

BlockEx Initial Coin Offering Market

&

Digital Asset Exchange Token White Paper

Abstract

BlockEx Limited is a London based FinTech company. We have a working product already launched, the Digital Asset Exchange Platform (DAXP), which can be found at www.blockexmarkets.com. The DAXP is a fully functioning global marketplace for all asset classes and instruments using distributed ledger technology (DLT). In addition to the DAXP, we are offering the Digital Token Product Offering and the Digital Asset Exchange Token (DAXT) as part of our efforts to add Initial Coin Offerings (ICOs) to the asset classes being serviced.

This paper reviews the ICO market landscape, explains the architecture of the two products, explores how each will change the existing landscape, and concludes with a research and technological roadmap.

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Contents

Abstract

Legal Considerations, Risk and Disclaimer

1. Introduction - ICO Overview

What is an ICO?

Comparison to Traditional Financing Options/Market

ICO Market

The Start

The Growth

The Crackdown

The Future

2. Problem

Distribution and Allocation

Lack of Regulatory Compliance and Standards

AML and KYC

Governance

Treasury Management

Exchange Rate Risk and Transparency

3. Solution

Digital Token Product Offering

ICO Market

Pot Allocation System

Token Issuing Company and 3rd Party Treasury Management Services

Digital Asset Exchange Token (DAXT)

AML, KYC, and Security

KYC

AML

Security

Security Architecture

Overview

Encryption at rest and in motion

Two factor authentication

IDS and Security Information and Event Management

Cryptocurrency wallet subsystem

Overview

Key handling

Withdrawal process

Internal Digital Asset Exchange Token (IDAXT)

4. ICO Market

Pot Allocation System

Under/fully subscribed pot allocation example

Over subscribed pot simple example

Oversubscribed pot detailed example

IDAXT

IDAXT Concept

IDAXT Implementation

ICO Token Issuance Mechanics

Technical pre-ICO preparations

ICO initiation

DAXT holding contract

IDAXT holding contract

POT contract

SALE contract

ICO token contract

ICO Pre-sale

ICO Sale

After ICO Sale

5. DAXT

What is our Token?

Discount

Allocation

Breakdown of the Token Sale

Lock up

Breakdown of the Lock Up Periods

Responsibility Statement

Use of funds

Protection of Proceeds

Governance of Proceeds

Token Utility

Fair Access Token Function

Fair Allocation Token Function

Economics of the DAXT

Utility

Seasonal Offerings

Price Floor

Supply Ceiling

How to Buy DAXT?

Book of Work

Vetting Process

6. Roadmap

High Level Products Roadmap

7. About Us

Why Us?

Network

Trust

Experience

BlockEx Team

Advisors

Co-authors

APPENDIX I - ICO Issuance Sequence Diagram

APPENDIX II - Smart Contract Draft Interfaces

1. Introduction - ICO Overview

In this section of the paper we will define what an ICO is, what it can and cannot do in comparison to traditional financing options in the current financial system, and how it came to be.

What is an ICO?

An ICO is the sale of digital tokens. The revenues generated from tokens are used to further business ventures. In an ICO, a newly issued digital token is sold to the buyers in exchange for fiat or cryptocurrencies. The newly issued cryptocurrency can “reward” the buyers in a variety of ways, such as access to exclusive features, exchange for a service, or to realise a discount to name but a few.

Comparison to Traditional Financing Options/Market

ICOs are often compared to Initial Public Offerings (IPOs). IPOs are the primary issuance of equity shares to the public. They are similar in that both ICOs and IPOs are meant to raise funds. However, while IPOs sell equities, which are residual ownership of the company's profits, ICOs sell rewards. As mentioned previously, these rewards can take different forms, and can be made to mimic a financial security. Therefore, ICOs are more malleable, and can accommodate buyers by carefully structuring the rewards. However, as a new phenomenon, they are at a disadvantage - there is a considerable legal risk due to the absence of standards and legal guidance.

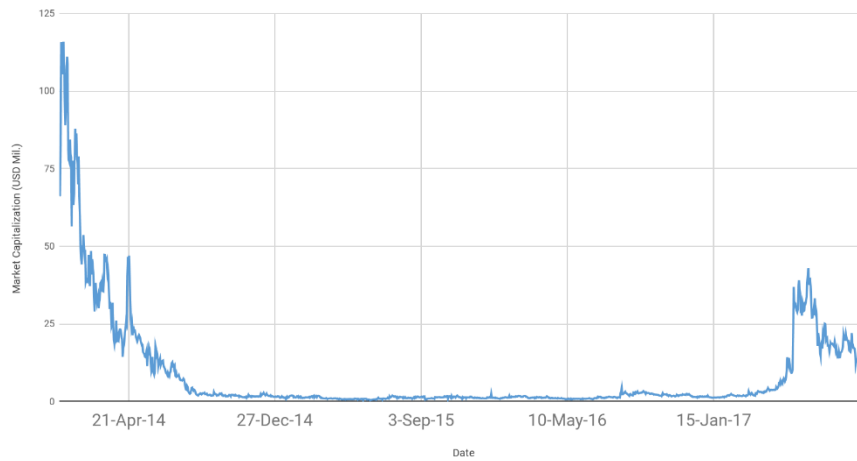
ICO Market

The Start

The ICO market started with the Mastercoin/Omni ICO in July 2013. It raised roughly 5,000 Bitcoin (BTC) (\$500,000 at the time), and was heralded a success. However, over time its market value eroded considerably. The DAO, a digital decentralised autonomous organisation, launched an ICO on the Ethereum blockchain through the use of smart contracts and was able to raise \$150 million, but this success was marred when an anonymous entity appropriated the funds raised by exploiting a flaw in the DAO smart contract code. To recover from the debacle the Ethereum

blockchain was forked and the Ethereum token was divided into two cryptocurrencies: Ethereum and Ethereum Classic. Therefore, just from observing the burgeoning of the ICO market, there have been some ICOs that were successful and some that were not.

Market Capitalization of Mastercoin/Omni

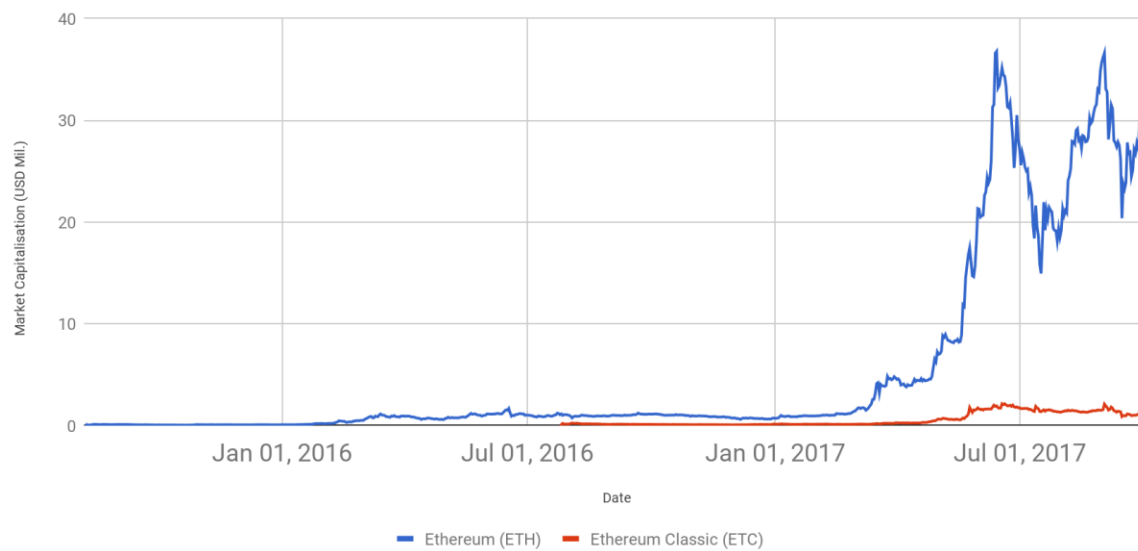


Source:

Coinmarketcap.com

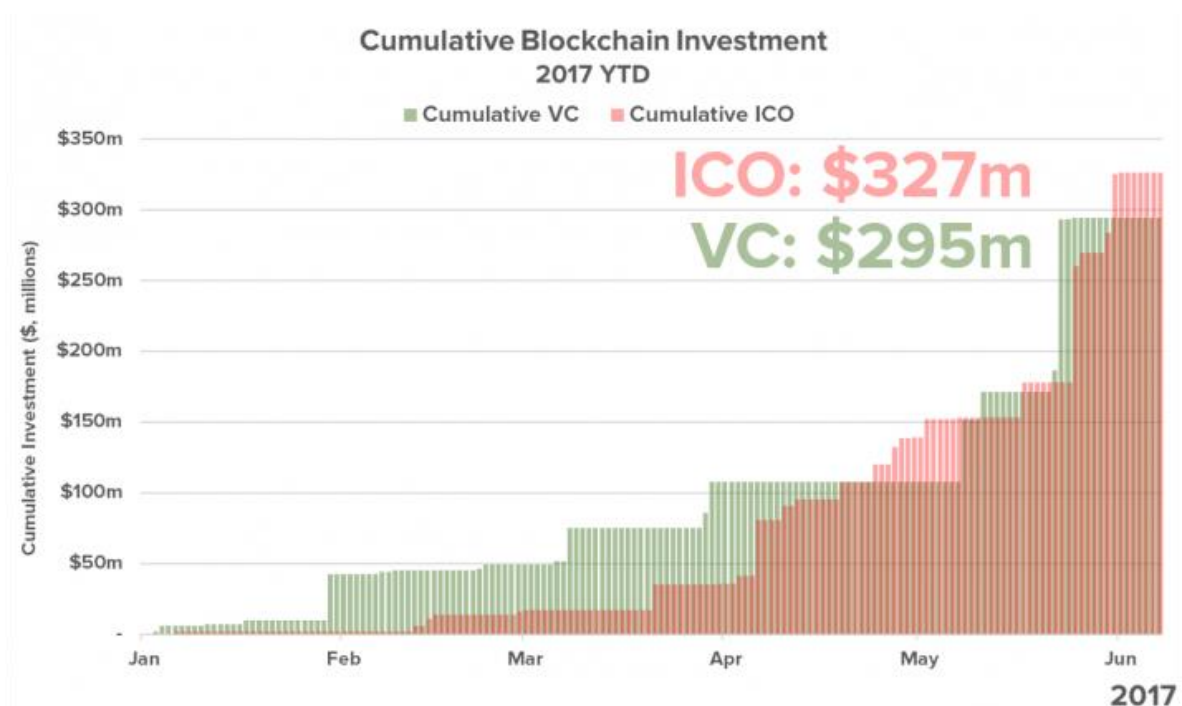
Source: Coinmarketcap.com

Market Capitalisation of Ethereum and Ethereum Classic



The Growth The ICO market has arguably been on a hot streak over the past few

months. The number of issuances and buyers has increased. As evidence for this growth, the combined market capitalisation of BTC and ETH (the main modes of investment in ICOs) has increased exponentially. It rose from approximately \$50B in July 2017, to \$95B in September 2017, a growth rate of over 90 percent¹. To compare, the S&P 500 had a growth rate of just over 3 percent during the same time period. In addition, this June, cumulative investment volume through ICOs has surpassed traditional venture capital (VC) investment. These figures point out that the ICO market is growing rapidly and quickly becoming a new method of financing.



