THE COMPLETE GUIDE

TO SECURITY TOKEN OFFERINGS

Applicature

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WHAT IS AN STO?

A security token offering, or STO, is understood as the process of issuing coins or tokens for a stakeholder to invest for future profit. These assets guarantee investors the right to future dividend payments.

In terms of the current state of the market, it is thought that security token offerings will bind traditional financial and cryptocurrency markets, resulting in breakthrough progress for investment opportunities in general.

Within the blockchain environment, tokenized securities are merging with technological advantages, providing stakeholders with security supported by regulatory structures. Unlike the traditional financial system, security token offerings back participants with investment smart contracts, ensuring that all parties comply with their obligations.

Securities include financial instruments such as:

- bonds
- stocks
- shares
- venture capital (VC)
- private equity
- revenue participation notes

Because they are tokenized and presented with a security token offering, these instruments hold monetary value. Securities are presented as fungible, transferable investment instruments backed by real-world value.

Security tokens hold information about the tokenized asset and provide stakeholders with the right to product ownership, which is securely recorded on the blockchain ledger. STOs offer a hybrid approach, as they provide greater regulatory safety than ICO. At the same time, they overlap with traditional public offerings through blockchain technology.

STO vs. ICO

The process of an STO launch is pretty much the same as the ICO process. The major difference, however, can be found in token characteristics and features.

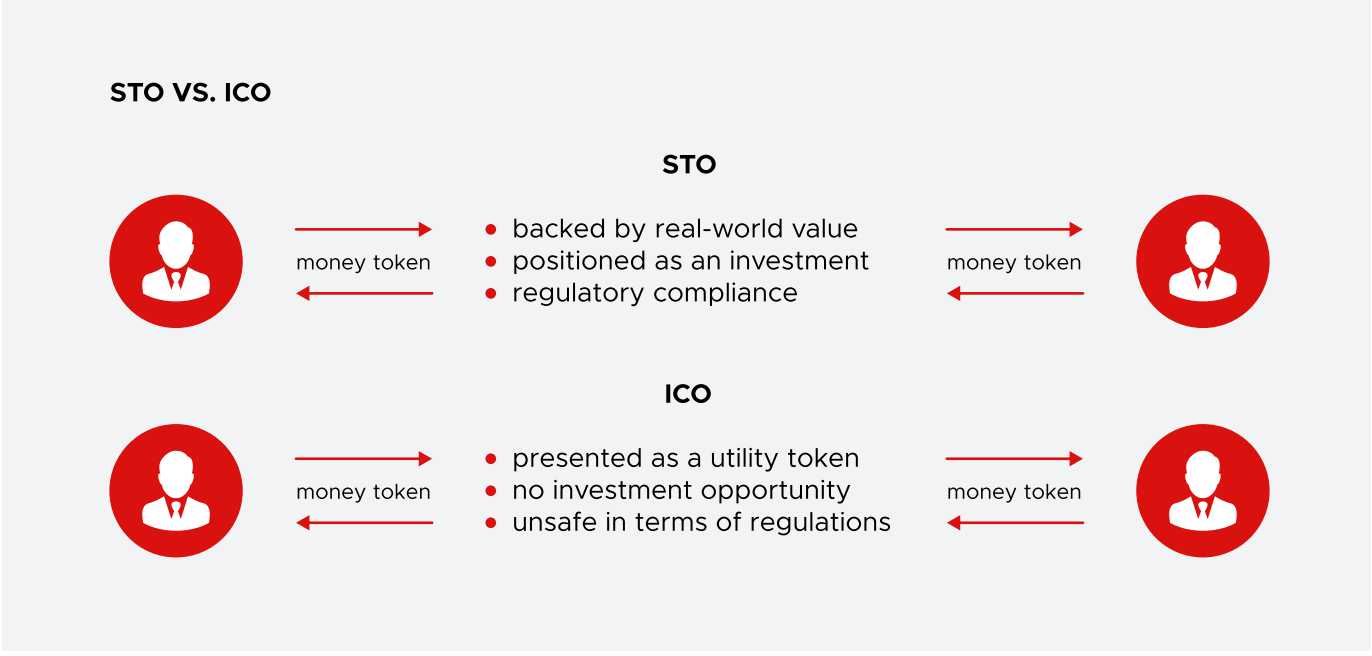
As mentioned above, security tokens are backed by real-world assets and designed in compliance with regulatory governance.
An Initial Coin offering, on the other hand, presents coins or tokens as a utility. These coins can be used to gain access to the platform as well as for internal purposes. The purpose of these types of coins is to grant users functionality and access within the platform.

Utility coins are not positioned as investments. The ICO process does not necessarily have to comply with legal obligations. On the one hand, it is easier to launch this type of process; on the other, users aren't backed up by security measures. Often, utility token offerings turn out to be scams.

Generally, there are two ways to design a token within a fundraising campaign: either as a utility token offering through an ICO or as a security token offering through an STO.

It should be stressed that utility tokens are no longer recognized in accordance with U.S. SEC regulations. Thus, even if a token is presented as a utility, it is still recognized as a security by the SEC.

This means that while issuing tokens with an offering, the issuing party should offer them only to accredited stakeholders who have undergone KYC verification with a signed document or agreement highlighting all of their rights and risk factors. The issuer must provide documentation (e.g., a white paper) outlining disclosures, legal compliance, and revenue-projection details.

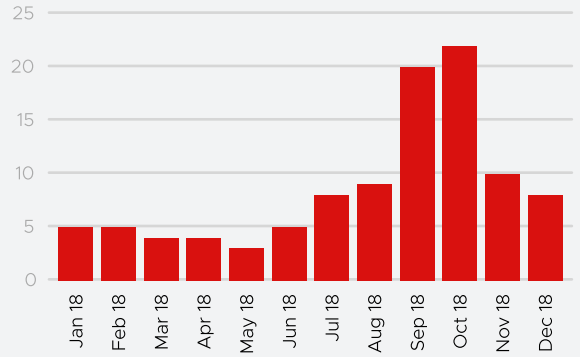


Security Token Offerings: Trend Analysis and Projections

STOs have recently gained far greater popularity than ICOs due to regulatory compliance and security. This has mainly been addressed by the SEC in the U.S. and by the South Korean FSC.

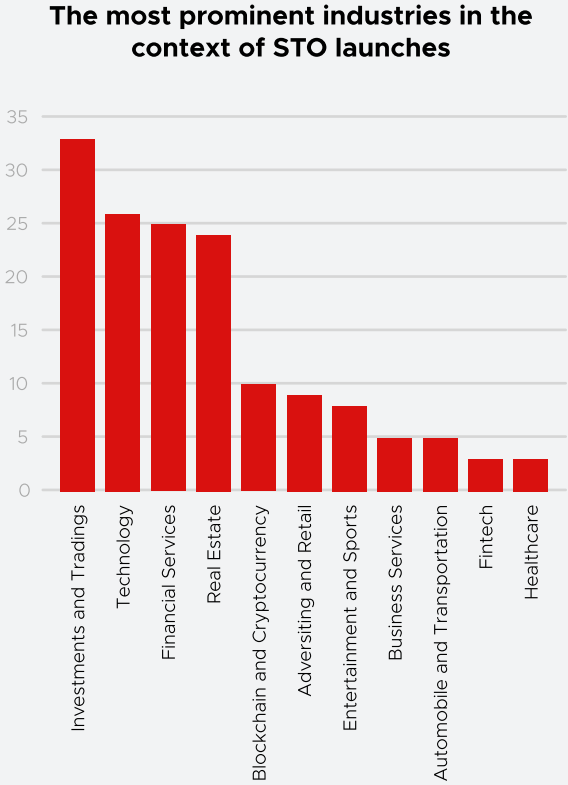
A strong regulatory basis appears to be beneficial, as it eliminates the chance of fraudulent activity and scams. It reassures big-market players hoping to raise funds via security offerings by providing them with investment confidence.

As a result, more than 100 STOs had been conducted as of 2018, according to the InWara's annual report:



Source: www.invara.com

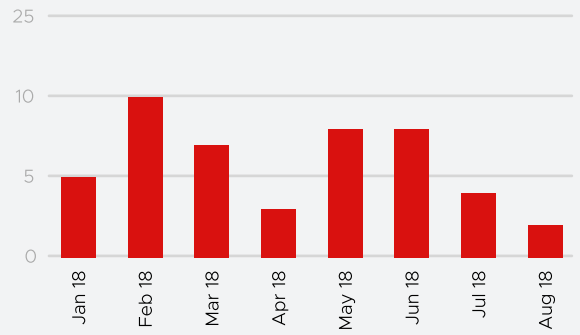
Industries like investment and trading, technology, FinTech, and real estate are currently the most prominent in the context of STO launches:



Source: www.invara.com

According to research, the number of Simple Agreements of Future Tokens (SAFT) has risen, as well. The latest research states that the SEC is systematically investigating potential projects for the SAFT framework:

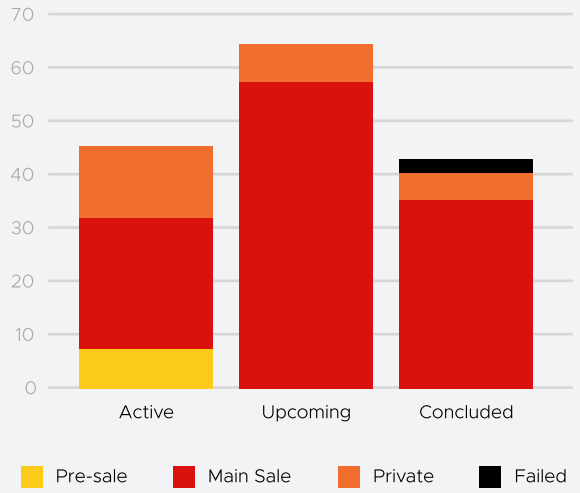
The rising number of SAFTs



Source: www.invara.com

Security token offerings are gaining success at a rate of 99%. As of today, the number of active or upcoming STOs equals 60% of all token offerings:

The number of active and upcoming STOs



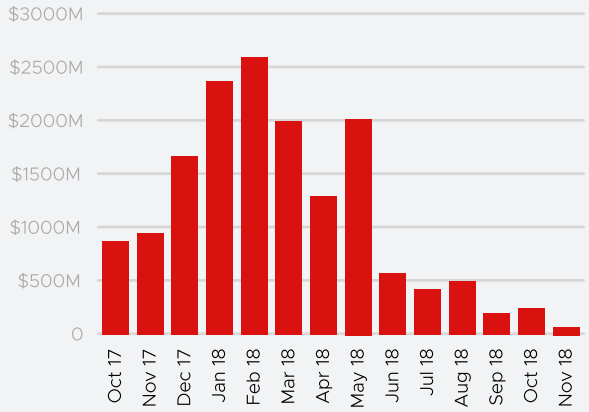
Source: www.invara.com

Some of the most prominent STOs are:

- Scientific Coin
- Monart
- Reit-Bz (BTG)
- BitBond
- edeXa
- Ikioo Tech
- Tropizen
- Aspen Coin
- Blue-Ocean Ventures
- HealthBank

Having analyzed ICO performance data, it has become obvious that this type of crowdfunding is dying off. Thus, the number of ICO capitalizations is gradually decreasing:

Total Capital Raised by ICOs – Monthly Totals ($M)



Source: www.tokendata.io

The ICObench report states that although the number of ICOs increased in 2018 in comparison to 2017, projects didn't manage to raise funds as successfully. There was only a 15% increase in the number of capitalizations, while the quantity of crowdsales increased 3.5 times:

	2017	2018
#ICOs ended	718	2517
#ICOs started	970	2816
Avg # ongoing ICOs daily	91	481
#ICOs listed	1349	3804
#ICOs raised funds	413	1012
Funds raised	$10,062,399,721	$11,596,382,015
Average funds raised	$14,132,583	
Variation 2017-18	$1,533,982,293	
Variation %	15%	

As a result, we can positively state that security token offerings are more beneficial than initial coin offerings in terms of:

- being more transparent due to KYC and AML verification
- providing more protection for investors
- serving as a compliance instrument within the context of legal finance
- ensuring a scalable liquidity pool
- eliminating token volatility

REGULATORY BASIS AND JURISDICTION

As governmental authorities have started regulating blockchain industry activity, it has become crucial to understand the process of cryptocurrency legalization.

There is no common rule for cases that can be easily applied. Legal regulations vary from region to region, requiring a different set of obligations to be applied in order to conduct crowdfunding legally.

Considering the fact that blockchain technology is here to stay and will inevitably develop, we are outlining the regulation aspects of various cases in order to launch security tokens in a compliant manner.

Regulations in the European Union and the United States vary. Speaking of U.S. laws, the SEC (Securities and Exchange Commission) defines all tokens offered during ICOs as security tokens. In addition, various U.S. regulators tend to define cryptocurrency differently:

- The CFTC (Commodity Futures Trading Commission) considers Bitcoin to be a commodity.
- The IRS (Internal Revenue Service) considers cryptocurrency to be a property.
- The SEC (Securities and Exchange Commission) sees all initial coin offerings as security token offerings.

Security Token Regulations within the U.S.

SEC solicitation allows for security token advertising through mass-media channels like newspapers, blogs, magazines, company websites, and broadcasting platforms. However, this doesn't include the exact business information shared by stakeholders via their networks for the purpose of attracting funds.

Key terms within the regulative basis of security tokens include:

Preemption. When a company sells its security tokens, it must remain compliant with security laws as well as federal regulations. While in the preemption process, a security token isn't supposed to be registered within state regulations or comply with the laws.

