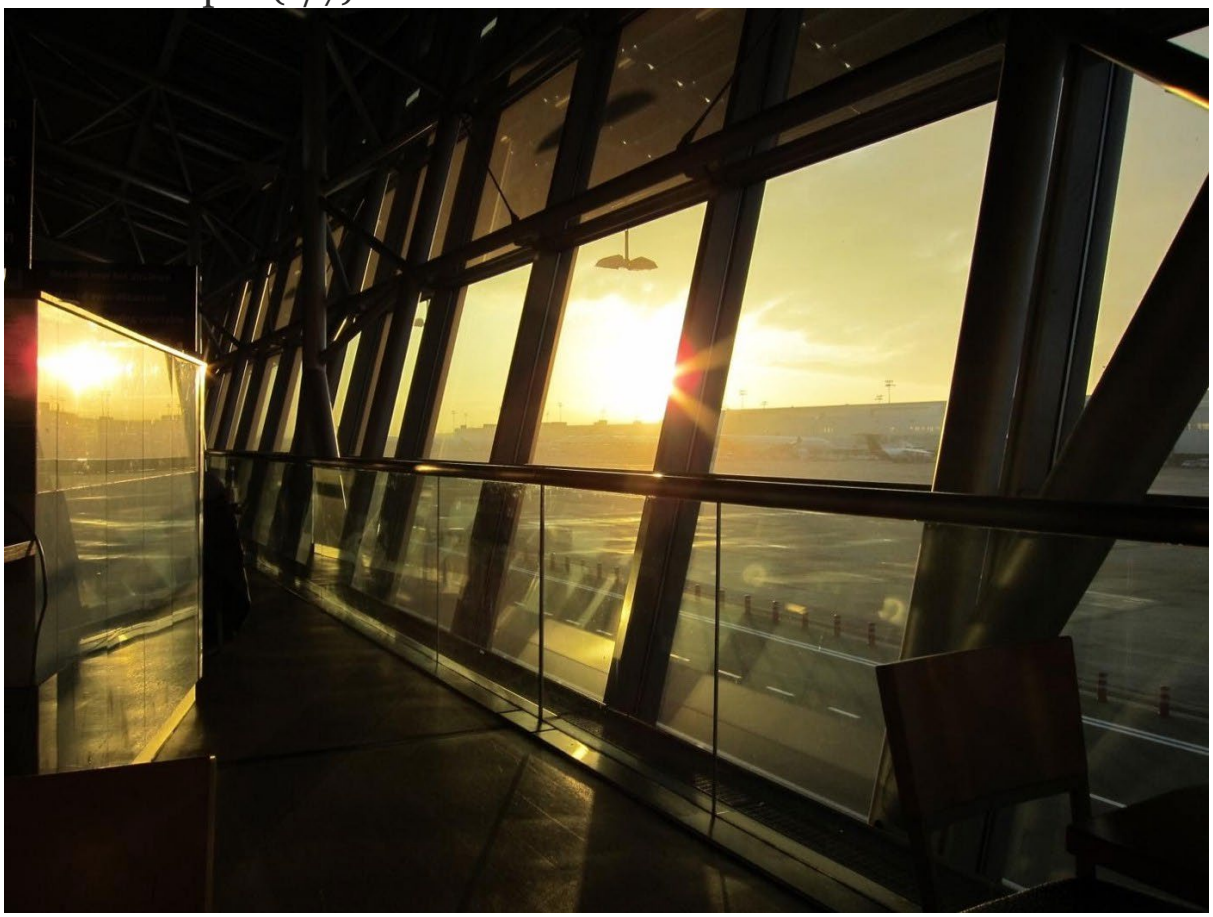
The Future of Digital Signing

Position Paper (1/7)



Preface

This position paper is the first part out of 7 that seeks to explore the current state of digital signing from the user perspective, with the intention to accurately identify major influence anchors, finally leading to a hope for greater clarity on how we imagine a future where everyone can embrace these acts of signing in their daily digital interactions, both physically as well as virtually. While having a deeper technical appreciation capability certainly helps in forming

an architectural understanding, it is not absolutely necessary as my focus is to approach chiefly from a humanistic point of view. Individual topics should be looked upon independently, then combinatively, in order to give us a glimpse of a plausible future.