Source: Coindesk

The Crackdown

It appears that some governments and their respective regulatory authorities are seeking to regulate this burgeoning sector.

When the ICO market started, the absence of regulation led to haphazard standards, and regulatory action as individuals increasingly used ICOs to finance not only blockchain but also projects of any kind². Now, regulators are catching up with the market. The FCA and SEC have issued guidance and warnings to individuals

¹ <https://www.cryptocoinsnews.com/bitcoin-price-breaks-past-4000-as-crypto-market-cap-grows-to-140-billion/>

² <https://news.bitcoin.com/a-phone-call-from-sec-p pressures-ico-startup-to-close-operations/>

investing in the ICO market³ ⁴. Multiple cryptocurrency projects have been halted indefinitely and had their funds reversed following regulatory action from the SEC⁵. Most alarmingly, the Chinese government halted cryptocurrency exchanges outright without further notice⁶. Soon after ICOs were banned and the funds raised from them were forcibly returned⁷. Not only that business executives related to cryptocurrencies and blockchain ventures were issued a travel ban⁸.

The Future

The unilateral crackdown by governments does not indicate that the ICO market will cease to exist. In fact, the Japanese government has accepted the ICO boom, and are authorising compliant and responsible cryptocurrency business operators⁹. Instead, this is a momentary pause that points to the ICO market and cryptocurrencies increasingly being under the purview of financial regulatory authorities around the world.

BlockEx's proposal is to establish a standard for releasing ICOs in a legally compliant and regulatory friendly manner with the use of the ICO Market and DAXT. The ICO Market will give participants access to a large variety of legally compliant ICOs, with full institutional procedures and standards, like that of a standard financial securities market. The DAXT will be the utility token to access the ICO Market. The details of our proposal will be discussed later in this paper.

2. Problem

In this section of the paper we will briefly identify the problems in the current ICO market that are expected to be remedied by using the ICO Market and the DAXT.

³ https://www.sec.gov/oiea/investor-alerts-and-bulletins/ib_coinofferings

⁴ <https://www.fca.org.uk/news/statements/initial-coin-offerings>

⁵ <https://www.coindesk.com/new-sec-cyber-unit-police-icos-dlt-violations/>

⁶ <http://fortune.com/2017/09/15/china-shutting-down-beijing-bitcoin-cryptocurrency-exchanges/>

⁷ <https://www.bloomberg.com/news/articles/2017-09-04/china-central-bank-says-initial-coin-offerings-are-illegal>

⁸ <https://www.wsj.com/articles/have-bitcoin-cant-travel-crackdown-grounds-china-cryptocurrency-executives-1505976459>

⁹ <https://www.techinasia.com/japan-approves-11-crypto-exchanges>

Distribution and Allocation

So far, the majority of the distribution and allocation of ICOs has been on a first-come, first served basis. This results in a heavily relationship based financing. Often, when an ICO is first publicized, only a small number of people are aware of it and able to purchase an allocation during this limited time frame. This results in only those who are close to the operators or marketers of an ICO in successfully acquiring portions. This is alarming, since early purchasers of tokens receive preferential treatment and disproportionately larger allocations ahead of the public at large.

Lack of Regulatory Compliance and Standards

Some cryptocurrency projects have been halted for creating ICOs that behave like financial securities without proper authorisation. In addition, there are a plethora of advertisements touting ICOs, and goading unsuspecting individuals to buy them. In response, many people believe ICOs are scams, and they have developed a bad reputation.

AML and KYC

As discussed earlier, ICOs can be structured as financial securities. Therefore, clients should be obliged to provide sensitive information. Without doing so, ICOs can be manipulated as a mode for money laundering. Participants of the ICO market can be exposed to fraud, even if the ICO in question does not constitute a financial security.

Governance

So far, the buying of tokens in the ICO market has been motivated by ideas presented in white papers. These ideas are blank cheque promises of which token holders have no route to verifying. Since the ICO market is not a fully regulated market, these promises are not bound by law, and not fit for legal action. Therefore, there is no monitoring and recourse mechanism for token buyers to keep issuers in check, and prevent fraud and scams.

Treasury Management

The issuers of ICOs face a unique problem in that they receive funds in the form of multiple cryptocurrencies. To be successful, ICOs need to accommodate multiple funding methods. While cryptocurrencies have matured, they are still significantly more volatile than traditional assets.

Exchange Rate Risk and Transparency

The final problem is the exchange rate risk when exchanging raised funds into ETH for token issuance processes and reduced transparency from resorting to off-chain exchanging.

When ICOs first started, the issuers exclusively accepted ETH for purchasing tokens. This is because ETH is required to fuel the smart contracts on the Ethereum blockchain. However, as the ICO market grew the issuers started accepting other modes of payment such as fiat or cryptocurrencies that could not fuel smart contracts on the Ethereum blockchain. This was a measure to market tokens to a larger customer base by increasing convenience to purchasing tokens. However, these non-ETH received funds must then be exchanged for ETH to fuel smart contracts.

There is a unique exchange rate risk from the time gap between the buyers handing over non-ETH funds and it being exchanged into ETH. Issuers have tried to remedy this risk by ETH spot exchanging right before ICO execution. While this lowers the risk involved, it does not eliminate it completely. In addition, the transparency quality of blockchain technology is partially compromised because there is an off-chain element of the ETH spot exchanging.

3. Solution

The BlockEx DAXP is an institutional grade exchange with blockchain asset origination, issuance, dematerialisation and life-cycle management tools. Our infrastructure framework allows for custom blockchain integrations for financial services, capital markets and governments. With this platform, we aim to connect the old to new by servicing multiple traditional and non-traditional asset classes into

one umbrella exchange and overhaul the capital markets by making trade, clearing, and settlement real time.

In this section of the paper we name and briefly describe specific BlockEx services and products within the DAXP that will resolve the identified problems in the current ICO market.

Digital Token Product Offering

The BlockEx DAXP services multiple conventional and non-conventional asset classes, and as part of our product offering is the ICO asset class. The ICO asset class is serviced by the Digital Token Product Offering, a turnkey solution for the ICO market.

The Digital Token Product Offering is comprised of: BlockEx Markets; advisory and structuring services; and the Pot Allocation System. This product offering will intend to resolve problems relating to distribution and allocation, and lack of regulatory compliance and standards, in the current ICO market.

ICO Market

BlockEx Markets is an online open marketplace for buying a variety of asset classes including ICOs. Specifically for ICOs, there will be the ICO Market: a dedicated space for individuals looking to issue ICOs to publish information and for individuals looking to purchase ICOs to view the published information. Through this product, it is intended that BlockEx will make marketing of ICOs to a larger buyer base easier and standardised in which we will proactively manage the information being published by the issuers so that it is reliable and information on multiple ICOs will be viewable on one centralised platform.

Pot Allocation System

The Pot Allocation System is an embedded program within the ICO Market. It automatically calculates the allocation of ICOs during a pre-sale. It is designed to calculate allocations for each customer according to the share of total funds subscribed, and so that DAXT is expended on each ICO. As a result, the Pot Allocation System is expected to make the distribution of ICOs fairer and more

transparent by resolving problems relating to distribution and allocation in the current ICO market.

Token Issuing Company and 3rd Party Treasury Management Services

BlockEx will advise issuers of ICOs on the management of the funds raised on the ICO Market. We will recommend the funds to be stored in a separate legal entity called a “token issuing company”. However, it must be noted that this is not a strict requirement as we will judge the structuring of the funds by gauging the scope and scale of the projects the issuers are planning. This offers two benefits: risk mitigation and governance. By storing the funds in a separate legal entity, it is intended that the issuers will be prevented from vandalizing them. BlockEx will offer governance to the funds by tracking the milestones that the issuers have reached. These milestones will be set during the ICO onboarding process, and can be in multiple areas (such as technical, business, etc). Only when milestones are met will additional funds be released to the issuers.

In addition to the token issuing company, BlockEx will offer ancillary 3rd party treasury management services, provided by partnered fund management companies. They will offer the financial expertise to actively manage the cryptocurrency holdings of the newly formed token issuing companies. This frees the issuers of ICOs from worrying about the high volatility associated with cryptocurrencies, so they can focus on their own business ventures.

BlockEx recognizes that this is a feature in which we can improve upon. We will progressively move off-chain operations on-chain. The first two functionalities to be delivered are smart contract based voting and treasury management. It is intended that these two should empower token holders to be the judge of management and governance of funds raised through ICOs without resorting to non-digital entities.

Digital Asset Exchange Token (DAXT)

The DAXT is BlockEx's ICO. It is a utility token. Only holders of DAXT will be able to access the pre-sale feature of ICOs in BlockEx Markets. DAXT must be burnt each

time a customer uses it to purchase ICOs on a pre-sale basis. This will resolve problems relating to distribution and allocation in the current ICO market. The specifications of the token and how to purchase them will be covered in a later [section](#) of this paper.

