RECREATING THE
DIGITAL ADVERTISING
ECOSYSTEM
# Table of Contents

1. **Industry Background & Opportunities** .................................................................................. 3  
   1.1 Industry Background ............................................................................................................. 3  
   1.2 Industry Pain Points ............................................................................................................ 3  
   1.3 Why blockchain? .................................................................................................................. 4  
   1.4 Project Highlights .............................................................................................................. 6  
2. **Adrealm: Who We Are, What We Do** .................................................................................. 7  
3. **The Adrealm Solution** ........................................................................................................ 9  
   3.1 Work-segmentation: key roles ............................................................................................ 10  
   3.2 System Architecture .......................................................................................................... 10  
   3.3 How Business Is Done in Adrealm .................................................................................... 22  
   3.4 Application Scenarios ....................................................................................................... 26  
4. **Technical Architecture** ..................................................................................................... 29  
5. **Adrealm Token** .................................................................................................................. 30  
   5.1 Token Type and Usage ....................................................................................................... 30  
   5.2 How the ARM token is used ............................................................................................ 31  
   5.3 Adrealm public chain mining ............................................................................................ 32  
   5.4 Adrealm Fees and Foundation Earnings ........................................................................... 32  
   5.5 Adrealm foundation lock-in and destroying mechanism ............................................... 33  
   5.6 Adrealm service provider onboarding .............................................................................. 33  
   5.7 AUSD and US Dollar Reserve Mechanism ...................................................................... 33  
   5.8 Smart Assets ..................................................................................................................... 35  
6. **Governance** .......................................................................................................................... 35  
7. **Business Roadmap** ............................................................................................................ 37  
   7.1 Strategic Partnership with UPLTV .................................................................................... 37  
   7.2 Business Development Plan .............................................................................................. 40  
8. **Core Team and Advisors** .................................................................................................. 41  
   8.1 Core Team Members ......................................................................................................... 41  
   8.2 Strategic Advisors ............................................................................................................ 44  
9. **Product Details** ................................................................................................................. 45  
   9.1 Product One: Xhance ....................................................................................................... 45  
   9.2 Product Two: Code Name DTR ....................................................................................... 47  
10. **Risk Warning** .................................................................................................................... 49  
11. **Disclaimer** .......................................................................................................................... 52
The War of Wordcraft

The following pages present in detail the architectural structure, business model, and fundamental value-proposition of Adrealm. We have attempted to make the content accessible, and the layout breathable. Where it was reasonable and appropriate to do so, we have used non-technical language to state plainly the problems Adrealm was created to solve; to explain thoroughly how our proprietary ecosystem works, and how it solves these problems; and to articulate clearly the benefits to advertisers, developers, and service-providers of using Adrealm.

Neither puffery nor exaggeration has found a home in this document, though as with all whitepapers these pages are an artless but orderly assemblages of facts, figures, and forecasts. But for those eager to get to the punch-line, here it is: The Adrealm ecosystem explained and described herein isn’t merely a “disrupter” or a game-changer. It is a value-rich paradigm shift in how the entire global digital advertising industry functions.

In revising our 15 May 2018 whitepaper (V2.0), we have taken to heart a bit of counsel from the writer Samuel Butler (d. 1902):

The successful man will see just so much more than his neighbours, as they will be able to see too when it is shown them, but not enough to puzzle them.

The decentralized public blockchain ecosystem we have created is a new paradigm for digital advertising. The resulting efficiencies eliminate industry pain-points; the manifest transparency frustrates if not quashes the most execrable fraud; and our open-source build and deployment of smart-contracts brings advertisers and developers (et al.) into closer and more productive neighbourhood.

You will not be puzzled, and we are confident that - once we’ve shown you how Adrealm works - you will share our vision of the future of digital advertising.
1. Industry Background & Opportunities

1.1 Industry Background

In 2018, the global digital advertising market will exceed USD 200 billion. Mobile ads will account for over 60% of all digital ad income.

In 2017, global digital advertising sales surpassed TV ad-spend for the first time. Digital ad sales are expected to reach USD 237 billion in 2018, with a 13% growth rate. Leading the overall growth, mobile advertising contributes 63% of the entire digital advertising market, reaching USD 147 billion at a 27% growth rate.

1.2 Industry Pain Points

1.2.1 Among all digital ads, as much as 9% of display ads and 22% of video ads are fraudulent. In addition to being intrinsically repugnant, fraud is tantamount to theft. In 2017, fraud contributed to economic losses approaching USD 6.5 billion. The problem is exacerbated by
the fact that many advertising platforms are unable to combat fraud -- and lack strong incentive to do so.

1.2.2 Accumulating the quality and extent of data needed for sound, strategic deployment of advertising content is costly, and advertisers burn-up both time and money testing their advertising strategy. Given the lack of reliable data required to evaluate the effectiveness and efficiency of ad platforms, even shrewd advertisers are sometimes lured onto dead-ends tracks.

1.2.3 As with the variety and diversity of independent publishers and developers, the abundance of niche channels is something to rejoice over. The downside to this abundance is that small to medium-sized advertisers accrue high costs when assessing (and then gambling on) channels for premium ad traffic.

1.2.4 In 2017, Google and Facebook enjoyed over 60% of total global digital ad spend. Together, they consume more than 85% of all new market share. In addition to a formidable and growing market presence, they present a continuous threat for upstream and downstream players – and not only in terms of profit margins. The lack of transparency in packaged services makes it difficult to track the specific advertising performance at each stage. When it comes to ad pricing, decentralized publishers have very limited bargaining power. This gives ad networks the upper hand in extending the bill settlement process, in which disputes are common.

1.2.5 In 2013, AliPay leaked account data of 20 million users; for Yahoo, in 2017, the figure was 3 billion. With technology development, companies become more adept at mining and filching data about their users. Users often provide information without being completely informed about how it will be used (and: who will be able to use it). Rarely are users remunerated for the use of their personal data.

1.3 Why blockchain?

In the traditional internet advertising market, access to and use of information is asymmetrical to a degree we believe is unacceptable. This asymmetry makes it very difficult to establish trusted mechanisms for the mediation of commerce between advertisers, publishers, and users.

As noted above, this is among the root causes of unethical practices -- e.g., deducted traffic from advertisers, and fraudulent traffic from publishers. In recent years, we have seen a wave of fraudulent activities coming from mid- and downstream players. One beneficiary of this
toxicity of this environment are data monitoring and verification companies. Their high fees, however, increase the transaction costs for everyone else, resulting in shrinking profits.

**Blockchain has the power to revolutionize the traditional advertising market.** Indeed, we predict that the widespread adoption of this technology – while not inevitable - would disempower monopolistic entities.

1.3.1 A distinguishing feature of blockchain technology is its transparent and open nature. Under consensus of operating rules, all participants are authorized to view and monitor data content. Data on the chain is traceable but immutable. **This drastically lowers (where it does not obviate) costs incurred by hiring third-party monitoring organizations.**

1.3.2 Within the blockchain, advertisers can **outsource each stage of service to multiple vendors through smart contracts, which allow for precise tracking of the data in real-time.** A liberalized reward and punishment mechanism will incentivize service providers to improve competitiveness based on service capability.

1.3.3 From a user’s perspective, **blockchain offers a transparent data system that enables users to be well informed of and manage their own information.** Through smart contracts, users can decide whether to publicize their basic personal or behavioral data to specific parties (e.g., data collection and data analytics service providers), with the prospect of receiving payment from them based on the usage of their information. We believe this can significantly improve user privacy as well as data accuracy and validity. Adrealm’s proprietary technology has the potential to reduce advertiser reliance on Facebook and Google.

1.3.4 Blockchain’s distributed storage and accounting make it highly efficient: **all transaction data is presented and settled in real-time** on the Adrealm platform. This will effectively eliminate the current circumstance of billing and settlement delays by the dominating party.

**Summary:**

By putting into practice blockchain’s core capabilities, Adrealm aims to solve key pain points for parties engaged in the profitable and burgeoning global digital advertising industry. Despite the fact that the digital advertising industry is a hundred-billion-dollar market, fraud, inefficiencies, user-information security, and near monopolistic hegemony destroy some of the industries latent-value. There is strong and widespread demand for a smart solution.
1.4 Project Highlights

1.4.1 Public chain structure that supports timely high-concurrency activity

Adopting a widely-implemented off-chain structure for cross-chain assets transactions, the public chain structure supports internet-scale concurrency level, which fully satisfies the needs of digital advertising business. This is realized by means of

- a basic module that allows for cross chain interactions aChannel, ensuring alternate forms of transactions on Adrealm; and,
- a side-chain suite that provides tools such as random sharding validation mechanism, creatively balancing internet capability, state verification, and security.

We will build a basic infrastructure that allows for high efficiency, security, and agility, and will provide different business templates that fit various advertising scenarios.

1.4.2 An innovative consensus model seamlessly aligned with the digital advertising business

Based on the core business model of the digital advertising business, Adrealm designed a self-adapting consensus mechanism for mining: PoVT (Proof of Valid Traffic). Valid Traffic is a commonly agreed upon asset class within digital advertising circles. Based on our unique proposition of “consensus-as-a-service” for businesses, Adrealm determines the weight of importance and priority between different accounts based on “valid traffic,” which will be used for node votes, reputation ranking, community votes, and reward calculations (etc.).

1.4.3 Innovative development path and strong go-to-market execution capability

With deep and unique understanding of the digital advertising industry, combined with a practical application of blockchain technology and ideals, Adrealm implements a two-pronged path focused on simultaneous development of the public chain+DApp layer (in consideration for the development cycle of the public chain), as well as a realistic market implementation strategy.

