Next generation agreements for everyone on the Ethereum Blockchain
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Abstract

Contract Vault is a Blockchain-powered platform that enables anyone to develop, use, resell, customise and repurpose legal agreements, Smart Contracts as well as entirely new categories of agreements without legal or technical knowledge on the Ethereum Blockchain.

Contract Vault bridges the gulf between legal contracts and Smart Contracts enabling the tokenisation and transfer of physical assets and rights on the Blockchain opening a whole new world of possibilities for the usage and adoption of Smart Contracts.

Contract Vault aims to build a vibrant ecosystem for individuals, businesses, legal professionals and Blockchain developers centred around an open marketplace.

Contract Vault is the new world of trust.

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Introducing Contract Vault

Every crypto-enthusiast knows that Blockchain technology creates contractual trust. It is a meaningful record of truth. That is why there are plenty of other startups already promising to improve contracts by using Blockchain.

However, we are thinking bigger. Contract Vault is a Blockchain-powered platform on which anyone can develop, use, resell, customise and repurpose legally sound contracts. We are working with world-class legal partners to make creating contracts something that anyone can do, and as simple as drag-and-drop.

That includes next generation Ricardian Contracts – contracts which marry natural language contracts with Smart Contracts and thus making them legally-enforceable.

Smart Contracts, implemented correctly, have the potential to facilitate agreements in thousands of existing and new contexts. Simply put, it is possible to modernise trade entirely, reducing the reliance on intermediaries, optimising digital processes, lowering transaction costs and enabling tamper-proof transactions. By making Smart Contracts legally-enforceable so that they have legal consequences in the “real world”, it is possible to make the transfer of arbitrary physical property, assets or rights entirely decentralised, secure and legally compliant.

Until now, Smart Contracts have come with significant risk – because like any powerful tool, without the right protections, they can go dramatically wrong. The Contract Vault platform includes independent, impartial verification of Smart Contracts, plenty of off-the-shelf functionality, and legal resources on tap if needed.

With Contract Vault, people with no legal or programming knowledge will be able to design and execute legally enforceable and highly functional contracts for any purpose.

Think of it as “confidence as a service” – empowering everyone from lawyers and businesses to ordinary people like you and me to make secure, binding agreements. From trading shares or selling Fine Art to unlocking micropayments in third world countries, Contract Vault is creating a new world of trust – and that makes our work a global opportunity.
Why?

Well, we are not trying to replace the law. Instead, we think Blockchain and Smart Contracts will massively expand the law. We are creating new opportunities for agreements to be verified, witnessed, questioned and arbitrated; bringing fairness and trust to millions of new transactions.

Let’s look at a similar example from 20 years ago. Before the internet and eBay, auctions were complex. It was only worth auctioning items of significant value because the logistics and risk all meant that the cost of participating was incredibly high. Enter eBay, and suddenly everyone could sell at auction - plus the audience for goods became global. eBay simply made auctions accessible to everyone.

Contract Vault envisions a similar scale of opportunity: until now, contracts have been complicated and only worthwhile for significant agreements. However, with the automation promised by Smart Contracts, the versatility provided by Ricardian Contracts and the scalability of the internet, simple agreements and their fulfilment will be available to more people in more contexts than ever before. Moreover, with a level of trust and certainty that was previously difficult for ordinary people and small businesses to achieve.

Just like eBay, Contract Vault is going to power entirely new transactions and applications, everything from lending money to friends, to more life-changing work. We are already partnered with companies that intend to leverage our platform’s SmartTemplates to create new and exciting applications: companies such as Arkadia Lending, who are building a platform that offers financing for new business projects in developing countries; or Eternitas who are developing Blockchain-based solutions for estate planning.

The Contract Vault opportunity is:
- Global: changing the world of trade and legal agreements forever
- Positive: creating trust for everyone
- Honest: supporting consumers and businesses and the existing legal systems they rely on
- Complete: our next generation Smart Contracts are fully legally enforceable
- Open to all: Everyone can create contracts in a flash
Background

The legal enforceability of Smart Contracts
The legal classification of Smart Contracts

Smart Contracts offer the possibility of using code on a Blockchain for the automated and algorithmic enforcement of predefined contract terms. However, contrary to the widespread view in the field of computer science, this code cannot yet replace law (code is not law). Smart Contracts do not meet the requirements for legal contracts and are as such not legally recognised in most jurisdictions.

To ensure that Smart Contracts are legally recognisable and enforceable it is imperative that the circumstances which led to the use of Smart Contracts and the functionality of the utilised Smart Contracts are fully understood and accepted by all the contractual partners.

For the above reasons, Contract Vault is of the opinion that purely technical applications of Smart Contracts which ignore these requirements and conditions, consequently neglecting fundamental contractual rights, are not sufficient.

Instead, Contract Vault employs a construct which is both machine-readable (thus conforming to the requirements of a Smart Contract) and human-readable thus allowing it to be read, understood and shared with outside parties.

This construct (simplified here) is known as a Ricardian Contract, the theory of which has existed for over 20 years.

Contracts which require formalities

In addition to contracts (which do not require formalities) many legal systems utilise contracts for which specific formalities are required. In Switzerland, a will must be handwritten, and a surety must be in writing and notarised. Marriage contracts and land purchases are also not legally valid without being notarised and a “digital notary” does not yet exist. Although Blockchain technology and Smart Contracts are ideally suited for such contracts, even utilising the Ricardian Contract approach, such contracts would still not have a legal effect in most jurisdictions.

However, this does not mean one should not strive to create the technical requirements for the use of Smart Contracts and Ricardian Contracts for these use cases. Several countries, for example: Estonia, Sweden and Switzerland, are very open to the use of Blockchain technology. It is much easier to persuade the legislature that change is necessary when the systems are already in place and the corresponding products work as intended, simplify processes, increase legal certainty and improve efficiency.