AML, KYC, and Security

BlockEx maintains strict institutional grade AML, KYC, and security policies for all of its services and products; these policies have been formed through dialogue with financial regulators and blockchain communities. The DAXT and BlockEx Markets are no exceptions to this rule.

KYC

BlockEx maintains a risk-based approach to KYC during onboarding of prospective clients. All individuals who want to utilize our products or conduct business with us will be required to provide us with a comprehensive and variable set of identity documents relevant to the nature of business or transaction between BlockEx and the individual or company in question. The provided identity documents are checked against list of known parties such as PEP or Sanctions lists. We reject conducting business with clients who have not met our prescribed requirements by providing identity documents and pose significant risk of money laundering, terrorist financing, and identity theft.

AML

BlockEx maintains trained and dedicated personnel for AML initiatives and active, constant, and risk-based monitoring of transactions between clients in the event that relevant jurisdiction authorities need to be notified of illicit activities.

Security

Security Architecture

Overview

Our frontend communicates with a middle tier 'security broker' web service/API. The frontend does not possess any business logic, only presentation logic for the web application.

This middle layer acts as a security broker and sits in a completely segregated network subnet only exposing its API port, ensuring that only authorized users currently logged in to the platform can communicate with it.

This architecture ensures that even if the frontend were compromised, an attacker would never get a hold of any Bitcoin wallets, as these are located on a completely segregated part of the network only accessible through a constrained user interface – the API, using specific API calls only pertaining to that particular users API token – i.e., a user would only be able to steal virtual currency they own themselves. The API key itself is a SHA-2 512 hash, making it practically impossible to guess another person's API key and hence access their funds.

Even if the API key of another account was guessed, the API does not allow you to withdraw either funds or virtual currency from the API. You can only withdraw from the website using two factor authentication. This in effect means that funds are fully safe and secure. Withdrawing of Bitcoin requires two factor authentication, withdrawing of GBP requires two

factor authentication and as this is a manual processing process with maker checker controls.

This is the same type of three tier architecture used by major e-banking platforms that ensure that accounts are segregated and that customer A cannot see customer B's data.

Encryption at rest and in motion

We use encryption of data both at rest and in motion and all endpoints are fully SSL encrypted. Our web server utilizes HTTP Strict Transport Security to ensure that communications to it are never vulnerable to Man in the Middle attacks. Passwords are stored using un-reversible salted cryptographic hashes to ensure they are safe.

Two factor authentication

To bolster account security, we also offer 2-factor authentication with Google Authenticator.

Post go-live we will also incorporate yubikey hardware 2-factor authentication as well.

IDS and Security Information and Event Management

Web application firewalls are in operation across our infrastructure for preventative action as well as a centralised log monitoring and alerting system to allow us to visualise in real time alerts and coordinate security response in real time. This system covers events such as failed logins, virus outbreaks, web application hacks and network scanning. We also are members of CISP and have active threat intelligence reporting to alert us to known blacklisted IPs and emerging threats.

Cryptocurrency wallet subsystem

Overview

BlockEx Cryptocurrency Wallet Server Subsystem (Wallet Server, WS) is a distinct part of the overall BlockEx Digital Asset Trading Platform architecture. It is designed completely separately from the main user facing frontend and backend systems.

The Wallet Server is developed as a separated system and shares no code, data persistence, deployment systems or infrastructure with the rest of the platform. It is deployed into a separated cloud environment under account not connected to the trading platform deployment. The Wallet Server is communicating with the rest of the system via a dedicated API. Access to the API is restricted and allows only one point of connection between the WS and the rest of the system. The Back Office (BO) system is integrated with WS API and both ends of this integration are authenticated for each request using mutually validated client and server certificates, certificate authenticity confirmed by the public key infrastructure signatures.

Key handling

Wallet Server is designed basing on the key assumption that the most sensitive part of the cryptography - the private keys - must not be held in the online accessibility at all. The Bitcoin and Ethereum address handling inside WS is implemented following BIP32 hierarchical deterministic key generation system.

The subsequent keys used for deposit acceptance and internal funds handling are generated from the master public key, while the corresponding master private keys are held offline and never exposed to the potential adversaries. This allows us to generate new deposit addresses and maintain the funds inside the system, and handle withdrawals securely.

This means that even fully compromising the WS infrastructure it is not possible to gain control and generate malicious withdrawal transactions.

Withdrawal process

With the implemented hierarchical deterministic key generation it is not possible to create outgoing transactions from the online system directly. Instead we execute withdrawal requests by the traders via offline signing procedure. The withdrawal requests from traders are reviewed and confirmed manually, after verification the batch of unsigned transactions is downloaded and manually transferred over the air gap to an offline system that is used solely for transaction signing. The transactions are signed by any two of three master private keys in existence, the private keys itself are held with three responsible top management personnel as hardware keys. The signed batch of transactions is transferred then back over the air gap to the online system and uploaded to the Wallet Server for broadcasting over the P2P networks of Bitcoin and Ethereum.

Specific detail to BlockEx's AML policy is viewable [here](#), the KYC policy [here](#), and the security policy [here](#). Our procedures should resolve problems relating to AML, KYC, and security in the current ICO market¹⁰.

Internal Digital Asset Exchange Token (IDAXT)

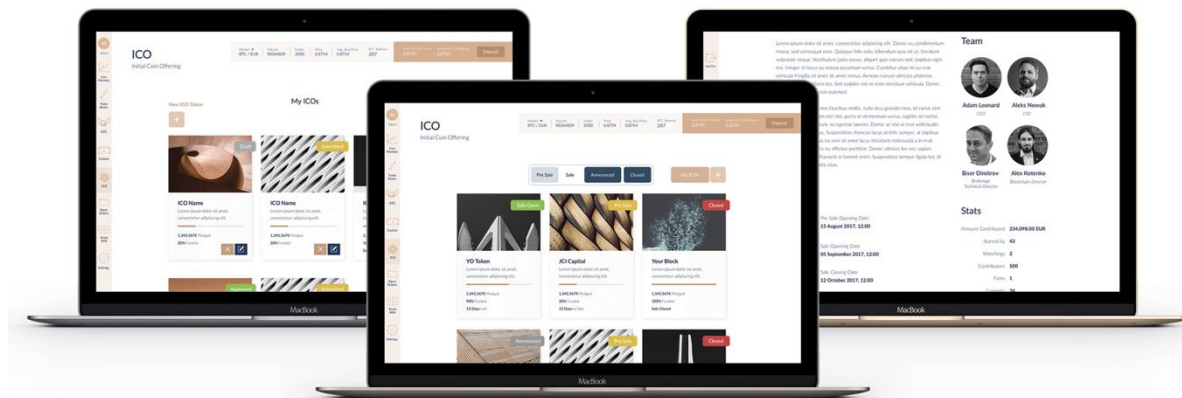
The IDAXT is an internal special purpose token that is not purchasable by the public. It serves as a mechanism to automatically transfer various funding methods, fiat or cryptocurrency on-chain. Not only will exchanging of funds from multiple currency denominations be risk-free but also transparent since it will happen on-chain. The IDAXT allows for non-crypto currencies to be exchanged on a instant basis, in addition the IDAXT is transparent as it transacts on the Ethereum blockchain. The IDAXT should, therefore, resolve problems relating to exchange risk and transparency in the current ICO market.

The specifications of the IDAXT, and how it will work inside BlockEx Markets in relation to the DAXT, will be covered in a later [section](#) of this paper.

¹⁰ Note: <https://www.blockexmarkets.com/>

4. ICO Market

The ICO Market is a segment of [BlockEx Markets](#) which adds ICOs into our asset class offering and is consisted of two core elements: the Pot Allocation System and the IDAXT.



