

Community Draft Version 1.3 - Subject to Change

Access Network

Bank Local, Grow Global

The Access Network is a self-governing, incentivized token economy that empowers participants to define financial access for themselves.

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Abstract

Communities in the developing world face pressing real world challenges but lack access to the financial and technological tools to improve their situation. Crypto-communities have pioneered disruptive blockchain solutions but lack a user base eager enough to immediately make their innovations effective in the real world. In this paper, we introduce the Access Network as a means of aligning the interests of these communities such that they may solve each other's problems.

The Access Network is a self-sustaining token economy that empowers participants to define financial access for themselves. Participants are incentivized to create long-term value for one another through a modular suite of smart contracts that self-amend and distribute funds according to the will of the network.

The ecosystem consists of five core layers:

1. ACX Utility Token
2. Governance Protocol
3. Incentive Pool
4. Decision Modules
5. Off-chain services

The Access Network's intrinsic token ("ACX") is used for the following

- Voting in on-chain protocols
- Participating in auxiliary services that incentivized contributors develop

6 Billion ACX will be unlocked over time to represent the 6 Billion financially underserved and allocated to ensure equitable distribution and aligned incentives among participants in the token generation event, the underserved, and future network contributors.

After launch, Access Network will integrate with "last-mile" third party providers, starting with Atlas Money, a P2P branchless banking platform that has successfully pioneered the digitization of door-to-door financial services in Ghana and Senegal. Atlas will integrate ACX with its banking platform of over 500 agents and 30,000 users who will become ACX on-ramps and holders, respectively. In addition to bootstrapping fiat-to-crypto liquidity in the developing world, Atlas will be contracted by the Access Network Foundation to develop mobile wallets and other services that enable greater participation in the Access Network and crypto more broadly.

Access Network is designed to accelerate financial inclusion and provide the previously underserved with an equitable say in the evolution of their financial freedom, connecting communities so that they may all co-create and thrive together.

Access Network's Founding Principles of Empowerment:

1. Financial access is a fundamental human right.
2. That right shall be perpetually developed through a properly incentivized ecosystem.
3. Decisions on the ecosystem's evolution shall be equally accessible to all citizens of the world.
4. The previously excluded shall be all the more empowered to define and shape said evolution.
5. Humanity is a global family that must come together to realize its boldest ambitions, and co-create a world that belongs to and benefits us all.

Problem Statement

Crypto Communities Need Access to the Underserved

Ever since Bitcoin appeared following the financial crisis of 2008, crypto and blockchain enthusiasts have been optimistic about the potential for blockchain technology to usher in an era of economic efficiency and inclusivity. Yet, while a vanguard of technologists focus on designing distributed cryptosystems to empower the people, 2 billion unbanked adults, that affect a total of nearly 6 billion lives are waiting on the sidelines. For these people engagement is forestalled by the following:

- Financially, a lack of local exchanges precludes individuals from ‘buying in’ to crypto-networks
- Technologically, the lack of smartphones and internet access precludes individuals from practically utilizing crypto-network development and ‘working in’ to the crypto economy.

For developed areas of the world where bank accounts and smartphones are ubiquitous, the problem is reversed. Financial and technological barriers are low, but people are much less willing to test unfamiliar paradigms since the existing centralized systems are “just good enough”. Most engagement with these potentially revolutionary technologies occurs only at the surface-level, with exchanges being used as trading platforms to seek a profit.

In effect, we have a minority of people with access to cryptocurrencies but little incentive to seriously participate in their true utilities, and a majority who could benefit immensely but lack the necessary access points to do so.

The Underserved Need Access to Decentralized Technology

The average adult in the developing world subsists on \$80 to \$120 a month¹, which has to cover all the costs of living for their whole family. Most people do not have a formal job but are rather necessity entrepreneurs by default—be they farmers, traders, craftspersons or street vendors. There is little to no public infrastructure, so marketplaces, while similar in the basic goods and services provided to those in developing economies, are largely informal. Despite a lack of access to the global economy, developing economies continue to grow at a rate of over 4% a year—largely due to the high pace of commercial activity in these local marketplaces.² In Ghana for example, there is a population of nearly 30 million, with a GDP of roughly \$40B, growing at just over 3.5% annually.³

Despite this growth, most people in developing economies have no access to basic financial services. The high costs associated with the brick and mortar model of formal banking institutions make setting up branches in rural areas infeasible (Ghana has 37 banks but 60% remain fully unbanked)⁴. Smaller financial institutions such as micro-finance institutions, while more accessible, are often untrustworthy and have been known to mismanage funds, collapse, and lose people’s life savings, time and time again.⁵

As a result, people often utilize their own communal networks to handle financial needs on an informal basis. In many emerging markets people pool their money together in rotating savings circles. Others simply store money under their mattress until they accumulate enough for large purchases.

Those who require additional lines of credit to grow their business are forced to borrow from predatory lenders who charge exorbitant rate of interest for relatively small loans. In many African and Asian countries, telecommunication

¹ <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

² <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG>

³ <https://data.worldbank.org/country/ghana>

⁴ <https://www.graphic.com.gh/business/business-news/unbanked-population-low-savings-culture-high-interest-rates.html>;
<http://www.thestatesmanonline.com/index.php/business/3292-only-40-ghanaians-have-bank-accounts-bawumia>

⁵ <http://scholarworks.wmich.edu/cgi/viewcontent.cgi?article=1048&context=ijad>

companies have begun offering mobile money, a service that ties a user's mobile phone account to a checking account. However, mobile money operators often charge high transaction fees and limit users to domestic transfers.

Mobile phone penetration in West Africa currently stands at roughly 80%⁶. However, in countries like Ghana, only 25% of people have a smartphone⁷. Smartphones and associated data plans can be prohibitively expensive for an average consumer. Furthermore, most rural areas have no data coverage at all, with LTE/4G only recently becoming available in select cities. In short, basic communications technology is ubiquitous in the developing world but access to formal financial systems is not.

The synergies between these two groups are very clear. The underserved represent a massive, diverse population with pressing economic and technological needs. Decentralized cryptosystems, by their very nature, need a massive and diverse population to thrive at scale. They are each the solution to each other's problems. The only issue is access to each other.

