blockchain

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# Digital Transformation Is Here

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**Digital Transformation**

To survive and thrive, many enterprises are embracing Digital Transformation in order to become capable of rapid response to change: to unexpected challenges, events, and opportunities.

Agile working encourages rapid and flexible response to change.

**Digital Processes, manual signing?**

As part of this transformation many manual processes are optimized and digitized to make them more flexible and to reduce overhead and lead times.

In this new agile enterprise manual signing is no longer an option.

Printing multiple copies of a document, then sign them, carry or send them for counter-signing. And then after the signing to scan them in to process and archive these signed documents.

This is no longer an option.

**Electronic Signatures**

There are several Electronic Signature solutions available on the market today. These solutions allow you to add legally binding signatures to documents.

They also offer the functionality to enable external parties to sign documents.

But this technology also has several disadvantages.

*Blockchain is the Big Disruptor, because we can inherently trust the information on a Blockchain.*
*Therefor we no longer need middlemen, which leads to endless possibilities.*

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# 5 Problems with Electronic Signatures

Electronic Signature solutions a a great improvement over manual signing, however, this technology also has several problems.

**Problem 1: only PDF and Office files**
First of all, these traditional signatures can only be added to PDF documents or some Office documents. Only these file-types offers support for storing the signing key certificates.

Other file types do not support these traditional electronic signatures.

**Problem 2: only specific CA certificates**
You will need to get an expensive certificate from only a limited group of Adobe approved *central* Certification Authorities (CA).

This Adobe Approved Trust List (AATL) has little over 50 members, with, f.i. just one in Germany, one in Holland and none in the UK.

**Problem 3: a central time-stamping server**
Besides this dependency on a central CA, you are also dependent on a central Time-stamping server. This is a requirement to check the validity of the certificate.

**Problem 4: signature is stored inside the document**
Another big problem is that the digital signature is only stored *inside* the document. This means that whoever needs to check if a document is signed, will also have full access to all (confidential) information in the document.

**Problem 5: parallel signing is not possible**
Because the signature is stored inside the document, the document changes with each signature.

This is why signing documents in parallel is impossible: everybody needs to sign the document sequentially.

# A better
# Electronic Signature
# using Blockchain

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**Create better Electronic Signature solutions**

Our eSignum API offers the same functionality and the
same legal basis, but we add important functionalities
to create much better solutions.

**Sign any digital object**

First of all, we support Digital Signatures for any type
of digital object, not just PDF and office documents, but
also drawings, pictures, videos, audio, or just data.

This enables many new possibilities to secure the
authenticity of all those digital data and files we are
exchanging in the new digital economy.

**Additional information on Blockchain**

We also enable you to add additional information about
the transaction on Blockchain.

For example the identities of the signatories, a status or
any other value or meta data about the transaction.

**Independent verification**

With the registration of the signature on a Blockchain,
the Digital Signature also lives independently of the
object.

This enables independent verification, with or without
the necessity of having access to the object itself.
You can proof, and others can verify, the authenticity of
the signing process with a Blockchain notarized
transaction log.

It also enables you to keep the original information safe.
Confidential information can be kept confidential.

**Better Approval solutions**

Since the object is not changed by the signature, you
can sign them in parallel.

This enables you to implement better business rules
for approvals, such as 4-eyes principle, unanimity vote,
majority vote, a veto vote, and more.

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# A single version of the Truth

**BLOCKCHAIN**

Blockchain provides a Distributed Ledger mechanism to lock in information and making it independently verifiable and audit-able.

**Multiple versions of the truth**
Currently each participant in a transaction has his own separate, individual ledger and therefore his own version of the truth.
Which is why we need to rely on intermediaries to provide trust and consolidation, which is inefficient, error prone and fraud sensitive, and leads to disputes.

**A single version of the truth**
With Blockchain for the first time there is a technology that can add indisputable Proof of Authenticity to all the content we create, store, process, share and distribute. A single version of the truth.

So, we now no longer need to rely on intermediaries, which is much more efficient, safer and cheaper.

But what can we do with it?

**Sign, certify and authenticate digital content**
With Blockchain you can create a unique electronic fingerprint (hash) for any document, object or data and anchor this on a Blockchain.