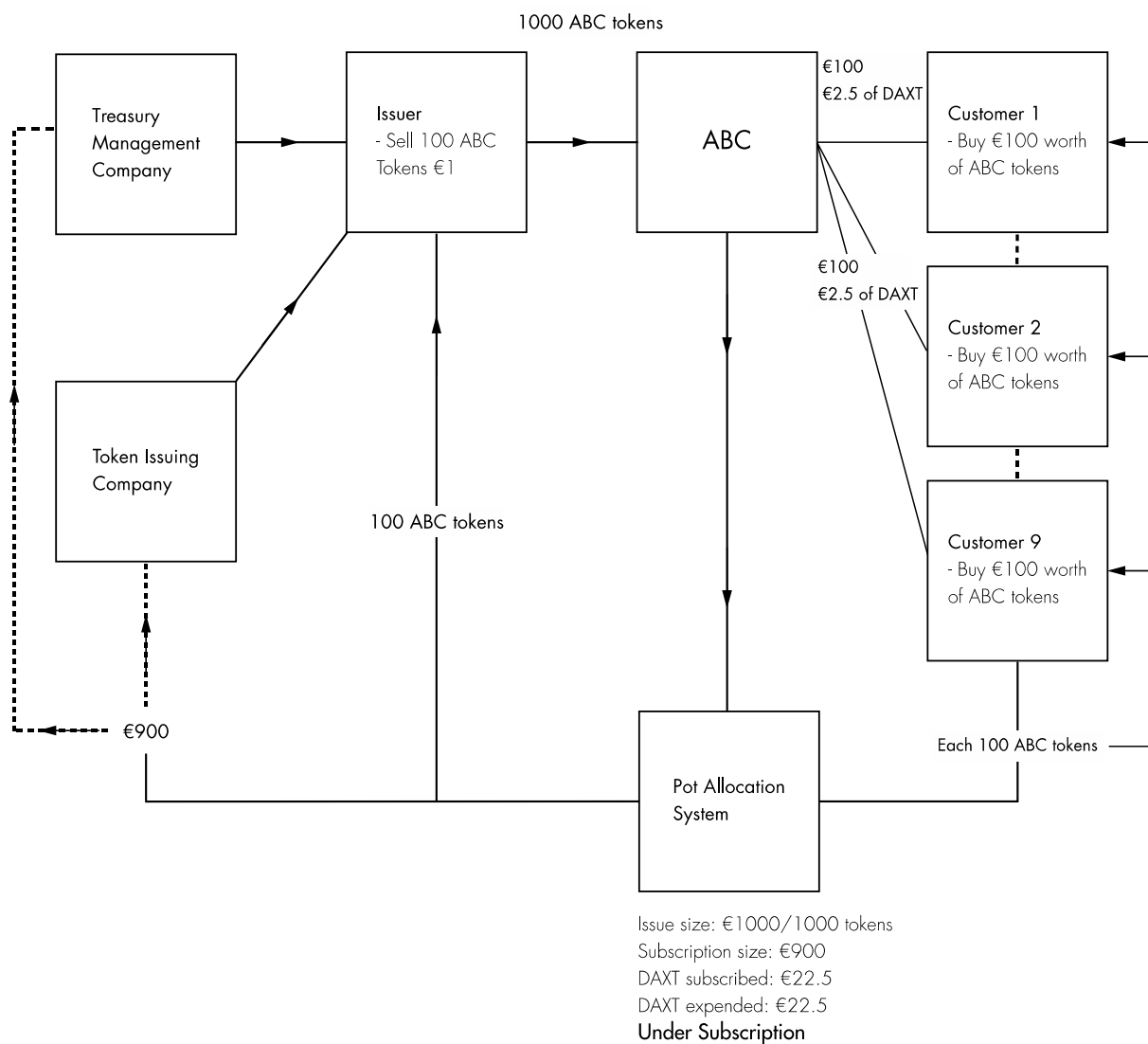
Pot Allocation System

The Pot Allocation System ensures that every participating buyer is allocated a fair share, proportional to the amount of funds committed to the pot. If the allocation is undersubscribed or subscribed exactly to the issued amount, no adjustment is needed. However, if the allocation is oversubscribed, then the actual allocation available will be distributed in proportion to the amount of funds subscribed, and will be reduced accordingly.

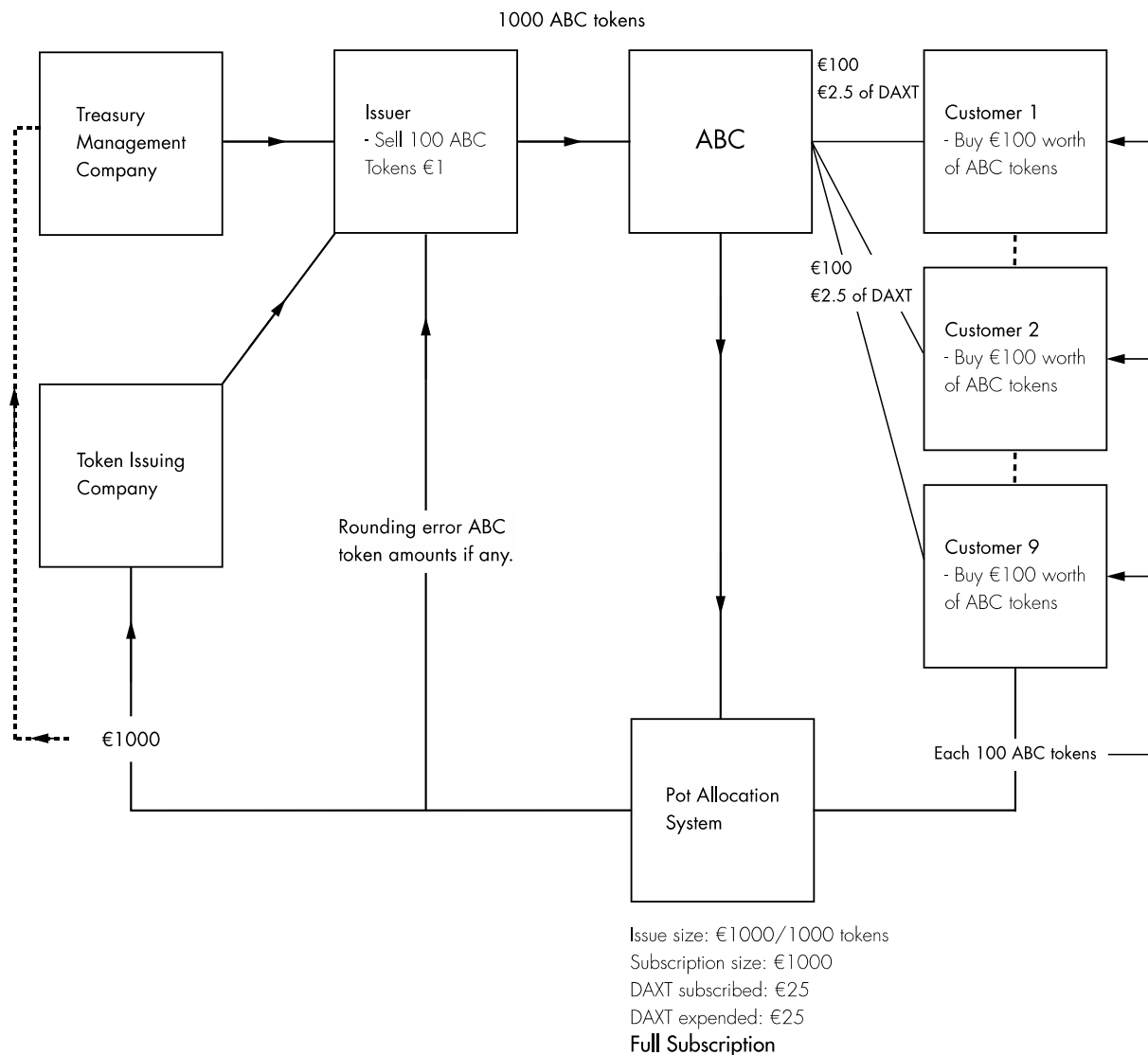
To guarantee an allocation from the Pot Allocation System, we require buyers to make two commitments. First is the total amount of funds equivalent in the tokens the buyers are willing to buy. Second is the 2.5 percent of the total amount of funds the buyers are committing in terms of DAXT at which is exchangeable at a fixed rate deemed at the ICO pre-sale start. To make understanding the Pot Allocation System easier, we have illustrated examples of under, over and full subscription of ICO pre-sale below.

Under/fully subscribed pot allocation example

The issuer of ABC token wants to sell 1000 tokens priced at €1 during an ICO pre-sale of 4 weeks. During the 4 weeks, 9 customers subscribe to the pre-sale, each committing €100, and an additional €2.5 worth of DAXT. This makes the total pot size €900. Therefore, it is undersubscribed by €100. At the end of the pre-sale, the Pot Allocation System will automatically allocate the ABC tokens to buyers. Since the pre-sale was undersubscribed, the remaining 100 tokens will be returned to the issuer, and could be sold during the ICO general sale. The 9 customers will each be allocated 100 ABC tokens. Their collective €22.5 worth of DAXT used to purchase the ABC tokens will be burnt.



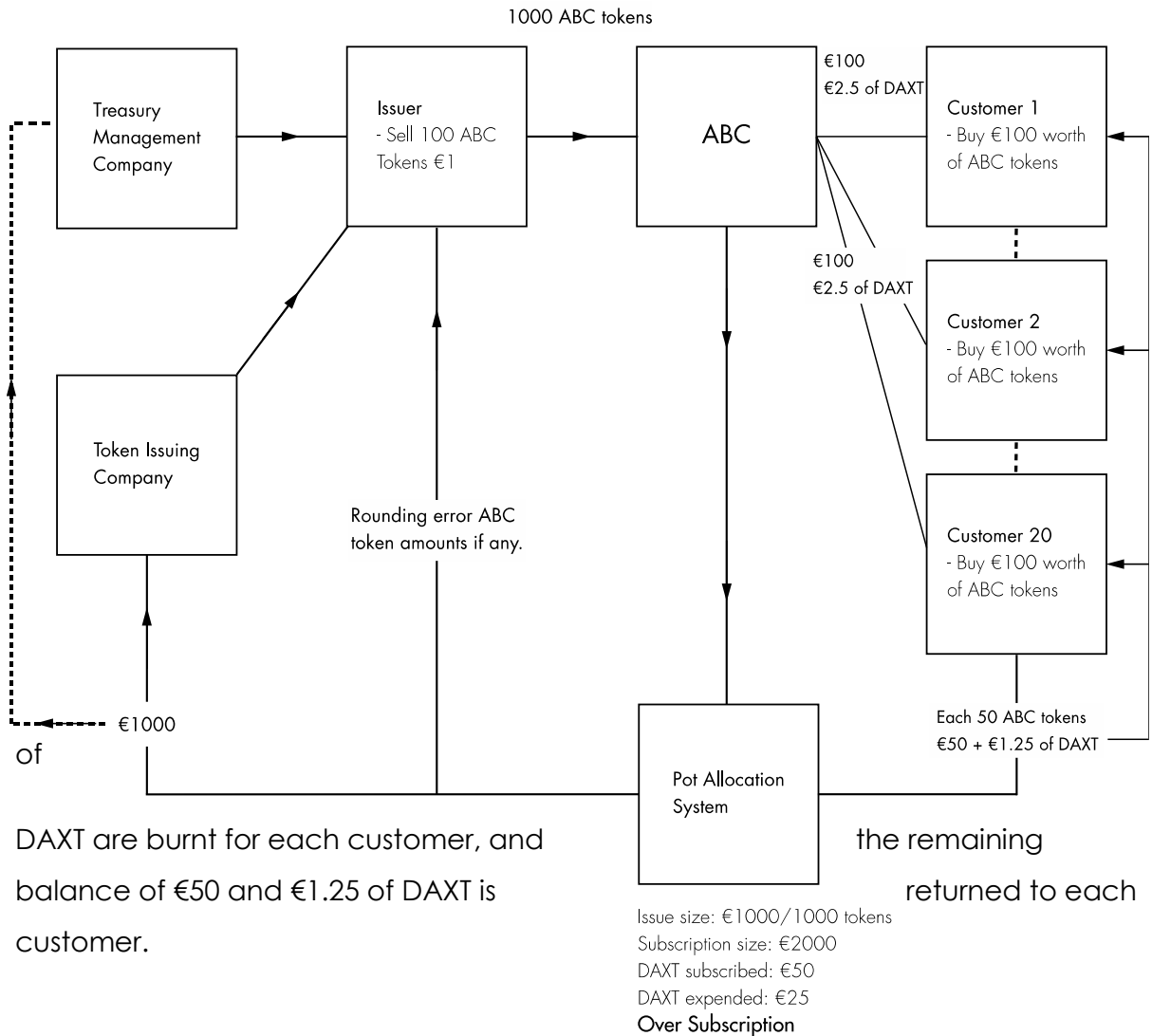
The allocations for customers during a full subscription is identical to that of an under subscription. However, the issuer will not be allocated leftover tokens.