Atlas Money Background

Atlas Money is a P2P branchless banking platform that allows anyone to become their own community micro-bank. Atlas Money agents go door-to-door daily to Atlas Money users collecting deposits, issuing withdrawals and offering microloans. Atlas Money is currently in Ghana and Senegal with over 500 Agents and 30,000 users, most of whom use it for daily deposits. Atlas Money has issued over 3,000 micro-loans so far, and because the model is savings and relationship led, has a near 0% default rate. Ghana has a population of roughly 30M people, while Senegal has close to 15M. Sizeable portions remain completely unbanked and a large majority receive inadequate financial access. Atlas is currently present in 3 of Ghana's 10 regions, and in 1 region in Senegal.

Atlas Money Agents use a smartphone app to transact with users, while users only need a feature phone to participate on the platform. Users pay Atlas Money a small monthly fee for the agent services provided. Being an Atlas Money agent is a full-time job and a well paying one at that, with most agents making over twice the country's average monthly income. Atlas Money sources new agents from local communities, empowering people that are already pillars of their offline communal networks, a pattern that is ubiquitous throughout West Africa and beyond.

In January 2016, the Atlas Money team moved to Ghana, and it was there that they found their product market fit: branchless community banking. The team shadowed existing communal bankers and found that the biggest problem was one of trust and uniformity—personal bankers and larger micro-finance institutions would often collapse, losing all user deposits. Atlas Money set out to build its product around the existing model of convenience and close personal relationships, while digitizing the experience to close the trust gap and provide a robust set of financial services.

In order to guarantee safety of user funds, Atlas Agents must pre-purchase digital credit before processing user transactions. They then swap credit for fiat throughout the day until running out of credit, and then re-purchase more credit with the cash on hand to process more transactions. For example, an Atlas Agent may purchase \$100 of digital value, and when they take a \$5 deposit, the user gets \$5 in credit on their wallet, accessible through their feature phone. Now, the Agent has \$95 in digital credit, and \$5 in cash. They will repeat this process until they have \$0 in credit, and \$100 in cash. They then exchange that cash for more digital credit from what's called a Super Agent-- be it Atlas, an individual provider, or a corporate partner such as a bank. In short, agents manage their liquidity while transacting in a trustless environment for end users. This is a common distribution process for mobile carriers when circulating mobile money credit or airtime scratch-off cards, and a robust network of Super Agents and Agents already exist.

Atlas grows and engages its operations by focusing on the existing communal fabrics of its markets. They meet with chiefs, market leaders, and religious leaders to source new community agents and get feedback on their product and

⁶ <https://www.gsma.com/mobileeconomy/west-africa/>

⁷ <http://assets.pewresearch.org/wp-content/uploads/sites/2/2016/02/2-23-2016-10-31-42-AM1.png>

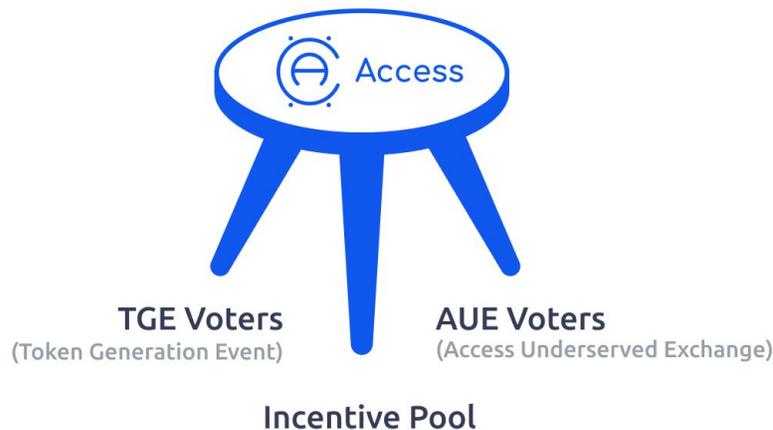
services. They also host monthly gatherings in each region, with Agents, as well as with user community groups such as market women that all sell plantains or fish. Places like Ghana and Senegal have complex and strong decentralized networks of community for all aspects of life. By leveraging the strength of these networks, Atlas ensures that it is constantly building with, rather than simply for, the people of developing markets.

Access Background

Access Network Foundation will leverage the borderless, programmable nature of cryptocurrency tokens and third party service providers in emerging markets— such as Atlas Money— to launch the Access Network, a self-sufficient token economy that incentivizes participants in the developing and developed world to create value for one another. In doing so, we aim to enable emerging markets to leapfrog developed economies while avoiding the path of inefficient and disempowering centralized systems.

Rather than connecting to existing financial systems with predefined terms of service that advantage a select few, the Access Network will animate a financial ecosystem controlled by its participants. The medium for political and economic participation in the ecosystem is “ACX”, a cryptographic digital token generated and recorded on the Ethereum blockchain network developed and executed by Access Network Token Generator, a Cayman Islands exempted foundation company. ACX is both (1) the key for participating in the network’s internal political processes, and (2) the intrinsic economic incentive itself. It will also be the medium of participation in auxiliary services, decentralized applications, and communities that incentivized contributors develop around the network.

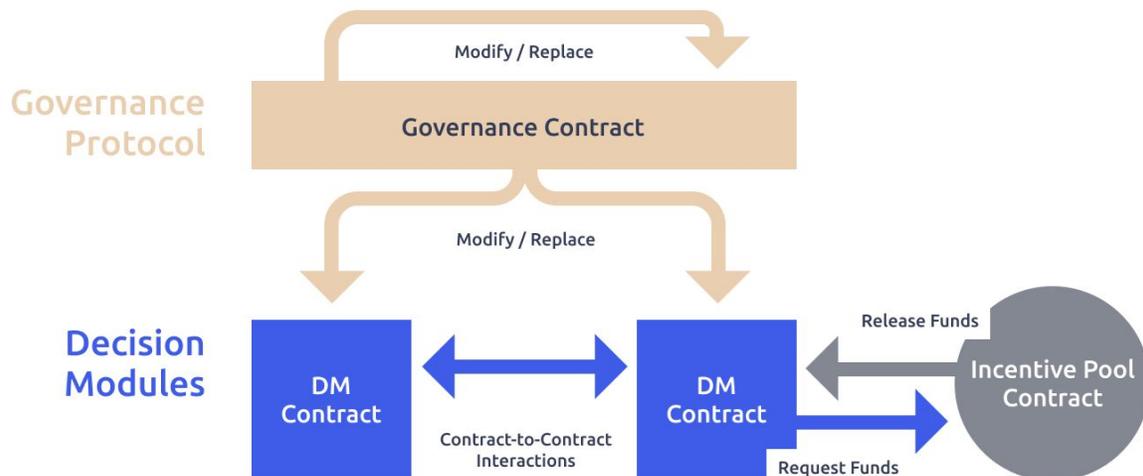
Participants will utilize ACX in democratic decision-making processes that direct incentives towards projects that contribute utility value to the ecosystem. This will allow users to continually define, price, and reward utility as they see fit. A suite of smart contracts deployed to the Ethereum blockchain will transparently mediate this process, enabling diverse sets of stakeholders to collaborate in a trustless manner. Participants can also upgrade components of the smart contract architecture using a democratic procedure, which itself is upgradeable. Future-proofing the network in this way gives participants the ability to integrate new market mechanisms, governance models, and protocol design practices as they evolve.