Contract Vault, therefore, strives to provide solutions even for these contractual agreements, in some cases employing workarounds to make them possible today.

Contract Vault is convinced that Blockchain-based solutions for land-registers, commercial registers as well as for corporate law in general, will become accepted faster in emerging markets as there are fewer established processes and the need for optimisation is much more significant.

Summary

Smart Contracts are only as good as the legal documents which accompany them. Without them, it is impossible for an outsider or a court to ascertain between whom and why a particular transaction took place. For contracts which do not require formalities, Ricardian Contracts represent the ideal construct for optimising and automating these contractual relationships and processes.

Using Ricardian Contracts for use cases that require formalities will require amendments to current laws in some jurisdictions. Lawmakers will only begin to take notice when pioneers active in this area present plausible solutions which provide added value.

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1 Rolf H. Weber, Blockchain as a legal challenge (German) in: Jusletter IT 18th May 2017, P. 8 ff.
2 http://iang.org/papers/ricardian_contract.html
As we have already noted, the advent of Smart Contracts will not lead to traditional agreements or services becoming less relevant, and as such it is our goal to be “contract-agnostic”. Our platform dispenses with the boundary between legal and smart agreements and not only provides tools that revolutionise how Smart Contracts and Ricardian Contracts are built, but also aims to improve conventional legal processes and agreements as they exist today.

Overview

The Contract Vault platform combines a multitude of tools and services to make the creation, distribution and execution of traditional and next-generation smart legal agreements simple.

The above figure provides a high-level overview of the relationship between content providers, users, templates and contracts which will be described in greater detail in the subsequent chapters. The Contract Vault platform currently uses the Ethereum Blockchain for Smart Contracts and Ricardian Contracts. However, as we have already created a layer of abstraction between our markup language SmartML and Solidity code, it is feasible to support additional Smart Contract platforms at some point in the future.
SmartTemplates

Contract Vault’s SmartTemplates are one of the cornerstones of our platform. While other platforms merely offer solutions for creating or using traditional or Smart Contracts, our SmartTemplates go a step further. SmartTemplates are reusable documents that can consist of a mix of legal prose and Smart Contract code; they can include variables, metadata, conditionals, calculations, Smart Contract logic, signatures, identity and Subtemplates. Using these templates, anyone can create various types of contracts without legal or technical knowledge just by completing easy-to-use forms. The Boston Consulting Group suggests that legal-technology solutions could perform as much as 30–50 percent of tasks carried out by junior lawyers today.\(^3\)

Based on the contents of these templates and the parameters provided by the contractual parties or by connected applications, the Contract Vault Platform can generate several different types of end-products:

- Legal agreements, which can then be used offline in the usual manner
- Legal agreements, which can be saved securely on decentralised storage and made tamper-proof using signed Blockchain transactions
- SmartForms and SmartDossiers, which empower legal professionals by enabling them to communicate and collaborate with their clients more efficiently
- Customised Smart Contracts, such as Ethereum Smart Contracts
- Legally-enforceable Smart Contracts in the form of Ricardian Contracts

Anyone can use our SmartEdit tool or SmartML language to create SmartTemplates easily. Typically legal or technical professionals, such as our content creation partners, will utilise these tools either to create templates for their clients, platform integrations or to provide end users with a wide variety of templates in the Contract Vault marketplace.

A significant amount of legal prose and Smart Contract code in legal agreements and Smart Contracts is reusable, which leads to some of the inefficiencies that have already been discussed. In these cases, our Subtemplates excel. Subtemplates offer all the same features of our templates, such as variables and conditionals and any number of them can be embedded in a SmartTemplate. This modularity and flexibility ensures that one template can later be used to create a multitude of customised contracts and that specific recurring sections or methods of legal and Smart Contracts only ever have to be written once. Templates and Subtemplates also contain metadata such as their language, applicable jurisdiction(s) and type to ensure that only valid Subtemplates can be embedded.

\(^3\)The Boston Consulting Group: How Legal Technology Will Change the Business of Law - Page 3
SmartEdit
Until now, lawyers and engineers have lacked the tools to build templates that can be used as traditional legal agreements, Smart Contracts or dynamic, smart agreements. In fact, in the case of the legal sector, there is a dearth of proper tooling for efficient document creation and commercialisation.

However, Contract Vault is a platform for everyone, not just lawyers and developers, so we need a way to create SmartTemplates that is both simple to use for the average user while also offering legal and technical professionals the features they need to enable them to create more complex templates. To solve this issue, we are developing the Contract Vault Editor ‘SmartEdit’ and its underlying template markup language ‘SmartML’.

SmartTemplates rely on our markup language SmartML, and while it is possible to use the markup language directly, it is not always feasible for non-technical users to do so. Expecting legal professionals to learn a complicated markup language is where other products fall short. SmartEdit allows users to access all the features of our templating system comfortably while still allowing power users to access the markup language if need be. It enables anyone to create templates for standard legal agreements, dynamic “smart” legal agreements, and even Ricardian Contracts in an environment that resembles a typical and familiar word processing application and which focuses on reusability and efficiency.

SmartML and SmartEdit usage
SmartML is the markup language used to build SmartTemplates on the Contract Vault platform. It is a human and machine-readable format that enables the generation of anything from standard PDF legal agreements to powerful Ricardian Contracts.

We intend to fully open source the SmartML language and hope that with the help of our partners and other stakeholders it will become the defacto standard for legal templates.

As with any language, SmartML is continuously evolving. However, we want to provide a short overview of the main features and how they are used in conjunction with SmartEdit here. Please note that this is subject to change.