Over subscribed pot simple example

The issuer of ABC token wants to sell 1000 tokens priced at €1 during an ICO pre-sale of 4 weeks. During the 4 weeks, 20 customers have subscribed to the pre-sale, each committing €100, and an additional €2.5 worth of DAXTs. This means the total subscription size is €2000, and the pot is over subscribed by €1000, or 100%.

At the end of pre-sale period the tokens are transferred to the customers. Since there are only 1,000 tokens in the pot, and there was a subscription for 2,000 tokens, the actual amount allocated to each customer is reduced proportionally. Every customer gets only €50 worth of ABC tokens, rather than the €100 that they originally subscribed for. Since the token price was fixed at the start of the pre-sale, only €50 of the €100 subscribed is taken from each customer's account. Lastly, only €1.25 worth



Oversubscribed pot detailed example

The issuer of ABC token wants to sell 1000 tokens priced at €1 during an ICO pre-sale of 4 weeks. During the 4 weeks, there are 5 customers that each subscribe different amount of funds to purchase ABC tokens. The EUR and DAXT amounts subscribed, actual allocation of ABC tokens, and actual EURs and DAXT amounts taken are detailed in the table below:

	EUR Subscribed	DAXT Subscribed	ABC Allocated	EUR Expended	DAXT Expended	EUR Returned	DAXT Returned

Customer 1	600.00	15.00	375.00	375.00	9.375	225.00	5.625
Customer 2	600.00	15.00	375.00	375.00	9.375	225.00	5.625
Customer 3	200.00	5.00	125.00	125.00	3.125	75.00	1.875
Customer 4	100.00	2.50	62.50	62.50	1.5625	37.50	0.9375
Customer 5	100.00	2.50	62.50	62.50	1.5625	37.50	0.9375
Total	1,600.00	40.00	1,000.00	1,000.00	25.00	600.00	15.00

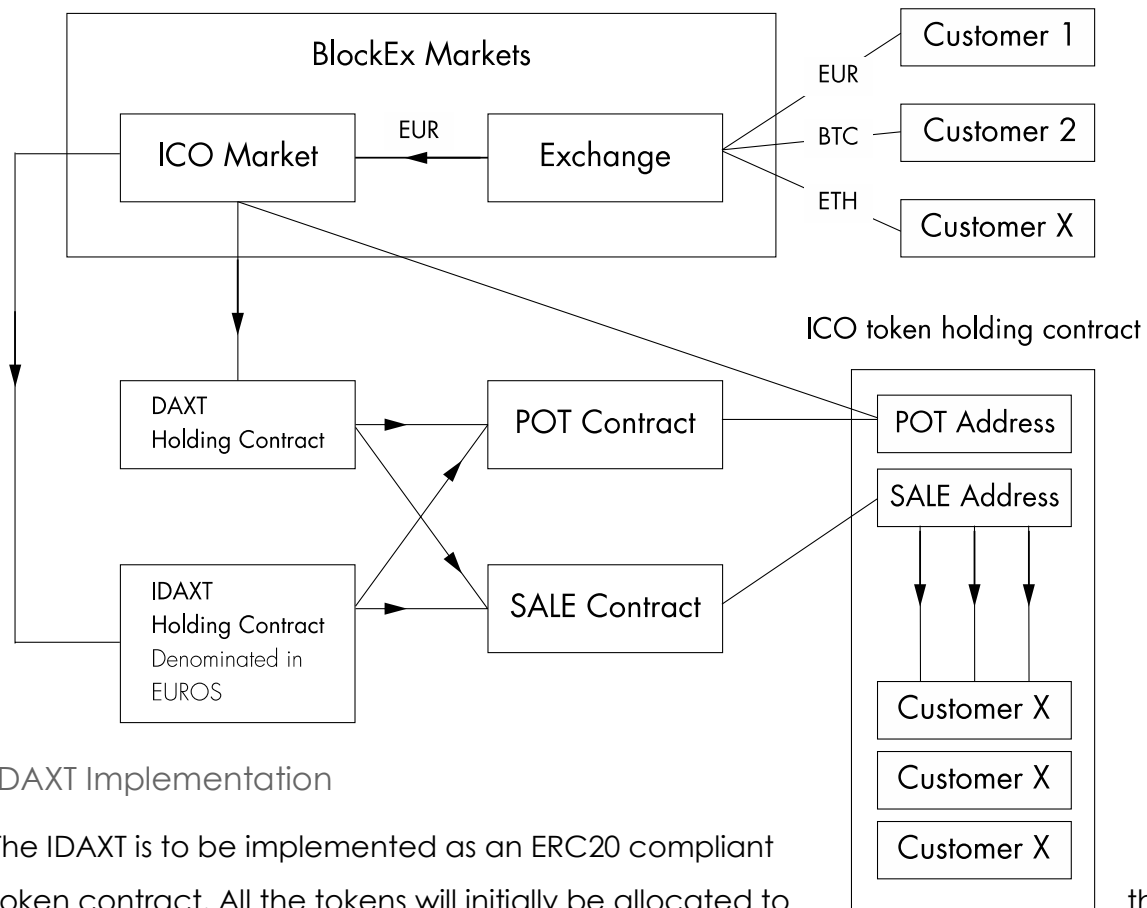
In this example, the distribution of ABC tokens is proportional to each pre-sale participant's commitment. The amounts distributed are proportionally reduced to the total of 1000 ABC tokens allocated for pre-sale. The calculation of the numbers in the Pot Allocation System will be rounded down. This will create a minuscule amount of leftover tokens which will be returned to the issuer. In addition, the remaining EUR and DAXT amounts not expended in the process are refunded to the customers.

IDAXT

IDAXT Concept

The funding mechanics inside the ICO Market is done using the IDAXT. The IDAXT is a special purpose token, specifically created for each individual ICO run on the platform. It represents the full amount of ICO funding target in the nominated currency of the ICO. It is issued fully premined at the start of each ICO, and solely controlled by the issuing platform. Immediate allocation to customers participating in the ICO occurs after full commitment.

The IDAXT ticker name does not refer to a single token, but to a family of internal, purpose-specific, and unique tokens which will be created purely as utility vehicles for the issuance process and will not be available for direct trading. However, these tokens will be useful for on-chain tracking of commitments and allocations made and provide level of transparency expected from a conventional ICO while not using ETH as the only possible medium of value transfer.



IDAXT Implementation

The IDAXT is to be implemented as an ERC20 compliant token contract. All the tokens will initially be allocated to the account of the ICO Market itself. Later, during the ICO process, part of the allocation will be transferred first to the POT contract's address for Pot Allocation System pre-sale execution, and later to the SALE contract address for distribution during the sale process.

The SALE contract must have one key additional feature: it must be able to hold the subaccounts for multiple users within the account of a specific user. This subaccount is not intended to function as the ERC20 standard 'allowance' feature. In fact, it is the reverse - it should be spendable only by the main account holder, but designate suballocation of tokens belonging to subaccount holder with the main account holder.

ICO Token Issuance Mechanics

The full process of allocation is presented as a sequence diagram in [Appendix I](#).

Technical pre-ICO preparations

Information/data capture from the issuer required before the ICO token issuance:

- The ICO issuer must create an account with the DAXP
 - Wallet address
- Basic details of the planned ICO need to be provided:
 - Token symbol
 - Announcement date
 - Pre-sale, general sale, and closure to those sales dates
 - Currency denomination of the ICO (must be one of the supported currencies)
 - Target amount to raise in the denominated currency

The information captured above will be used to configure the smart contracts.

ICO initiation

To initiate the ICO process, the ICO Market must ensure a set of smart contracts is deployed and configured on the Ethereum blockchain.

The draft interfaces of the contracts are provided in [Appendix II](#).

DAXT holding contract

This is an extended ERC20 token contract. It is not deployed per ICO, and instead is a long-living token contract on the Ethereum blockchain to maintain the DAXT holdings. As a standard token contract, it does not belong to the ICO Market specifically, and instead is maintained by BlockEx as the issuer of the DAXT. This contract must have at least one addition to the ERC20 standard interface - it must allow subaccounts control the same way as described above for the IDAXT contract.

IDAXT holding contract

This is an extended ERC20 token contract. This contract has a specific purpose in the ICO process, and is deployed from scratch for each ICO. This contract has a fixed IDAXT allocation that directly represents the target amount intended to be raised by the ICO issuer in the currency of issuance. This contract is for one-off usage per ICO,

and is emptied as soon as the ICO process is finished and no further interaction needed.

POT contract

The POT contract implements the Pot Allocation System pre-sale allocation mechanics described earlier in this whitepaper. This is a separate, custom, long-lived smart contract. Its purpose is to account for the specific ICOs commitments, and map those to user addresses, and also to calculate the pot allocations after pre-sale, and distribute tokens accordingly.

The POT contract is initiated with certain configuration data at deployment time. This includes:

- Pre-sale start date
- Pre-sale end date
- Optional cool off period
- ICO Market authorised control address
- Address of DAXT contract
- Address of IDAXT contract
- DAXT/IDAXT exchange rate
- Address of ICO contract

SALE contract

The SALE contract is a fairly simple token distribution contract. Its purpose is to make sure the user has the correct IDAXT allocation, and immediately grant them a corresponding amount of ICO tokens. The SALE contract is initiated when the sale starts, and it ends at deployment time. Its operations will only be possible during the sale.

The SALE contract is initiated with certain configuration data at deployment time.

This includes:

- Sale start date
- Sale end date
- Optional cool off period
- ICO Market authorised control address
- Address of IDAXT contract

- Address of ICO contract

ICO token contract

This is an ERC20 compliant contract that holds actual tokens issued during the ICO. This can be deployed by the ICO Market system on behalf of the issuing party, or may be deployed and maintained by the issuers themselves, if they need to include any custom additional functionality. The only prerequisites for this contract are that it has to implement ERC20 standard interface and its address needs to be known to the ICO Market.