In order to align interests among developing world users, developers, and developed world users, ACX will be distributed through the Access Underserved Exchange (“AUE”), Incentive Pool, and a token generation event. Each component of this three-legged stool will provide a critical access point between the Access Network and relevant stakeholders in the global economy. The AUE is a multisig account that reserves a fraction of the total ACX supply

for distribution to underserved populations in the developing world. Access Network Foundation will oversee AUE distribution, partnering with third party providers— such as Atlas Money— that integrate ACX earn-in and rewards into their existing service offerings. The Incentive Pool is a token-weighted voting system that can distribute ACX to ecosystem contributors. Token holders will use trustless decision-making procedures to decide how Incentive Pool tokens will be allocated to different projects over time. Lastly, the token generation event will enable private contributors to join the network by purchasing tokens at network launch. The Access Network Token Generator (Token Generator) will oversee the token generation event. These three access points constitute the liquidity channels that will facilitate the adoption and continued development of an inclusive and effective token economy.

Smart Contract Architecture



The Access Ecosystem

The Access Network is designed to sustain a self-governed, internally incentivized ecosystem of continually improving forms of financial access.

The core components of the Access Network are the amendable Governance Protocol and fixed Incentive Pool. Upon reaching consensus at predefined intervals, network participants can use the Governance Protocol to modify and replace the smart contracts that define their coordination procedures. This allows for the creation of arbitrarily complex decision modules that regulate routine decision-making processes. The Governance Protocol can also self-amend, meaning a consensus of network participants can modify the rules for reaching consensus in the future. The Incentive Pool unlocks the network's utility token, ACX, at a predetermined, unchangeable rate. Although the Governance Protocol and its descendent modules cannot alter the Incentive Pool itself (i.e. the unlocking rate), they can regulate the distribution of its unlocked funds. In this paper, Access Network Foundation proposes the first iteration of one such module called the Polling Module, a multi-round voting system that rewards individuals who contribute to the Access Network in proportion to the popularity of their contributions.

This democratically-mutable suite of smart contracts will be nested in a broader ecosystem of off-chain services that add utility to the token as they multiply and mature. Because the interests of network participants are aligned through common ownership of ACX, they will only be incentivized to make decisions or approve projects that improve the ecosystem's functionality. This paper will propose the first set of service layer applications including mobile and web wallets for ACX; a platform to track, submit, and vote on polls (Polling Module interface) and

amendments (Governance Protocol interface); and the Access Underserved Exchange, which will act as a technological and economic bridge to stimulate the circulation of ACX in Africa and beyond.

The following sections outline the mechanisms, actors, and incentives at play in the Access Network as well as their significance to the system as a whole. The ecosystem consists of five core layers: (a) the ACX Utility Token; (b) the Governance Protocol; (c) the Incentive Pool; (d) Decision Modules such as the proposed Polling Module; (e) and off-chain services introduced by third party providers. Taken together, these layers will provide a practical crypto-economic framework for communities around the world to dynamically address each other's needs.

ACX Token

ACX is an ERC-20 compliant token that will be used to participate in on-chain decision processes as well as the auxiliary services rendered in various off-chain contexts. The entire Access Network relies on the circulation of ACX, which is analogous to a key that grants its holder the ability to participate in the network. ACX will have several core functions that multiply as the ecosystem diversifies and expands.

- The Governance Protocol gives ACX holders the power to alter on-chain components of the Access Network by drafting and ratifying new decision modules and governance amendments
- The Incentive Pool unlocks ACX to reward participants who contribute to the ecosystem
- Once the Polling Module is deployed, ACX can be used to participate in the process of delegating, voting, and submitting polls that will allocate and disburse Incentive Pool funds to Access Network contributors
- Lastly, ACX can be used as the incentive, medium of exchange, and unit of account in the applications, markets, and communities that are built around the network

There is a total supply of 6 billion ACX, 1.62 billion of which are locked into the ACX Incentive Pool. After the token generation event, the Incentive Pool will begin unlocking these tokens at a linear rate over ten years to bootstrap the development of off-chain services (*see Incentive Pool*).

The Governance Protocol: On-Chain Meta-Coordination

The Governance Protocol is a strictly defined set of rules for altering on-chain components of the Access Network. It is designed to future-proof the network over the long-term while allowing it to operate effectively on a day-to-day basis. The procedure occurs entirely on-chain in three distinct phases and repeats on a quarterly basis. For every two election cycles to modify the decision module contracts, there is one to modify the Governance Protocol contract. This way, network participants have the opportunity to amend the contracts that control routine decision-making processes twice as often as those that control the rules for making those amendments. The network is free to alter these intervals and will likely opt for longer time intervals as preferred mechanisms are tested and stabilized.

First, network participants have a month to suggest protocol amendments by submitting hashes of replacement Solidity contracts. Next, participants have a month to vote on their preferred protocol amendment. The amendment that receives the most voting weight by the end of this period becomes the candidate contract for the current election cycle. In the third and final month, participants vote for or against the candidate contract. If quorum is reached and a majority of the quorum votes yes, then the amendment is ratified and replaces the relevant smart contracts. If quorum is not reached or a majority vote no, then all contracts remain unchanged. The initial quorum is set to 10% of all tokens in circulation.