Adrealm aims to continuously develop practical DApp layer products that can be commercially viable for industry participants. We address key industry pain points throughout the public chain development timeline. This will better pave the road for a stronger public chain. Adrealm will release the first DApp product, Xhance, within after four months of project kickoff, to ensure market traction of the first batch of industry participants.
1.4.4 A clear and large market still poised for growth

The digital advertising market is a hundred billion-dollar market with clearly felt pain points for all its participants. These problems are heavily felt between advertisers, publishers and users.

1.4.5 Top tech and management team

The Adrealm team as a whole has amassed strong AI and big data experience in terms of product development. The core team has worked together for over three years on launching global businesses, curating a strong international management team. In a previous venture, the team was able to acquire over 300 million users under nine months, becoming the fourth largest global Android Developer and a Facebook global developer case study. From app development to becoming China's largest casual and casino type game publisher, its business foundation has already realized profitable growth.

1.4.6 Solid business foundation and best-in-class technology

Based on a business foundation of product data, customer and industry resources, since the launch of UPLTV, the business has achieved over ten million MAUs in under four months with 900 million ad impressions in one month. UPLTV's AI-driven ad optimization platform works together with big data platform, Dataverse, built over years of operation; the two will enable Adrealm’s success, provide technology, customer base and traffic for the blockchain-powered ecosystem.

2. Adrealm: Who We Are, What We Do

2.1 Our team has accumulated over three years of global industry leadership experience, product-experience with AI and big data, and a record of success in tackling international markets. We became a global-developer case study for Facebook, and we established ourselves as the fourth largest Android developer globally by reaching over 300 million users in fewer than nine months. Within one year of transitioning from mobile apps to gaming, we became the largest export publisher in China for “casual” and “casino” gaming categories, realizing profitability with scale.

2.2 We have accumulated a strong foundation of clientele, industry resources, and data from our existing products. This allowed us to gain tremendous traction: over 10 million MAUs (monthly active users) and over 900 million displayed impressions within four months of product roll-out. We also have an AI-driven ad monetization platform (UPLTV) as well as a strong data platform built from years of being in the business (Dataverse). These are elements of the critical backbone for
Adrealm and the immediate take-off, including the technical support, user adoption, traffic integration and development of the overall business.

2.3 The launch of the first product in the Adrealm ecosystem within four months of project initiation based on our deep understanding of digital advertising and blockchain applications to this industry. The team is focused on continuously developing innovative products for the ecosystem.

2.4 Adrealm will redefine digital advertising by cultivating a self-sustaining open ecosystem. Within this ecosystem, participants can achieve advertising effectiveness, operational efficiency, trustless and fair transactions, and freedom of choice -- a full stack of blockchain-based digital advertising solutions.

2.5 Developmental benchmarks

**Short-term goals (2018)**

- Adrealm public chain infrastructure R&D
- Using blockchain technology, develop commercially viable products that can be adopted by market to address industry pain points, key among which are solving for data ownership, data mobility, and anti-fraud, these being part of the foundation of our unique ecosystem

**Mid-term goals (2019-2020)**

- Launch of Adrealm public chain, thereby establishing a new era of blockchain-based digital advertising transaction and service standard
- Redefine value allocation through more efficient and reasonable transaction process
- Facilitate the initial build-up of the ecosystem

**Long-term goal (2020 and beyond)**

- Build and expand network effect and smart data capability for the Adrealm public chain
- Empower industry participants globally to realize an omnipresent digital advertising ecosystem that covers a global network

By building a stronger and smarter data foundation coupled by network effect, we shall empower industry participants from across the globe to realize a comprehensive, equitable, ethical, efficient, and sustainable advertising ecosystem.
3. The Adrealm Solution

Adrealm aims to provide an open underlying layer of transactional and data capability. The business ecosystem is open-source. In the early phase of building the ecosystem, Adrealm will lead the building of Apps and key data processing engines to facilitate and encourage other developers to create third-party apps on Adrealm. Adrealm will serve as an ecosystem operating system.

Adrealm diminishes the reach and effect of large monopolistic platforms by enabling differentiated services and crowdsourcing at key stages of advertising. By establishing a transparent marketplace for “micro-services” for advertisers and developers, together we will reach a new threshold of ethical and efficient operations.

The first step is (a) to separate each of the technical phases of advertising into the blockchain, and (b) redefine each role as a “micro-service.” Each role will then correspond to a type of service. Each type of service will have a group of service providers that fulfills the service-need through the execution of smart contracts. In this way, risk is reduced through crowdsourcing -- may the best service provider win the contract.

Adrealm will be responsible for standardizing the operating model for each type of service provider, and for providing standard codes and smart contract templates.
3.1 Work-segmentation: key roles

**Advertisers** are the parties willing to pay for traffic (audiences). They are on the demand-side of this model. There are multiple methods for calculating payment, but generally they’re based on metrics like page-views, click-through rates, *etc.*, and how much the advertiser pays is measured in terms of how many people see and/or engage the advertisement.

**Publishers/Developers** are on the supply-side of the model, and the service they supply is traffic. Publishers and developers may have one or multiple media/sites which requires monetization. In the Adrealm ecosystem, publishers/developers can monitor bids, which will exist in Adrealm as smart contracts released by advertisers.

We identify six main **service providers**. A service provider will register their service (by category) through Adrealm. Once registered, they will have access to specific types of smart contracts released by developers and advertisers. The following are key service-providers:

- **Data Analytics** professionals provide performance attribution, events tracking, and ROI analysis for advertisers and publishers

- **Data Exchange** professionals provide a marketplace for verified, fair-priced, and transparent data-exchange services, when rightful ownership of on-chain data is established

- **Data Management** professionals provide accurate user profile tracing and other related services for advertisers, publishers, and other service providers

- **Advertising Optimization** Optimizing distribution strategy by using existing or other DMP data, combined with internal algorithms.

- **Advertising asset/rich media production** Creators of quality assets that create higher CTR, CVR, and ROI and is paid based on ad performance results

- **Anti-Fraud** professionals evaluate the likelihood of fraudulent activity for a specific transaction by running public and owned-data as through internal anti-fraud algorithms

3.2 System Architecture

The pain points we discussed at the beginning of this whitepaper need to be understood in the context of the nature and scale of business transactions in digital advertising. When we turned our attention to the inefficiencies of the industry – in which, we note, we are an established global presence - we saw that blockchain technology offered not just a pain-management solution, but a cure for the disease.
This is a point we would like to emphasize about Adrealm: We did not set-out to find a monetizable use-case for blockchain. On the contrary, our blockchain-based token-generating ecosystem was developed as a specific response to inefficiencies (and ugliness) we have observed and experienced in the current digital advertising industry. In evaluating whether Adrealm is right for you, we hope you will reflect a little upon the significance of Adrealm’s origins.

But let’s get back to the design and architecture of Adrealm.

Adrealm’s system architecture utilizes a triple-layer structure:

- Public Chain layer
- Service layer (Engines & Apps)
- Off-Chain Network

Given the large number of participants and the massive amount of data involved in digital advertising, a layered approach is required for decoupling and multiplexing needed to reinvent the industry. Each layer will have (and will be governed by) a unique infrastructure. This is necessary for agility, high concurrency capability, and big data.

### 3.2.1 Off-chain Network

The most typical business scenario in the digital advertising space consists of a series of recorded data changes. Data processing activity is seen as continuous, high-concurrency changes to the state of data.
Take as an example the attribution (or tracking) business. This involves collecting advertiser installation and in-app data, as well as ad impressions and click data from the developers. All this data is then processed based on a specific logic to confirm the state of attribution.

For digital advertising, a high capability of timeliness and concurrency in data processing is a fundamental need. Adrealm has designed a comprehensive off-chain network infrastructure that can accommodate cross-chain asset transactions and support for various internet-grade concurrency activity. This is designed to satisfy the unique business needs of the industry, including analytics, data mining, programmatic and automated transactions, as well as anti-fraud. Through an off-chain network, privacy guarantees can also be strengthened, as it can effectively segregate identity.

**Off-chain Network Components**

**(1) aChannel: Cross-Chain Transactions**

aChannel is a basic module enabling cross-chain interactions with the public chain, including verifications in the smart contract and transaction script, and realizing interface with other public chains. aChannel can also realize asset mapping of Bitcoin (BTC) and various other assets. Allowing them to be easily used on the Adrealm public chain. (This is important, as Bitcoin does not inherently support smart contract capability.) In addition to mining rewards, Adrealm public chain can also provide various higher level capabilities, to seamlessly satisfy business processes.

Adrealm’s off-chain network encompasses various methods of transaction modes from different public chains, because our aChannel allows the Adrealm public chain to easily interact with BTC, ETH, and others, without having to worry about technical requirements. This enables all of Adrealm’s off-chain network services to have cross-chain transaction capabilities.

**(2) Side-Chain Suite**

Each business “scenario” can be commonly understood as a state channel. These state channels can support the complexity of various hierarchical business scenarios. Adrealm’s off-chain network aims to realize a set of these channels, in a smart contract environment, by way of a set of one-off, single-usage side-chains. This set of side-chains will be ordered and managed in the form of a Merkle Tree, whereby layers can expand infinitely to enable per-second level processing. All transactions within the side-chain suite can be removed and edited before it is submitted to the above layer.

Prior to opening the state channel, all participants shall lock down a certain amount of token assets, according to the business parameters. The lock-in process is similar to RSMC (Recoverable Sequence Model).
Maturity Contract) used in the Lightning Network, but is projected from an on-chain contract of a registered service provider in the side-chain suite towards the off-chain contract. This registration process can be seen as a type of lock-in reserve mechanism, which is deductible under circumstances of fraud.