ICO Pre-sale

Before starting the pre-sale ICO Market must ensure that the ICO token contract has allocated the needed amount of tokens to the POT contract address for further distribution according to the Pot System. If this is not done, the POT contract will not accept any customer subscriptions.

During the pre-sale the POT contract will accept transactions stating the user's address and the amount subscribed to the pot. However, the subscriptions will only be accepted if the DAXT contract and IDAXT contract can confirm respective token balances for that user's address. Each individual user token subscription timestamp will be recorded.

During the pre-sale, the POT contract will also accept withdrawal requests that allow users to cancel their pre-sale subscription. These requests will only be allowed from the user's address itself, or from the ICO Market authorised address. These requests are only accepted during the cool off period after the ICO subscription is recorded for that specific user.

As soon as pre-sale period is over (or the user cool off period is over, whichever is later) the POT contract will start executing token distribution according to the Pot Allocation System. This calculation will be done in batches, to avoid possible breach of block gas limit. By default, this calculation will be triggered by the transaction from ICO Market, but can be triggered by any interested party. The distribution for any address is only possible once the cool off period for that user is over.

Once all pre-sale allocations for an ICO are done, all the unused tokens for the ICO (if any) will be returned back to ICO Market, and issuer controlled addresses and data related to this ICO can be wiped from the contract.

ICO Sale

Before starting the pre-sale, ICO Market must ensure that the ICO token contract has allocated the needed amount of tokens to the address of the SALE contract for further distribution according to the Pot Allocation System. If this is not done, the SALE contract will not accept any customer subscriptions.

During the sale period, the SALE contract will accept transactions for allocation of ICO tokens to user addresses. This allocation will only happen if the user has enough IDAXT tokens. The cool off period must be defined - the actual allocation action will be delayed until the cool off period is over.

During the sale period, the SALE contract will also accept transactions cancelling allocations. Cancellation transactions will only be accepted during the user's cool off period, and will only be accepted either from that user's address or from the ICO Market authorised address.

The sale is over as soon as either all available tokens are sold and all cool off periods are over, or at the ICO sale close date.

After ICO Sale

As soon as the ICO sale is over, the SALE contract will stop accepting new sale transactions. However, it will still process delayed allocations if the cool off period is still not over for any of the earlier executed sales. As soon as cool off periods for all users are over, any ICO tokens unsold at this point are returned to the issuer. After this, the data for this ICO can be removed from the SALE contract and POT contract, and the dedicated IDAXT contract can be wiped.

5. DAXT

What is our Token?

The 'Digital Asset Exchange Token' (DAXT) is the ICO of BlockEx. DAXT is a utility coin rather than an asset coin (such as BTC). Buyers will have a guaranteed allocation during ICO pre-sales on the ICO Market if they use the DAXT, which is burnt after use¹¹. If they expend all their DAXT, they can purchase additional DAXT on BlockEx's DAXP, either from the market, or during BlockEx's seasonal coin offerings.

How to acquire DAXT ?

DAXT can be bought via the DAXP which is currently live and hosted on BlockEx Markets [www.blockexmarkets.com] Once a user signs up to the platform they will be required to enter information in order to populate their account. In order to participate in the DAXT token sale the account holder will have to undergo full AML and KYC. The account can then be funded via fiat or crypto and then used to secure allocation in DAXT.

Qualities of the DAXT ICO:

- Available for purchase only via the ICO Market.¹²
- Issued on a pre-mined basis and will not be minable.
- 51 percent of the allocation will be available at the time of the issuance.
- 25 percent of the allocation will be retained by the company to be assigned for marketing, referral and bounty programs, if enacted.
- There will be additional tranches, or Seasonal Coin Offerings, of the DAXT periodically, and as appropriate, on an ongoing basis.¹³
- The tokens will be issued as an ERC20 compliant token.

¹¹ Note: ICO buyer will have to subscribe 2.5 percent of the notional value of the funds they are subscribing to guarantee allocation.

¹² Note: Secondary trading of DAXT will be allowed on other ERC20 compliant exchange platforms in the future.

¹³ Note: Seasonal Coin Offerings will be executed under a schedule, which will be sent via a dedicated mailing list, and viewable on BlockEx's press releases well ahead of time. The preliminary details for the various tranche releases of DAXT are viewable on our [website](#).

Discount

To incentivise individuals to participate in the pre-sale, there will be a price discount of 25%.



Allocation

The total supply of DAXT in our first tranche release will be a total of 130 mil. tokens with a capitalization of €35.70 mil. Therefore, there will be a hard cap of €35.70 mil on the first tranche release/ICO of DAXT.

Breakdown of the Token Sale

Round	# of Token Allocated	% of Total Token Supply
Advisors/Contributors	6,006,000	4.6%
Friends and Family	21,294,000	16.4%
Private Pre-Sale	26,000,000	20.0%
Public Pre-Sale	13,000,000	10.0%
ICO	5,200,000	4.0%
Total	71,500,000	55.0%

Lock up

Participants of the pre-sale will have to adhere to lock up period of 1 month for public pre-sale participants and 3 months for private pre-sale participants. The lock

up period prohibits selling of DAXTs on the secondary market and withdrawing from the BlockEx designated wallet. However, DAXTs can be used to subscribe to ICO pre-sales on the DAXP. Restrictions will be removed after the lock up period has passed.

Breakdown of the Lock Up Periods

Round	Lock Up Periods
Advisors/Contributors	3 Months
Friends and Family	3 Months
Private Pre-Sale	3 Months
Public Pre-Sale	1 Month
ICO	No Lock Up

Responsibility Statement

To the best of the knowledge and belief of the Adam Leonard and Aleks Nowak (whose names appear on page 31 of this White Paper), they have taken reasonable care to ensure that the information contained in this document is in accordance with the facts, and does not omit anything likely to materially affect the import of such information.

The Key Person(s) will ensure that BlockEx Limited (the “Company”) undertakes the following:

1. The Company will engage with a top tier auditor [EY, KPMG or PwC] to audit the smart contract that will be used to issue the ERC20 tokens following the BlockEx token sale;
2. The Company will make use of the proceeds of the token sale solely for the purposes set out in the White Paper or otherwise for the proper management and operations of the Company;

3. The Company will publish a budgeted forecast of expenditure ("Forecast") prior to its token sale for the 12 month period following the token sale, and will engage a top tier chartered accountant to audit all expenditure incurred by the Company (including expenditure to develop the blockchain platform described in this White Paper and as it seeks to make preparations for the launch of the BlockEx business operations in the United Kingdom;

4. The Company will store cryptocurrencies raised from the BlockEx token sale in a secure multi-signature wallet and endeavour to appoint a reputable independent person or entity to act as one of the co-signatories to that wallet. The Company will only release stored cryptocurrencies from the secure wallet for the purpose of satisfying expenditure budgeted for in the Forecast. On a quarterly basis BlockEx's appointed auditor shall review the expenditure over the previous quarter to ensure it is in line with the budgeted forecasts. If expenditure over [10] % of that in the budgeted forecast has been made, the Company will make an announcement of that fact on its website. In no event may expenditure over [20]% of the budgeted forecast be made by the Company unless the auditor has been notified in advance and has confirmed in writing to the Company that it is satisfied the monies are being utilised for the proper purposes of the Company.

5. The Company will use its reasonable endeavours to launch the BlockEx business operations in the United Kingdom.

6. The Company agrees that should it become evident that the Company's project (the "Project") as described in the White Paper is not achievable or is no longer viable (economically or otherwise) within reasonable time-frames bearing in mind the scheduled operational launch of the Project as set out in the White Paper, the Company will:

- (i) determine to effect an orderly wind-up of its business unless it has received independent legal advice that such action is not in the best interests of token-holders ("Continuation Advice");

- (ii) where Continuation Advice has not been obtained, proceed to an orderly wind-up of business by paying outstanding creditors and allocating a reasonable amount of any remaining token sale proceeds to provide for an orderly wind-up of the Company and its operations (including but not limited to meeting the Company's liabilities and any obligations); and
- (iii) thereafter implement an ethical and fair means of returning the balance value of token proceeds in the Company's possession, such as by repurchasing the tokens that are then in issue to current token holders,

in all events subject to independent legal advice.

If you no longer hold the tokens, it is unlikely you will receive any monies from the above process.

The Company urges you to read the "Legal Considerations, Risks and Disclaimer" section in full at page 2 of this White Paper.

Use of funds

BlockEx will be using the funds from the DAXT sale (pre-sale and general sale) in the following ways:

Business use

- 15% marketing
- 20% scaling compliance team
- 25% scaling technical team
- 25% licensing and legal fees

Surety bond

- 15% assigned to create a surety bond to insure against catastrophic events on the DAXP

Protection of Proceeds

The funds raised will be protected through the security protocols as prescribed in previous [section](#) of this paper. Once the token sale has finished the funds whether they are in the form of fiat or crypto will be sent directly to the custody of the token issuance company (BlockEx Limited [GIB]). The Token issuance company will itself implement treasury management provisions as previously described in this whitepaper in order to safeguard the assets of the issuing company.

Governance of Proceeds

The proceeds from the token sale will be under the control of a separate legal entity (a token issuing company) incorporated in Gibraltar BlockEx Limited [Gibraltar]. Whereby, after the sale process is complete, fiat funds will be moved to the bank account of the token issuing company and crypto funds moved to the multisignature wallet under the control of the token issuing company. BlockEx will not be able to withdraw any form of funds from the token issuing company without the explicit approval of our clients.

Incorporation document to the newly formed token issuing company is viewable [here](#).

Token Utility

A DAXT will afford the token holder two core utilities. These utilities are defined below:

1. Fair access
2. Fair allocation

The utility of the DAXT may evolve over time and increase in value for the token holder.

Fair Access Token Function

Ownership of a DAXT will allow the token holder pre-sale access to the ICOs listed on the ICO Market. All of the ICOs listed will have been vetted by BlockEx and its associated partners. The details to the vetting process of ICOs is viewable in the later [section](#) of this whitepaper.