Anyone that has access to this object can now verify the authenticity by simply recreating the hash and verify it on the Blockchain.

**Create independently verifiable audit trails**
You can register steps in a workflow on a Blockchain where each registration is linked to a specific case, document and action, creating a chain of transactions: an audit-able trail.

**Interact with Smart Contracts**
The Sphereon Blockchain API can also interact with so-called Smart Contract applications, allowing you to provide the necessary input directly from within your applications to enable Smart Contracts to execute.

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# Blockchain,
# How does it work?

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Blockchain is best described as a distributed and replicated database.

Typically, a traditional database is stored in a central location, somewhere on a networked server.
The database is managed by one or more database administrators.
Users must be authorized to use the database. User transactions store, change and read data in the central database.

By contrast Blockchain is a decentralized database that is replicated on thousands of computers globally through the use of a peer-to-peer network.

A user-transaction added to the Blockchain database is replicated to all nodes in the network. The network uses a mathematical consensus mechanism to validate and approve each transaction.
Only after validation and consensus the transaction is committed to the database.

This database can typically be accessed by anyone (public blockchain) or anyone with a permission to access the database (permissioned blockchain).

**Key concepts of Blockchain**

*Distributed ledger*
A ledger is shared over many nodes in a peer-to-peer network. Transactions are hashed and then replicated in all the shared ledgers.

*Hashing*
Any generic data set (a value, a file, a database, the status of a transaction, etc.) can be hashed to produce a short unique identifier, an electronic fingerprint, called a hash.

*Consensus*
All transactions are validated through a consensus mechanism before they are committed. Different Blockchain systems can have different consensus mechanisms.

*Public, Private or Permissioned Blockchain*
A *Public* ledger can be used by anyone. By contrast a *Private* ledger is maintained and accessed by a single organization.
A *Permissioned* ledger is distributed, shared and used by multiple but specifically authorized users.

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# Sphereon,
# an API-driven cloud platform

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Sphereon offers an innovative API-driven software platform as the gateway between today's Business IT systems and Blockchain.

**Easy integration**
We are here to help you quickly build powerful and flexible solutions that enables you to integrate your current business systems with Blockchain.

We provide standard integration plug-ins for Alfresco, MS SharePoint and Office 365, making it very easy to integrate Sphereon, without the need of low level programming.

**store.sphereon.com**
Our APIs are public and published in our API Store and are accompanied by extensive online documentation, live-try-outs, sample-code and SDKs for all modern programming languages like Java, C#, PHP, Phyton, and many more.

**Sphereon Blockchain APIs**
Use our Blockchain APIs to quickly integrate your current Business IT systems with Blockchain.

- **Blockchain Proof API**
  A high-level API to prove, or disprove, the existence of any digital content at a certain point in time.

- **Easy Blockchain API**
  Provides a blockchain agnostic solution to create and use interlinking Blockchain data structures.

- **Crypto Keys API**
  To create, import, and manage Secrets, Keys and Certificates. The API includes integration with MS Azure KeyVault.

*Online Developer Documentation on all our Blockchain APIs can be found on the Sphereon.com website* 🔗

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# About Sphereon

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Sphereon is an innovative software company, often ahead of the curve, based in The Netherlands, with a mission to make Sphereon the gateway between today's Business IT systems and Blockchain.

*We are here to help you quickly build powerful and flexible solutions that enable your current business systems to integrate with Blockchain.*

**Change is not a constant, change is exponential**
We live in a time of exponential growth of technology as described by Moravec, Vinge, Kurzweil and others.

In order for us all to survive and thrive, we need to embracing co-creation and cooperation in order to become capable of rapid response to change: to unexpected challenges, events, and opportunities.

Our success is a result of the solutions that we build together with you, our customers.

We provide the software platform and you have the knowledge and experience in your market domains.

**We need to create real partnerships**
We all need to participate in ecosystems of networked vendors, partners, contract workers, as well as customers, that work together in order to thrive in today's fast-moving, hyper-connected world.
We need to work together and co-create new products, services and business models faster and smarter.

Sphereon is actively looking for such partnerships to co-create solutions for tomorrow today.

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