Restricted securities. In accordance with the SEC statement , securities can't be listed on the exchanges without meeting the following conditions:

1. **Holding Period.** Before anyone can sell restricted securities in the marketplace, he/she must hold them for a certain period of time. If the company that issued the securities is a "reporting company" subject to the reporting requirements of the Securities Exchange Act of 1934, one must hold the securities for at least six months. If the issuer of the securities is not subject to reporting requirements, one must hold the securities for at least one year. The relevant holding period begins when the securities are bought and fully paid for. The holding period only applies to restricted securities. Because securities acquired in the public market are not restricted, there is no holding period for an affiliate who purchases securities from the issuer in the marketplace.

2. **Current Public Information.** There must be adequate and current information about the issuing company publicly available before the sale can be made. For reporting companies, this generally means that the companies have complied with the periodic reporting requirements of the Securities Exchange Act of 1934. For non-reporting companies, this means that certain company information, including information regarding the nature of its business, the identity of its officers and directors, and its financial statements, is publicly available.

3. **Trading Volume Formula.** For an affiliate, the number of equity securities to sell during any three-month period cannot exceed 1% of the outstanding shares of the same class being sold; or, if the class is listed on a stock exchange, the 1% or the average reported weekly trading volume during the four weeks preceding the filing of a notice of sale on Form 144. Over-the-counter stocks, including those quoted on the OTC Bulletin Board and the Pink Sheets, can only be sold using the 1% measurement.

4. **Ordinary Brokerage Transactions.** For an affiliate, sales must be handled in all respects as routine transactions, and brokers may not receive more than a normal commission. Neither the seller nor the broker can solicit orders to buy the securities.

5. **Filing a Notice of Proposed Sale With the SEC.** Affiliates must file a notice with the SEC on Form 144 if the sale involves more than 5,000 shares, or the aggregate dollar amount is greater than $50,000 in any three-month period[1].

In order to launch an STO campaign, the project must be compliant with SEC regulations in order to obtain a license. Projects hoping to raise funds and receive investments from U.S. members can apply their requests in accordance with the following regulations: Reg D, Reg A+, and Reg CF.

Regulation D

This regulation combines four rules: Rule 506 (b), Rule 506 (c), Rule 503, and Rule 504.

Reg D			
	Rule 506(b)	Rule 506(c)	Rule 504
Annual offer limit	None	None	$5M
General solicitation	No	Yes	Permitted in certain situations
Investor requirements	Unlimited accredited investors. Up to 35 sophisticated, but non-accredited investors	Unlimited accredited investors	None
SEC filing requirements	Form D	Form D	Form D
Restriction on resale	Restricted	Restricted	Restricted
Preemption of state registration	Yes	Yes	No

1 http://bit.ly/SEC_statement

Rule 503 doesn't specify any restrictions with regard to investor status. As for rule 504, it is only possible to raise $5 million with the securities registered with appropriate regulators.

Rule 506 Pros and Cons

Pros	Cons
• **Unlimited Capital**—Since registered offerings have become more expensive and complex, raising an unlimited amount pursuant to exemptions has gained importance. • **General Solicitation**—A general solicitation includes an offer to sell securities with the use of an unrestricted and publicly available website. Most STOs, in the way they are currently conducted, constitute general solicitations. If you are also doing a sale abroad pursuant to Reg S, general solicitation can become tricky, and you should consult with local counsel. • **State Law Preemption**—"Covered securities" are exempt from blue sky laws.	• **Accredited Investors Only**—Limiting the pool of investors is less of a drawback than many believe, as past securities offerings show that a significant majority of funds are raised from accredited investors • **Restricted Securities**—With limited exceptions, securities sold under Rule 506(c) cannot be transferred for 12 months. This restriction may be problematic for any company that is offering a compliant network token with the expectation that it can be used quickly in transactions in its network. • **Accredited Investor Verification**—The issuer must take reasonable steps to verify each investor's accredited investor status.

Rule 506 (b) and 504 Basic Features

506(b)	504
• **No General Solicitation**—no marketing or advertising of the offering • **No Accredited Investor Verification**—The company must not have any reason to believe that any investor is not an accredited investor. • **Up to 35 Unaccredited Investors**—They can participate in the offering, but the company's disclosure obligations become much greater.	• **Diverse Investor Pool**—The STO is open to accredited and unaccredited investors. • **No General Solicitation**—No marketing or advertising of the offering is permitted. Capital Raise up To $5 million—this amount was raised from $1 million recently to provide more opportunities to rely on this exemption • **No State Preemption**—Blue sky laws apply, and the company must register its STO, or the STO must be exempt from registration under those laws.

Regulation A+

Regulation A+ functions similarly to the traditional IPO (initial public offering) process. It is beneficial for young startups or projects in the initial steps of development. It is possible to raise up to $50 million while attracting unaccredited investors. Compared to Reg D, Reg A+ securities aren't restricted in terms of resale. This is beneficial because it provides greater liquidity on the market.

Reg A		
	Tier 1	Tier 2
Annual offer limit	$20M	$50M
General solicitation	No	Yes
Investor requirements	Permitted before qualification	Permitted before qualification
SEC filing requirements	Form 1-A + two years of financial statements	Form 1-A + two years of financial statements (annual, semiannual, current)
Restriction on resale	No	No
Preemption of state registration	Yes	Yes

With Reg A+, consider the following pros and cons:

Pros	Cons
• **Diverse Investor Pool**—The STO is open to accredited and unaccredited investors. • **Immediate Transferability**—Securities are freely transferable immediately after the STO. • **Capital up To $50 million** (under Tier 2)—Under most circumstances, $50 million will be plenty of capital for a company to grow its business. • **State Law Preemption** (under Tier 2)—The issuance of securities is exempt from blue sky laws, but transfers are not exempt unless the securities are listed on a national securities exchange (e.g., NASDAQ) or transferred to qualified purchasers. • **Marketing**—A properly planned Reg A+ offering can be a great marketing tool that provides value beyond the capital raised.	• **SEC Review**—This process is time-consuming, expensive, and can take up to 12 months for STOs. To our knowledge, at the time of publication of this article, there have not been any qualified Reg A+ token offerings. • **Audited Financial Statements**—Companies must include audited financial statements in the offering statement. • **Ongoing Reporting Obligations**—The company must file annual reports and semi-annual reports, which creates additional costs and distractions for management. • **U.S. or Canadian Entity**—If the STO is for smart securities that do not represent equity or debt in the company, or for compliant network tokens, the company often will need to pay U.S. (including state) and/or Canadian taxes on the entire amount of the capital raised as opposed to using a more efficient structure with fewer taxes paid in a more tax-friendly jurisdiction. • **State Preemption**—Blue sky laws apply to secondary trading. • **No Investment Company**—A company that meets the definition of an investment company cannot rely on Reg A+ (see below for further detail on this point.)

Regulation CF

The CF regulation provides projects with one of the fastest opportunities for fundraising. However, the upper limit is just $1.07 million. Small startups that do not require very high sums can absolutely go for it with a 1-year lock-up period within secondary markets.

There are certain limitations to adhere to in terms of investor status and relevant income.

Reg CF	
Annual offer limit	$1.07M
General solicitation	Permitted with limits on advertising
Investor requirements	Limitation based on annual income and net worth
SEC filing requirements	Form C + two years of audited financial statements
Restriction on resale	12 months
Preemption of state registration	Yes

The basic features of the CF regulation are as follows	
Diverse Investor Pool	accredited and unaccredited investors may participate
Limited Raising of Capital	companies may raise up to $1.07 million
Transfer Restrictions	investors can’t transfer securities for 12 months
Domicile	the company must be a U.S. entity
Reporting Obligations	the company must file an annual report
No Investment Company	the company must not be an investment

Security Token Regulations within the European Union

Security token offering regulations in the European Union cover all EU countries. The EU Prospectus Directive is developed for projects that are going to distribute tokens. It requires registration. and was designed under the Financial Services Action Plan to cover the EU in its entirety with one regulation governing security token offerings.

This directive was created to ensure investor protection on owned security tokens issued by a blockchain startup. It provides a more secure, transparent, comfortable solution for startups to attract investments while receiving confirmation from a single financial regulator.

The Prospectus Directive is a flexible solution for companies intending to launch a security token offering. Registration in one EU jurisdiction can be easily transmitted to other European countries. As private token offerings are also compliant with this regulation, they must be translated into each EU country's official language. Nevertheless, there could be different exceptions in the financial regulation for each EU member.

After submission of the prospectus registration application, the financial authority of the chosen EU jurisdiction sets the timeline for project verification and deliverance. Depending on the prospectus directive, the project's bank account is not obliged to be opened in the chosen jurisdiction, but it has to be registered within the European Union.

STO Regulations in Malta

Malta is open for blockchain startups and digital currencies, as its government understands global recognition of the technology and the impact it will bring.

Three bills have been developed by the Maltese government for security token offering regulations: the Virtual Financial Asset Act (VFA Act), the Innovative Technological Arrangement and Services Act (ITAC Act), and the Malta Digital Innovation Authority Act (MDIA). They have been designed for new structural development within innovative blockchain technology.

The Maltese government has created a foundation formed by legal entities with regard to the above-mentioned bills. This solution was designed to discover STO technology and its potential. In comparison with countries like the U.S., Switzerland, and Gibraltar, Malta not only requires compliance with KYC/AML verification procedures, but their STO verification role is not limited to the projects' official documentation (White Paper, Yellow Paper, etc.)

The main competitive advantage of Maltese jurisdiction over others is that because it is an EU member, once a project is registered in Malta, it is automatically compliant with other EU members.

Investment Requirements	Professional Investor Funds (PIFs)	Alternative Investor Funds (AIFs)	UCITS	SICAVs [2]
Administrator required?	Flexible – May be delegated to an MFSA approved third-party in Malta.	Required – May be delegated to a third party administrator.	Optional – Manager responsible for administration, except if appointing an MFSA approved third-party.	Required by extension of applicable fund license structure.
AML Officer required?	Required – May also act as a compliance officer.	Required	Required	Required
Annual Supervisory / Annual Return Fee	Scheme €2,000 Sub-funds: €600	Scheme €2,000 Sub-funds: €600	Scheme €3,000 Sub-funds: €450	Annual Company Returns fee – €1,600
Application Fee / Registration Fee	Scheme €2,000 Sub-funds: €1,000	Scheme €2,000 Sub-funds: €1,000	Scheme €2,500 Sub-funds: €450	SICAVs are subject to a company registration fee of €1,750
Auditor required?	Required	Required	Required	Required – Annual auditing of accounts.
Compliance Officer required?	Required – May also act as AML officer.	Required	Required	Required by extension of applicable fund license structure.
Custodian required?	Optional – Safekeeping measures must be implemented	Required	Required – must be a licensed body sanctioned by the MFSA.	Required by extension of applicable fund license structure.
Further Requirements	The MFSA accepts service providers from recognised jurisdictions.	Annual reporting required.	Monthly statistical reporting to MFSA, annual reporting required.	SICAVs are established through the Companies Act (SICAV Incorporated Cell Companies) Regulations, 2010.
Minimum investment	€100,000	€100,000	Third-party managed UCITS – €125,000 Self-managed UCITS – €300,000	Dependent on fund type – e.g. minimum for PIF structured as a SICAV – €100,000
Targeted Investors	Experienced investors Qualifying investors Extraordinary investors	Professional & Qualifying investors	Investors must have satisfactory financial resources, and demonstrate relevant experience.	Retail/Professional investors (typically suited towards PIFs) – May be incorporated as a public or private company.

2 https://icomalta.com/security-token-regulation/

STO Regulations in Switzerland

In Switzerland, security token offerings are attracting an increasing amount of attention from crypto investors and blockchain startups. According to FINMA, all security tokens are asset tokens. Swiss regulations affecting security tokens are designed to provide investors with relevant information for making wise investment decisions.

FINMA also defines security tokens as standardized, certificated or uncertificated securities, derivatives, and intermediated securities.

Tokens distributed by blockchain startups and defined as securities are standardized for trading and can go public if they are not issued to separate crypto investors.

- **STOs are Regulated by FINMA, the Swiss Financial Market Supervisory Authority**
  FINMA provides legal requirements regarding STO campaigns in Switzerland

- **FINMA Released Guidelines in 2018 Which Categorizes Tokens into 3 Groups**
  It is specifying tokens in three main groups: payment tokens (means of payment), utility tokens (grant access to the application or service) and asset/security tokens (represent actual assets like dividends, profits, or interest).

- **According to FINMA, Security Tokens are Subject to the Same Regulations as Other Securities such as Stocks, Bonds, and Derivatives**
  Launching an STO campaign, the company has to be compliant with the same laws, as stocks, bonds, or derivatives. A failure to comply with these laws can result in punishments.

- **STOs are Subject to KYC Laws**
  The KYC verification avoids the fraud and helps regulators to do their job.

- **STOs are Also Subject to the "Big Five" Swiss Banking Regulations**
  These regulations are the Stock Exchange Regulation Act, the Anti-Money Laundering (AML) Regulations, Banking Regulations, Financial Market Infrastructure Regulations, and Collective Investment Scheme Regulations. If the project aims to launch an STO campaign, it has to be compliant with all these regulations.

STO Regulations in Estonia

When a blockchain project launches an STO in Estonia, it must be compliant with a number of applicable laws.