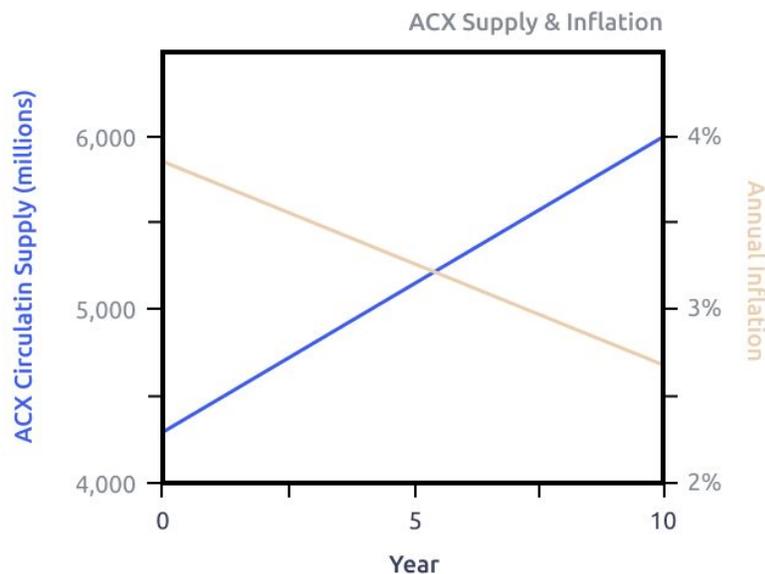


During decision module election cycles, smart contracts that control access to the Incentive Pool can be modified or replaced, but the Governance Protocol itself remains unchanged. Such changes could alter or remove components like the Radical Trust Function, Floating Quorum, or Liquid Democracy rules (*see Polling Module*). Decision module elections cycles can also add entirely new mechanisms such as incentivized voting or Artificial Intelligence modules to filter spam polls. During Governance Protocol election cycles, only the Governance Protocol contract can be amended. Such amendments can alter parameters of the election cycle process itself, such as the frequency, duration, or quorum requirements. Token generation event and Incentive Pool contracts are immutable, as the former controls initial circulating supply and stakeholder allocation while the latter controls circulating supply over time. Access Network Foundation will retain override privileges expiring 12 months after launch in order to ensure 1) technological feasibility and 2) maintenance of equitable governance structures ahead of greater maturity and amending practices.

The Incentive Pool

ACX Generation

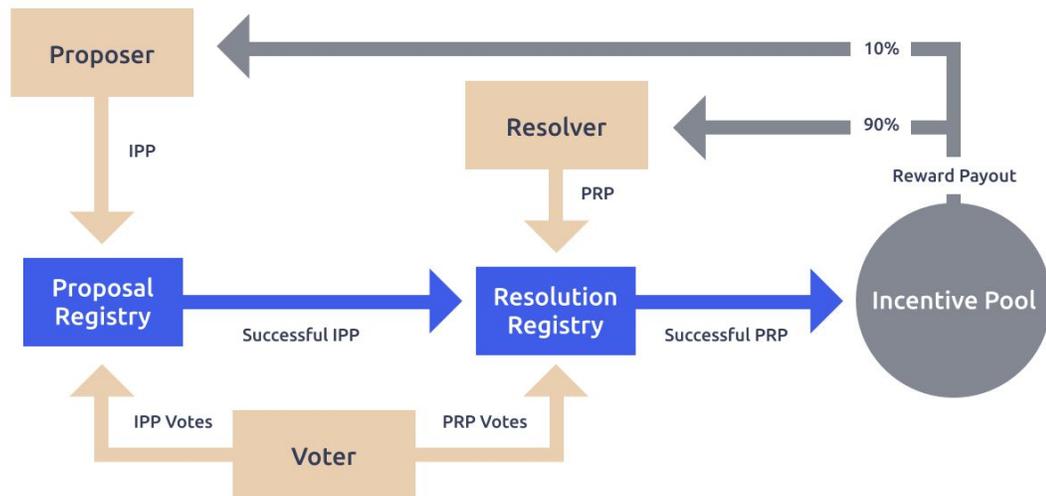
Tokens allocated to the Incentive Pool unlock at a linear rate over the first ten years after launch. Unlocked tokens can then be awarded to Access Network contributors by the active decision module (*see Polling Module*). Thus, the circulating supply of ACX will be deterministically bounded as follows:



Because the Incentive Pool is periodically paying out contributors to the ecosystem as coordinated by decision modules, the size of the Incentive Pool is always the number of ACX tokens unlocked minus the amount paid out to contributors (plus any additional tokens sent to the pool by external actors).

The following section outlines the design for the “Polling Module,” a decision module that will be proposed during the first decision module election cycle. The Polling Module’s design reflects the Access Network’s founding principles but will ultimately be voted on by token holders.

The Polling Module



The Polling Module: On-Chain Coordination

A decision module is a set of rules that asynchronously mediates the interactions of token holders during routine decision-making processes. These interactions occur entirely on-chain through user-to-contract and contract-to-contract transactions that allocate funds to reward contributions to the ecosystem. The Polling Module is Access Network Foundation’s proposal for the Access Network’s first decision module. Its implementation will be voted upon during the first decision module election cycle.

The Polling Module sets up a two-phase “call and response” process for deciding on which projects to fund and how to price them. In the proposal phase, token holders vote on whether or not a given improvement proposal should be approved. If a proposal receives enough votes, then the resolution phase begins where users compete to submit proposal resolutions. If one of the resolutions are approved, then the resolving account as well as the original proposing account are credited with funds from the Incentive Pool in proportion to the popularity of the original proposal.

The Proposal Registry and Resolution Registry contracts autonomously administrate each phase of the process. The Proposal Registry accepts Improvement Proposal Polls (IPP’s) and IPP votes to compute their popularity. The Resolution Registry accepts Proposal Resolution Polls (PRP’s) and PRP votes to determine whether or not payment should be made.

1. Proposal Registry

Improvement Proposal Poll

An IPP outlines the proposer’s idea for an improvement to the network, be it a feature request for some existing service or an entirely new service altogether. It also contains several optional parameters including duration.