Fair Allocation Token Function

Ownership of a DAXT will facilitate maximum allocation to the BlockEx listed ICOs via the Pot Allocation System. In order to secure allocation of an ICO listed on the ICO Market at pre-sale, the 2.5% of the notional trade amount will need to be acquired and subsequently 'burnt' in order to secure the order. Once the DAXT has been burnt the order will be secured against the allocation and if the allocation becomes oversubscribed then the Pot Allocation System will ensure an allocation based on a weighted average of the funds received.

By using the Pot Allocation System, it provides a level playing field for the first time ever in the ICO market. By purchasing and using your DAXT tokens, we should be able to ensure that you will be treated the same whether you are the largest or smallest and first or last order in the book.

See the detailed description of the Pot Allocation System mechanics and allocation examples in the [Pot Allocation System section](#).

Economics of the DAXT

The value of the DAXT is its utility in accessing the ICO pre-sale feature on the ICO Market.

Utility

The DAXT allows buyers to access the pre-sale feature of the ICO Market. This gives the holder a purchasing right ahead of the public. The value of this utility will be fixed by BlockEx in the first tranche release at €1 per token

Seasonal Offerings

BlockEx will release additional tranches of the DAXT on regular intervals to allow for sufficient supply of tokens available for ICO Market participants in purchasing ICOs.

There will be no additional tranche releases for a period 6 months after the end of our first/initial tranche sales process.

BlockEx will manage the release of DAXTs in two key aspects: price floor and supply ceiling

Price Floor

BlockEx will establish a price floor of €1 on DAXTs offerings. The price of DAXTs during future offerings will be at least €1 per DAXT.

Supply Ceiling

BlockEx will establish a supply ceiling of 130 mil. tokens on DAXTs. We will track the total number or supply of DAXTs circulating in public and will not inject additional DAXTs into circulation of exceeding 130 mil.

How to Buy DAXT?

Before any party can get involved with the BlockEx ICO, they must sign up to the BlockEx DAXP. All individuals will need to pass Anti Money Laundering (AML) and Know Your Customer (KYC) checks. Only after passing these checks will the client become eligible to participate in the ICO.

DAXT will be available to buy in three distinct phases: pre-sale, general sale, and on the secondary market (post ICO). Pre-sale and general sale phases will run on the ICO Market. The secondary market trading will be on the DAXP, and eventually on other platforms supporting tokens following the ERC20 standard.

The DAXT will be available for pre-sale during a [6] week period prior to the general sale.

After the pre-sale, the general sale will make DAXT available to all via the ICO Market. The general sale ICO period will last for [3] weeks, or until the full allocation of DAXT have been sold (whichever happens first).

DAXT will be priced in EUR during the pre-sale and general sale phases of the ICO. To purchase tokens at these stages, the customer will need to make sure they have enough EUR balance in their account at BlockEx Markets, either directly funding it

through a variety of depositing methods, or by exchanging supported fiat and cryptocurrencies (BTC and ETH) to EUR on the platform.

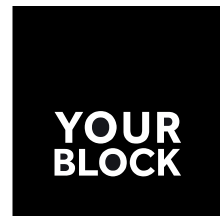
The token sale will be available to all individuals excluding those on the UK Sanctions List and Named Persons Sanctions List.

Book of Work



Howdoo

Modex
SMART CONTRACT MARKETPLACE



Vetting Process

The ICOs that are included in the Book of Work are those that have gone through BlockEx's vetting process. These involve the following:

Meeting with ICO issuers

Gauge market disruptibility of the proposed project

Gauge project delivery potential

- Team composition

- Team capability/capacity

- Project difficulty

Gauge alpha/beta/MVP products

Measure regulatory risk

Check governance procedure

Gather relevant and necessary documents

- KYC

- AML

- Company incorporation.

6. Roadmap

High Level Products Roadmap

ICO Roadmap



Business Roadmap

Expand services to the United States



Technological Roadmap

Completed Builds



Future Builds



7. About Us

The BlockEx Digital Asset Exchange Platform manages the entire lifecycle of blockchain based digital assets, including origination, issuance, exchange, settlement and redemption.

The BlockEx DAXP includes a digital asset creation tool, exchange, clearing, settlement, registry and brokerage software.

The exchange is HFT capable with institutional connectivity via API FIX and ITCH protocols and is digital asset framework (Blockchain/DLT) agnostic.

Currently, BlockEx is building out product extensions to include licensable (securities, trade order, origination and deal flow) management tools as well as regulatory reporting for any asset originated on the platform. Any product BlockEx builds either leaves behind a tradable asset or creates distribution and deal flow.

A Digital Asset is any financial product built using Blockchain or Distributed Ledger Technology. This may include but is not limited to bonds, equities, ETFs, syndicated loans, trade and supply chain finance, insurance etc.

BlockEx is a blockchain financial technology developer and provider. We develop blockchain applications, such as middle and back office software tools, for financial institutions. Additionally, we provide blockchain financial technology services such as the Digital Asset Platform (DAXP), Digital Asset Creation Tool (DACT) and ICO Market.

All our products have one goal: to centralise the currently fragmented financial securities market using the blockchain, a decentralising technology. We service the full lifecycle of securities on one platform, from issuance to settlement, and connect them to the rising cryptocurrency market. We connect the old to the new, and deliver cost savings, efficiencies, and transparencies. This makes transactions increasingly affordable for small and large parties, unlocking financing options that were previously unavailable to small and medium sized enterprises (SMEs) or individuals.

Why Us?

Why choose BlockEx? We are not a new entrant, but a ready financial technology firm that has met technical, business, and regulatory milestones:

Technical Milestones

- Exchange in production



- White label brokerage software in production
- Digital asset creation tool in production

Business Milestones

- Formation of key partnerships
 - BIG 4 auditing firm channel partner
 - European CSD partner for Golden Gate Tool
 - Supply chain systems provider

Clients

- Bond issuing clients 3
- ICO issuing clients 7
- Brokerage clients 5

Regulatory Milestones:

- FCA Regulatory Sandbox
- AIFC Sandbox

Choose BlockEx because:

Network

The BlockEx network is growing as we increase our geographical imprint. We are onboarding brokerages around the world from the United States, the United Kingdom, Taiwan, Israel, and Kazakhstan. This will provide us with the resources and opportunities to fulfil our goals in providing financial solutions cost efficiently and securely.

Trust

BlockEx strives to protect all participants in our marketplace, whether buyers or sellers of assets. We take your trust in our business seriously, and have full institutional KYC and AML procedures in place. Our adherence to laws and regulation and protecting consumer rights is proven by the fact that we have been admitted into

the FCA Regulatory Sandbox for provisional authorisation in testing issuance and dematerialisation of bonds.

Experience

BlockEx is composed of a team of experienced professionals. They are from a variety of backgrounds such as financial services, software development, and business development. The key members of our staff are showcased in the next section of this paper.

BlockEx Team

Chief Executive Officer - Adam Leonard

With 20 years of Payments, AdTech and FinTech experience, Adam lead the building of several award winning platforms in the AdTech and Gaming space. He has been solely focused on FinTech since 2011, after discovering cryptocurrencies.

Chief Information Officer - Aleks Nowak

Aleks has been immersed in the cryptocurrency space since 2011. He has worked on numerous alternative currency projects, and now sits on several high level cryptocurrency working groups, focused on the regulation of cryptocurrencies.

Chief Operating Officer – Ronald Martin

Ron joins BlockEx as former Executive in Residence at Bain Capital Ventures. Ron leaves the traditional financial world to bring his financial platform experience to the blockchain.

MD Head of Capital Markets - James Godfrey

With 30 years of credit trading experience running the trading desks as an MD at both Nomura and Mizuho, James is now a Blockchain evangelist. "Having been at the forefront of the explosion in electronic trading, it is obvious that Blockchain is the financial markets Chuck Yeager moment!"

MD BlockEx Asia - Joseph Tsou

With both Citi and KPMG Advisory experience, Joseph has immense knowledge within the Financial Services and FinTech industries. This drives him to promote and facilitate collaboration between FIs and FinTech startups. He holds a BSc and MSc from Imperial College London.

Head of Blockchain Development - Alex Kotenko

Startup and blockchain veteran, working at leading roles in start-ups for the last seven years, and in the blockchain space since 2013. Seasoned team leader, proficient in building and running effective product centric development teams.

Head of OTC Trading - Edd Carlton

Edd joins BlockEx having previously run and managed a cryptocurrency trading desk in the city. Edd brings 8+ years capital markets experience as well as specialist in Crypto, Initial Coin Offering, and Distributed Ledger Technology knowledge.

Brokerage Technical Director - Biser Dimitrov

Biser is a serial entrepreneur, software engineer and product designer with more than a decade of experience building products for companies small and large

including NHIS and Tradologic. He has successfully delivered DLT based applications to Fortune 500 Banks.

Director of Finance and Regulation - Andy Perkins

Entrepreneurial Chartered Accountant with extensive financial services experience at Citigroup and Investec, specialising in equity and retail structured products. After successfully running his own start-ups, Andy brings this knowledge and experience to build and drive BlockEx forward.

Business Development Director - Shay Sharon

With background in management and business development for international companies, Shay is an expert in building and executing sales pipelines for existing and new markets, as well as creating opportunities for future markets and partnerships.

MD Corporate and Institutional Banking - Alice Huang

Alice has experience of working in the global corporate banking industry with Citi, UBS and state own banks from both the EU and Asia, as well as working with the British government on science and innovation projects.

Advisors

Our team is advised by world renowned crypto-professionals who have experience working with distributed ledger technologies (DLTs). They push BlockEx's goals forward by serving as our technical and business advisors.

Eric Benz

Eric has over 10 years of experience working in and around Financial Technology. He has delivered innovative SaaS systems for some of today's biggest institutions around payments, identity, and banking infrastructure.

<https://www.linkedin.com/in/ericbenz84/>

Jon Matonis

Jon is a Founding Director of the Bitcoin Foundation and his career has included senior posts at VISA International, VeriSign, Sumitomo Bank, and Hushmail. He is an economist and e-Money researcher focused on expanding the circulation of non-political digital currencies, Jon also serves as an independent board director to companies in the Bitcoin, the Blockchain, mobile payments, and gaming sectors.