**Side-chain suite tools**

In the case of user-nodes discovering fraudulent activity in the midst of state change (once the state channel has opened), parties can refuse their signature and submit relevant evidence to substantiate claims that certain states to be erased. For a decision to be made regarding whether a change should be executed, a majority rule shall be implemented with a multi-sig mechanism (explained below).

- **Multisig:** Multisig technology originates from the traditional multi-signature account, wherein a multi-signature account means the assets on one account belongs to N number of people. When N number of people have differing opinions about the usage of assets in the account, and given that each individual has the same weight allowed to each one’s decision, then, to guarantee the effective usage of assets in the account (where M number of people within the total N number of people agrees to the transaction [M<N]), the transaction becomes valid. This is the definition of an M/N multisig account. In the environment of a smart contract, multisig can leveraged in the validation process of contract state -- that is, the verification of data or processing of data under various states through multi-party voting mechanism.

- **Sharding:** Most blockchain solutions nowadays utilize node syncing to process each transaction. This heavily limits the capability of the entire network. However, if we leave state verification and authority to several participants only, this can increase the possibility and risk of fraud. Adrealm’s off-chain network leverages a hybrid solution: each state validation must satisfy a specific amount of sharding confirmation. This is achieved by breaking down what was originally a “whole” state validation into separate independently validated parts, allowing randomly selected nodes to validate the state. This design can create more efficient, secure, extendable and private system, as well as effectively avoid colluded fraud.

- **Nesting:** In certain business cases, several participants (i.e. service providers) may allow for state change processes to be executed in smaller participated ranges, and may not have any strong relationship with any business activity on-chain. For these activities, another sub-layer on the chained network can be opened on the side-chain suite to further increase the speed of business activity.
Business Templates

Each business-category within the ecosystem correlates to a series of specific participants and processing logic. Adrealm has therefore built differing business templates in the off-chain network for different business scenarios.

Consider ad placement bidding, for example: Advertiser A wishes to buy Ad Campaign C from Publisher B. This costs 1,000 ARM, yielding 200 effective ad displays. Advertiser A then locks 1,000 ARM into the smart contract, in which all advertising activity that results in the payment to Publisher B is recorded in the off-chain network. Participants of this scenario include A, B, and all service providers involved. Each state change that happens on the side-chain entails a cost requiring payment by the publisher, and which is confirmed by the advertiser (evidence may be generated by service providers). The data structure shall be represented as

[advertiser sig + publisher sig + previous business state + new business state + timestamp]

At the end of the campaign, all side-chain data will be submitted at once to the public chain, and the payment of 1,000 ARM will be executed automatically. Since this prevents non-participants from visiting the side-chain, it effectively protects the data privacy of participants throughout.

Combined with the consensus mechanism of the public chain, the business template can be extended to other high-concurrency state change industry areas where it can be applicable.

- **Fraud Proof:** The transaction process is an effective time window for disputes. Usually this will not exceed 10 days, which is much shorter than the 3-6 month window in the traditional transaction model. This is assigned once the data collected on the state of business (through the off-chain network) is submitted to on-chain for payment. During a dispute period, participants can submit evidence of fraudulent activity at any given time. Once verified (i.e., data fraud or state fraud has been committed), deductibles will be extracted from the fraudulent party. The whole process is executed on the public chain through a smart contract, and therefore all results from the dispute will also be recorded on-chain.

- **Consensus Support:** It is expected that each participating party wishes to protect its own interests, therefore the introduction of a random witness node to truthfully reflect valid traffic throughout a business process reflected in the data generated in the off-chain network. This provides beneficial guarantees to the PoVT calculations on the Adrealm public chain.
3.2.2 Service Layer (Engines & DApps)

Aside from the core advertising business of ad display, a series of third-parties are needed to provide complementary services. The service layer is populated by service providers who will provide services at each stage of the digital advertising process. This will become a platform for other related services outside of the core advertising display stage.

The technological structure for the service layer is defined by a series of interfaces, service content, transaction standard as well as a service program API build based on standards for a particular service vendor.

Service providers on the service layer will follow a set of requirements to receive permissions, and to utilize data on the data layer to provide services. In the meantime, service providers can use their own data, as well as provide services based on the domain of expertise through a centralized method. Service payments must be verified and billed through Adrealm’s transaction layer.

All engines and DApps must be completely open to third-parties. In an effort to ensure that basic functionalities can be used, Adrealm will build several key engines and DApps on its own or with its partners, in the early stages of ecosystem construction. However, Adrealm will not hold special policies or promotion towards its self-built engines and DApps. Adrealm will encourage third-party developers to build their own engines and DApps on the ecosystem, the purpose of which is to improve the overall user experience of the platform.

3.2.3 Public Chain Layer

Adrealm public chain encompasses the contract publication, execution, payment, incentive realization, and data verification and storage between all roles (advertisers, publishers, and service providers) in one unified platform. All forms of activities, such as ad buying and other related services with service providers, will be automatically executed and paid through the form of a smart contract on the public chain.

Adrealm public chain introduces a self-adapting hybrid consensus mechanism known as PoVT (Proof of Valid Traffic) for mining. This has been designed to fit the characteristics of the advertising industry and actively balances the process of incentivization.

Introducing PoVT: Proof of Valid Traffic

Overview

PoVT, short for Proof of Valid Traffic, operates on Adrealm, which is a vertical-specific public chain designed for the advertising industry. It is also a consensus mechanism designed specifically for the core business models within the industry.
For the digital advertising space, valid traffic is a value metric for participants. The idea is to assign the level of importance and weight within the Adrealm ecosystem based on the amount of valid traffic in one’s account. This will also be used for voting, reputation system ranking, and reward dividend calculations.

*What kind of traffic will be deemed “valid traffic” on Adrealm?* In the traditional digital advertising business, the validity of traffic is determined by whether it satisfies a set of KPIs set by the advertiser, including CTR, CVR, retention, and ROI (etc.). In Adrealm, we continue to follow this standard. The statistical compilation and judgement as to whether it meets standards (or: to what degree it meets those standards) will usually be completed by third-party data tracking and analytics service providers. This is one reason why we’ve aimed to realize this through Xhance, a blockchain-powered data tracking and analytics product, launched in the early stages of our ecosystem building efforts.

What should be noted is that Xhance is not the only data tracking and analytics service provider running on the Adrealm ecosystem. Adrealm will provide an open source environment for any organization or individual to build this type of capability.

PoVT borrows its design from PoS/dPoS/PoLand and is the first to coin the concept of “consensus-as-a-business-service”. We believe the Adrealm public chain will be a significant milestone for the blockchain space.

**Account and Role Types**

The Adrealm public chain address is the account, made up of a 40-character long sequence. Sequences starting with “T” represents test net and “M” as main net. The next two letters will represent the following account categories:

- AD - Advertiser, traffic demand side
- DE - Developer, traffic supply side
- AF - Anti-Fraud, service provider
- Sx - Service Provider x, other service providers

**Basis for Calculation**

Each ad display (traffic) is born from the developer-side and consumed by the advertiser-side. Anti-fraud service providers shall witness this entire process and evaluate the quality of this traffic. Throughout this process, all parties will undergo changes in their PoVT score, and the degree of this change is determined by one’s coefficient known as “Character Weight Factor (CWF)”.

The function of CWF: For each unit for valid traffic generation and consumption, the system’s PoVT total will increase by 1. Due to the role difference for each participant, each will have a different ratio
for receiving the added PoVT score. As the part most affected by the CWF by the PoVT represents the level of system activity flow, this coefficient is highly important.

The initial value of CWF will be written in the first block and will be adjusted in a naturally adaptable environment, according to business needs.

The basis for PoVT calculation is as follows:

- Owns no less than 100,000 ARM
- Owns no later than the most recent 43,200 blocks (~30 days)

To avoid a Sybil attack or other types of attack that attempt to manipulate the PoVT score, Adrealm has designed a series of complex calculation methods, including NCDawareRank and EigenTrust++ etc. Based on the above calculation verification results on the Bitcoin and Ethereum network, we can prove that PoVT is strong enough to effectively control the token ownership amount and sustainably promote the growth of valid traffic.

A detailed calculation and verification process will be elaborated in our tech papers.

Adrealm has also created a self-adapting mechanism for participant role-weight of importance and a dual-governance mechanism for community voting.

**CWF**

In the genesis block, the declared setting for CWF is as follows:

\[
\text{AD:0.3, DE0.1, AF:0.5, Sx:0.1}
\]

The self-adapting adjustments are initiated when one out of the two conditions are met:

1. Since the last CWF adjustments were made, that a total of 14,400 blocks (~10 days) have been created
2. That one party’s PoVT score has exceeded the total PoVT score by 40% within the system

The self-adapting adjustment logic is:

1. By computing the total PoVT score for each party, lowering the CWF of the highest party to 90% of its original, which will then be evening distributed to the other parties (keeping a total of 1)
2. The new CWF will be written into the most current block, used for calculations of the new PoVT value

This approach is taken to prevent one party from controlling over half of the PoVT score, which hinders the overall growth of the economy.

**Community Voting**

Matters related to the voting procedures of the governing council, council seats and key roles will be in the governance chapter. Council members have the right to initiate a proposal for adjusting the consensus coefficient.

Accounts with a PoVT score higher than 0 may vote, where the weight of the vote is dependent on the account’s PoVT score.

Voting procedure takes place on-chain. Once the required ratio of votes has been established, the coefficient adjustment will automatically become effective in the next block.

**Native Assets**

Adrealm’s public chain supports two types of native assets:

1. **ARM token**: Represents one’s rights and benefits to the chain
2. **AUSD token**: A static value token

ARM is the only universal warrant within the Adrealm network, used for community governance, rewards, mobility, and other transaction fees. AUSD is a static value currency where 1 AUSD = 1 USD, used only for specific business payments and is not available on the public market.