Importing
Contract Vault is about making processes more efficient, and SmartEdit makes it simple to import existing content. For example, Contracts created in Microsoft Word or Ethereum Smart Contracts written in Solidity can be uploaded and imported or copy & pasted directly into the editor.

Once imported, the content can be made customisable and dynamic by adding any of SmartML’s elements, thus creating a reusable SmartTemplate or Subtemplate which can then be sold in the Contract Vault marketplace, drafted or used in other SmartTemplates.
Metadata

Every SmartTemplate and Subtemplate contains metadata which, amongst other things, determine how it can be used on the Contract Vault platform and marketplace as well as crucial information such as the jurisdiction the template applies to, as well as parameters such as the type of contract, price and audit status.

Subtemplates

Subtemplates are SmartTemplates that can be embedded into other SmartTemplates. They provide the same functionality and flexibility and are an excellent way to reuse repetitive legal prose (contractual clauses) or Smart Contract code. In combination with variables and conditions, Subtemplates ensure that specific parts of a contract only ever have to be written once.

Imagine a template for a loan agreement. With the help of Subtemplates and conditions, it is trivial to create a SmartTemplate that can generate different types of loan agreements depending on whatever the contractual parties choose. This single template could be used to generate either a standard loan agreement which states that the loan shall be repaid in fiat money, or a “smart” legal agreement that consists of the necessary Smart Contract code and legal prose specifying that the loan shall be repaid in Ether.

A more simplistic example is a SmartTemplate that needs to adapt depending on whether one of the contractual parties is a natural or legal person. These features are easily accessible in SmartEdit and require only a couple of mouse clicks to achieve.

Styling

While styling and formatting may not be relevant when using the platform to build customisable Smart Contracts, it is vital for law firms who use our platform to generate CI conform contracts for their clients. SmartML supports all the formatting options expected from a modern WYSIWYG editor. While, technically speaking, not a feature of SmartML, the Contract Vault platform allows customers to define custom stylesheets that are used when generating traditional Word or PDF contracts.
Variables

Variables are central to any templating language, and SmartML supports a wide variety of variables. In addition to primitive types of variables such as text and various types of numbers (integer, percentage, financial, written form) it also offers complex types such as address, Ethereum address, single-select and multi-select option fields, date and datetime.

Variables can be given names and explanatory texts which help contractual parties understand what kind of input is expected. Similarly, variables can be configured with boundaries and limits which allow the template creator to restrict the input values allowed in draft mode.

To make it apparent that specific variables are related they can be added to a named logical group which will create a grouping in drafting mode.

Calculations

SmartML supports all standard arithmetic operators. These operators can be applied to one or many variables to produce a new calculate output variable. For example, in a SAFT agreement, the input variable could be the amount of money a participant is willing to invest, and the corresponding calculated output variable would be the number of tokens promised to the investor (“amount of money” multiplied by “the token exchange rate” = “the number of tokens promised”). To further expand on this example, conditions could be used to the token exchange rate could vary depending on the date the contract is signed.

Conditions

Conditions enable the usage of advanced logic in templates such as the inclusion of a specific Subtemplate, variable or calculation depending on a user’s answer to questions in the contract draft mode. Using conditions, the template creator can create simple “yes” or “no” questions or more complicated custom questions such as a choice between currencies, eg. Ether, Fiat or an altcoin. Based on the answer a party provides in draft mode the correct variable, e.g. an amount denominated in Swiss Francs or the correct Subtemplate, e.g. a Smart Contract for payment in Ether is automatically included and the correct type of contract, in this case, either a legal agreement or a Ricardian contract is generated.

SmartML also supports nested conditions which allow the template author to create complex decision trees which enable conditions to depend on the answer to a previous question.
Identity
Signatures are essential not only for legal agreements but also for legally-enforceable Smart Contracts and Ricardian Contracts. The Contract Vault platform supports the signing of contracts with Blockchain transactions, as well as with qualified digital signatures.

In SmartEdit the template creator can effortlessly choose the type of signature/identity needed depending on the legal requirements of the contract.

Smart Contracts
While it is, of course, possible to develop standard Ethereum Smart Contracts entirely independently of the Contract Vault platform and then use Smart Contract Calls in SmartML to call and execute them, it is highly advantageous to use SmartEdit’s Smart Contract mode to write customisable Smart Contracts. SmartEdit comes with a second mode which enables the user to add the same features to Smart Contract Templates that can be added to legal agreements such as variables and conditions.

Smart Contract Mode contains the features developers expect, including syntax highlighting and error-checking even when creating customisable Smart Contract templates. These features are made possible by replacing the customisable parts of the template with valid values on the fly. SmartEdit can also be used to create standard Smart Contracts without any customisable parts, which are entirely optional. The benefit, however, to using SmartEdit for their creation, in this case, is that it makes the process of including calls to the Smart Contract in other templates much more streamlined.

Smart Contract Templates built with SmartEdit can be sold in the Contract Vault marketplace just like any other SmartTemplate.

Smart Contract Calls
To make a legal agreement “smart”, SmartML allows the template author to embed Smart Contract Calls in any SmartTemplate. Unlike other platforms, it is possible to call functions of Smart Contracts that:
1. are already running on the Ethereum Blockchain
2. have not yet been deployed to the Ethereum Blockchain.

The second option is only available if SmartEdit was used to build the Smart Contract and the Smart Contract was deployed using the Contract Vault platform. Regardless of which option the template author chooses, embedding a Smart Contract Call is as simple as specifying the Smart Contract address and describing the function’s interface in SmartML. In the case of Smart Contracts built with SmartEdit, the system can add this information automatically.