First of all, when a project intends to issue and distribute security tokens, it must be compliant with the Estonian Financial Supervision Authority, which requires registration of the prospectus. There are a few exceptions to this regulation. Prospectus registration is not required if the project meets any of the following conditions:

- security tokens will be distributed exclusively between qualified investors
- the securities offer is provided to 150 investors or less, except for qualified investors
- the securities offer is addressed to investors who purchase securities at a total cost of at least 100,000 euros for each investor and each individual offer
- securities offers with nominal/book value must equal at least 100,000 euros per security
- securities offers must have a total remuneration of 2.5 million euros or less for all contracting states in the amount calculated for one year.

If a project doesn't meet the above-mentioned conditions, its offer is defined as a public offer, and the project must register its prospectus with the EFSA.

There are a few countries in the EU that don't require a prospectus. For example, if a security token is issued in the Czech Republic, a prospectus is not necessary if the total value of issued securities does not exceed 1 million EUR (1.5 million EUR in Luxembourg, 2.5 million EUR in Poland and Sweden, and 5 million EUR in Croatia, Spain, and the U.K.). The new Prospectus Regulation states that if the issuer is raising up to 8 million EUR, the country of issuance can decide whether or not the issuer needs to issue a prospectus.

The Most Friendly STO Jurisdictions

Generally, selection of the most friendly STO jurisdiction depends upon the country's certainty that STO legal aspects will be respected. According to current market information, most countries around the world provide either restrictions or strict laws that work to prevent fraudulent projects. Nevertheless, there are a few jurisdictions that provide a friendly environment and flexible regulations regarding STOs and blockchain startups.

STO Regulations in Lithuania

Lithuania is becoming the main fintech hub in the EU that attracts blockchain-based companies. It has accomplished a huge amount of work in the STO field in terms of compliance and regulation. The Ministry of Finance of Lithuania has developed multi-institutional interpretations for the companies hoping to launch STOs in the areas of taxation, compliance with European Union financial regulations, and accounting.

Lithuanian governmental authorities like the Ministry of Economy and the Ministry of Finance have approved and are supporting the DESICO project, which is developing a platform that will provide a full package of STO-related services to blockchain startups. The DESICO platform will be operating under Lithuanian regulations in France, as well, and will provide the ability not only to issue securities, but also to trade them in compliance with European Union regulations.

STO Regulations in Israel

Nowadays, Israel is becoming a very attractive location for blockchain companies that are developing cryptocurrency exchanges and launching token generation events. Its government is providing a huge amount of support for innovative technology and hopes to become a "crypto hub".

A few government authorities, such as the Israeli Anti-Money Laundering Authority, the Israel Tax Authority, and the Israel Securities Authority ("ISA") that provide regulations for Security Token Offerings. Any project planning to launch an STO campaign must be compliant with Israel's security laws.

As a benefit for ICO/STO companies that meet certain qualifications, the Israeli government is providing flexible taxation. Furthermore, these benefits will increase if companies are less developed economically. These areas include regions in the north and south of Israel as well as Jerusalem. In these cases, tax rates could be decreased up to 6% (in comparison to 12% and 23%).

STO Regulations in Singapore

The government of Singapore offers a friendly-enough policy toward companies planning to launch Security Token Offering campaigns.

According to market information, in the first quarter of 2018, there were 11 successful Token Generation Events registered in Singapore, in comparison to 10 in Switzerland and 6 in the U.S. The Monetary Authority of Singapore (MAS) has developed a regulatory sandbox designed primarily for companies that work with innovative technologies.

The Guide to Digital Token Offerings, designed by the MAS, equates digital tokens with shares or bonds so their regulations can be compliant with the Securities and Futures Act. In this case, a company planning to launch an STO passes a traditional registration process with the Monetary Authority of Singapore through registration of a prospectus.

There are few exceptions to prospectus registration, which are as follows:

- The size of the issue does not exceed 5 million U.S. dollars within 12 months.
- There are fewer than 50 persons in private placement within 12 months.

SECURITY TOKEN STANDARDS

Security tokens can be deployed under different token standards within the campaign launch. As long as a token is backed up by real-world value, it is considered to be a security.
Ethereum-based tokens following ERC standards can be used during the security token offering.

ERC Token Standards

Since the ERC standard is the most adopted and widely used in the crypto community, let's review its characteristics.

ERC token standards are developed on top of the Ethereum blockchain. This platform is capable of storing transactions, and acts as a VM (virtual machine) to encode and execute smart contracts. ERC token standards simplify project development by creating a decentralized environment and network functionality optimization.

Ethereum-based tokens have the advantage of being able to represent an entire project or technology. These assets can be created for security token offerings based on an Ethereum smart contract. The company is then able to conduct a token offering to raise capital for project development.

Token disposal, fee payment, and commissions can be conducted in ETH, BTC, or fiat. In this case, investors can purchase tokens according to the ERC standard and transfer crypto or fiat payments into the STO's wallet.

ERC token standards are unified, playing the role of crypto-asset, digital currency, and shares. It should be stressed that they are compliant with the required address format, and serve as shares. This provides the possibility of gaining income from future dividends. Stakeholders can take part in the company's management processes controlling token transfer, consumption, and maintenance.

Nowadays, there are several security token standards, that can be used for a Security Token Offering, including the ST-20 token, which was developed by the Polymath; the R-Token, developed by the Harbor; and ERC standards like ERC1400, ERC1404, and ERC1410, which were proposed by the crypto community.

The description presented below provides a brief understanding of these standards and the differences between them.

ST-20 Token Standard

The ST-20 token standard was developed by the Polymath team, and represents the same ERC-20 token standard, with the supplemental feature of obligatory certification for both individual investors and institutional investors.

It allows investors to be compliant with governmental regulations while participating in Security Token Offerings. Furthermore, it offers the opportunity to use additional modules in the VerifyTransfer function.

VerifyTransfer is the most significant function in the ST-20 token standard, and includes the following modules:

- Whitelisting support
- Blacklisting support
- Transfer limit settings
- Restrictions on token transfers

The SecurityToken ST20 is an implementation of the ST-20 protocol that allows the addition of different modules to control its behavior. Different modules can be attached to a SecurityToken:

TransferManager modules: These control the logic behind transfers and how they are allowed or disallowed. By default, the ST (Security Token) gets a GeneralTransferManager module attached in order to determine if transfers should be allowed based on a whitelist approach.

The GeneralTransferManager behaves differently depending who is trying to transfer the tokens.

a. In an offering setting (investors buying tokens from the issuer) the investor's address should be present on an internal whitelist managed by the issuer within the GeneralTransferManager.
b. In a peer to peer transfer, restrictions apply based on real-life lockups that are enforced on-chain. For example, if a particular holder has a 1-year sale restriction for the token, the transaction will fail until that year passes.

Security Token Offering **(STO) modules**: A SecurityToken can be attached to one (and only one) STO module that will dictate the logic of how those tokens will be sold/distributed. An STO is the equivalent to the Crowdsale contracts often found present in traditional ICOs.

Permission Manager modules: These modules manage permissions on different aspects of the issuance process. The issuer can use this module to manage permissions and designate administrators on his token. For example, the issuer might give a KYC firm permissions to add investors to the whitelist.

Checkpoint Modules. These modules allow the issuer to define checkpoints at which token balances and the total supply of a token can be consistently queried. This functionality is useful for dividend payment mechanisms and on-chain governance, both of which need to be able to determine token balances consistently as of a specified point in time.

Burn Modules. These modules allow issuers or investors to burn or redeem their tokens in exchange of another token which can be on chain or offchain[3].

3 https://github.com/PolymathNetwork/polymath-core

R-Token Standard

The R-Token was developed by the Harbor team, and includes transfer() and transferFrom() methods from the ERC20 token standard. Additionally, it has implemented a check feature for token transfers. The check() function can be presented in different forms, but the solution designed by TokenRegulatorService is the default approach for whitelisting. Permissions affecting participants and token transfers can be utilized in various combinations for compliance with government regulations. There is also the ServiceRegistry mechanism, designed to make the process of R-Token upgrade easier. Regulations are changing according to market needs.

Components	Features
RegulatedToken: • Permissioned ERC-20 smart contract representing ownership of securities • Compatible with existing wallets and exchanges that support the ERC-20 token standard • Overrides the existing ERC-20 transfer method to check with an on-chain Regulator Service for trade approval **RegulatorService:** • Contains the permissions necessary for regulatory compliance • Relies on off-chain trade approver to set and update permissions **ServiceRegistry:** • Accounts for regulatory requirement changes over time • Routes the R-Token to the correct version of the Regulator Service	• Configurable without code modification and need for more security auditing • Upgradable so an owner/admin can change business logic as rules evolve over time • An owner/admin can lock/unlock trading for a period of time • An owner/admin can whitelist/blacklist partial token transfers • An owner/admin can qualify/disqualify a trade participant from sending tokens • An owner/admin can qualify/disqualify a trade participant from receiving[4] tokens

ERC1400 Token Standard

In the ERC1400 contract, token transfers are separated into several sections. In this case, there is the ability to provide restrictions on:

- dividends
- voting processes
- other functions, not just restrictions on addresses.

Below are outlined the requirements for a ERC1400 token standard agreement:

- MUST have a standard interface to query if a transfer would be successful and return a reason for failure.
- MAY be able to modify metadata at time of transfer based on off-chain data, on-chain data and the parameters of the transfer.
- MAY require signed data to be passed into a transfer transaction in order to validate it on-chain.
- MUST be ERC20 compatible.
- SHOULD be ERC721 compatible.
- SHOULD be ERC777 compatible[5].

4 https://github.com/harborhq/r-token
5 https://github.com/ethereum/EIPs/issues/1400

ERC1404 Token Standard

The ERC1404 token standard took over the competitive advantages of the ERC20 token standard with the implementation of a few enhancements in restrictions on token transfers. The ERC1404 token standard has two main implemented functions:

- **detectTransferRestriction**
  This implemented function provides the issuer with the ability to develop restriction logic for token transfer.

- **messageForTransferRestriction**
  This implemented function provides an explanation with a message to the token holder about why the token transfer is being restricted.

In order to be compliant with the securities laws, the issuer will have to restrict the ERC20 token transfers. The further motivation for ERC1404 token standard utilization includes:

- Enforcing Token Lock-Up Periods
- Enforcing Passed AML/KYC Checks
- Private Real-Estate Investment Trusts
- Delaware General Corporations Law Shares[6]

ERC1410 Token Standard

The ERC1410 token standard offers partially-fungible features, and is presented as an extended version of the ERC777 token standard. It provides an interface that supports numerous sections for grouping passes. In this case, each grouping pass requires a key identificator and a balance to provide limitations from the operational side.

A Partially-Fungible Token allows for attaching metadata to a partial balance of a token holder. These partial balances are called partitions and are indexed by a bytes32 _partition key which can be associated with metadata on-chain or off-chain.

The specification for this metadata, beyond the existence of the _partition key to identify it, does not form part of this standard. The token holders address can be paired with the partition to use as a metadata key if data varies across token holders with the same partition (e.g. a "restricted" partition may be associated with different lock up dates for each token holder).

For an individual owner, each token in a partition therefore shares common metadata.

Token fungibility includes metadata, therefore, we have:

- for a specific user, tokens within a given partition are fungible
- for a specific user, tokens from different partitions may not be fungible

It is important to note that partitions with the same bytes32 key across different users may be associated with different metadata depending on the implementation.

Token Specifications:

- **balanceOf.** Aggregates a token holders balances across all partitions. Equivalent to balanceOf in the ERC-20/777 specification. MUST count the sum of all partition balances assigned to a token holder.

- **balanceOfByPartition.** As well as querying total balances across all partitions through balanceOf there may be a need to determine the balance of a specific partition. For a given token holder, the sum of balanceOfByPartition across partitionsOf MUST be equal to balanceOf.

- **partitionsOf.** A token holder may have their balance split into several partitions (partitions) - this function will return all of the partitions associated with a particular token holder address.

- **totalSupply.** Returns the total amount of tokens issued across all token holders and partitions. MUST count all tokens tracked by this contract[7].

6 https://github.com/ethereum/EIPs/issues/1404
7 https://github.com/ethereum/EIPs/issues/1410

Non-ERC Token Standards

In addition to traditional ERC tokens, other blockchain tokens can be used in the context of a security token launch. As mentioned above, the main feature these token must possess is backup by real-world value.