**Asset Mapping**

Cryptocurrencies coming from other public chains (i.e. BTC, ETH) may transact on the Adrealm chain through the form of “asset mortgage,” to generate its corresponding smart asset (realized through the aChannel component). For example, 1ETH is converted to 1aETH, where aETH can easily participate in Adrealm transactions and enjoy mining rewards. This type of “asset mortgage” can undeniably be reversed and cancelled. Asset mapping allows users to directly participate in payments related to business transactions on the public chain with other public chain currencies without additional fees.

As other cryptocurrencies may experience large or turbulent fluctuations in price, it is unlikely to be not beneficial to parties to use them for payment for traditional advertising services. Adrealm does
however offers participants the freedom to choose whether they would like to conduct transaction for services through non-ARM cryptocurrencies.

**Anti-Fraud for Advertising**

Ad fraud is serious issue plaguing the digital advertising industry, and it is especially acute in the mobile internet domain. According to Talkingdata, over 90% of mobile ad clicks are fraudulent. Fraudulent ad traffic extorts a heavy toll on advertisers, who can fight fraud through the following ways only:

1. Trust the inherent anti-fraud capability of the ad platform itself
2. Use third-party tracking and attribution anti-fraud functionalities
3. Retain independent anti-fraud service providers

Anti-fraud functionalities within the ad platform are insufficient to protect the advertiser. Indeed, ad platforms are motivated to detect fraud risks from the developer side, and they wish to do so only in order to earn more money for themselves, rather than to save money for advertisers. There is even an unfortunate incentive not to disclose fraudulent activity: ad platforms worry that reporting such fraud would serve only to worsen advertisers’ trust.

Third-party tracking and attribution platforms provide very limited anti-fraud capabilities. As this is often not their core service offering, third-party platforms limit their resources to developing functionalities that detect fraudulent behavior. This makes their services virtually useless in the face of highly advanced and irregular fraudulent behavior. What’s more, attribution platforms charge high prices for usage.

Despite the fact that this functionality is a fundamental necessity, there is a lack of mature anti-fraud service providers. Anti-fraud requires a data foundation, which is why ad platforms and third-party tracking services are able to offering anti-fraud functionality (i.e., they have the relevant data to track). The paradox is apparent: despite the fact that advertisers realize the added value of an independent anti-fraud service provider, deciding whether to hand over to them valuable data to them is a challenge. Lacking data, it is difficult for independent service providers to survive and grow, many persisting as add-on functionalities merely.

Adrealm hopes to usher in a profound and lasting paradigm-shift in the global digital advertising industry. To that end we intend to build a space that welcomes independent service providers -- including those who focus on anti-fraud technology.
Adrealm has built a two-layer design for anti-fraud: System Rules + AI

System Rules

Provided by Xhance (or by other Adrealm on-chain service providers), and covering anti-fraud capabilities offered by regular third-party tracking and analytics platforms, these functionalities include (but are not limited to):

1. IP/device ID blacklist hit rate analysis
2. New device detection and ratio analysis
3. Loyal customer ratio analysis
4. Device type distribution analysis
5. Length of usage distribution analysis
6. Time-gap analysis of impression to click, click to install, and install to activation
7. App store download speed analysis
8. Others

The system rules apply the most advanced anti-fraud architecture to provide basic anti-fraud functionalities. What differs from traditional industry methodology is that advertiser data does not need to be shared throughout the above stated processes. All of the above can be done on the advertiser’s own nodes (See specific Xhance related tech docs).

AI

Adrealm will build a real-time AI anti-fraud operating environment, to provide the following core functionalities:

1. To download specific anti-fraud service provider analysis model documents (encrypted) and operate the models
2. Import real-time impression, clicks and install data and compute risk index for fraud using the computation models
3. Record all operating processes and units for payment (per time)

The model will be provided by Adrealm’s “anti-fraud service providers,” each service provider having its own in-house data science team. The team will utilize machine learning, AI, and data analytics tools to form analysis models through a series of training and learning.

To support the work of anti-fraud service providers, Adrealm will make a training data pool open to all identities registered as “anti-fraud service provider”. This data pool will consist of be recent anonymized data and will be reliant on Adrealm advertisers and other parties to donate voluntarily.
Adrealm will openly invite global data scientists to participate in a rewarded data analytics challenge, similar to the event [https://www.kaggle.com/c/talkingdata-adtracking-fraud-detection](https://www.kaggle.com/c/talkingdata-adtracking-fraud-detection).

Similar to the system rules, Adrealm’s AI functionality runs on the advertiser’s node. Advertisers do not need to release the data.

Additionally, the public chain consensus PoVT design gives a higher coefficient to anti-fraud service providers (see above). This is intended to encourage more participation from such parties. When there are more participants leveraging the AI-model, anti-fraud service providers will receive higher weights to their PoVT score.

Adrealm aims to continue to travel forward with and support the data science community, to eliminate fully fraud.

**Other Characteristics**

Adrealm has included some other characteristics to serve the advertising business model:

1. A built-in identify check: KYP (know your partner)
2. Consensus optimization for storage, with no additional costs for data to be onboarded
3. Fast query and filter
4. Utilizing technologies such as proxy double-encryption and zero-knowledge cryptography (zksnark method), to better ensure user privacy
5. Multi-sig mechanism to ensure secure transactions and effective arbitration

### 3.2.4 Development Roadmap

Adrealm chose a two-pronged development path, a unique “public chain+DApp” structure, focusing on business solutions. Without enriched business “scenarios” and a non-landing public chain technology, it is merely an obscure vision and ideal. Therefore, during the development of the Adrealm public chain, we must first realize independent DApps that can run on its own outside of the public chain. The DApps not only provide a foundation and resource of traffic and users for the public chain, but will also solve immediate problems in the industry, encouraging more people outside of the blockchain industry to get involved in the building of our ecosystem. With the completion of the AdRealm public chain, all DApps (either self-developed or developed by third party) will become part of the AdRealm ecosystem.

Based on our experience and insights into the digital advertising industry, we have decoupled the various stages on the advertising value chain and fused the key value proposition of blockchain technology into these stages. While building the public chain layer, the development of the first two
DApps is strategic in that it not only realizes a reconstruction of data rules, it can also practically solve industry pain points, ensuring that the public chain has enough technological foundation. Our goal is not only to show the value-add of blockchain for digital advertising for participants but also that it can improve actual earnings.

- **Xhance** (see chapter 9.1) – Advertising attribution is the root of all advertising data and is the most commonly used data service. Xhance may be seen as an “attribution” product, but it aims to serve as the foundation of advertising data in AdRealm, creating an opening for data reconstruction. Xhance will not only provide attribution but also include anti-fraud, ROI and LTV analytics capabilities.

- **DTR** (see chapter 9.2) – Data intelligence is the core underlying capability for the digital advertising industry. Through DTR, we can redefine data ownership, facilitate data mobility and form a new digital advertising intelligence engine.

For other relevant services, AdRealm will either self-develop, partner or enable DApps to be built on the ecosystem. Ultimately, a fully closed loop business process will be formed with the launch of the Adrealm public chain, through a public chain layer that connects to an off-chain suite and service layer.

### 3.3 How Business Is Done in Adrealm

The advertiser begins by submitting a smart contract unto the chain. This simultaneously freezes the budget of the advertiser. On the developer side, the contract will be automatically carried out when there’s a match – that is, then there’s an alignment between the need and expectations of both parties. This same process may involve service-providers in other areas, such as creative materials, tracking, analytics, anti-fraud etc. The services carried out by these providers will also be validated and automated through smart contracts.

The entire transaction process will be regulated by the revenue-sharing ratio of the smart contract, ensuring that the relevant parties will be allocated the right amount of budget-split from the advertiser. This eliminates the need for and cost of traditional ad platforms, reducing the cost of brand- and trust-building. Developers and publishers will be split in the range of 85% - 90% while the rest 10% - 15% goes to service providers.

As micro-services are planned and executed through smart contracts, the whole advertising process (from display to payment) becomes transparent and automated. This fair open system structure minimizes costs associated with ad matching and display.
The model predicts that excellent service providers will continuously win more clients by raising their service capabilities without having to increase sales and marketing expenses. This is especially true for AI technology service providers, for whom costs will be close to zero. Adrealm promotes healthy competition, cultivating service excellence and service results throughout the ecosystem.

**Business process for participants**

1. Advertisers can access the smart contract template (CPC/CPM/CPA) on the public chain and input key parameters to create a campaign, including:
   
   a. Promotional materials and creatives
   b. Target audience parameters, for example: US, casual games, female between ages 18-35, for traffic filtering
   c. Budget information, bidding mode and target price range
   d. Service vendor requests, such as price and PoVT values
   e. Timeline and time requirements

2. During the smart contract request, publishers/developers and service vendors will automatically hear the contract request. Once certain prerequisites are met, the campaign will go into execution:
   
   a. The process in which a contract is requested and heard is automatically completed through Adrealm
   b. Once a campaign enters execution mode, all participants’ public key and identification information will be synced to the off-chain ad display system

3. Execution of the Campaign happens off-chain as follows:
   
   a. Through the ad SDK and server-side program provided by Adrealm, multiple campaigns will jointly bid for a specific impression on a specific ad placement
   b. During execution, each party will provide the signature for off-chain interaction relevant to its data; since the public key has already been implemented, the identity of each party can be trusted
   c. Basic system rules for anti-fraud will be recorded and labeled by the service provider in real-time (details to be found in the anti-fraud section)

4. During campaign promotion, data from the campaign will be submitted to the public chain after signatures; the smart contract will also determine the validity of the data.
a. In the agreed upon window of time, the campaign will be marked as complete; no party shall submit any updates to the results data

b. In the case of a dispute held by a single party, data must be received in time in order to reset the window of time for the campaign

5. Campaigns marked “complete” will immediately initiate payment and billing as well as an update process for the PoVT

a. According to the actual effective consensus setting, settlement and PoVT updates may lag, giving room for dispute settlement

The following is an example of a campaign in CPC mode, illustrating how an advertiser can anticipate the entire business process:

- Advertiser A wants to promote casual game G to American females.
- Advertiser A exchanges $1000 to ARM tokens on the exchange.