Background

History of Signing

Before the act of signing officially took its place as a transactionary bond, we have been used to making verbal promises as a precursor towards having follow-on commitments take place through barter trade. It generally involved targets in the transaction, followed by a promise, and sealed with expectations have been clearly laid out for execution actions for all parties, to be completed according to satisfaction. Whether we are dealing with livestock barter trade in the olden days, or contractual promises of the modern world, the elements of having a promise securing follow-up actions for certain defined objects have always remained the same. A signature represents the manifestation of a binding promise between one or more parties with an implied further expectation: be it an action, expectation or commitment.

The Promissory Dilemma

Since the elements guarding transactions do not vary much in substance over time, why then do promises still not reach their intended level of utility, thereby necessitating the need for written

contracts? Information dissymmetry coupled with innate human intentions to escape from perceived negative outcomes serve to cast doubt on the entire agreement. Lack of sufficiency in what goes into a promise might also lead to parties wanting to constantly revisit a supposedly confirmed agreement.

Putting ourselves in the position of a party who might be able to benefit more from the original agreement by casting doubt or the way it is interpreted certainly reveals more loopholes in the original construct of how the agreement came about. At the core of such decision making processes is often a weighing of incentives for various scenarios. If a party perceives that they do not have as big an incentive as originally intended to continue honoring the agreement, versus intentionally injecting variables to cast doubt, obfuscate or even entirely back out of an agreement in order to get a better upside, then their next steps will not come as a surprise. This is due to the fundamental lack of a common security bond, often times loosely interpreted as “skin in the game”. How then can we have the future of digital signing not just embrace but also be cognizant of these factors in the drafting of an agreement? I originally believed that we could engineer mechanisms which hold parties accountable in a neutral verifiable construct, coupled with pre-agreed expectations codified into explicit actions, and further securing them with bonds will greatly reduce the likelihood of default. However, therein still lies an inherent simple conflict because as long as the party considering breaking an agreement perceives that their eventual benefit outweighs what they are currently sacrificing, they will still break an agreement. Humans are dynamic beings and elements of the prisoner’s dilemma being surfacing.

The solution there-in might lie in going against common expectations of penalizing those who break agreements, but instead reward those who carry out their end of agreements. This has profound impact on behavioral as well as societal interactions.

Signing is Inherently Decentralized by nature

As we consider what are the various factors which constitute requirements for better agreements to take place, an important element is that the act of entering into a promise/agreement, or as we have now better defined leading towards the definition of signing, is that the entire process of signing is inherently decentralized by design. Parties come together of their own will based on an offer being made that is being accepted for an expected consideration. At this stage, these parties generally do not require another party to be involved in officiating the agreement. Rather, many transactions in fact come with a certain level of privacy that do not want the involvement of other parties who are not privy to the agreement.

Why then do we still gravitate towards having third parties involved in some agreements? Reasons provided for justification of such involvement often include that of requiring a neutral party, conflict resolution, agreement validation, document authenticity, and many other regulatory requirements. We therefore need to carefully balance out the practical requirements of signing with one of more parties in a public setting over whether the importance of validation exceeds that of continued contractual non-repudiation.

Can we find a neutral third party to act as an anchor of trust?

Signatures are meant to confirm acceptance of promises by the relevant parties involved, and carry a certain implied official representation. These could be authority, approval, and implied promise(s).

Democratization of Digital Signing

As we consider how technology has evolved over recent years, it is clear that electronic signatures have been replaced with significantly more secure acts of digital signatures, which in themselves represent technological advancements to safeguard the entire signing process. Instead of simply affixing an electronic image of a signature, we are now able to insert cryptographically generated unique signature hashes of all parties into documents, in addition to implementing further security mechanisms to prove non-repudiation, provenance, immutability and even generate verifiable credentials.

Despite all of these features being readily available, users have not truly embraced technology as part of their daily lives on a massive scale. We attribute these barriers of adoption to a lack of clear understanding towards what the act of digital signing entails, privacy concerns, security challenges in deploying practicable applications, and usage perception.

The Problem with Existing Documents

Documents today are inherently *static* and do not represent any form of follow-up actions, expressive at best, contrary to what contracts/agreements are supposed to do. The missing link in terms of actionable follow-on transactions can likely be solved using smart contracts, but do not thoroughly address the considerations leading up towards breaking of agreements or provide any mitigating factors.