Stellar XLM

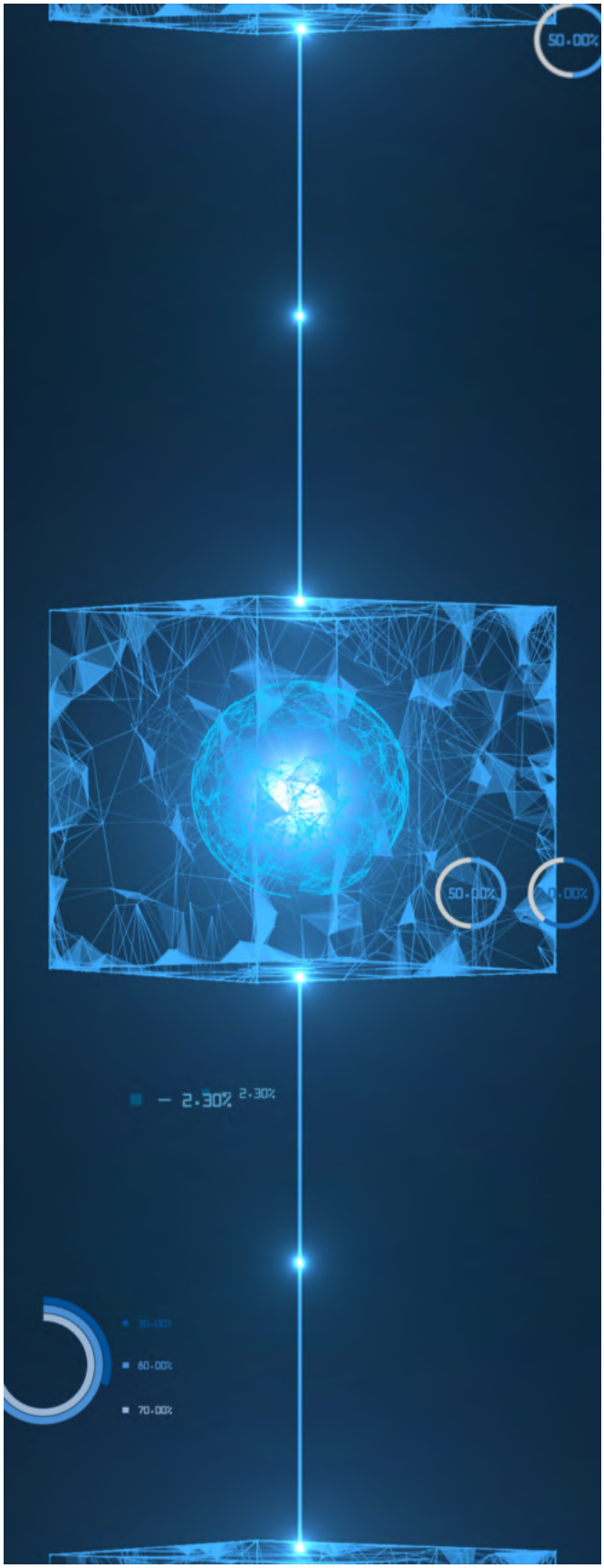
Stellar XLM, for instance, is one of the examples utilized in the STO process. Its protocol is on the path of moving towards legally-compliant STOs. DSTOQ, for example, which is a licensed stock exchange, recently launched a P2P marketplace for security tokens on top of the Stellar protocol. In contrast with such platforms as Polymath or Civic, Stellar was created to eliminate Ethereum's limitations and provide:

- added AML requirements
- issuance of tokens by crypto-beginners
- limited access to token ownership
- Implementation of KYC requirements

EOS

EOS is an open-source blockchain platform for decentralized applications, that had launched its mainnet in summer 2018. It has designed the Financial Security Protocol, that allows the deployment of EOS-backed security tokens. Security tokens, that are designed by the EOS, can compete with the Ethereum based ERC1400 token standard, but includes additional modules for more efficiency:

- **fsp.security** is responsible for issue, transfer and life-cycle management of securities
- **fsp.regulator** acts as a gate-keeper of the protocol, setting up a certain set of rules
- **fsp.exchange** provides a point of liquidity for instances of fsp.security
- **fsp.registry** is responsible for KYC / AML checks and verification
- **fsp.communication** is responsible for processing communication within the protocol



8 http://bit.ly/eos-enters-the-security-token-scene

THE STO ECOSYSTEM

To dive deeply into an STO ecosystem, it is crucial to understand the process of a security token offering launch as well as the parties involved in the process.

First, the company planning to issue securities needs to understand their reasons for tokenization. Benefits include the following:

- high degree of asset fractionalization
- high liquidity
- low fees
- increased market acceptance and efficiency

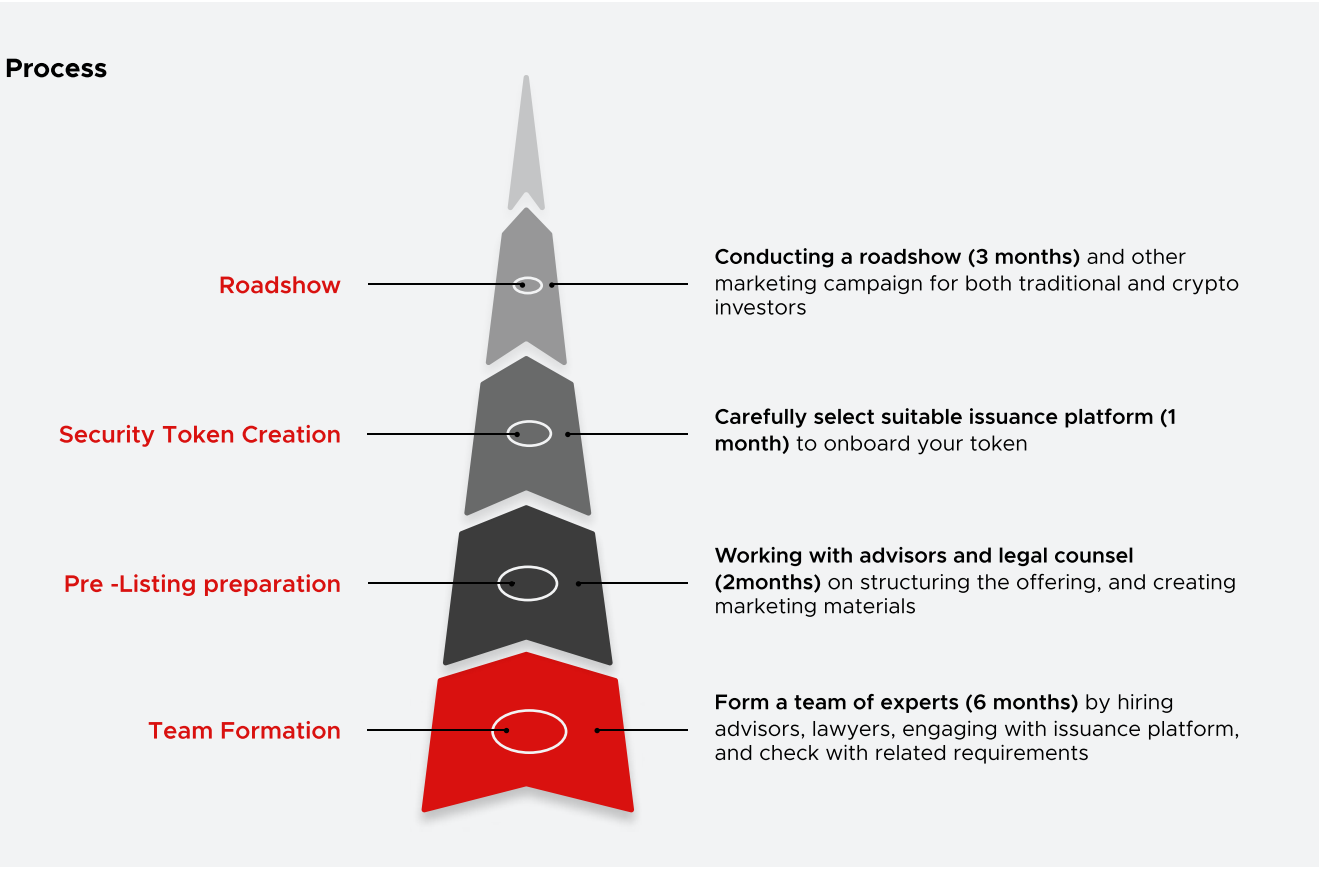
The main advantage lies in access to a capital pool. Considering the fact that security tokens can be purchased and sold globally in accordance with relevant regulations, their price is set in a fair and reasonable way so as to be attractive stakeholders. SEC compliance provides a solid, secure campaign structure and appeal in terms of technological innovation.

The STO Launch Process

The entire STO timeline commonly lasts for approximately one year, including four major stages of preparation.

When a company or project starts preparing a security token offering, it is important to keep in mind that the process of preparation may last for six months and include the following:

- team formation (advisor/lawyer/legal counsel hiring)
- pre-listing preparation (structuring the STO)
- security token creation (issuance and technical platforms)
- defining and implementing the marketing strategy; roadshow travel for investor engagement



Team Formation

This stage commonly takes the most time: about six months. It is important to form a team of true experts in order to ensure smooth project execution.

The team should include diverse members from a range of various industries: legal, marketing, business development, financial (accounting), and so on. Consultancy with all the above-mentioned members guarantees the proper trajectory of project development.

The legal aspect is especially important in terms of choosing the right regulatory basis for security token compliance and following the rules of the appropriate jurisdiction.

During this stage, it is also time to research the issuance platforms that will serve all user, company, and investor needs.

Pre-Listing Period, STO Structure

Taking into account expert feedback, this stage, which takes approximately two months, involves preparation of structure, marketing strategy, and the PR campaign.

White-Paper Creation

The white paper is an integral document for any security token offering. It summarizes company information, goals, and intentions within the current market and outlines the technology with which the project will reach its goals. It should mostly focus on the solution and outline full company information for investors.

Commonly, the first stage of any token sale is a private sale. The main audience for the private sale is investors. Therefore, it is crucial to prove to potential investors that the project will solve a range of issues in the current market, has novelty in its approach, and promises to fulfill its goals and intentions. An integral part of this process is providing investors and venture capitalists (as well as the community) with precise business-plan development, which must be included in the white paper.

The business plan outlines the company's road to the achievement of set goals and tasks. It is necessary to understand the operational model and its monetization activities. This includes target market evaluation, estimation of market share, and the company's projections in terms of future revenue, expenditures, and total profit.

Our recommendation is to think about the following definitions in the business-plan development:

- the company's business model, use cases, and unique value
- the target market with market-share projections
- the financial model with key projections (e.g., revenue, OpEx, CapEx, and profit).

Token Creation

As long as the legal aspect is clarified and the marketing strategy is implemented step by step, the company can start focusing on token creation.

The company must make a decision concerning the issuing platform. As of today, there is a range of platforms to choose from. A list is presented below. In the Polymath example, the token creation can be divided into the following points:

1. Register token symbol. In this step, the token name and token symbol will be reserved for 15 days. Creation of the token should be done within the time limit.

2. Choosing providers. There is a range of partners, including advisory, the legal team, KYC/AML providers, and the marketing team, which offers help to the STO.

3. Token creation. Additional information, such as websites or a legend, can be added. After that, token issuance can be completed.

4. Detailing the offering. Here are some details that should be considered:

    - Start/end date: inform potential investors of the time period for investment.
    - Accepted payment: state if the token is being raised in POLY or ETH
    - Hard cap: state the maximum amount of money that will ideally be raised.
    - Rate: state the percentage of POLY or ETH at which the token is valued.

5. Whitelisting investors. Whitelisting allows investors to participate in the STO. When investors send POLY or ETH token to the STO contract, the company's token will be given to them. The whitelist can be updated at any time during the STO.

Marketing Strategy Implementation

A strong marketing plan is a crucial point for project development. A project can have a very useful and necessary product, but without the right marketing plan, it could easily fail. Choosing the correct marketing strategy will lead the project to success.

In terms of the marketing campaign, it is important to introduce the security token to the community. Identify its structure and properties, provide additional information about the team, and propose the white paper. All of this should be delivered via the correct marketing channels and social platforms for the appropriate audience. Keep in mind the following marketing-plan elements:

- **Website Development**
  The website is the seed point of the marketing strategy, as it is the place where trust is built and where potential investors decide whether or not to invest.

- **Search Engine Optimization**
  Correctly-performed SEO ensures a cost-effective, long-term source of targeted, interested traffic.

- **Media Outreach and PR**
  This section of the marketing plan should include press releases, guest posts and articles, and coin listings on ICO rating resources.

- **Email Marketing**
  This marketing campaign should be conducted very carefully, as sending individual/personal emails too often or without a concrete content could be defined as spam.

- **Social Media and Community Marketing**
  Social media and community management is a crucial part of any successful ICO marketing plan. This part should include posting information on the project updates on free resources like Reddit, Facebook, and Twitter, specialized forums, Quora discussions, etc.

- **Bounty Campaigns**
  Bounty programs also play an important role in marketing campaigns, as they provide incentives and rewards that can be used for the future.
  All of the mentioned-above activities can easily guarantee additional trust for the project from the crypto community. In addition, the marketing plan should include roadshow details and goals. Keep in mind that different regulations have different approaches to marketing strategy, and certain information should not be revealed publicly. It is important to comply with the rules of the appropriate jurisdiction.

Security Token Sale

When everything is done and tokens are being offered to the community, the company should provide their support to investors and and keep them updated on the latest changes. This will ensure a trustless relationship between the company and investors.

MAJOR TECHNOLOGY PLAYERS

Having discussed the main stages of the STO launch, let's take a closer look at the major technology players.

Token Issuers

Security Token Issuers form a significant share of the STO ecosystem, as they provide the framework for legal aspects, the KYC and AML verification processes, development, and deployment of token-flow infrastructure.

Below is a brief description of the leading agencies forming the security token ecosystem.

TokenGear	**TokenGear** is a full-fledged solution for customized launching of token offerings with a user-friendly configurative interface, scalable payment system, and KYC verification system.
OWN	**WeOwn** is a blockchain-based financial asset tokenization platform designed to provide significant benefits to equity capital markets through disintermediation of legacy market practices.
NEUFUND	**Neufund** provides an end-to-end solution for asset tokenization and issuance.
Abacus	**Abacus** is an administration platform for tokenized securities.
SECURRENCY	**Securrency** offers clients a streamlined issuance process, global identity and wallet proofing, and an API and abstraction layer in addition to an enhanced liquidity model.
tokeny The Trusted Tokenization Platform	**The Tokeny** sale platform allows companies to focus on their business concept, marketing, and all the other aspects of their ICO or STO without needing to be concerned with any of the technical challenges.

SECURITONOMY	**Securitonomy** allows the complete issuance and management of tokenized securities, and is based in Malta, one of the industry's most progressive jurisdictions.