Smart Contract Calls can also be used to interact with Oracles allowing communication with off-chain systems and external data, which in turn can then trigger Smart Contract functions. Oracles play a crucial role in more complex transactions such as the transfer of physical assets or rights using Ricardian Contracts.

SmartDossiers
In the real world, it is frequently the case that contractual relationships are defined by more than one contract. To this end, multiple SmartTemplates can be linked to create a SmartDossier. In contract draft mode the system ensures that shared variables only have to be inputted once.
Drafting

SmartTemplates are abstract representations of contracts. To generate real contracts (regardless of their type) from these templates the Contract Vault platform features a robust draft mode. In draft mode, the contract is displayed as a simple SmartForm which provides guidance and helpful information, such as the name, limits and boundaries and explanatory text of a variable. These features make it easy for anyone to draft a contract from a SmartTemplate, regardless of if the user created the template or bought it from the Contract Vault marketplace. The draft process is collaborative; if, for example, one user drafts a contract and sends it to another user, the sender can allow the recipient of the contract draft to make changes or comments which the sender will then see. This collaborative approach removes the need to send contracts back and forth using email or other inefficient methods.

It is overly optimistic to assume that every contractual party will also be a Contract Vault user, especially considering the many clients a law firm may have. Therefore, it is also possible to send contract draft SmartForms to users without Contract Vault accounts, who can then input data and sign the contract smoothly and efficiently.

An excellent illustration of this are notaries dealing with company incorporations. The notary only has to prepare the SmartTemplates once, using variables and conditions to model the various permutations of the contracts; bundle the templates into a SmartDossier; and then send a standalone link to the dossier to their clients with just a few clicks.

Another example is a service provider that builds Token Smart Contracts for companies holding ICOs. By using SmartTemplates to create customisable Smart Contracts, the company can then choose to either:

- use draft mode solely internally, only providing the finished Smart Contract end-product to their clients.
- use the collaborative features of draft mode and SmartForms to allow their clients to input the type and details of the token contract.
- sell the SmartTemplates in the marketplace for anyone to use.

The Contract Vault API provides a method for our customers to instantiate and customise SmartTemplates without using contract draft mode.
Contract Management

A significant advantage of digital contracts such as Smart Contracts or Ricardian Contracts is that it is possible to monitor events and transactions as they happen. The Contract Vault platform offers an extensive monitoring and notification system that will inform users when any of their deployed contracts triggers an event.

An event can be as simple as a notification that a counterparty has signed a contract draft or something more critical, such as a notification that a payment is overdue or that an item was not shipped on time. The user could then, for example, choose to open a dispute using arbitration or to inform an escrow agent, which could also be a Smart Contract, to return his funds.

The Vault wallet

All operations on the Contract Vault platform are powered by VLT (Vault) tokens: users can, for example, use VLT to pay for SmartTemplates and services and can earn VLT by providing services or otherwise contributing to the Contract Vault ecosystem. For a detailed overview of all the intended usages of VLT, please refer to the Token Classification document which can be found in the documents section of the Contract Vault website.

Every Contract Vault user has a Vault wallet that holds all VLT for use on the platform and receives any VLT earned on the platform. Users cannot use VLT directly from external wallets; they must first transfer the tokens into their Vault wallet from any ERC-20 compatible wallet, such as MetaMask, Mist or MyEtherWallet. Alternatively, users can purchase VLT directly on the platform using Fiat currencies and conventional payment methods.

Ricardian Contracts

To use Smart Contracts for the transfer of physical assets, services or rights in the material world, they must be tied to natural language contracts. Ricardian Contracts are one construct that can be used to achieve this. Ricardian Contracts have several defining characteristics\(^4\), the most important of which are:

- they are human-readable
- they are machine-readable (parsable)
- they are a self-contained single source of truth, which means they contain all pertinent information in one single document, including signatures and the contractual parties
- they represent a legal contract

\(^4\) [http://webfunds.org/guide/ricardian.html#requirements](http://webfunds.org/guide/ricardian.html#requirements)
Contract Vault handles these requirements automatically. To create a SmartTemplate capable of generating a Ricardian Contract the template must include legal prose, at least one Smart Contract Call to a Smart Contract built using SmartEdit, the signature parameter, and can also optionally include the arbitration parameter.

After the contract has been drafted, the platform:
- generates and deploys the Smart Contract which includes additional storage for the cryptographic reference and digital fingerprint of the Ricardian Contract
- references the contract address of the deployed Smart Contract in the final draft of the Ricardian Contract
- waits for the parties to accept and sign the Ricardian Contract after which it finds its digital fingerprint
- stores the Ricardian Contract on decentralised storage
- sends a transaction containing the address and digital fingerprint of the Ricardian Contract into the storage of the deployed Smart Contract

Storage
A common misconception regarding Blockchain technologies is that it is cheap to store large amounts of data on the Blockchain. At the time of writing this document, it could cost up to US$ 5000 to store 1MB of data on the Ethereum Blockchain.

To make Smart Contracts legally-enforceable we have already established that it is necessary to link the legal contract with the Smart Contract and vice-versa using cryptographic references. After deploying a Smart Contract, we, of course, have its permanent address. To achieve the same for the legal part of the contract, we use decentralised storage providers such as IPFS, with plans to also support Ethereum Swarm when it is released. For customers with private instances, we will also offer the option of providing an alternative storage provider.

Arbitration
The Contract Vault platform intends to offer independent and decentralised dispute resolution in the form of arbitration, which is a crucial component in ensuring the efficiency and legal-enforceability of Ricardian Contracts. Qualified users can apply to become arbitrators on the Contract Vault platform, and after being approved, they can offer their arbitration services in the marketplace. The contractual parties nominate one or multiple arbitrators while drafting a SmartTemplate with its type set to “Ricardian Contract”.