Advertiser A submits a smart contract on the Adrealm system, including the following key information:

- Subject of promotion: Game G Promotional needs: USA, female
- Promotion budget: $100/Day
- Promotion period: 10 days counting from today
- Tracking service provider: Any service provider with fees no higher than x%
- Payment terms: CPC at $0.1 max
- Media restrictions: None
- Advertising format: Rewarded video ads
- Materials: Official advertising materials for game G

Since the advertiser chose “any service provider” for tracking, Adrealm will randomly assign any service provider given the x% requirement. If the matching is unsuccessfully during the contract request period, the smart contract will be cancelled and retrieved.

In this example, say 1000 developers/publishers heard the contract for this campaign, 900 passed the requirement and blacklist filter.

Once the request has been completed, service providers and developers shall share their public key into the off-chain network and all interactions will take place there.
From the developers’ perspective, they may participate in multiple campaigns at once. Using the ad optimization tools provided by a service provider, the developer can realize multiple real-time bidding for multiple campaigns.

The ad optimization service provider F receives a notice from developer D’s presets and adds the requests by advertiser A into its bidding list. Developer D’s end user U will see ad displays once developer D initiates an ad display opportunity.

Through the help of data service provider M, ad optimization service provider F can confirm end user U is indeed American female audiences which is aligned to advertiser A’s needs. A small payment will be settled between F and M according to a pre-signed smart contract signed between the two parties.

Ad optimization service provider F will rank the eCPM rates for multiple ads for advertiser A according to its historic data and computation method. Advertiser A’s ad will show given that their eCPM is the highest out of all for a given ad impression.

Once the ad has been successfully displayed, user U clicks on the ad. This behavior is once again tracked by each service provider. The anti-fraud service provider will verify the behavior according to the rules and mark ongoing data.

Once verified, these will be marked valid traffic:

- A token amount valued at $0.1 will be transferred to Developer D in the off-chain network
- Developer D will pay ad optimization provider F according to the agreed ratio based on the rev-share from CPC model
- Based on the rules of the smart contract, the advertiser will automatically pay its tracking service provider a fee of $0.1*x%

With the conclusion of a campaign promotion, the advertiser shall submit a series of data results to the on-chain, including:

- The quantity and type of effective impressions submitted by Developer D, used for calculating changes in PoVT
- Valid signatures from various participating parties
- Quantity and direction of ARM transfer

The public chain relies on the preset logic of a smart contract to ensure no mistakes during the process. At the end of the time window, a confirmation changes the status of the campaign and executes the transfer of ARM.
3.4 Application Scenarios

3.4.1 Dealing with fraudulent ad activity from the developer/publisher side

In the Adrealm ecosystem, anti-fraud service vendors practicing rule-based system and AI-based anti-fraud technology will help advertisers detect fraud and regain lost results from campaign promotion.

For more information, please see specifics on the section regarding anti-fraud. The following is an illustration of actual working process:

- Advertiser A1 and Developer D1 agrees on a campaign C0 in the form of CPC
- The advertiser uses anti-fraud service provider S0 which is based on system rules as well as S101 and S102 anti-fraud service providers which are AI-based
- In the advertiser data nodes, the codes and model documents from S0, S101, and S102 will be installed from an operating TEE virtual machine, to prepare for further data processing work
- At the start of C0, TEE will continuously receive real time feeds of campaign activity data and complete computations
- During C0 operations, according to the rule presets of S0, part of the ad clicks are labeled “abnormal”, originating IP from a target blacklist
- According to advertiser A1’s preset logic, the above recorded data will be passed onto the data chain by S0 signature and is notified through the off-chain channel to Advertiser A1 and Developer D1
- If developer D1 has disputes regarding any of the recorded data, they must submit a higher PoVT score (total) anti-fraud provider within the given time frame to verify the questionable data results in order to reverse the negative record towards S0
- Once campaign C0 ends, all abnormal labels that are not reversed shall not be given automatic payment
- As the complete calculations are completed by S101 and S102 and an analysis report is provided, the advertiser can find out how much fraud risk exists from Developer D1 traffic (besides those labeled by the rules)
- The results from S101 and 102 may not be directly used as evidence for bill settlement but can be used as reference for Advertiser A1 to determine whether to continue working with developer D1
- At the same time, the transaction chain will add all abnormal traffic ratio data by D1 into campaign C0, signed by the various anti-fraud service providers
- Shall the anti-fraud service providers reverse the data label, this will affect their PoVT score within this promotion campaign
- Reversed data can be repeatedly changed and each time will reset the recorded time extension

Considering the cost of execution and realistic possibilities, this action will not take place ad infinitum
- The number of anti-fraud service providers on the chain is limited for each campaign and those who have already participated cannot participate again, allowing us to reach a final decision and result within limited time
- Only the results provided by the system rule anti-fraud service provider will be used in payment deduction; AI-based service providers will only be used as reference and recording on-chain.

3.4.2 Ad price bidding for advertisers

When more than one ad is matched to a specific display opportunity, how do we determine which one gets the ad placement? Google and Facebook both have different ways to determine this (GSP & VCG). We have decided that the algorithm needed here should be crowdsourced to service providers for ad optimization, and let it run its own fitness test.

There can be numerous ad optimization providers who can serve advertisers and developers on the Adrealm network. Developers can freely choose between multiple service providers and test different ad display logic to see which brings the highest monetization efficiency.

Both advertiser and developer ends will have advertisement optimization service providers (that correlate to DSP and SSP internal logic); however, the target and result evaluation criteria are different.

A chosen ad optimizing service provider by the developer will be granted parts (or all) of relevant user data, thereby controlling the order of ads being displayed.

The key here is to have “ad optimization service providers” replace prior ad networks, thus making all advertising resources the same for all advertisers. For ad optimizing service providers, their aim will be to gain more data and continuously improving their algorithm to achieve higher efficiency.

3.4.3 High concurrency activity and scalability issues with blockchain

The final verification in the blockchain usually is done by all participants self-verifying each transaction. In order for a new block to be accepted, all participants must comprehensively verify the accuracy. This not only lowers the speed, it causes bottlenecks, and entails other high inefficiency-costs.

Adrealm attempts to build an off-chain network system where most computations happen off-chain. This allows for the mandatory accumulated updates on the chain to expand to over ten million per second in computational quantity. This state of computation is achieved through a series of verifications from rewarded verifiers, to ensure accuracy on the side-chain.
Similar to Lightning Network, Adrealm off-chain network is a series of smart contracts operating above the public chain. This is to guarantee that participants of a contract have enough capital and able to settle the bill at a later time on the public chain. With that, participants will not need to create the corresponding transaction on the main chain for each state change but only need to record small amounts of information onto the chain.

Since the number of participants required to confirm a state change in the off-chain side chain is less, this summarizes and drills down key data required to be recorded into the main chain. Confirmation is instantaneous. The use of multi-layer structure, decoupling participants required for confirmation, further reduces the cost of verification. Side-chain witness nodes follow a partitioned consensus, to accommodate both service viability and efficiency.

The off-chain network will also implement a set of choices for distributed data storage agreements, providing a programming interface for paid data storage services, thereby establishing an effective backbone foundation for big data.

### 3.4.4 Matching the power of Facebook and Google

This is achieved by getting service providers to focusing on product design. Adrealm encourages service providers to focus on optimization algorithm technology itself: the more effective the ad display capability, the greater the likelihood of winning service agreements via smart contracts. Our use of blockchain technology returns data ownership, attracts data providers to join Adrealm, and facilitates data mobility on the data exchange platform. This will give Adrealm a resourceful, stable, and continuous source of data.

Data analytics vendors with good builds will be attracted to the simple rev-share model and the easy integration process. This, we believe, is strong encouragement to the world’s most powerful computational engines to provide service on the chain.

Adrealm sets the rules and standards, at the same time providing additional data evaluation, ranking, and mining services. Our design complements the network by drawing in service providers that allow users to monetize their own data, creating personalized data. The power of Google and Facebook is matched by authorizing data service providers to acquire certain personal data on accounts (such as Facebook and Google), which is paid through tokens through smart contracts, on a monthly basis.
3.4.5 Dealing with advertising traffic “futures”

In special cases, Adrealm may see the emergence of a role for “futures traffic dealer”. This happens when advertisers believe that – in a foreseeable future - there will be an acute spike in advertising-pricing, within a specific time-frame. Though they may not have any advertising needs at the moment, they may choose to submit a series of smart contracts to “reserve” parts or all of the target traffic for a specific future time frame.

Speculation of time-slots can raise their market price. When that time-frame arrives, advertisers needing channels within that time-frame must in the smart contract bid at a higher price for a share of that specific target traffic. The “futures traffic dealer” thus makes a margin from this transaction.

This compromises the availability of the network’s traffic, and results in an inefficient distribution of network resources. Adrealm aims to prevent this from happening by implementing several operational models – even at the current stage – so as to restrict futures traffic dealing. We aim to restrict speculative traffic-reselling through technological means. Algorithms will detect and withdraws smart contracts which seem to not originate from real advertising demands.