Agencies

Blockchain agencies can provide services like legal advisories, technical development services, consulting, and marketing campaigns. They make up a vast section of the STO ecosystem.

Applicature	**Applicature** is blockchain development agency that works on projects in the blockchain industry involving the development of smart contacts as well as theresearch, deployment, and customization of blockchain solutions. Applicature is a technical advisory to blockchain companies and technical consultancy on token offerings.
New Alchemy	**New Alchemy** is a strategy and technology advisory group specializing in tokenization on the blockchain. It is one of the only companies able to offer a full spectrum of guidance, from tactical technical execution to high-level theoretical modeling.
AmaZix	**AmaZix** offers professional crypto ICO consultants with technical expertise who provide excellent support and are led by an elite team of managers.
PROTOS ASSET MANAGEMENT	**Protos** is a financial advisory and asset-management firm focused on the blockchain sector.
FLUIDITY	**Fluidity** provides technology services to registered broker-dealers, issuers, and financial institutions for tokenized securities.

Exchanges

Security Token Exchanges provide token access while ensuring that liquidity remains an integral part of the ecosystem as a whole. Consider the list below before choosing a final option for listing services.

Bancor Protocol is the standard for the creation of Smart Tokens: cryptocurrencies with direct, built-in convertibility through smart contracts. Bancor utilizes an innovative token "connector" method to enable formulaic price calculation and continuous liquidity for all compliant tokens without needing to match two parties in an exchange.

Blocktrade.com is a top-tier trading facility for security tokens, crypto assets, Crypto Traded Indices, and other tokenized assets.

iSTOX is a future-ready capital market platform set to usher in a new era for capital fundraising through the use of Security Token Offerings (STOs). As a flexible, inclusive and efficient capital market platform, iSTOX will greatly benefit companies looking to raise capital and investors seeking bespoke investment opportunities.

The KoreProtocol is a tool for tokenized securities. It is a multi-jurisdictional protocol that has been designed for the protection of investors, issues, and other participants in private capital markets around the world.

LCX, the Liechtenstein Cryptoassets Exchange, is a blockchain ecosystem for professional investors. LCX provides crypto custody service called LCX Vault, a crypto trading desk called LCX Terminal, an advanced trading platform for security tokens and other cryptoassets called LCX Exchange, and an international fiat-to-crypto exchange called Binance LCX, which is a joint venture with Binance.

Ledgity is a platform and mobile application fully dedicated to security tokens, from issuance to peer-to-peer exchange. All users finally have access to a technology that is 100% compliant with applicable laws and regulations governing security tokenization.

"**The Malta Stock Exchange [MSX]** became a reality upon enactment of the Malta Stock Exchange Act in 1990, and commenced its trading operations on 8 January 1992." As of September 11, 2018, Malta has signed a Memorandum of Understanding with leading crypto exchange Binance to jointly develop an exchange for security token trading.

OpenFinance Network seeks to offer a U.S. securities regulation-compliant trading venue for security tokens followed by a "full process platform" that includes issuer templates for security tokens as well as "advanced investor tools."

STOKR will be a crowd investment platform powered by the Ethereum blockchain to create independent access to new capital markets. Through EU-compliant security token offerings (STOs), everyday investors can directly fund innovative start-ups and SMEs in return for a share of the venture's future profits.

Templum seeks to offer both a platform for the initial sale of security tokens and an exchange for subsequent trading on the secondary market.

tZero is building an exchange platform that seeks to offer traders access to the security token secondary market by providing encrypted accounts, a trading venue, and clearing/settlement services.

VRBex plans to be the premier exchange for investors seeking to exchange or trade cryptocurrency and to invest in crypto-assets such as security tokens.

LAUNCHING WITH TOKENGEAR

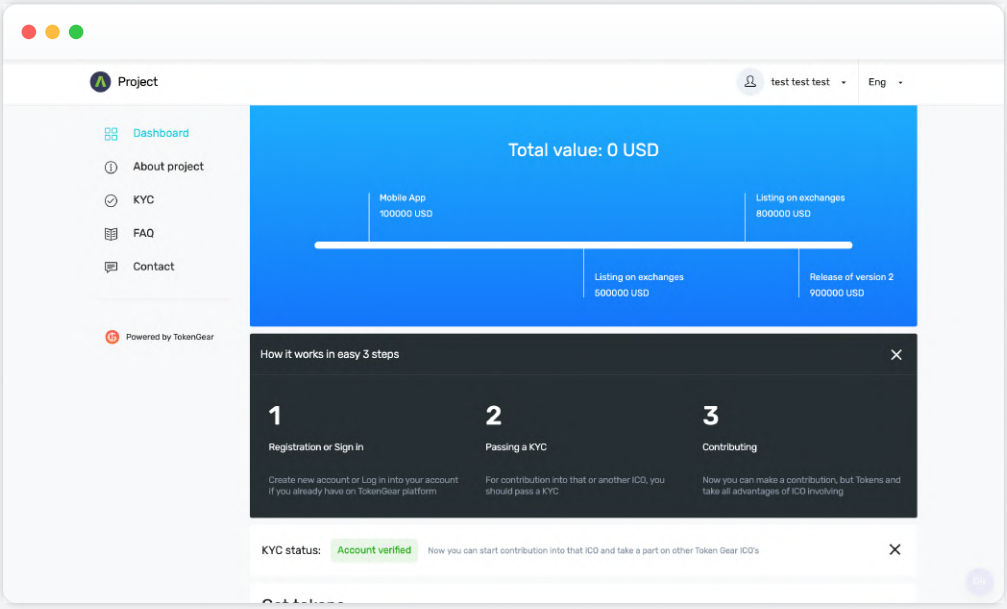
TokenGear is a full-fledged solution for customized launching of token offerings with a user-friendly configurative interface, scalable payment system, and KYC verification system. All movement on the platform requires just a few clicks to be fulfilled. In order to fully understand platform functionality, let's investigate TokenGear from different perspectives: user and admin.

User Dashboard

1. **Milestones.** The contribution dashboard is easily adjusted according to user requirements. The user has the ability to view project milestones. In order for investors to effectively manage their investments, there is also an escrow-based solution: FundGuard. Milestone-based money flow reduces the risk of inadequate funds while a smart contract makes transactions safe and easily trackable for both investors and founders.

2. **Registration process.** In order to become an active participant on the platform and be granted rights for further transactions, users need to go through a 3-step verification process:

   - Registration or signup
   - Passing KYC
   - Contribution

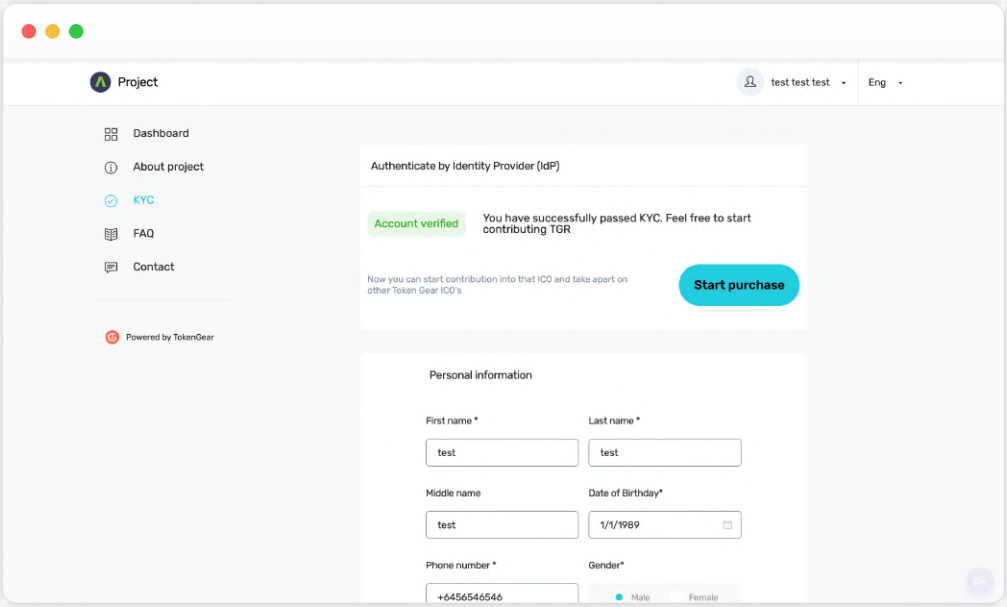


About the Project

Before passing KYC, users need to learn more about the project. The platform allows viewing of the project's description with all necessary details for further interaction with team members.

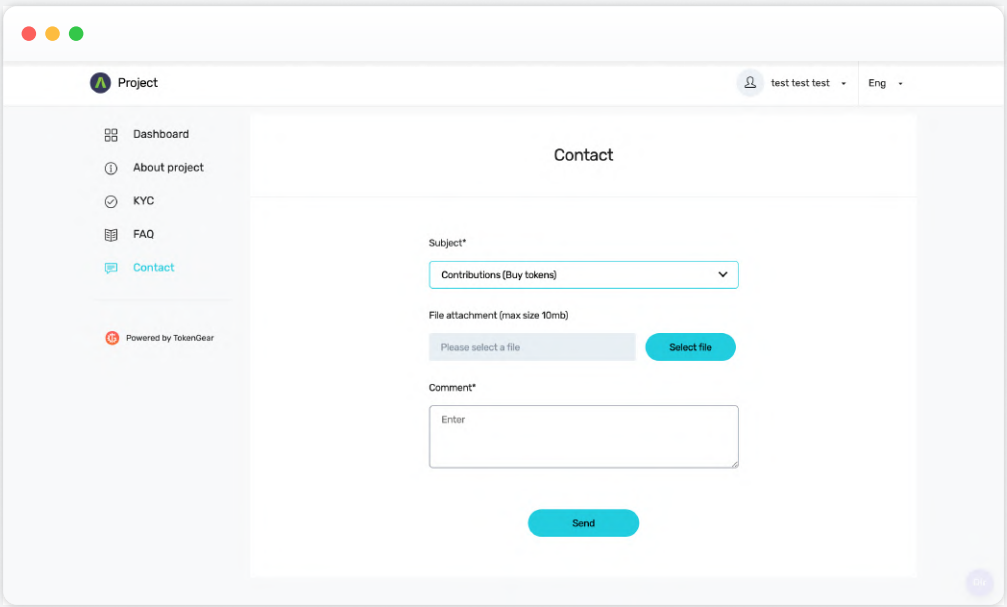
KYC Verification

With KYC integration functionality, the system ensures the selection of trustworthy contributors to prevent fraud and any illegal behavior. After filling out the required identification information, users can be verified automatically by choosing a third-party provider, or data can be manually confirmed or declined by an admin.



FAQ & Contact Section

Users can choose an appropriate means of communication with the team. FAQ and contact integration are alternatives for support and interaction between parties.