In the event of a dispute, depending on the terms stated in the agreement, the arbitrator is either the first instance, giving the parties the option to appeal using the ordinary legal system or the sole and final authority.

API
Early on during the conceptual phase of Contract Vault while we were in talks with businesses ranging from startups to large insurance companies, it quickly became apparent that these businesses had exciting ideas for Blockchain applications but were also lacking the resources or know-how to create them.

Contract Vault offers an extensive API that in conjunction with our marketplace can be leveraged to augment existing applications with Smart Contract technology or to create entirely new applications without requiring a large number of experienced programmers or having to pay a hefty sum for the development of the Smart Contracts.

With our API, applications can connect to our platform to generate, draft, sign, deploy and monitor contracts as well as being able to automate most of the other features the platform provides. The most straightforward use case would be for a user or company to purchase a SmartTemplate from the marketplace and then use the API to generate and deploy legal or Smart Contracts for their application.

To better demonstrate the wide-range of use cases that the API makes possible we have listed a number of projects that are building on the Contract Vault API in the Applications section of this document.

White label and private instances
Law firms and other customers can use Contract Vault as a white label product or private instance. Private instances are useful for limiting the marketplace to only the content the law firm created. Furthermore, it enables the firm to use a completely different pricing strategy for their templates in their private client-only marketplace, compared to the publicly accessible marketplace.

Private instances can be run on custom domains and with custom styling which allows the firm to use their corporate identity.
Marketplace

The marketplace is a core part of the Contract Vault vision to provide anyone with easy access to contract templates, whether it is templates for employment agreements under Swiss or Chinese law, Smart Contracts for supply management, Ricardian Contracts for the selling of fine art, or services provided by legal and Blockchain professionals.

Any marketplace is only as useful as the content it holds, or as Bill Gates put it in his 1996 essay: “Content is King”. Contract Vault is first and foremost a technology company and not a content provider. Our job is to provide a platform and toolchain that enables and incentivises content providers to use it. To this end, we are working closely with both legal and technical partners who are committed to providing their services in the marketplace as well as seeding the marketplace with an initial set of SmartTemplates and Subtemplates. These content providers will be provided with an early Beta version of the platform to ensure that they can start the content creation process as early as possible. Furthermore, we intend to incentivise content creation for all jurisdictions and actively recruit service providers both before and after the public launch of the Contract Vault platform.
Pricing
All of the content and services in the marketplace are only purchasable with the VLT token. Because cryptocurrencies can be somewhat volatile, all base prices are set in fiat currencies. The end price in VLT is then dynamically calculated by the platform.

SmartTemplates
Once a user has created a SmartTemplate, they can choose to publish it in the publicly available marketplace for anyone to use and/or in their private instance marketplace where it can only be accessed by their clients. The SmartTemplate’s metadata, such as applicable jurisdictions, language, price and notes help the system classify the SmartTemplate and help with its discoverability.

All SmartTemplates, regardless of their type are protected as copyrighted works and are licensed to the users that wish to use them. To deter the unauthorised copying and reselling of SmartTemplates the underlying SmartML code is not visible to the buyer. Authors can have their templates legally reviewed and technically audited. Reviewed templates will be flagged as such in the marketplace to provide consumers with confidence in the quality and security of the template. Additionally, the marketplace has a rating system, which incentivises users to rate a template after purchasing.

The pricing options for SmartTemplates is the key to the adoption rate of the platform and are therefore subject to change. Currently, we intend to allow the template author to set a price which includes an unlimited amount of contract drafts (i.e. each time a user generates a contract from the SmartTemplate) as well as a separate price for one-time contract generation (i.e. the user can only generate one contract from the SmartTemplate). We are also experimenting with a model that allows the author to set a price for an editable version of the SmartTemplate.

Services
In addition to the content in the form of SmartTemplates, service providers can also offer their services directly to consumers in the marketplace. Currently, we envision that services will include manual and automated technical audits, legal reviews, SmartTemplate creation services and arbitration.

Similar to the SmartTemplate rating system, users are incentivised to rate and review their experience after using a service or service provider.

SmartTemplate creation and review services
A further goal of the Contract Vault marketplace is to make it easy for consumers to access lawyers and programmers who can create custom SmartTemplates for legal agreements and Smart Contracts. This, in turn, creates an ecosystem where said service providers can offer their services directly to a large number of potential customers.

The platform allows users to directly contact and request an offer for the creation or review of a SmartTemplate from a service provider. The service provider can then create an offer in the form of an agreement, which the user can accept, negotiate or decline. This whole process was, of course, built using our SmartTemplates and SmartForms. Optionally the agreement can include provisions for the payment to be held in escrow until the terms of the agreement are met.

Security audits
With Smart Contracts and especially Ricardian Contracts being used to transfer valuable assets, security audits are vital to ensure that consumers can use these new technologies with confidence. Contract Vault is partnered with industry-leading Blockchain companies who will provide both manual and state-of-the-art automated auditing services in the marketplace. Contract Vault intends to continually add new auditing providers to encourage fair pricing.
Applications

There are no limits when it comes to the use cases of the Contract Vault platform. As already noted, agreements can be modelled as traditional contracts, Smart Contracts or a mixture of both. However, beyond that, the Contract Vault API and Platform-as-a-Service functionality enable the creation of complete Blockchain applications.

To further illustrate the benefits of our SmartTemplates and PaaS features and the vast range of potential usages we are listing some featured use cases and applications currently in development or being planned that use or leverage the Contract Vault platform.