4. Technical Architecture

Adrealm contains a public chain (Adrealm Blockchain), off-chain network, and a service layer. The public chain will be the main body for carriage of value and transfer of value, to provide the highest level of reliability, facilitating the mobility of assets and creation of value. The off-chain network is seen as a series of components and tools that complements the public chain. The design of the off-chain network is to enable traditional internet characteristics such as the demand for high concurrency, high throughput, cross-chain asset payments, and distributed big data storage activities. It will periodically interact with the public chain at low frequency, to provide an expanded platform for public chain computations. The business template component in the off-chain network enables business-specific use cases for the advertising business, defining a different processing logic for different business scenarios. The service layer will initially provide the APIs for developers, hiding complexities from fundamental technology layer. Core application functionalities realized through the service layer can also be easily integrated.
The following is an illustration of the entire Adrealm technological architecture:

For more details on the technology, please refer to “Adrealm Tech Whitepaper”.

5. Adrealm Token

5.1 Token Type and Usage

Adrealm issues two types of tokens.

- **ARM** – Currently an Ethereum-based decentralized blockchain digital asset based on the ERC20 token standard. With the rollout of Adrealm public chain, this will be reflected on the public chain on a 1:1 basis.
- **AUSD** – A static token with the rate of USD 1:1 guaranteed by Adrealm (AUSD is a deposit mechanism -- see below). **AUSD cannot be circulated in the public marketplace and is only used for transaction-recording and tracking purposes.** AUSD is created when ARM is converted to AUSD and destroyed when converted back to ARM (by entering a blank URL).

The purpose of creating two types of tokens is to prevent price volatility of ETH (and thus ARM) from making the Adrealm service marketplace hostage to crypto markets, and thus unworkable.
The ARM token, is currently based on Ethereum, is directly pegged to the value of ETH, and is openly traded along with ETH. Because the value of ETH fluctuates, so too will the value of ARM. Volatile swings and spikes in the ETH may result in unexpectedly high valuation of the ARM; and without any insulation from volatility, severely fluctuating values of ARM would have tremendous negative impact on Adrealm’s digital advertising marketplace.

For example, if we allowed advertisers to use ARM to buy traffic, pricing fluctuations in the open market for ETH (and therefore for ARM) might leave developers reluctant to take service-contracts. But we’ve solved that problem. Use of the AUSD token – which is pegged to the value of the US dollar - is restricted to transactions in the ecosystem. This eliminates risk for developers: they will receive payments in AUSD tokens, which can be converted to ARM, and then into fiat currency.

5.2 How the ARM token is used

- Using ETH, the advertiser buys ARM tokens from the open market

- The advertiser creates a smart contract for its advertising needs. With the creation of the smart contract, the system (1) converts the ARM tokens into AUSD tokens internally, and (2) freezes the converted AUSD tokens.
  
  - ARM to AUSD conversion rates fluctuate in real time to ensure the 1:1 exchange rate of AUSD to USD
  - If the transaction does not fully complete, the remaining AUSD tokens will be automatically converted into ARM tokens at the current exchange rate and given back to the account holder
  - The AUSD tokens are created by Adrealm when the contract is created

- Upon task completion, developers and service providers receive payments in AUSD. Developers and service providers can exchange AUSD into ARM, and thereafter exchange the ARM into ETH in the open market
  
  - Developers and service providers can hold small amounts of AUSD tokens temporarily in which Adrealm ensures the 1:1 exchange rate of AUSD to USD
  - When developers and service providers exchange the AUSD tokens into ARM tokens, the value of ARM will fluctuate with the changes of the market
  - AUSD are recovered and destroyed (i.e. entering into a blank account, will not affect historical data tracking capability) by Adrealm, at the same time, Adrealm pays in ARM at the present exchange rate
  - Developers and service providers can hold up to a certain amount of AUSD tokens, once exceeding the limit, the system will mandatorily exchange AUSD into ARM
• Adrealm charges a small percentage of AUSD from each transaction as “gas” fees, the rate being determined per transaction

• Adrealm must effectively manage its token pool at all times, ensuring for both supply and appropriate amounts of ARM to deal with daily business needs, and as insulation against and possible crisis. ETH and BTC will also be stored to be used when needed to deal with market stability.
  o Adrealm will set a mandatory exchange mechanism triggered by intense fluctuations in ARM value and mandatorily exchange the AUSD into ARM under extreme circumstances
  o Tax fees charged in the transactions will also be used for maintaining market stability

5.3 Adrealm public chain mining

With the launch of Adrealm Blockchain, mining is initiated following the consensus protocol of PoVT. Minable tokens will be 30% of total ARM supply, that is three billion tokens allocated for mining.

• Through the burning model V/L detailed calculation prediction, the level of mining difficulty is determined as the following proposal to realize the sustainable operations and effective incentivization of Adrealm network:

• Mining volume diminishes every four years, starting from 2019 and ending in 2034
  o 2019-2022 - 400 million ARM tokens generated annually (Pre-mined tokens for those incurred within 2019)
  o 2023-2026 - 200 million ARM tokens generated annually
  o 2027-2030 - 100 million ARM tokens generated annually
  o 2031-2034 - 50 million ARM tokens generated annually

• All ARM tokens mined share the same quality, rights and price of ARM earned during transactions and can enter the market for participatory purposes

5.4 Adrealm Fees and Foundation Earnings

The objective of Adrealm’s operating blockchain foundation is non-for-profit. It wishes to reconstruct the current digital advertising market and build an ecosystem that is future-facing. Transaction fees within the Adrealm network is mainly used to maintain the advertising ecosystem and facilitate ecosystem building. Adrealm uses a PoVT consensus mechanism, stated in chapter 3.2.3, all transactions will generate a PoVT score for participants in the transaction. Adrealm transaction fees
are charged when PoVT is confirmed. In the initial stages, 5%-10% will be set as the fee and this ratio will be charged according to the role of the participant. To better maintain the economic system in the future, the fees may be adjusted and will be decided upon through voting.

5.5 Adrealm foundation lock-in and destroying mechanism

Adrealm buys back ARM in the form of transaction fees on the network. Deducting daily expenses by the Adrealm foundation, the rest of the ARM will be locked in by the foundation. Adrealm foundation will lock-in ARM tokens by quarter and is voted upon whether amounts of ARM is to be destroyed. This is also the method in which Adrealm ecosystem transfers and shares the value of the ecosystem to the rest of ARM token holders.

5.6 Adrealm service provider onboarding

By onboarding to our ecosystem various service providers to the platform, Adrealm will create a more transparent and fair transaction platform. To ensure the service quality and to protect multiple party interests, Adrealm has the following onboarding requirements:

- All service providers must own ARM as capital reserve, as prima facie proof of service capability and value to the chain. This ARM reserve is tied to the chain through smart contracts.

- There will be differences in the amount of capital reserve required for different service vendor types. Different levels of capital reserve amounts will indicate different levels of service grade. This will at some levels bear upon service vendor name-ranking.

- When providing services for others, Adrealm will extract a fixed rate of 0.004% in transaction fees. Capital reserve held by service providers will also generate loyalty points, with loyalty point calculations differing among service vendor types. Adrealm foundation will hold periodic voting to determine the calculation rules, in order to stabilize the interests of multiple parties.

5.7 AUSD and US Dollar Reserve Mechanism

- As discussed above, the AUSD token is created and put to use primarily to insulate parties (advertisers, developers and individual service providers) from market volatility during a contract transaction. The value of the AUSD token itself needs to be strictly maintained for stability purposes. We have thus provided a reliable ARM+USD double capital reserve to ensure the stability of AUSD.
The AUSD token is an intermediary currency that is constantly created and destroyed. Its total amount also depends on the total transaction size within the system for a given time period. Since this transaction size is equivalent to Adrealm’s business magnitude, it can be effectively forecasted: the reserve can be easily managed. The utilization of a capital reserve to guarantee the value of AUSD can be easily managed.

When AUSD is generated from Adrealm, the requestor must provide a fixed amount of ARM. Upon receiving ARM, AUSD will be given to the requestor based on the real-time exchange rate. Until the AUSD is returned, the fixed amount of ARM will be locked up.

According to a fixed ratio P% (starting with P=100, meaning 100% reserve amount), Adrealm will deposit a reserve amount equal to total AUSD token amount *P% into the bank, or purchase low risk/high liquidity currency funds and short-term bonds. This can be effectively exchanged from AUSD tokens to BTC or fiat currency when needed.

The reserve ratio P is adjusted according to the scale of Adrealm’s business, the storage level of AUSD tokens, and market volatility. It will also be open to inspection by investors and by the community. Under stable market conditions, Adrealm will lower the reserve ratio P accordingly, to expand Adrealm’s market size. Likewise, Adrealm will also increase the reserve ratio P to ensure the safety of business and health of economic conditions.

Reserve ratio adjustments as well as other related transaction records will be released on Adrealm’s official website regularly.

The initial reserve pool will come primarily from initial stage fundraising, whereby Adrealm will be converting part of it into US dollars. As our transaction size increases, the reserve amount will also grow mainly from transaction tax charges, as described in 5.2.

Regarding mandatory conversion conditions of AUSD to ARM tokens:

- When the permitted time period of holding AUSD tokens has elapsed (initial value set at 72 hours), AUSD tokens will be mandatorily and automatically converted to ARM tokens.
- When ownership exceeded a certain amount of AUSD tokens (initial value at AUSD token value up to $10,000 USD), AUSD tokens will be mandatorily and automatically converted to ARM tokens.
- If BTC and ETH values fluctuate beyond a specific range (initial value set at 10%) within 24 hours, an alert for evaluation mechanism will initiate. In extreme cases, all AUSD tokens can be converted to ARM tokens.
The mechanisms described above will allow Adrealm to manage effectively the stability of AUSD tokens and reliably support the high efficiency business operations.