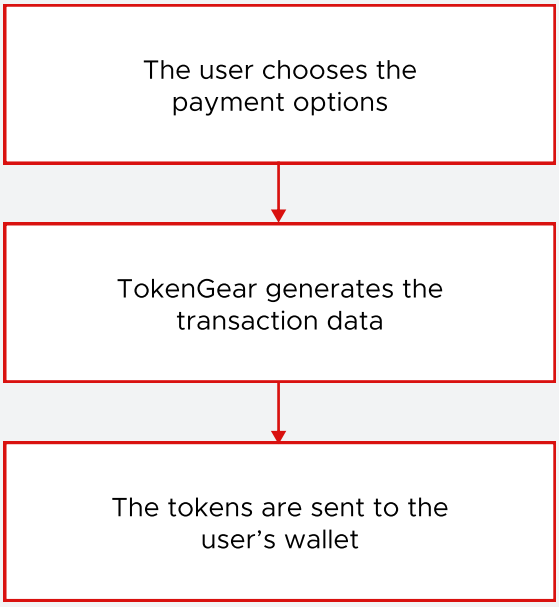


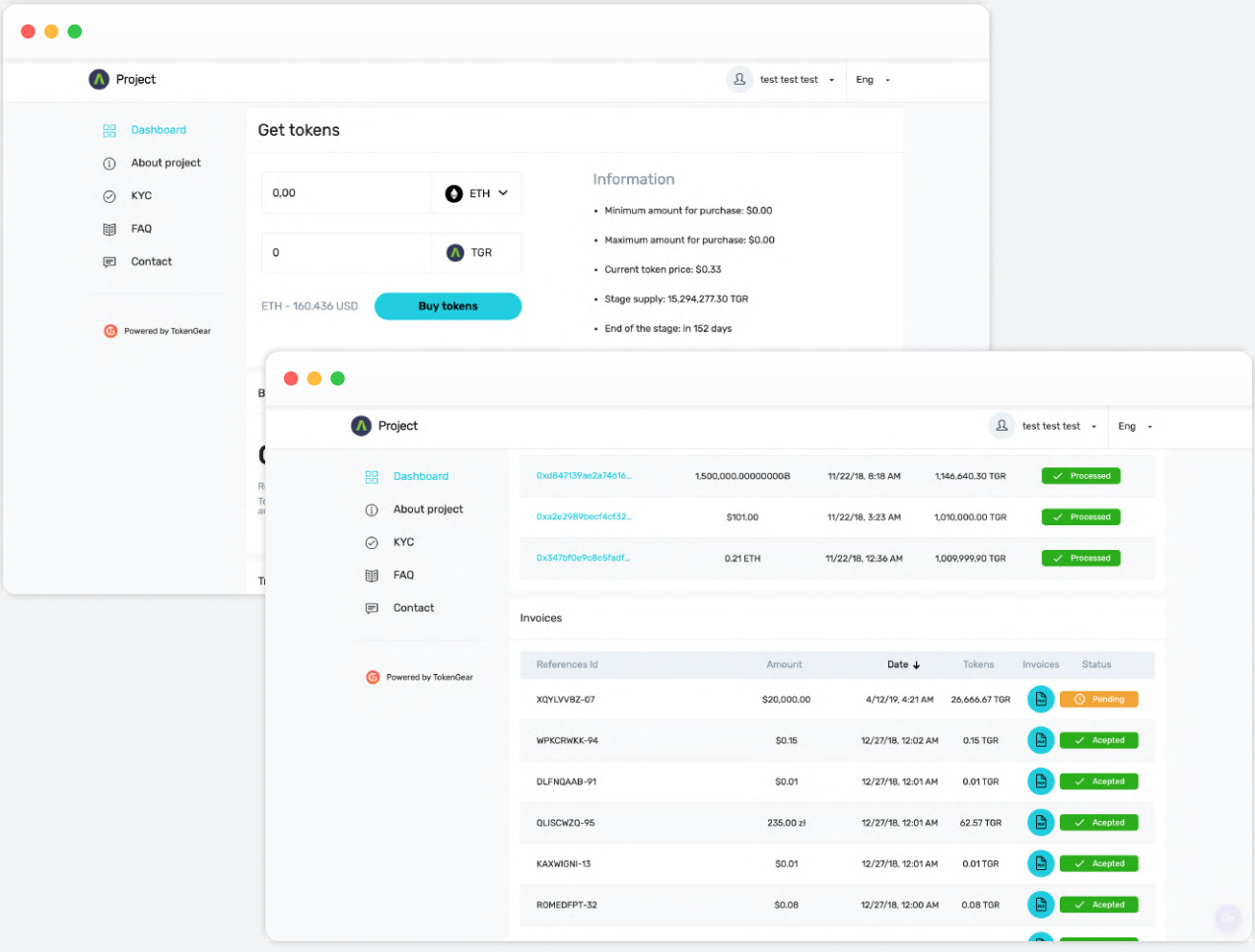
Contribution Flow

Once the KYC verification process is complete, the next step is contributing funds and getting tokens. The platform offers multiple payment methods to facilitate the payment procedure for each user. There are various options for contribution:cryptocurrencies, FIAT, the Shapeshift payment method, bank wire transfers, or payment-processing companies.
Users choose the payment option >>> TokenGear generates the transaction data >>> tokens are sent to the user's wallet.

Through the smart-contract suite, rewards are adjusted within seconds.

In this section, the contributor can view the current state of the token sale and track completed transactions and available token balance for his/her account automatically after successful payment.





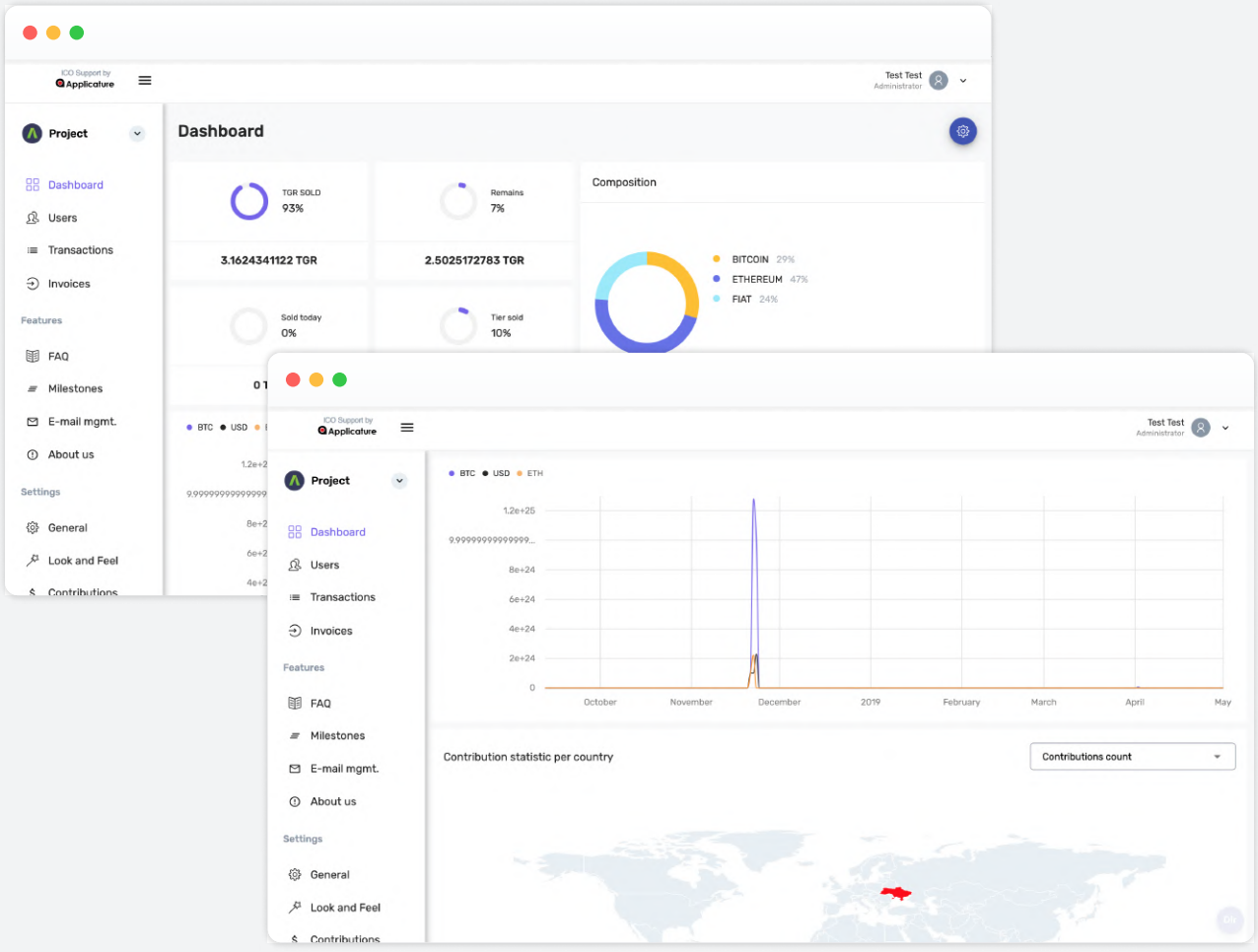
Admin Platform

Dashboard

The functionality of the admin panel allows wide-ranging opportunities for easy, smooth contribution management. There is a multitude of additional modules for better user engagement. Project members can analyze the current situation by viewing analytical data with statistics diagrams & charts reflecting the state of contributions by distribution in coins, sold tokens,etc.

Statistics reflecting data for the number of tokens sold over a certain time period are provided in the format of a time chart. This option is a valuable tool for marketing teams in terms of integration of data for promotional activities.

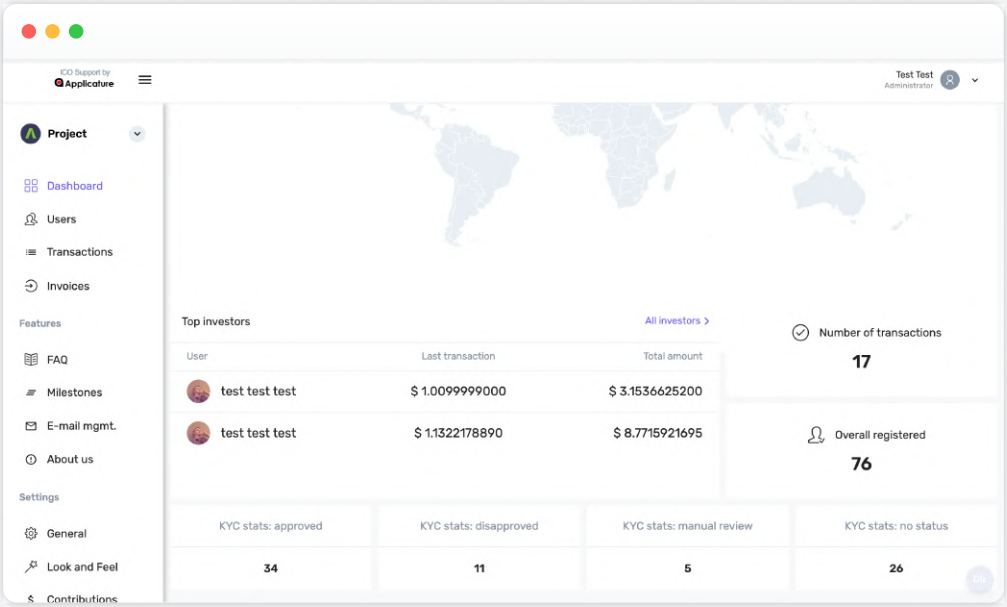
Contribution statistics by country are provided in the form of a heat map. Admins can get data in the following formats:



Contribution statistics by country are provided in the form of a heat map. Admins can get data in the following formats:

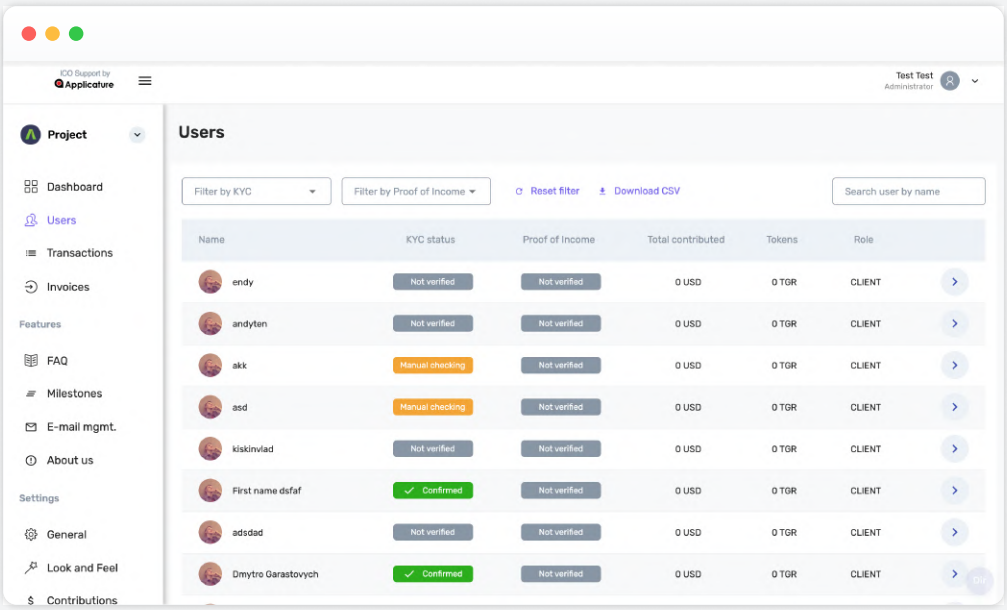
- Contribution amount
- Average contribution amount per contributor
- Average contribution USD amount per contributor
- Contributor count

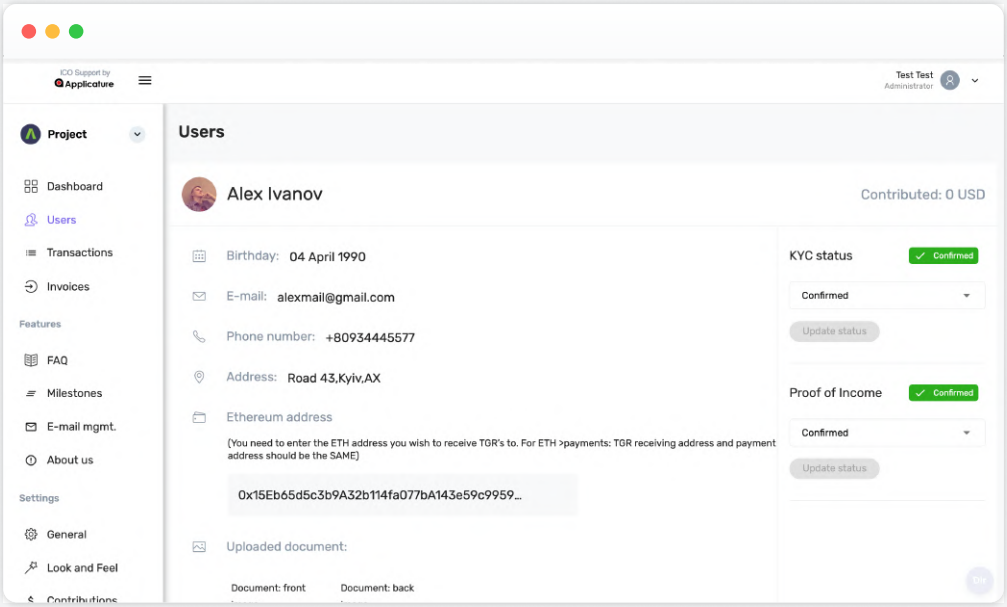
Admins see top investors and the overall number of registered members and fulfilled transactions, including detailed data on the KYC verification process.