SmartShares

SmartShares aims to solve the following problems with the help of Contract Vault’s Ricardian Contracts and identity services:

- Create markets for unlisted companies and manage the exchange of shares.
- Create liquidity for what is currently mostly an illiquid asset.
- Allow companies to manage their relationships with shareholders via Smart Contracts.
- Pay dividends seamlessly with Smart Contracts.

Stock markets are complicated and expensive, so non-listed entities have no way of accessing the liquid funds offered by an open market without the considerable expense of an IPO or at least the significant pain of listing on a subsidiary market like AIM. Costs are also high for those executing trades. By using Smart Contracts to tokenise non-listed company shares and Ricardian Contracts to make them tradeable, the cost of dealing can come down to a fraction of what even today’s online share platforms can offer.

Furthermore, with non-listed company shares digitised on the Blockchain, other aspects such as voting and dividend allocation, for example, can be done more efficiently. Also, shareholders can use their - now liquid - shares as securities to raise capital.

As a first step, interested companies need to evaluate and amend their statutes and shareholders agreements, enable the tokenisation of shares, and set rules for their transfer, if any. We are cooperating with notaries to ensure an efficient and cost-effective amendment. Once tokenised, the SmartShares replace the existing ones, and each company runs its own token Smart Contract which holds a list of shareholders and their token allocation. Making a trade is as simple as moving entitlements as with any Blockchain transaction: the ledger is decentralised, and the transaction is corroborated by agreement.

We are working on the processes (and they are processes, not digital tools) to ensure the identities of the parties in a trade can be established and connected to Ethereum addresses. Each exchange must also be digitally signed – synchronously – for a trade to take place, and those digital signatures also verified. Contract Vault is a leader in Ricardian Contracts; the Smart Contracts with the legal and functional qualities required to execute trades actively.

SmartShares is a joint venture with our technical and legal partners, we have already put significant work into the legal frameworks to make decentralised trading a reality. Our SmartShares product (a trading environment and support services for the development of trading oriented Smart Contracts) is already in development, building on the architecture provided by the Contract Vault Platform.
SmartICO

Working with our technical and legal partners, we are already building the key components of an off-the-shelf ICO architecture for multiple jurisdictions and regulatory environments, which will be available to mix-and-match according to needs, in the Contract Vault Marketplace.

ICO services usually include marketing, legal and tax, token advisory, technical development (website, Smart Contracts, landing page, dashboard) and regulatory compliance (KYC/AML/licenses).

SmartICO focuses on what we believe can be optimised and to a degree even automated: the legal framework, efficient token advisory, technical development and regulatory compliance. The goal is to enable compliant, fair and transparent ICOs at a low cost.

In today’s world, service providers try to underline the uniqueness of each ICO and claim that it requires a very focused, individual, manual approach. We do not share this view. In fact, the opposite is true. Most ICOs we reviewed are almost identical from a technical and legal perspective, and there is no reason to suggest a greenfield approach each time instead of reusing reviewed SmartTemplates and choosing effortlessly between customizable Smart Contracts.

The Contract Vault platform provides all the necessary features to provide a truly turnkey ICO service: SmartTemplates for the creation of customizable Smart Contracts and legal documents, identity solutions as well as legal services.
Will execution and donations

Smart Contracts have the potential to change estate management and inheritance planning forever. Individuals have so far had to rely on legal intermediaries and inefficient processes for estate planning. The French-German start-up Eternitas specializes in estate management and automated will execution via Smart Contracts. Eternitas intends to create immortal last wills on the Blockchain and an autonomous method for the distribution of assets to beneficiaries using Contract Vault’s powerful, customisable templates and its API.

1http://eternitas.io/
Smart Contracts and Publishing

Smart Contracts will redefine the relationship between publishing houses and authors. Advances, royalty payments and the sale of further rights (e.g. for translations and foreign territories) can all be managed within legally-enforceable Smart Contracts and triggered by clearly defined and measurable events. This will help publishers to automate their accountancy and legal processes which will cut costs, but perhaps more importantly allow their teams to concentrate on higher-value creative activities.

Equally, outside the traditional publishing business, authors will no longer have to rely on the centralised nature of the industry: self-publishing will be streamlined and available to all (including even real-time royalty payments), supporting completely new classes of e.g. corporate, on-demand and vanity publishing. Contract Vault is currently in talks with partners from the publishing sphere, and with startups working on applications in this field.

Smart Contracts and Market Lending

Arkadia is an international socially responsible peer-to-peer lending platform, forging a new paradigm in the rapidly growing peer-to-peer lending market. Arkadia intends to leverage novel data science techniques, machine learning, state of the art Blockchain technology such as Contract Vault’s SmartTemplates, and institutional partnerships to provide financially viable projects in emerging markets with a cheaper source of capital. Arkadia reduces the number of intermediaries and information asymmetries, allowing retail investors to achieve substantially higher returns than on the high street, all while helping build and develop emerging market economies.

Farmland investing

FarmTogether plans to democratise and radically streamline the complicated process of farmland investing. The Contract Vault platform makes the tokenisation and legally-enforceable decentralised transfer of physical assets and rights simple, which makes it a perfect fit for projects such as FarmTogether. By tokenising assets such as farmland, costs can be drastically reduced, making it a viable investment for everyone. FarmTogether and Contract Vault are in talks to make this vision a reality.

http://eternitas.io/
https://www.arkadialending.com/
https://farmtogether.com/
The Vault token sale

The Contract Vault economy is mainly based on the VLT token. The VLT token will be available starting from May 1, 2018. This whitepaper does not contain any information regarding the token sale. Please visit the document section\(^8\) of the Contract Vault website for further information and please note that the linked information is subject to change.