5.8 Smart Assets

Aside from the core Adrealm assets ARM and AUSD tokens, Adrealm Blockchain will support other smart assets (similar to ERC20 and ERC721 tokens on Ethereum) as well as asset mapping of other blockchain assets onto the Adrealm off-chain network.

Smart assets support various kinds of asset nature, we currently support the following types of assets that are friendly towards the advertising industry:

1. Token assets that can be divided infinitely, similar to the ERC20 token type
2. A mapped token asset type based on specific requirements, such as aETH and aBTC etc.
3. Non-divisible and strongly correlated with fast consumption, such as ad placement asset type
4. Non-divisible and duplicable asset types, such as data assets

Adrealm virtual machine will have a preset smart contract interface for all types of smart assets. An atomic clock will be synchronized in the virtual machine to effectively satisfy the need for timely payments during advertising services.

In the future, smart asset types on Adrealm Blockchain will evolve accordingly and periodically submitted to the council for review and decisions. The development team will also continue to expand and update the needs for smart asset types.

6. Governance

Adrealm will establish a non-profit fund overseas. Funds raised are used mainly for design and R&D, operation and management, comprehensive governance, etc. of Adrealm, in order to improve transparency and promote the development and application of Adrealm’s network and ecosystem.

Cryptocurrency tokens raised by Adrealm shall be managed with transparency, efficiency, and auditable principles. All capitals and digital assets raised post-ICO will be managed and controlled under Adrealm’s non-profit fund.
Adrealm will set up a council structure where major decisions will be conducted through council member votings. Before the Adrealm Blockchain begins to operate, a temporary council committee will be formed by its team members, investors and advisors. The committee will be in charge of the development and operations of Adrealm Blockchain and DApps. The temporary committee will have a two-year term from the start of ICO or at least until one year after the main net goes live. This is to ensure the stability in the initial stages of Adrealm, guaranteeing that the Adrealm network will have enough node participation until later governance takes place.

With the end of the temporary committee term, the Adrealm network will form the first committee by conducting transparently a vote based on PoVT. The first committee will have 13 council members, and each member will need to possess a certain amount of ARM tokens in order to participate in the election. The Adrealm official council will be represented by members in each role participating in network adjustments.

Initial allocation of council seats will be as follows:

- Advertisers: two seats
- Developers: two seats
- Service providers: two seats
- Community contributors: two seats
- Core developers: two seats
- Investors and advisors: two seats

The council will elect an executive committee according to business needs, to conduct foundation related matters. There will be one executive committee president.

The first Adrealm council and executive committee will be given a two-year term. A new election will be held to elect the next term, as well as configure an executive committee.

The salary package of the executive director is determined by the financial department and approved by all council members through voting.

The Adrealm fund will receive annual auditing, in which its operations and risk evaluation will be completed by a leading global auditing firm. The foundation will rate events through using key indicators, e.g. the degrees of impact, scope range, affected number of tokens and occurrence probability, to enable priority of decision-making. Events with high ratings will be given priority by the council.
7. Business Roadmap

7.1 Strategic Partnership with UPLTV

Since its inception, Adrealm had entered into a strategic alliance with the world’s first AI-driven ad monetization optimization platform, UPLTV. Adrealm will seamlessly integrate advertisers, ad platforms, and content developers from UPLTV platform into the chain ecosystem with UPLTV SDK. At the same time, UPLTV will also provide the talent teams, tech development, and industry resources for Adrealm.

7.1.1 Stable Business Resources and Partnership

UPLTV is an AI-driven monetization operating platform focused on global mobile gaming. The platform will provide key areas of support in the following:

- drawing upon Dataverse big data platform, UPLTV went into action on April 7th, 2017.
- UPLTV released its first operating version by May, 2017, and integrated games published by Avid.ly.
- The mediation platform released a more stable version by mid-June, 2017 and integrating more games for developer testing, also publicly providing backend reporting system.
- An official website upltv.com was launched and the commercial version had become publicly available by early August, 2017.
- As of December 31, 2017, UPLTV began working with hundreds of gaming developers, with over 10 million MAUs and total impressions displayed exceeding 900 million in the month of December, daily revenue flow on the platform exceeded USD 47,000.
UPLTV has cooperated with hundreds of developers and publishers with thousands of games integrated.

Traffic partners include leading industry players such as Facebook and Google AdMob.
7.1.2 Leading technological capability

Replacing manual ad monetization optimization, AI utilizes machine learning on each display opportunity and frequency. Under equivalent circumstances with other globally leading ad mediation platforms, UPLTV SDK increases ad ARPU value by over 50% on the premise of slightly reducing advertisement display volume per person. Over time, as more data is channelled through by the content developers, widening the gap between competitors. The following is a comparison between UPLTV and two other global top ad mediation platforms:

7.1.3 The Dataverse advantage

Researched and developed in-house, Dataverse is a global data collection, statistical analysis system. By acquiring audience related data from international games, it is more accurate, efficient and timely than third party providers. Dataverse can support data storage up to over 100 million DAUs and over a million new user data. This provides fundamental analytics capability for UPLTV’s overall gaming business.
7.1.4 Strong overseas development team

UPLTV is equipped with the industry’s top technical and management teams. Within two and a half years, the tech team has successfully built global leading AI and big data products, and launched them to hundreds of millions of global users. UPLTV’s overseas management team rose from the previous Holaverse network, which achieved the acquisition of over 300 million users within nine months, being recognized by both Facebook global developer case study and the world’s fourth largest Android developer.

![Facebook](image1)

Hola Launcher becomes the second application which is listed into the case leaning and display of global developers of Facebook.
Displayed at the first place on the display page (Clean Master is at the second place)

In July 2015, Holaverse ranked No. 4 in the Global Google Play Applications of App Annie-Ranking List of Companies. Co-listed with Cheetah Mobile as large key accounts on Google China

7.2 Business Development Plan

Based on product planning, Adrealm will surround future planning and go-to-market around the following three layers:
For detailed product information on Xhance, please see Chapter 9.1
For detailed product information for DTR, please see Chapter 9.2

8. Core Team and Advisors

8.1 Core Team Members

Brian Xie - Founder
A leading figure for China’s mobile internet overseas expansion, Brian led the Holaverse team in both publishing and operating multiple mobile applications, accumulating over 500 million overseas users and becoming the fourth largest developer on Google Play. In a year’s time, Brian brought Avid.ly from zero to one, becoming China’s largest export publisher for casual and casino type games, helping the business realize profit in scale. Brian is strong adept at conquering the overseas mobile internet market, bringing in-depth and acute insights. Holding prior multiple senior roles, Brian has previously served as VP for TCL China, Regional GM for HTC (Dopod), channel marketing for Microsoft China’s mobile business and senior sales director for Dopod.

Alix Liu - Partner, Product & R&D
Alix is responsible for the core business technology. Coming from over 10 years of internet industry experience, Alix is equipped with in-depth blockchain knowledge as well as usage scenarios for the advertising industry. Alix previously held roles in product R&D and advertising monetization at Baidu and ValueClick, he is also one of the earliest Bitcoin miners in China.
Will Zhao – Head of AI and Data Analytics
Will specializes in distributive high-concurrency system architectures and is equipped with strong data processing and AI algorithmic practices. He has also developed in-depth research towards the underlying architecture of blockchain technology. Will previously worked at Qihoo 360 and Holaverse, developing and managing projects with over 500 million user downloads.

Jack Chen – VP, Product
Specializes in blockchain products and early participant in cryptocurrency. Has been long researching the application of blockchain and has led the product design and ICO for blockchain financial project “Bankorus”. Jack has also provided consulting services for real estate blockchain projects. Jack has over 10 years of IT/internet experience and has led enterprise level applications for HP, SAP and other Fortune 500 companies.

Phillip Zhao – Director, Engineering
Phillip is an early blockchain adopter and investor since 2013. He has insights and knowledge on how blockchain can better empowers the Internet ecosystem. Besides, Phillip has 10+ years industry experience, including large scale distributed system and enterprise system.

Peng Liu – Blockchain Senior R&D Engineer
Peng has over five years of software development experience and 2 years of management experience. He served on teams such as DNV GL, ELEKTA and Aliyun and has deep expertise in SOA system development.

Xian Wang – Blockchain Senior R&D Engineer
Xian specializes in mobile internet and has focused on industry leading projects for mobile gaming development and monetization. Has led the technology development for many mobile gaming projects. Served on the team of Cocos2dx and main engineer for CocosPlay.

Bi Hu - Senior Data Algorithm Engineer
Since 2009, Bi had continued his research in AI and participated in the algorithmic research efforts for cnfinance.cn, Youku, and JD. He also has eight patents applied through his work as primary inventor.

Andy Ning - Senior Server Development Engineer
Andy has 11 years of software development experience and 8 years of technical team management experience. He served as the senior development engineer of Telenav and Huawei, as well as the senior server terminal development manager for Holaverse.
Dean Hu - Senior Product Manager
Dean had been involved in the mobile internet industry since 2012 and had focused on product R&D. He had held positions in server technology manager and product director. Dean also led teams to develop 5 mobile products, 2 ad platform systems with over ten million users.

Coly Zhang - Senior Server Development Engineer
Coly has 4 years of experience in ad monetization and 2 years of practical experience in gaming industry. He has sequentially served as the overseas game publishing technical support leader and ad monetization and optimization, helping games with over 2 million DAUs and utility applications with over 10 Million DAUs improve their advertising earnings by at least 20%.

Coober Liang - Senior Operation and Maintenance Engineer
Coober has over 10 years of internet operations and maintenance experience. He has been awarded the Red Hat Certified Engineer (RHCE) certification and was part of multiple transformational milestones from the PC to mobile. He also participates in the practice of implementing blockchain technology architecture.