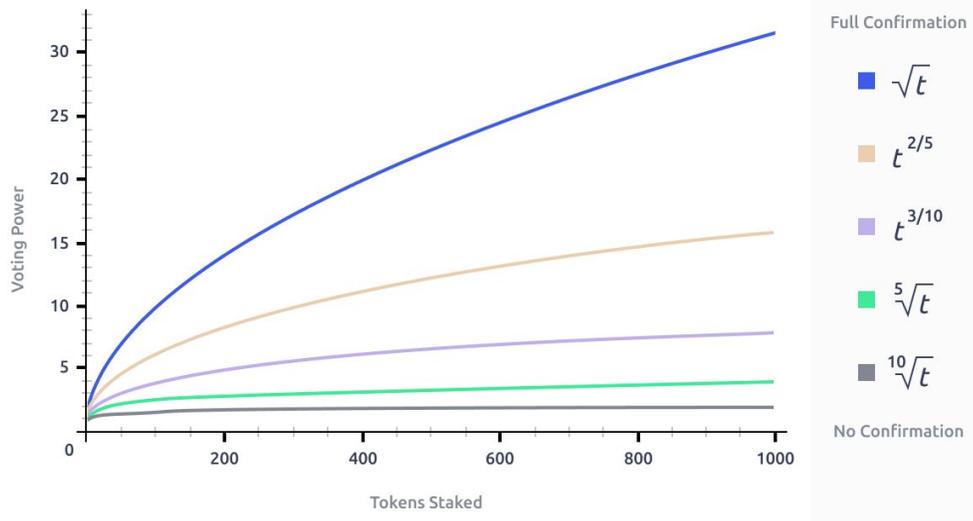
SPECIFIED BY PROPOSER		COMPUTED BY CONTRACT	
Title	title of IPP	Poll ID	transaction ID of the submission
Description	description of IPP	Author	public address of proposer
Duration	maximum length of time to keep IPP open (default/min = 2 weeks)	Status	status of IPP (open, closed, pending, settled)
Extension	extension to allow for additional fields in the future (optional)	Weight	cumulative voting weight staked towards IPP

Radical Trust: Reputation-Weighted Quadratic Voting

As long as the IPP is open, any token holder can vote in favor of the poll by temporarily staking a portion of their tokens towards it. The voting weight of each token is determined by the Radical Trust Function, a reputation-weighted quadratic voting formula intended to curb the power that any single voter can exert in the system. Quadratic voting decreases the marginal weight of each successive token staked by a user for a given poll along a sublinear curve. The proposed implementation uses a radical function that limits voting influence to asymptotic growth on the order of $T^{1/2}$ where T denotes the number of tokens staked towards a given poll.

Voting power is further weighted by the participant's reputation coefficient, r , which represents the level of trust associated with a particular account. Each account starts off with a reputation coefficient of 1.0. Users then have the option of verifying their identity through various decentralized channels including uPort, Civic, and Keybase. For each additional identity verification, an account's reputation score increases by one, up until a maximum of 5.0. This gives identity verified accounts up to five orders of magnitude more voting weight than unverified ones. The reputation score mitigates against Sybil attacks—where a user votes from multiple fake accounts to bypass the quadratic limitation—by giving well-known users more influence than unknown users. In this way, the Radical Trust Function encourages an equitable distribution of power where influence grows sublinearly— as a root value of tokens staked— rather than linearly as is the case with most token-weighted voting implementations.

Radical Trust
 $W = T^{r/10}$, where $1.0 \leq r \leq 5.0$
 Voting Power at each Confirmation Level



Liquid Democracy: Hierarchical Token Delegation

ACX holders also have the ability to delegate their voting power to other ACX holders while retaining ownership of the tokens themselves. Using the *delegate()* function, any holder can specify the address of a desired delegate as well as the number of tokens to assign. The delegate then has that many more tokens at their disposal, subject to the limitations of the Radical Trust Function. This means that a group of people will tend to have more voting influence by voting individually than if they delegate their votes to a single representative. For example, if four fully verified ACX holders separately stake 100 tokens towards a particular poll, the total weight of their votes is 40.

$$\sum W = T_1^{5/10} + T_2^{5/10} + T_3^{5/10} + T_4^{5/10}$$

$$\sum W = 4 * \sqrt{100} = 40$$

If the group delegates all of their tokens to one representative, then all of the votes are weighted as if they came from that account, resulting in total weight of 20.

$$\sum W = T_4^{5/10}$$

$$\sum W = \sqrt{400} = 20$$

However, in cases where one individual has a higher reputation score than her peers, the group can use delegation to increase its cumulative weight. Reusing the previous example with a fully verified T_4 and the rest fully unverified, the total weight of the group is 14.75 when voting separately compared to 20 when delegating to T_4 as shown above.

$$\sum W = T_1^{1/10} + T_2^{1/10} + T_3^{1/10} + T_4^{5/10}$$

$$\sum W = 3 * \sqrt[10]{100} + \sqrt{100} = 14.755$$

All other costs equal, this design encourages voters to delegate towards higher reputation accounts when possible and to vote individually otherwise.

Delegations are also transitive, meaning that delegates can delegate the tokens they control to others, who can further delegate those tokens. While the original holder retains ownership of the token at all times, the power to stake the token towards particular polls can be passed along indefinitely. The owner retains the right to revoke any

2. Resolution Registry

Proposal Resolution Poll

The PRP outlines the resolver’s solution to an improvement proposal, be it a business plan, live website, or bug fix. The resolver must specify the ID of the IPP that their resolution addresses as well as the proportion of the allocated payout they wish to claim (*see Payout Allocation*). A resolver might request less than the full allocation to increase the likelihood that voters will vote in favor of their resolution.

SPECIFIED BY RESOLVER		COMPUTED BY CONTRACT	
Proposal Reference	poll ID for the IPP that this PRP addresses	Poll ID	transaction ID of the submission
Title	title of PRP	Author	public address of resolver
Description	description of PRP; should include off-chain link to ‘subjective proof of resolution’	Status	status of PRP (open, closed)
Desired Allocation	proportion of allocated payout resolver is requesting (default 1.0)	Weight	cumulative voting weight staked towards PRP
Extension	extension to allow for additional fields in the future (optional)	Duration	length of time to keep PRP open (same as duration of corresponding IPP)

PRP Settlement

As long as the PRP remains open, any token holder can vote ‘for’ or ‘against’ the poll by temporarily staking a portion of their tokens towards it. The voting weight of the tokens staked is determined by the Radical Trust Function used in the Proposal Registry. The Resolution Registry updates the PRP’s cumulative weight as votes are cast or rescinded during this period. The first vote cast after its duration has elapsed triggers a function that closes the poll and determines if the PRP has succeeded. First, its PRP Quotient is calculated as the proportion of total network voting weight staked towards the poll at closing.

$$*PRP\ Quotient*$$

$$PRP\ Quotient = \frac{PRP\ weight}{network\ voting\ weight}$$

If the PRP Quotient is greater than or equal to the corresponding IPP Quotient, quorum has been reached. This means that at least as much voting weight was staked towards the PRP as was initially staked towards the corresponding IPP. If quorum is reached and the weight of ‘for’ votes outweighs that of ‘against’ votes, the PRP is allocated a portion of the Incentive Pool. The corresponding IPP is considered settled and any new PRP submissions referencing this IPP will be rejected. If quorum is not reached or the majority vote against the PRP, then it is removed and the IPP remains pending.