\(^8\)https://www.contractvault.io/token/#document-assets
Business model and tokenomics

The Contract Vault platform enables a variety of commercialisation approaches, some of which are elaborated on in this chapter. The examples presented here represent our current intentions based on the planned functionality of the platform. Therefore, the implementation of these or any other revenue streams is subject to change. Contract Vault aims to create a healthy token economy for the VLT token and as such actively promotes the usage of VLT on the platform.

Commercialisation of content and services offered on the platform

The Contract Vault marketplace offers service providers the opportunity to sell their content and services. A part of each sale will go to Contract Vault directly.

Prices for content and services on the marketplace are set in fiat currencies to avoid the volatility of cryptocurrencies and are displayed in the user’s national currency as well as in VLT. The price in VLT is calculated dynamically by the platform. Consumers can purchase or license content or services by either transferring VLT into their Vault wallet or by buying VLT tokens directly on the platform.

Platform usage by individuals and businesses

- A user purchases a service or a SmartTemplate in the marketplace and pays the required price in VLT. The service provider or content creator receives the corresponding payment in VLT minus a small commission that goes to Contract Vault.
- A user rates or reviews a service, SmartTemplate or a service provider and receives a small payment in VLT.
- Optionally a user can explicitly opt-in to share anonymised data with and receive special offers from service providers, such as insurance companies which can offer value-added services such as car insurance for example, after the user is party to a car purchase agreement. If the user takes advantage of the offer, he will receive part of the commission in VLT that Contract Vault receives from the service provider.

The traditional legal services market is worth US$700 Billion per year. The largest markets are the US (45%), UK (7%), Germany (4%) and France (3.5%). According to a survey by Deloitte, about 52% of in-house departments are considering buying legal services from “non-traditional law firms”. B2B legal services was the largest segment in 2016, which accounted for about 52% of the legal services market. This means that 48% of the legal services market concerned individuals.

9 Global Legal Services Market Report 2017
10 Deloitte: Future Trends for Legal Services: Global research study (June 2016)
Platform usage by legal service providers

- Legal service providers, such as law firms, notaries and independent lawyers, can use SmartEdit to create SmartTemplates for sale in the Contract Vault marketplace. They receive the purchase price in VLT, minus a small commission when their SmartTemplates are used to draft contracts.

- Legal service providers can provide custom-made SmartTemplates on demand as well as legal reviews of SmartTemplates. The price for these services is negotiated directly between the user and the service provider. On completion, the service provider receives the negotiated price in VLT minus a small commission.

- Legal service providers can use VLT to display other services, offered independently of the Contract Vault platform to Contract Vault users. Users can then contact them quickly and directly through the platform. Further interaction takes place outside of the Contract Vault platform.

- Legal service providers can furthermore earn VLT by making themselves available as arbitrators for Ricardian Contracts. The arbitrators of a Ricardian Contract are nominated by the contractual parties in contract draft mode.

Platform usage by Smart Contract developers and auditors

- Smart Contract Developers can use SmartEdit to sell Smart Contracts or SmartTemplates that can generate customisable Smart Contracts in the marketplace. They receive the purchase price in VLT, minus a small commission when their Smart Contract is purchased or when their SmartTemplates are used to draft contracts.

- Smart Contract developers can provide custom-made SmartTemplates or Smart Contracts on demand to customers. The price for these services is negotiated directly between the user and the developer. On completion, the developer receives the negotiated price in VLT minus a small commission.

- Smart Contract auditors and auditing companies can provide their services to users or SmartTemplate authors. In the case of manual audits, the price for these services is negotiated directly between the user and the auditor. For automated audits, auditing companies usually use fixed prices. On completion of the audit receives the negotiated or fixed price in VLT minus a small commission.

- Similarly to legal service providers, Smart Contract developers can use VLT to display other services, offered independently of the Contract Vault platform to Contract Vault users. Users can then contact them quickly and directly through the platform. Further interaction takes place outside of the Contract Vault platform.

Platform usage by value-adding companies

Companies such as insurance companies can offer tailor-made special offers to Contract Vault users that explicitly opt-in to this service. If the Contract Vault user enters into a contract with the company providing the offer, Contract Vault receives a commission, a portion of which is converted to VLT and distributed to the user.

Platform-as-a-Service

The Contract Vault platform can be used as a private instance with a private marketplace and also features an extensive API for B2B integrations. We plan to offer a variety of tailor-made PaaS packages for law firms interested in using a white-labelled private marketplace to service their clients, as well as businesses who want to use the API to manage their contractual agreements on the Contract Vault platform or leverage it to build entire Blockchain applications.
The indicative roadmap and development priorities provided here are subject to change. We plan on releasing a public beta version of the Contract Vault platform in July 2018, which will include:

- SmartEdit, SmartML and SmartTemplates
- The Contract Vault marketplace for SmartTemplates
- Private marketplace instances
- SmartForms and contract drafting mode
- The Vault wallet

Further development priorities depend primarily on the amount of funding available. Below is an illustrative example of Contract Vault’s development and incentivisation priorities related to the level of funding available.