<https://www.linkedin.com/in/jonmatonis/>

Trent McConaghy

Trent is co-creator of the BigchainDB scalable blockchain database, its public network IPDB, and ascribe.io for IP on blockchains. Previously, he spent 15 years designing distributed AI systems to help drive Moore's Law. He has written a PhD, two textbooks, and 50 papers and patents.

<https://www.linkedin.com/in/trentmc/>

Co-authors

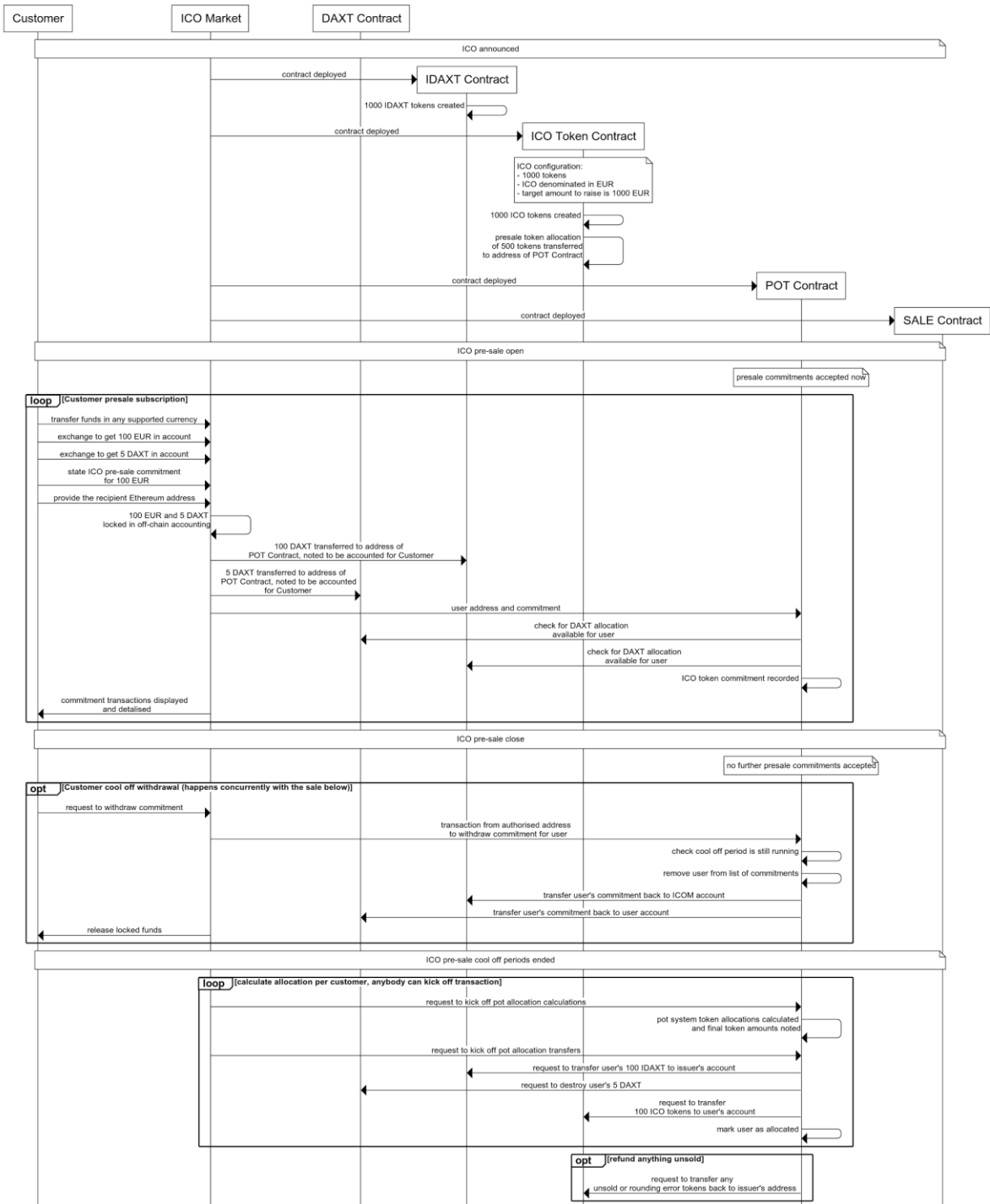
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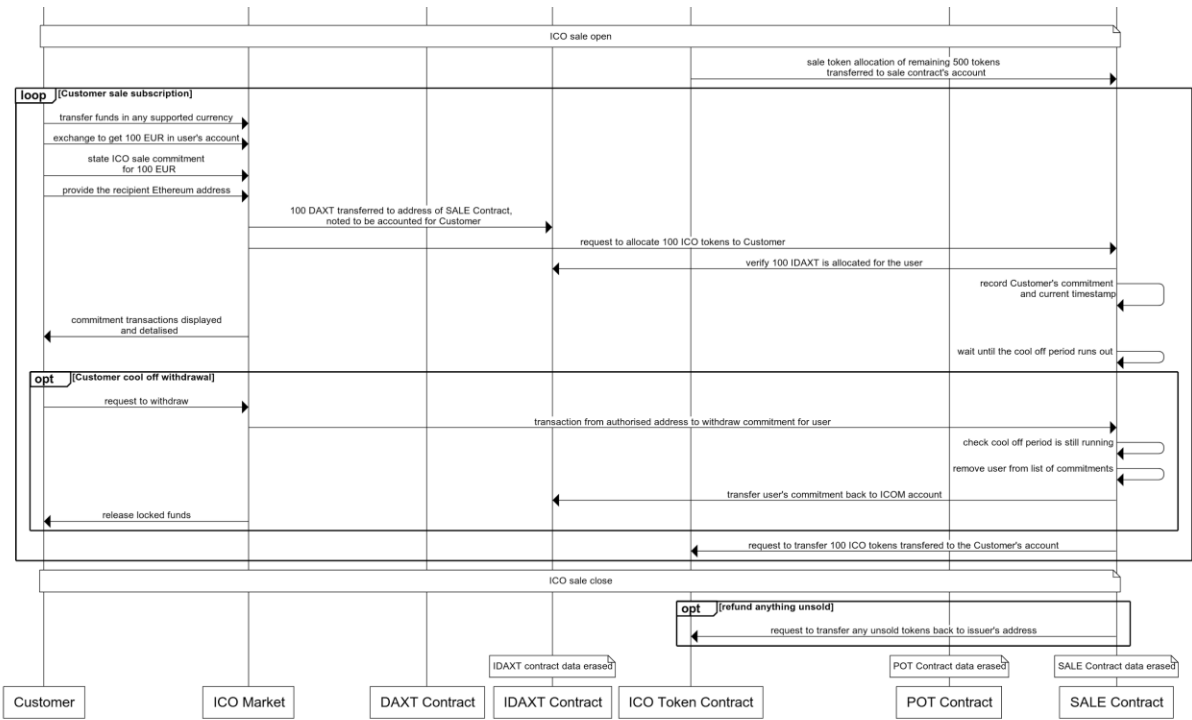
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ICO smart contract mechanics



continued on the next page...



APPENDIX II - Smart Contract Draft Interfaces

```
contract DAXT {
    // standard ERC20 interface
    function totalSupply() constant returns (uint totalSupply);
    function balanceOf(address _owner) constant returns (uint balance);
    function transfer(address _to, uint _value) returns (bool success);
    function transferFrom(address _from, address _to, uint _value) returns (bool
success);
    function approve(address _spender, uint _value) returns (bool success);
    function allowance(address _owner, address _spender) constant returns (uint
remaining);
    event Transfer(address indexed _from, address indexed _to, uint _value);
    event Approval(address indexed _owner, address indexed _spender, uint _value);

    // custom functions

    // transfer from an account that has subaccounting enabled
    // regular transfer and transferFrom will not work for this type of account
    function transferFromSubaccount(address _from, address _fromSubaccount, address
_to, uint _value) returns (bool success);

    // increases total supply by given amount, newly minted tokens allocated to
sender's
// address. only available to authorised addresses
    function increaseSupply(uint _value) returns (bool success);

    // enable subaccounts accounting for a given address owner
    // disabled by default
    function enableSubaccounts(address _owner) returns (bool success);

    // check balance of a subaccount within given owner's account
    function subaccountBalanceOf(address _owner, address _subaccount) constant
returns (uint balance);
}

contract IDAXT {
    // standard ERC20 interface
    function totalSupply() constant returns (uint totalSupply);
    function balanceOf(address _owner) constant returns (uint balance);
    function transfer(address _to, uint _value) returns (bool success);
    function transferFrom(address _from, address _to, uint _value) returns (bool
success);
    function approve(address _spender, uint _value) returns (bool success);
    function allowance(address _owner, address _spender) constant returns (uint
remaining);
    event Transfer(address indexed _from, address indexed _to, uint _value);
    event Approval(address indexed _owner, address indexed _spender, uint _value);

    // custom functions

    // enable subaccounts accounting for a given address owner
    // disabled by default
    function enableSubaccounts(address _owner) returns (bool success);

    // check balance of a subaccount within given owner's account
    function balanceOfSubaccount(address _owner, address _subaccount) constant
returns (uint balance);
}
```

```

}

contract POT {
    // create commitment record for customer
    function addCustomerCommitment(address _customer, uint _value) returns (bool success);

    // remove commitment record for customer
    function withdrawCustomerCommitment(address _customer) returns (bool success);

    // calculate pot allocation for customer
    function calculateCustomerPotAllocation(address _customer) returns (bool success);

    // transfer allocated tokens to customer
    function transferCustomerPotAllocation(address _customer) returns (bool success);
}

contract SALE {
    // create commitment record for customer
    function addCustomerCommitment(address _customer, uint _value) returns (bool success);

    // remove commitment record for customer
    function withdrawCustomerCommitment(address _customer) returns (bool success);

    // transfer allocated tokens to customer
    function transferCustomerAllocation(address _customer) returns (bool success);
}

contract ICO {
    // standard ERC20 interface
}

```