Payout Allocation

When a PRP is successful, the Resolution Registry determines the proportion of available rewards to allocate as payout according to the corresponding proposal poll’s IPP Quotient. The more votes an IPP received before closing, the higher the payout allocated for its resolution. The allocated payout is determined as follows:

$$\text{Allocated Payout} = \text{IPP Quotient} * \text{Incentive Pool}$$

where $0 < \text{IPP Quotient} \leq 1.0$

This way, the proportion of total network voting weight staked towards a proposal is equivalent to the proportion of the Incentive Pool allocated towards its resolution. This fundamental equivalency underpins the logic of compensation in the Polling Protocol.

$$\frac{\text{Allocated Payout}}{\text{Incentive Pool}} = \frac{\text{IPP weight}}{\text{network voting weight}}$$

Because the resolver can specify a desired allocation below one hundred percent, the actual payout will be given by:

$$\text{Payout} = \text{Desired Allocation} * \text{IPP Quotient} * \text{Incentive Pool}$$

where $0 < \text{Desired Allocation} \leq 1.0$

The difference between Allocated Payout and Payout remains in the Incentive Pool.

After payouts are calculated, the PRP author is awarded 90% of the total payout and the author of the corresponding IPP receives the remaining 10%.

Beyond the Protocol: Off-Chain Services

By participating in on-chain decision modules that allocate and distribute funds for ecosystem contributions, ACX holders will be able to continually direct the development of off-chain services. These may include financial service platforms such as ACX exchanges, marketplaces, merchant payment portals, and integrations with popular messaging apps. They can also include mobile and web applications for interfacing with the evolving smart contract architecture in ways that users and developers see fit. Beyond user-friendly interfaces for smart contract interactions, developers could also add auxiliary functionality to the core protocol like off-chain reputation systems, poll sorting algorithms, or delegate accountability systems. Such top layer components can utilize public data from the blockchain without the need to alter any decision modules. Lastly, network participants can reward contributions that are not technological or financial in nature. The network can leverage the Incentive Pool to fund community meetups, smartphone distribution, or other campaigns if it so chooses.

While ACX in the Incentive Pool will incentivize contributions from stakeholders over time, the Access Network Foundation will assist in developing interfaces to improve usability of the network's on-chain protocols:

Governance Protocol Interface

A graphical user interface for submitting, tracking, and voting on amendments during election cycles.

Polling Module Interface

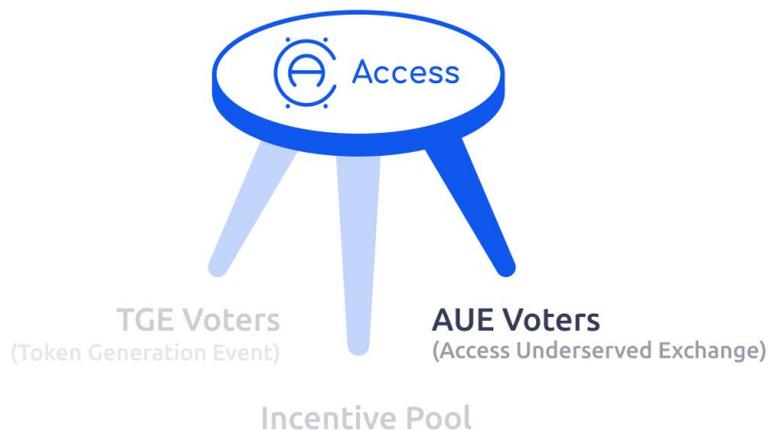
An updated interface that includes functionality for submitting proposals, voting on proposal polls, submitting resolutions, and voting on resolution polls. It will also include functionality for searching, sorting, and tracking submitted polls and real-time updates on relevant information like current voting weight and time remaining.

ACX Wallet

Multisig ACX wallets for developing world users to easily manage their ACX and participate in on-chain decision processes using their personal feature phones and third party service providers' smartphones or servers.

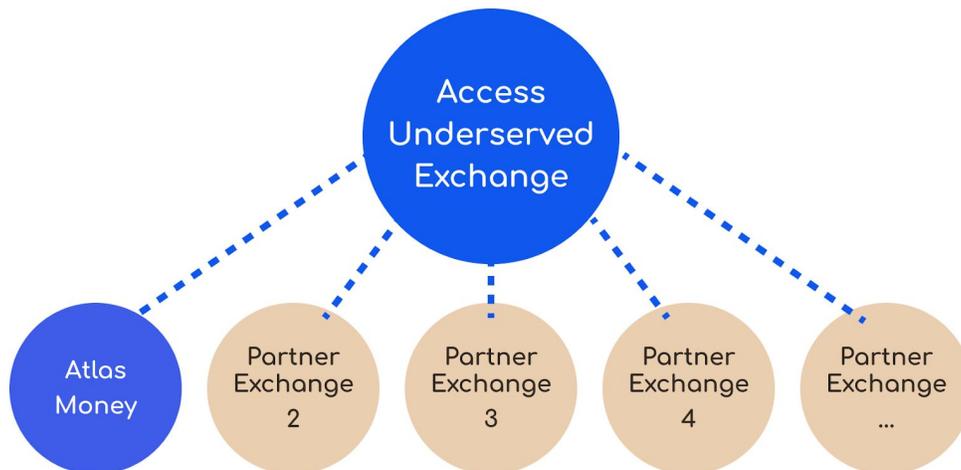
Access Network Foundation will also support third party service providers like Atlas Money in developing second layer services for more advanced functionality such as fiat/crypto loans (to be provided by third parties – including Atlas Money), remittance apps, and ecommerce products (*see generally; Roadmap*).

The Access Underserved Exchange



Dynamics and Possibilities

The Access Underserved Exchange (AUE) will ensure equitable composition of network participants by reserving a fraction of the total ACX supply for underserved populations. Access Network Foundation will oversee the distribution of ACX from the AUE to third party providers— such as local banks, NGO’s and agent network operators— that help grow the on-the-ground infrastructure by directly reaching underserved users. AUE funds will incentivize local organizations to integrate ACX voting, exchange, and financial tools into into their existing service offerings.