User Management

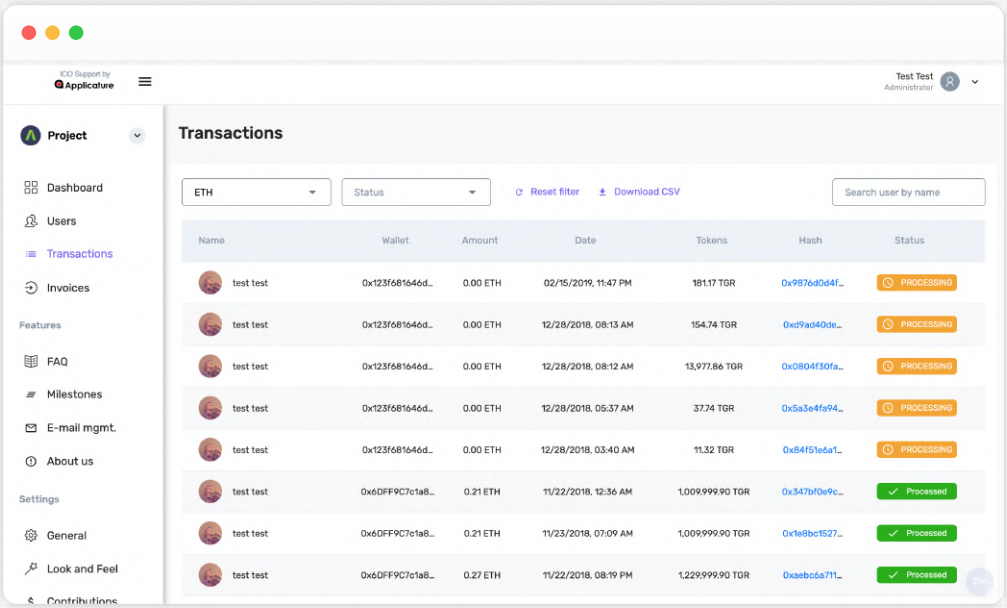
In the user dashboard, one can filter users by KYC and Proof of Income, view KYC status, and carry out manual verification.





Transactions

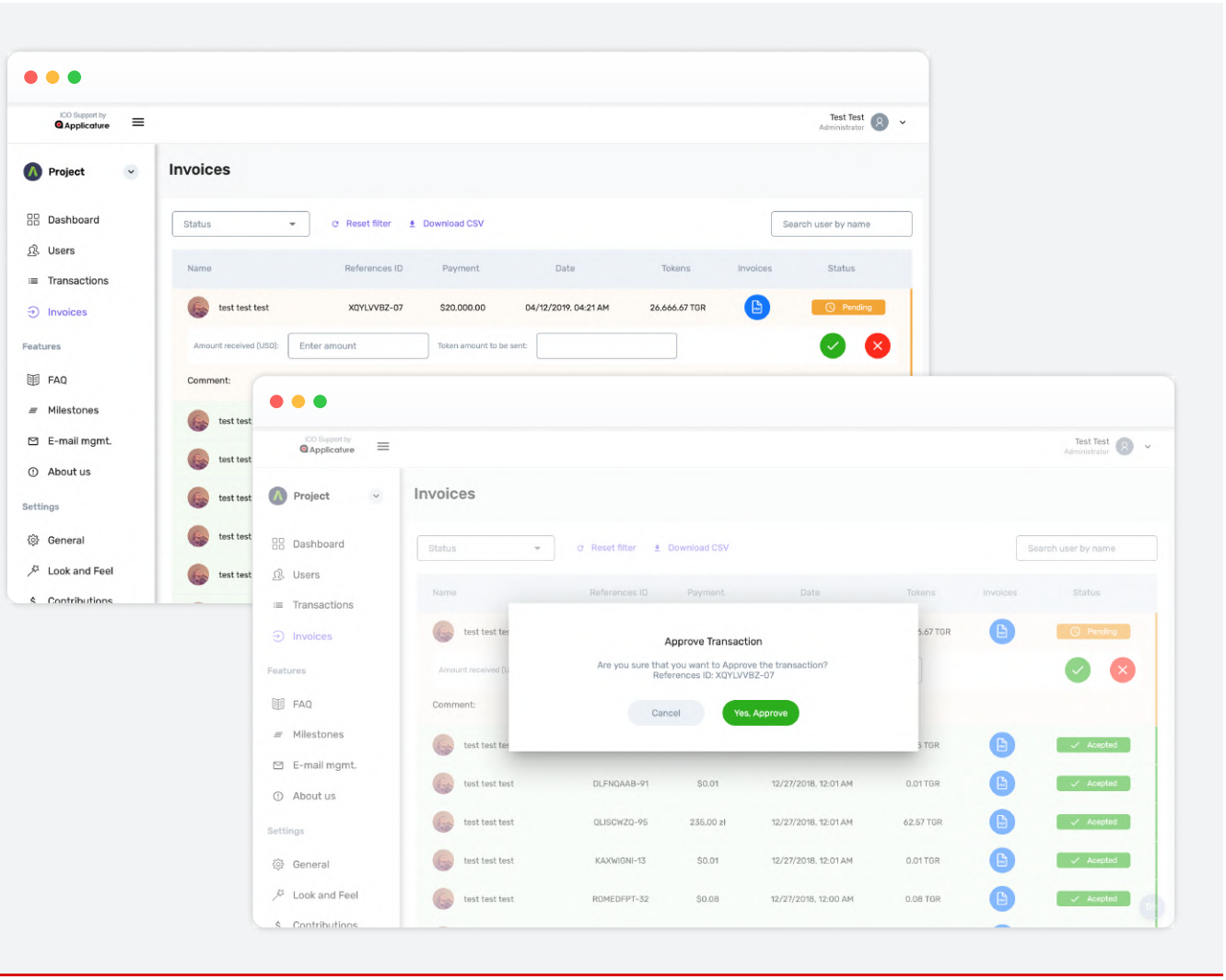
This functionality allows viewing of the full transaction history, details, and the current state of any given transaction. Users can see all completed and pending transactions. With TXHashes, users get the picture of who contributed to a project and when. Admins are also granted the right to download CSV files for analysis and assessment of data. This option allows viewing of statistics for further analytical research based on transaction completeness.



Invoices

This procedure is conducted manually by filling out all information about contributions made through invoices and manually verified.

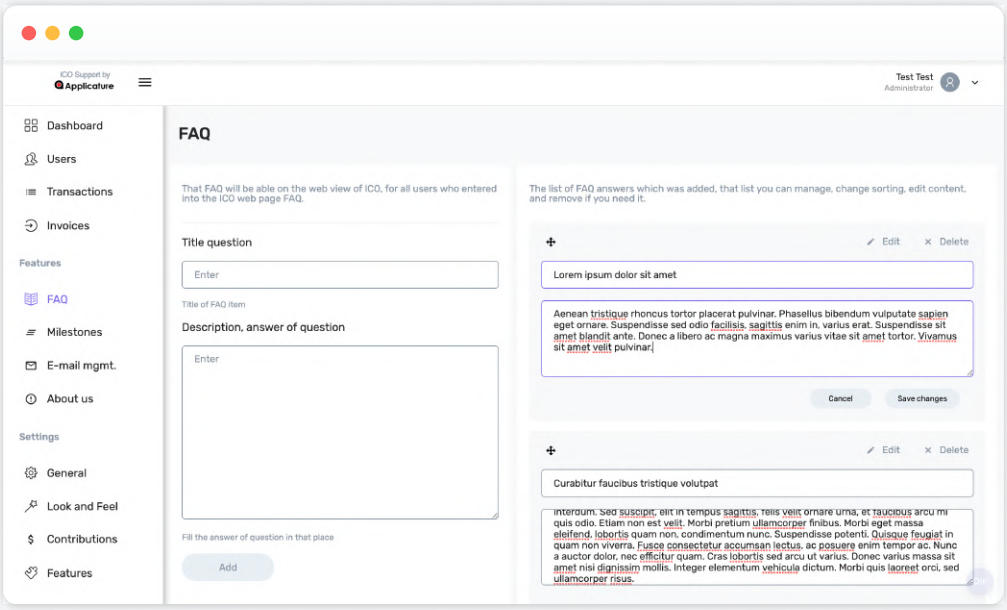
Admins supervise compliance with bank accounts, manually filing the received amount. There is an option to tie bank accounts in order to automatically receive financial data and see operations conducted on the account. The owner of the bank account is attached to a specific cabinet dashboard, and manages the process by inserting data from the bank involving the contribution amount. This takes place with a reference ID to perform automated calculations and approve transactions.



Features

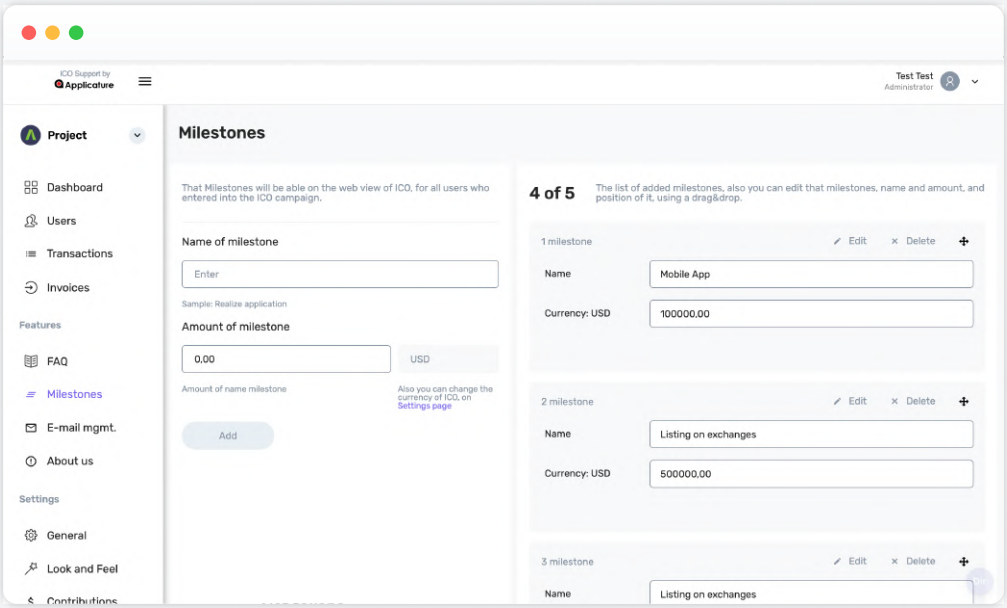
FAQ

Admins create a list of frequently-asked questions which can be then managed: change sorting, edit content, save and remove lists.



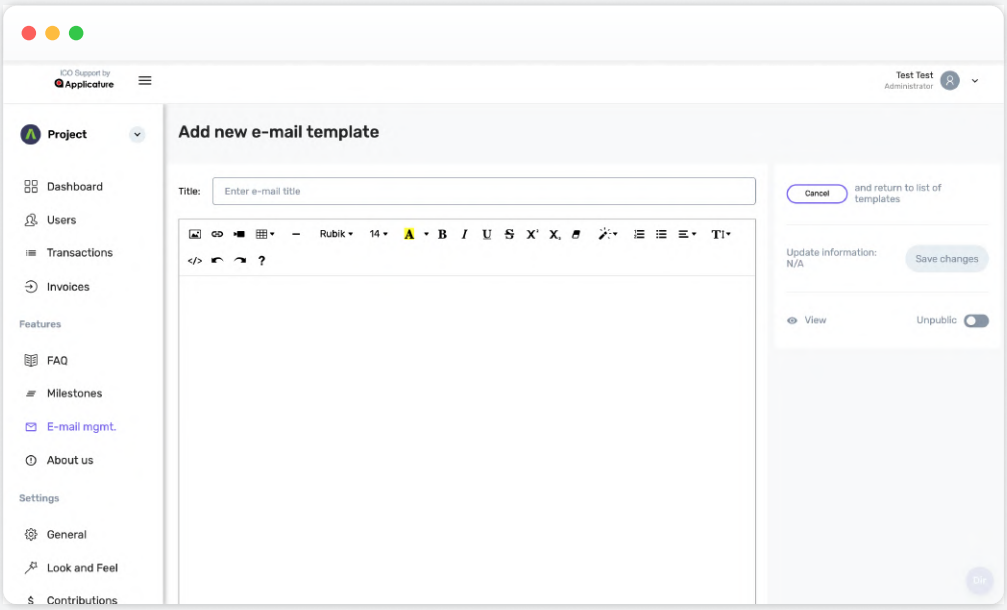
Milestones

The user adds a list of milestones for investors, providing the following information: name, amount, and position.



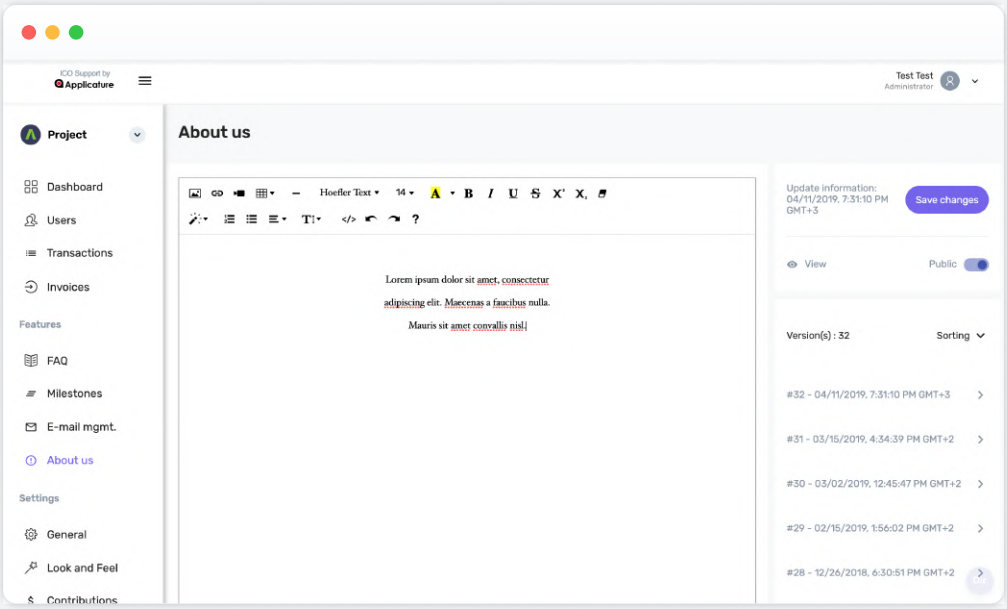
Email Management System

The system manages emails, creating templates of the letters for different contributors. This system also provides trigger events.