Parties will benefit immensely from the ability to make sense of the context within documents in order to derive value from within the lines. A numerical figure represented on an invoice document could mean far ranging options such as an amount owing from one party to another, to a promise to purchase at a certain amount, or even the price of a particular unit of good/service — it all depends on the context. By building a layer of intelligence on top of documents which understands what various fields mean, we are in fact unlocking so much more value firstly from understanding, all the way to joining context across documents.

Documents as Anchors of Value

Devaluation of Documents happens when we are unable to effectively interpret the intrinsic intentions to which the document contents were originally created upon. While content is key, there is immense value in understanding content as well as context within documents. However, this can only happen when the base level data elements as well as their context are accurately captured at the point of conception, such that follow-on actions can make sense of these rich data elements.

Documents are also used as effective Anchors of Value in order to lend claim or ownership over a real world asset. However, this should not simply be restricted towards physical assets but increasingly so even virtual, digital as well as assets which can be managed within the metaverse — all governed by documents.

Uniquely Portable

Your valuables are unique and should always be portable to be stored securely. However, doing so also opens up to duplication, piracy, and even elements related to the "double spending problem". Likewise, your contracts/agreements are in fact the very gateway towards the starting points around recognizing asset ownership, or value transfer/execution. They should therefore also be as unique as the assets which they govern, yet transferrable such as in the case of a title deed.

By having a unique representation of an original document that is portable, we are able to attribute an anchor towards a real world or virtual world ownership.

Selective Participation

Document owners should always be in control of the data contained therein, with the ability to extract out rich data from within to be used selectively across various use case application aspects. It goes beyond simply redacting information on an existing document, but rather extracting out important aspects (what we know today as

independently verifiable proofs) which can be used without divulging the entire document.

The Future of Promises

Stand the test of time — they should be immutably mapped towards a particular period in time past. It does not mean that as time passes and memories fade, that a promise should likewise not hold any less ground than it was before, nor should its value degrade over time. While it is possible that some assets might "not be worth the paper it is printed on" this could take the form of digital paper which are uniquely portable as mentioned before.

Record of Trust

Incentivizing parties who do not break agreements can be upheld, while concurrently proving a recurring pattern of broken promises for certain parties.

This ensures that we are neutral when interpreting records of credibility for any party attempting to enter into a new agreement, but with privacy preserving features. In a fully decentralized landscape, we need common base identifiers to anchor decision making considerations upon such that these input factors are unbiased, verifiable, measurable and impartial.

The "token of appreciation" is well known as a gesture of goodwill given by one party to another which has traditionally represented

physical gifts. Why did they not just verbally articulate or demonstrate out in public their associated gratitude? That's because we are programed to associate the tangibles with ready value, that is why it may not be "good enough" to simply say but practically demonstrate by having a visualization of that token (or promise in our case), which then becomes measurable and quantifiable, therein displaying itself. We often put our trust in the things that are seen, yet implicitly devalue the things which are unseen. This presents a situation which could potentially blindside an individual by using factors which could sway reactions.

Can one *feel* a promise being carried out? Not necessarily. But we can more readily measure the breath and length (or even scope) of that promise based on the associated action(s) carried out. Humans therefore lend value to these actions and tie them to the originating promise. Would you attribute more blame to a person for trying their best yet eventually failing, or the individual who did nothing to attempt to salvage a situation?

Being able to measure and account for the multitude of promises that we make as well as the associated follow-up actions leads towards cognitively recognizing "trustworthiness" in a certain form because we want to (perhaps desperately?) rush towards making conclusions in the way that has an established anchor within accepted norms. Conclusion: **trust takes time to prove and is subjective**.

What's Next

In the next part, I will introduce the concept of **Non-Fungible Documents** as a readily available option to govern ownership of documents that themselves are gatekeepers of value. We will then attempt to summarize the salient points made in this post and identify a recommended model towards ensuring a more equitable construct for approaching digital agreements.

I sincerely acknowledge and thank the following individuals for their selfless contributions in assisting me with fact and reality checking my thoughts which culminated in the very first of this 7 part series.

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