Local integration of Atlas Money and Access Network

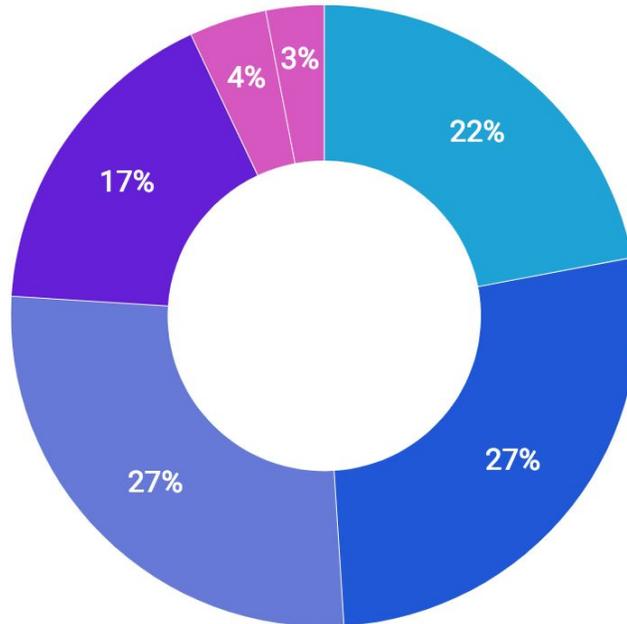
Atlas Money has successfully pioneered the digitization of a P2P network of door-to-door financial service providers, and plans to significantly scale operations in the coming years. Atlas has already created an on-ramp for token distribution, but has also made a foundation of savings and loans for other developers to build upon, adding more functionality and greater impact. The potential growth of agent networks and newer tools for financial access will be accelerated by integration with the Access Network.

Atlas will bootstrap ACX adoption and support continued circulation by serving as the Access Network's first local partner exchange. Upon integration, Atlas agents will become service providers and micro-exchanges that provide continued crypto-fiat liquidity for their clientele. They will also serve as technological access points for users with feature phones ahead of greater smartphone adoption. Because agents are already pillars of their local communities, they are well-positioned to act as voting delegates and key nodes in communication feedback loops between end users and the Access Network. Atlas Money will also utilize their monthly meetups for agents, users, and community leaders to exchange ideas in order to facilitate inclusivity and active participation in the network's decision-making processes. Combined, these actions will reduce barriers to entry, improve liquidity, and grow the user base, helping to achieve the impact potential of the Access Network.

Atlas will effectively serve as the first interface layer for underserved users in Africa to participate in the Access Network. The Access Network Foundation will work with Atlas to grow and enhance the Access Network, granting it ACX from the AUE to incentivize individuals to provision services locally. Meanwhile the Incentive Pool will incentivize development teams around to build tools that enhance the offerings of those very same service providers. Atlas will also integrate Access Network voting protocols into its platform so that underserved end users have a voice in the direction of the Access Network's continued evolution.

ACX Allocation

6,000,000,000 ACX, to represent the 6 Billion people without adequate financial access, will be created and distributed over time to various participants. Achieving the most widespread distribution is critical to the fulfillment of the Access Network's founding principles.



ACX Distribution

Access Network Token Generator will generate and distribute the tokens to the groups named in this section.

- **22% Token Generation Event:** 1,320,000,000 ACX will be made available in consideration of contributions from initial participants to stimulate the initial circulation of ACX.
- **27% Access Underserved Exchange:** 1,620,000,000 ACX will remain locked up and will newly enter into circulation on an as needed basis. These ACX are locked-up in order to ensure equitable circulation of ACX amongst developing world participants. Access Network Foundation will oversee circulation of these tokens over time (post-TGE) among third parties such as Atlas Money that directly service underserved populations. Direct airdrops to underserved communities and individuals may also be developed to reward users who grow the network.
- **27% Incentive Pool:** To ensure alignment of interests across the Access Network, 1,620,000,000 ACX will be minted to a smart contract that unlocks tokens over predetermined curve. Unlocked tokens are distributed by token holders via on-chain decision modules.
- **17% Access Network Foundation:** 1,020,000,000 ACX are reserved for founders, employees and future employees of the Access Network Foundation and third party providers which it contracts. Tokens

allocated to founders and current employees will follow a vesting schedule where 25% vest immediately and the remaining 75% vest over four years.

- **4% Advisors:** 240,000,000 ACX are reserved for current and future advisors of the Access Network Foundation. Advisor tokens will follow a vesting schedule where 25% vest immediately and the remaining 75% vest over four years.
- **3% Community Rewards:** 180,000,000 ACX will be reserved to reward individuals who participate in Community Rewards programs run by the Access Network Foundation. These programs may include community building and bug bounty campaigns.

Use of Proceeds

Proceeds raised in the token generation event will go directly to Access Network Token Generator who will then enter into an agreement with Access Network Foundation whereby the proceeds are passed to Access Network Foundation to undertake the objectives described below.

- **50% Operational Growth:** Access Network Foundation will grant and lend funds to third party service providers around the globe that join, grow and improve its last-mile financial services infrastructure.
- **20% Access Technical Development:** Eradicating the hurdles that restrict the unbanked from entering global financial markets will require the development of a robust suite of tools tailored to meet those needs. Access Network Foundation will help build applications, partner with third party providers in developing products that enhance the Access Network's functionality and usability, and facilitate on-chain governance around future developments.
- **10% International and Local Marketing:** Access Network Foundation will ensure that the promises of Access Network and ACX Token are shared across developed and developing countries through strategic storytelling and marketing campaigns.
- **10% ACX Store Rewards:** To facilitate the utility and adoption of ACX in emerging markets, Access Network Foundation will partner with local manufacturers, distributors and retailers to accept ACX for physical goods. Users will be able to redeem ACX for items like smartphones.
- **5% Legal Fees and Treasury Management:** Access Network Foundation will ensure that the top law firms and financial experts in the developed and developing world are contracted to protect the interests of the project and its participants.
- **5% Access Africa Events & Hackathons:** Access Network Foundation will grow local community support by hosting community events such as hackathons that reward early users and contributors.

Roadmap

In parallel with the Access Network's autonomous coordination mechanisms, Access Network Foundation will lead development of technologies and partnerships that enhance core protocols, off-chain service applications, and overall evolution.

Q4 2018:

Testing Complete

Development and testing of token and other core contracts is completed.

Q1 2019:

Token Launch

ACX Token and other core contracts are launched on mainnet.