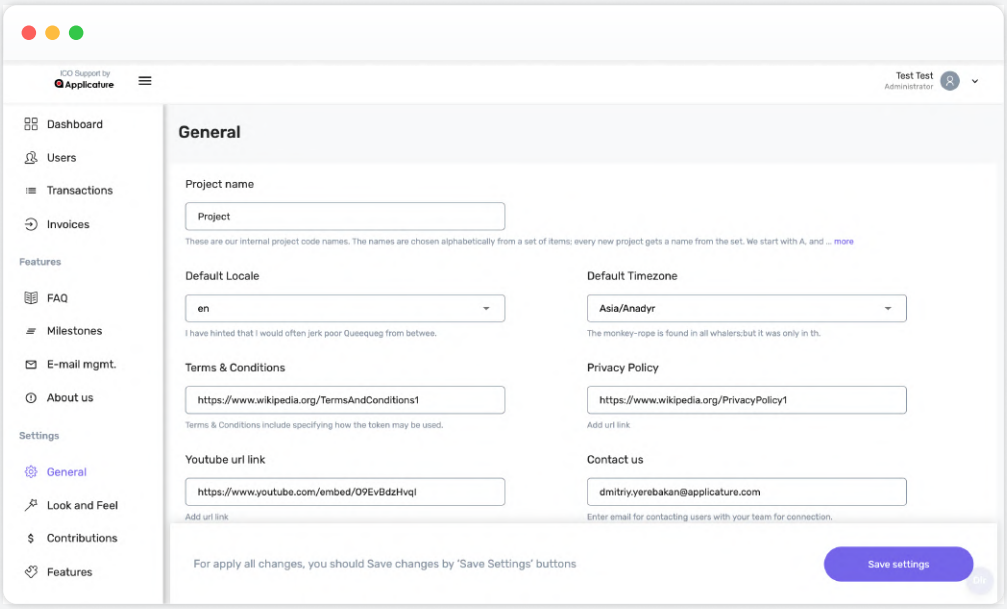
About Us

In this section, admins can edit all information about the project and customize the content, providing it in different formats (tables, links, videos, etc.) before previewing changes on the product page.

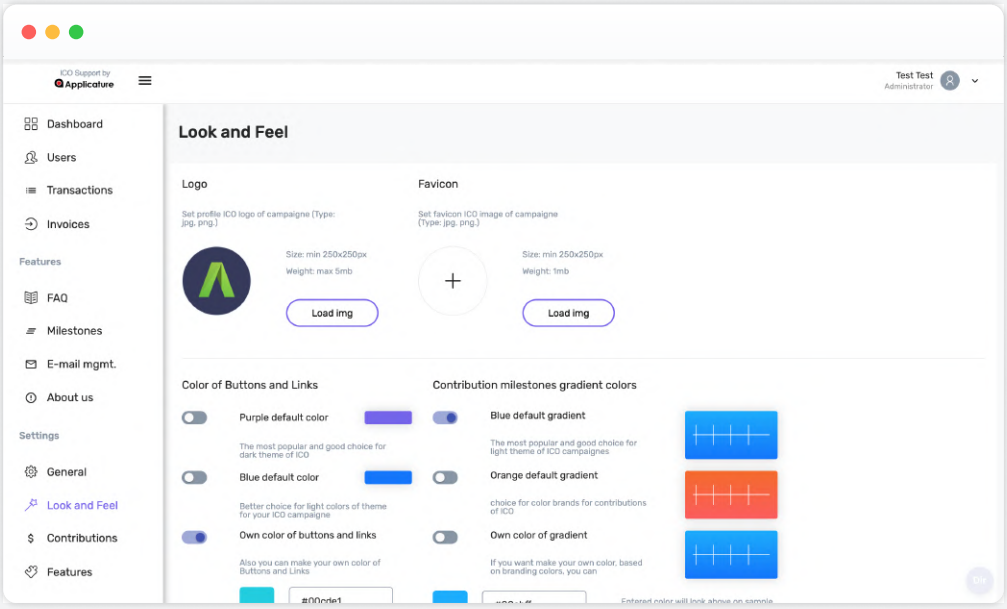


Settings

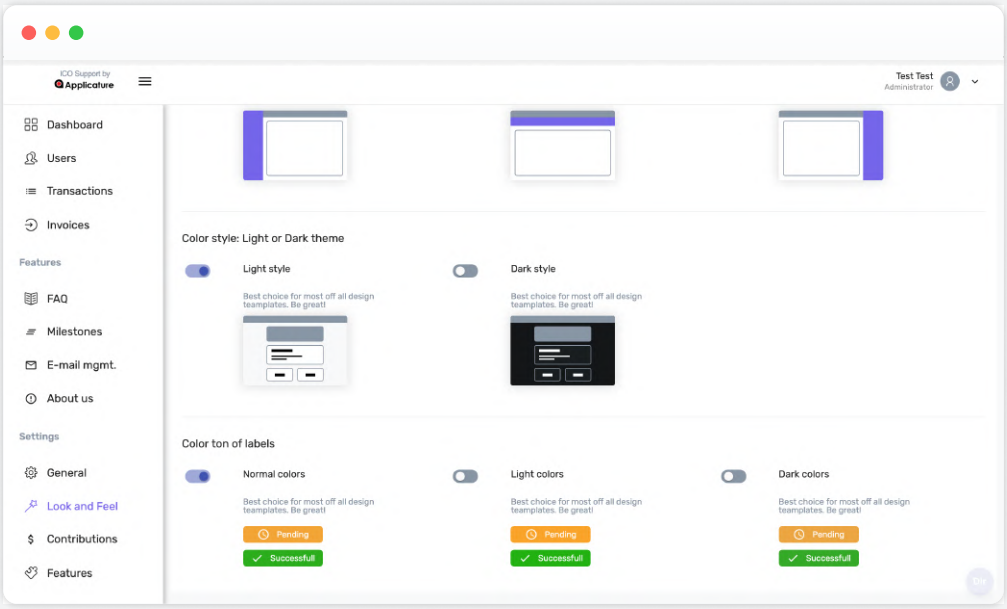
- **General information** contains: project name, default location, default timezone, terms & conditions, YouTube URL link, and privacy policy.



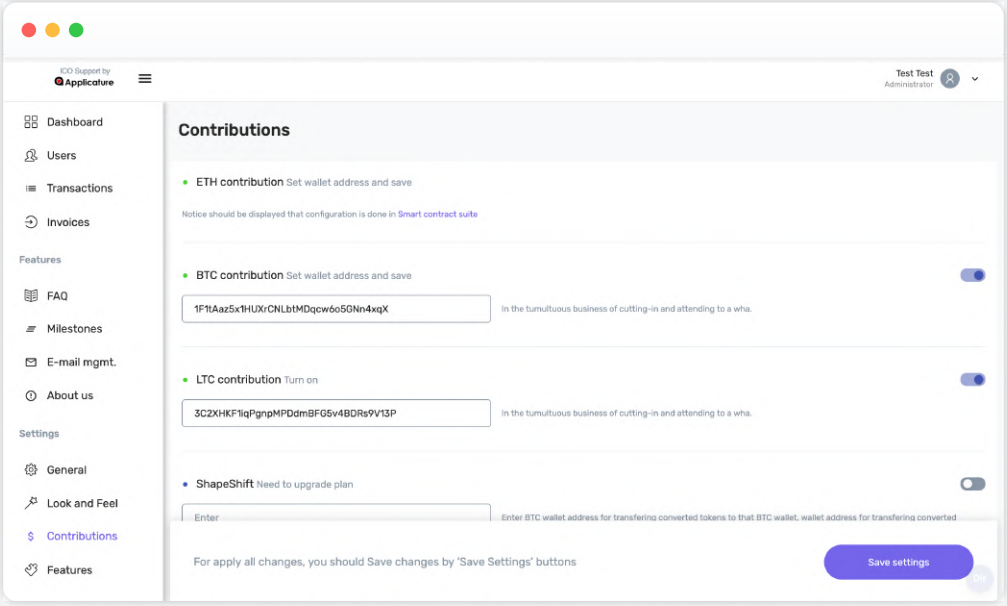
- **Look and Feel** – Project teams can customize project environment on the platform according to their visions, tastes, and moods. With custom interface functionality, admins are able to integrate a landing-page website with a TokenGear contribution dashboard.



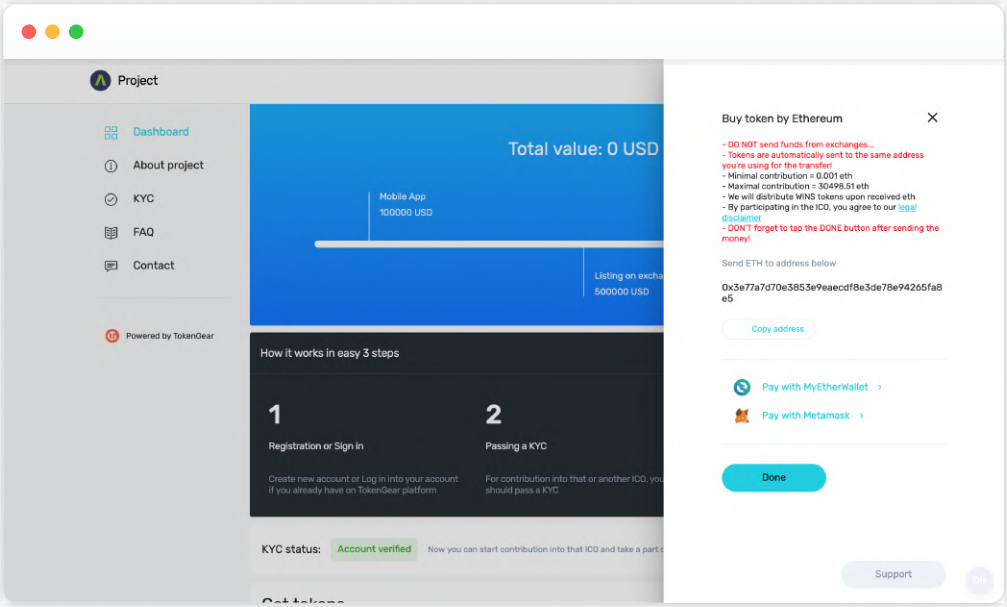
There are plenty of options for creating the ideal dashboard by managing the layout of menu navigation and modifying colors and gradients for theme, style, and background. All that is required is a few clicks and a couple of minutes to customize the dashboard.



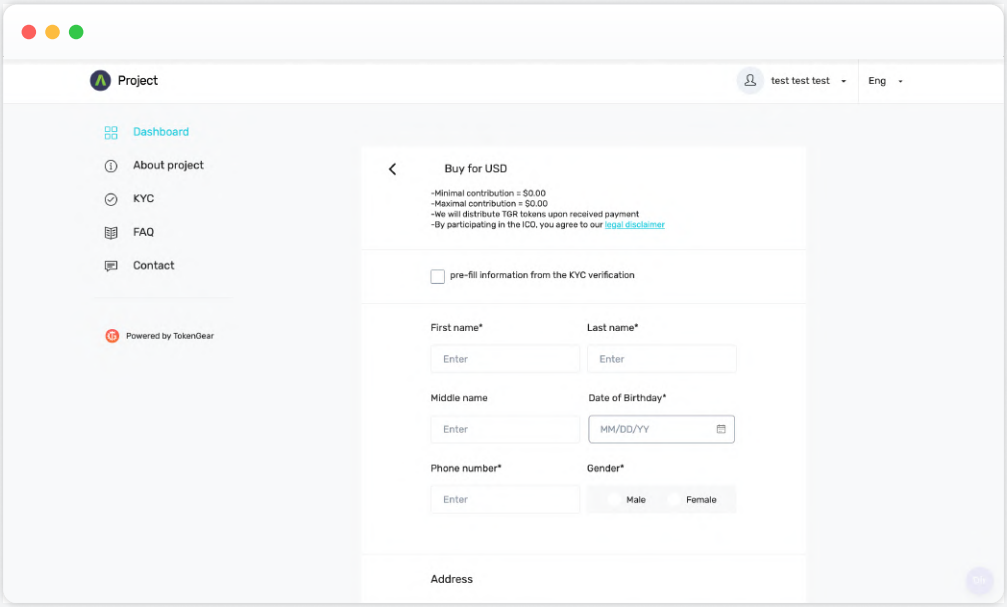
- **Contributions** – Members need to set their wallet addresses to receive the crypto coin amount. ShapeShift integration allows them to receive approximately 72 coins, which are sent to the BTC wallet. There is also a section for setting information about FIAT invoices. Users search for the required currency and select it as the payment method.



Benefits of the dashboard include a user-friendly interface with the flexible ability to simply purchase tokens. For example, users can pay for tokens with EtherWallet or Metamask.



If a user tends to pay in USD, he/she needs to pre-fill the information from the KYC verification by checking it off. From that point forward, all identification data about the individual will automatically be filled in certain fields.



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