<table>
<thead>
<tr>
<th>&lt; 10 Million CHF</th>
<th>10-30 Million CHF</th>
<th>&gt; 30 Million CHF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core functionality and incentivisation for key jurisdictions</td>
<td>Extended functionality and incentivisation on a global scale</td>
<td>Advanced functionality and R&amp;D efforts</td>
</tr>
<tr>
<td>SmartTemplates for customisable contracts, Smart Contracts and Ricardian Contracts</td>
<td>Extended API and PaaS features</td>
<td>Advertising platform (value-added services)</td>
</tr>
<tr>
<td>SmartML</td>
<td>Global incentivisation of legal content and service providers</td>
<td>Support of additional Smart Contract platforms</td>
</tr>
<tr>
<td>Marketplace for Templates and Services</td>
<td>Licensing of world-class legal templates and Smart Contracts for the marketplace</td>
<td>AI features such as code-to-contract and contract-to-code</td>
</tr>
<tr>
<td>Incentivisation of mainly Western European legal content and service providers</td>
<td>Creation of Ricardian Contract Templates for a wide range of use cases</td>
<td>Development of the SmartICO platform</td>
</tr>
<tr>
<td>Signature and identity solutions mainly for the DACH region</td>
<td>Signature and identity solutions for additional applicable jurisdictions</td>
<td></td>
</tr>
<tr>
<td>White label features</td>
<td>Development of the SmartShares platform</td>
<td></td>
</tr>
</tbody>
</table>
Team

Gordon Mickel
Founder & Managing Director
Gordon studied Computer Science at the University of Basel and has 20 years practical experience delivering production grade software. He has been involved in Blockchain technology since 2013 and is especially interested in the Ethereum project and the possibilities of decentralized apps. For the past four years he has been working as a freelance Lead Developer for companies such as RUAG Defence, Kaba Schweiz, PostFinance, Novartis, Swisscom and Basler Versicherungen.

Perica Grasarevic
Founder & Chief Counsel
Perica holds a Master of Law from the University of Zurich. As the co-founder and General Counsel of Swiss Cryptotech GmbH, a company providing consulting services in the Blockchain and cryptocurrency area since early 2014, he has gained broad experience on which he can fall back on for this project. In addition, he has been working for a global software company (worldwide leading in the automated processing of vehicle related data) as a Legal Counsel since 2013.
Daniel Killenberger
Developer
Daniel holds a Bachelor’s Degree in Computer Science with a focus on artificial intelligence from the University of Basel, and has been engaged with Blockchain technology and cryptocurrencies since 2012 after hearing about Bitcoin. His interest peaked with the launch of Ethereum as he saw a huge potential in decentralized applications. This lead him to study cryptography and Blockchain technologies outside of university.

Achim Lau
Legal
After his studies of economics and law at the University of Saarbrücken, Achim earned his Master of Law at the University of Constance before starting his career as legal counsel of a software start-up company. For more than 15 years he collected experience as legal advisor in different large international US (3rd biggest worldwide) and national software companies specialising in the data security sector, following his dedication for progressive law in the high tech sector.
Ian Simpson
Communications and marketing
Focused communications, thought leadership and strategic digital marketing are the elements which Ian brings to Contract Vault as Communications Advisor. Educated at Middlebury College, VT - his experience spans multiple continents and disciplines within the international startup scene. After being transplanted to Crypto Valley in early 2017, he has played an important role in building the local crypto/Blockchain ecosystem while coordinating Europe’s largest Blockchain startup contest - the Blockchain Competition and organising the first Blockchain Summit in Zug.

Daniel Streuli
Finance
Daniel holds, among others, a Master of Science in Physics from the ETH Zurich and has passed all three CFA (“Chartered Financial Analyst”) exams. He gained extensive experience in the DCM Derivatives field during his work for a leading Swiss investment bank.
Gvozden Zivkovic
Legal

Gvozden is an experienced Serbian attorney at law with a focus on commercial law, who worked at the largest insurance firm in the Balkans. He is mainly responsible for our expansion and strategic partnerships in Southeastern Europe.
**Advisors**

**Alexander Hofmann**  
**Intellectual Property**  
Alexander Hofmann advises and represents clients in negotiations in all areas of IT-law, in particular outsourcings (managed services), cloud computing, utilities, and digitization, but also in complex sourcing projects for hard- and software as well as in strategic IT-change projects, and in all current contracting of IT-law and shared economy.

**Dr. Christian Laux**  
**Strategy**  
Dr. Christian Laux combines his experience both as inside counsel as well as his practice as outside counsel since many years with a passion for technology. In his daily practice Christian focuses on IT law matters, and he has extensive experience with technology-related and e-commerce issues.

**Mark Schieweck**  
**Negotiations and partnerships**  
Mark Schieweck advises clients regarding matters and in negotiations in all areas of information and telecommunication law, in particular in complex hard- and/or software sourcing projects, open source software, project agreements, outsourcing arrangements (Managed Services), cloud computing and all common type of agreements in the area of ICT-law and e-commerce.
Dr. Juerg Hess

Technology

Dr. Juerg Hess has extensive experience in outsourcing and related issues. He combines his experience as in-house counsel of IBM Switzerland Ltd with the skills he gained in international assignments as well as with his background in economics.

Rick O’Neill, FRSA

Digital marketing

Rick graduated with a BA(Hons) in Product Design & Marketing at Southampton University, before going on to become Student Designer of the Year for the RSA (and made an honorary Fellow of the Society). An Entrepreneur at heart, skilled in Brand, Digital Marketing and Visual Communication, Rick has built and advised several businesses. After a successful exit from his first business in 2007, Rick went on to become Co-Founder of LTF (a high-end digital marketing agency, about to celebrate its 10th year in business) & Klarifi (a visual storytelling platform for B2B sales teams). LTF has recently become known for driving successful digital marketing campaigns for Blockchain Startups and ICOs, and we are delighted that Rick has joined us as Digital Marketing Advisor at Contract Vault.

Micha Roon

Blockchain expert

Micha is a veteran software engineer with 25 years practical experience delivering production grade software for big organisations mainly in the financial industry. His interest in Blockchain in general and Ethereum in particular dates back to 2014 when he was struck by the power of the smart-contract paradigm and knew immediately that this would change the world. Since then he has contributed to many Blockchain projects, 2 asset backed coins, a decentralised asset management, a decentralised ad network, a crypto document management system and a decentralised liquidity network.
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