Atlas Money supported ACX Wallet

ACX Wallet for underserved users in West Africa.

Atlas Money supported ACX Incentives and Redemption

Atlas Money agents become ACX micro-exchanges, offering tokenized financial services for users to buy, earn and redeem ACX. With hundreds of agents embedded across local communities, Atlas Money will put ACX in the hands of thousands of West Africans by gamifying their flagship Mobile Banker App.

Q2 2019:

Fiat-to-Crypto Exchanges Launch in Ghana and Senegal

By partnering with global exchange platforms, Access Network operating partners will offer fiat to crypto exchanges in emerging markets, beginning with Ghana and Senegal through Atlas Money. ACX will be used to receive a discount on exchange fees.

Access Loans

Access Network Foundation will launch a loan app to allow for outside capital to reach local users in the form of P2P micro-loans, building on the success of the banking infrastructure enabled by network operating partners like Atlas. Users will be able to stake their locally earned ACX to collateralize loans.

Access Solar Investment Pilot

Access Network Foundation is developing tools to allow crowdsourced pools of capital to enter local markets in the form of communal infrastructure loans. The first pilot will connect private accredited investors to established solar firms to enable cheap, sustainable energy access. Local users will pay fees to access energy and pay back outside lenders. What remains is co-ownership of infrastructure and equity building for future communal loans.

Q3 2019:

Governance & Decision Module Contracts & Interface Launch

Governance and Decision Module contracts go live on mainnet along with graphical user interfaces for each. The Governance web app allows users to submit amendments and vote during election cycles. The Decision Module web app allows users to submit, track and vote on funding proposals.

Atlas Money integrates feature phones delegations

Atlas Money develops the infrastructure required for delegated voting, so that West Africans are able to delegate voting power to leaders in their communities.

Q4 2019:

Technological Inclusion Infrastructure

Financial inclusion is tied to technological inclusion. Many people in emerging markets suffer from unreliable mobile phone and data service, especially in rural areas. Access Network Foundation will look to develop technologies and partnerships that bring mesh networking and other critical infrastructure to Access Network participants.

Conclusion

The Access Network is conceived as a way to decentralize financial inclusion and empower the underserved, designed to speed up overall development through continued improvements to their state of financial access, accomplished by an incentivized token economy that they can govern and control for themselves. Access Network is poised to ensure their economic empowerment thanks to an amendable governance protocol and suite of decision modules that keep their interests paramount as the Access Network evolves. The Access Network offers the crypto-community an elegant future-proof on-chain governance protocol and decision-making procedure to sustain development of the ecosystem. Importantly, the Access Network and its third party service providers offer the crypto-community access to a fast growing base of thousands of underbanked users whom they can directly communicate with and serve. The crypto-community has innovated greatly despite the generalized speculative trend and the lack of access to regular daily users with which to prove their prototypes. In the same way, the unbanked have found resourceful ways of practicing community to overcome the burden of financial exclusion. The Access Network offers a means to connect and empower these two communities, so that they may thrive and co-create together.

Definitions

Access Network (“Access”) - The collection of smart contracts, token holders, third-party service providers and off-chain service applications described in this paper

ACX Token (“ACX”) - Cryptographic digital token generated and recorded on the Ethereum blockchain network

Access Network Foundation - Network Operator responsible for all development, partnerships, and contracting of third-parties; Cayman Islands exempted foundation company

Access Network Token Generator - Token Generator responsible for token launch and initial distribution; Cayman Islands exempted foundation company

Atlas Money - Third-party service provider that will integrate ACX into its banking platform following token launch; Delaware C Corporation

Incentive Pool - Smart contract controlled by token-holder votes with initial administrative override by Access Network Foundation; Its tokens are intended to reward stakeholders who build useful tools for the ecosystem

Access Underserved Exchange (AUE) - Multisig treasury account controlled by Access Network Foundation; Its tokens are intended to reward for stakeholders who maintain and grow the human banking infrastructure

Disclaimers

The ultimate implementation of the Access Network is dependent upon several factors and risks outside of the control of the founding member(s), including regulatory risks, contributor participation, the adoption of blockchain technology and the continued use and adoption of the Ethereum network. Nothing in this paper or otherwise shall require the Access Network Foundation to take any steps to continue the development or otherwise implement the Access Network in its envisioned form if not all the necessary conditions are in place for any such implementation.

Access Network Foundation reserves the right to abandon and/or change the implementation of the Access Network contemplated by this paper at any time and for any reason. AUE partners must be approved by Access Network Foundation and are limited to underserved markets Africa, Latin America and Asia.

Prospective users of the Access Network and other contributors to the token generation event are advised to participate at their own risk and without reliance on any statement contained in this White Paper or any other corresponding materials.

ACX is not a security, debt, equity, investment contract or other profit sharing or interest-bearing instrument.

Since no blockchain based ecosystem can thrive by restricting the transfer of its digital rights, the ACX tokens are made transferable among participants of the protocol. One inherent consequence of these digital token attributes is price fluctuation. The price of a token may fluctuate based on the quantity of tokens earned, spent or transferred among the protocol participants, including via the Incentive Pool or otherwise.

Each participant of the protocol provides value-added services to make the protocol an innovative, decentralized, thriving and resilient ecosystem. Each participant has the obligation to abide by its terms of service and code of conduct or risks being banned for serious breach or repetitive non-compliance behaviors. The token attributes come with governance rights and incentives to grow and promote the protocol but also deterrence mechanisms to ensure services are rendered in accordance with the purpose of the protocol and its code of conduct, such that the protocol can realize its full growth potential.

The official version of this document is the English version.

Risk Factors

All token purchasers will have an opportunity to review potential risks involved in purchasing ACX tokens as contained in the risk disclosures schedule of our standard token purchase terms and conditions which each purchaser must enter into in order to purchase and receive ACX tokens. We strongly recommend that each purchaser review those risk disclosures in detail before purchasing ACX tokens.

In addition, on 23 April 2018, the Cayman Islands Monetary Authority (CIMA) issued an advisory on the potential risks of investments in Initial Coin Offerings and all forms of virtual currency. CIMA stated that token purchasers should thoroughly research virtual currencies, digital coins, tokens, and the companies or entities behind them in order to separate fiction from facts. For further information on the CIMA advisory, token purchasers are encouraged to visit the following link

https://www.cima.ky/upimages/noticedoc/1524507769PublicAdvisory-VirtualCurrencies_1524507769.pdf

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