Carl Cai, VP, Global Business Development
With a Master of Philosophy from Cambridge University, Carl has 6 years of experience in overseas M&A and management consulting; he worked at Pricewaterhouse Coopers where he assisted many Chinese enterprises expand overseas for both business development, overseas acquisitions, and business integration.

Mei Li, General Manager, Europe
Mei is an industry leader and entrepreneur in mobile innovation and cross-border business structuring. She has held leadership roles at NTT Docomo and the founder of 778mobile.

Veronica Lim, Director, Korea Business Development
Veronica is a native Korean with over 10+ years of experience in Korea’s game development and digital advertising space. She specializes in cross-border business development and marketing strategies.

Melinda Kang, Market Growth, North America
Canadian Chinese, MBA, with over 5 years of both corporate and agency marketing experience serving MNCs such as HP, Lenovo and Google in their China go-to-market strategies.
8.2 Strategic Advisors

Jian Sun
Founder of JLab Foundation and former partner of JD Capital (SH.600053). Jian has invested in numerous unicorn companies in the mobile internet sector. JLab has invested in over 40 blockchain projects globally including Comsa, Quoine, ONT, Elf, Cointiger, Thunder token etc.

Yan Gong
Professor of Entrepreneurship at China Europe International Business School (CEIBS). Gong Yan has a Ph.D in Strategy from the University of Wisconsin, he has also lectured at the University of California.

Morten E. Wulff
Morten is the founder of GameAnalytics, one of the biggest free analytics platforms globally dedicated to serving game developers. He has served as an investor and strategic board member for several companies, specializing in the gaming and data space.

Perry Jung
Perry is the Chairman of Chainers and Blockchain Investment and CEO of Vision Creator. He has 10+ years cross-border investment experience SK group, SV Investment etc. He also did the first IPO(3NOD) of Chinese company in Korea Exchange. As a blockchain evangelist in Korea and leading economic influencer in Korea, Perry is frequently invited from top medias both from China and Korea, such as People's Daily, SBS, KBS etc. He graduated CKGSB MBA, Korea Univ.

J Ellis Cameron-Perry, PhD
Dr. Cameron-Perry is a philosopher, writer, and market-strategist. He has been based in East China since 2000. The author of several hundred original articles, on topics ranging from negligence law to e-commerce, he has consulted for the International Channel of Zhejiang Radio & Television Group since its launch in 2006.

Russell Haines
As the chief designer for Adrealm, Russell also develops design system for some of the world’s leading technology companies. Working between Auckland and Beijing, he bridges research led creative insight with technology and innovation to design and build products and brands that deliver new experiences and behavioral change. His projects have won the Red Dot Award, CES top product and iF design awards.
9. Product Details

9.1 Product One: Xhance

Xhance will be the origin of Adrealm’s efforts to rebuild digital advertising, as it provides the backbone of data reconstruction. Xhance will not only be an attribution product but also includes key functions such as anti-fraud, ROI and LTV analysis capability.

In the current market for advertising data tracking, many problems exist, such as fake data, and security/data privacy issues. Service providers within the market collect and store data without any external audit, hazarding data leakage, privacy exposure, etc. The transparency level is also very low, making it hard to guarantee data rights for advertisers and publishers. The data source lacks ownership clarity after data collection, making it difficult to mobilize data flow, hindering further data potential, causing data silos, and resulting in weak advertising impact. Major service providers have a near monopolistic hold on the industry.

Xhance aims to provide the basic necessities of tracking and attribution, providing a new blockchain infrastructure that is open-source, aimed at solving problems in the industry. Not only are all nodes open source on Xhance, but the data collection and logic are transparent and manageable. The data processing phase will be executed through TEE (Trust Execution Environment) code to ensure this stage to be open, fair, and verifiable. Xhance has a double security mechanism to ensure client data security. Data will first be separated from an advertiser perspective and encrypted, reducing the risk of data leakage. The entire process will not be engaged by any third party, guaranteeing data ownership through code and secure technology to avoid any invasion of privacy.

Xhance technological infrastructure is composed of the following:
<table>
<thead>
<tr>
<th>Parts</th>
<th>Ownership</th>
<th>Primary Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Portal</td>
<td>Adrealm</td>
<td>Functionality introduction, integration guide, tech docs etc.</td>
</tr>
<tr>
<td>Advertiser Portal</td>
<td>Advertiser</td>
<td>Ad platform interface, data reporting and user management etc.</td>
</tr>
<tr>
<td>Attribution SDK</td>
<td>Advertiser, Adrealm</td>
<td>Data collection and reporting</td>
</tr>
<tr>
<td>TEE</td>
<td>Advertiser, Adrealm</td>
<td>Attribution calculation, Post back, data dashboard</td>
</tr>
<tr>
<td>Advertiser Chain</td>
<td>Advertiser</td>
<td>Record and store encrypted data from advertising</td>
</tr>
<tr>
<td>Digest Chain</td>
<td>Adrealm</td>
<td>Record and store digest chain data from advertising</td>
</tr>
<tr>
<td>Advertiser Node</td>
<td>Advertiser</td>
<td>Provide data chain storage and operational resources, advertiser portal operating environment, data storage resources and TEE</td>
</tr>
<tr>
<td>Adrealm Node</td>
<td>Adrealm</td>
<td>Provide digest chain storage and operational resources, public portal operational environment and TEE</td>
</tr>
</tbody>
</table>

Structurally, as follows:
Xhance’s basic services are free. Some operational costs (i.e. server and operation support) are priced based on AUSD, but payment is accepted only in ARM and the exchange to AUSD will take place automatically. Xhance is priced far below market third-party prices. In practice, usage flow is as follows:

9.2 Product Two: Code Name DTR

DTR returns data ownership to its rightful owner and unleashes the potential of data through the creation of a closed value loop.

The fundamental fabric of our current society has become digital. All individuals and organizations are sources of data. Over the past decade, it has become clear that this situation is pregnant with both opportunities and dangers, not in the least when it comes to data-driven activities. This is especially the case for digital advertising, which is heavily reliant on precise audience targeting based on data analytics. Most of this is accomplished through building an accurate and comprehensive data source that can be leveraged to optimize advertising performance.

The existence and availability of valuable first-hand, reliable data sources are key pieces of the puzzle. The current landscape looks like this:

- Lack of data ownership clarity where users cannot monetize or exchange personal data;
- Lack of efficient, trusted, regulated and verifiable data exchange market;
- Most data have formed silos and cannot form a closed loop, data value is not returned to owners and is wasted instead;
- Third party DMPs lack long term reliable and legal third party data source; DXP as the standard sellers’ market; and,
- Internet giants have a virtual monopoly on user data, which it may use to its own advantage, causing privacy issues.

Enabled by blockchain technology, DTR aims to build a stable, scalable and sustainable data pool and exchange platform that can power the next era of our digital demands. DTR will provide a place where trusted first-hand data can be verified, consolidated and traced in a transparent way.
To realize this, DTR will

- Verify, integrate, and provide a tracking protocol for all credible data sources;
- Serve as a matchmaking data exchange, providing an open and transparent transaction process through encryption technology, reducing data leakage;
- Ensure that the matchmaking process is flexible, to maximize data value;
- Provide that data transactions are automatic, “one click” smart contracts;

Adrealm ecosystem supports data ownership, data protection and multiple monetization of data, and utilizes multiple witnesses as a data verification mechanism, to effectively reduce transaction friction.

The DTR platform is composed of the following:

<table>
<thead>
<tr>
<th>Platform Participant</th>
<th>Main Functions</th>
</tr>
</thead>
</table>
| Data Seller          | 1) Provide original data  
                        | 2) Price original data  
                        | 3) Initiate the usage of TEE to begin data masking engine |
| Data Buyer           | 1) Provide Data exchange public key encryption  
                        | 2) Search relevant requirements for data on the portal  
                        | 3) Pay for first hand data with token |
| TEE (Trusted Executable Environment) Data Masking Engine | 1) Provide signature and data masking based on the sellers’ private key  
                                                        | 2) On chain masked data and build the search index |
| Platform Portal      | 1) Provide the buyer with search functionality  
                        | 2) Data buy-sell transaction process (includes smart contract)  
                        | 3) Seller Data verification functionality |

Data on DTR is priced by the seller, and remittance is accepted only in the static token AUSD (1AUSD = 1USD). The exchange matchmaking process is ultimately determined by the buyer (whether to buy or not). The payment is given in ARM and exchanged to AUSD based on the exchange rate. **All sellers who hope to make a sale on the platform much deposit a certain amount of ARM on the platform.**
If, once the exchange has taken place, the buyer is suspicious of the data it has purchased, the buyer can raise a request for data verification. The buyer participates in the process. The verification process will reward ARM. The process is as follows:

10. Risk Warning

Digital assets are a new investment model with many risks involved. Potential investors should carefully consider all investments and personal risks before undertaking investment:

**Risks from the cryptocurrency trading market**
The market for token sales is inseparable from the larger cryptocurrency market. In the case of market recession or other uncontrollable factors, the value of tokens may be undervalued for a long period of time despite the prospects of tokenization itself.

**Regulatory risks**
As blockchain is still at its infancy, there is a lack of legal documents globally (including China) regarding the premises, transaction, information disclosure and locking requirements for an ICO. It is still uncertain how the policies will exactly play out, thus causing many uncertainties to investment and liquidation. Blockchain has also attracted much monitoring and supervision from countries throughout the world. There could be additional interference or policies surrounding Adrealm application and the Adrealm token, such as policy restrictions to the usage and trading of ARM tokens, which could become an obstacle to the development of Adrealm and the token.
Risk of competition
With the development of information technology and mobile internet, digital assets represented by “BTC” and “ETH” gradually emerge, multiple sorts of decentralized advertising platforms continue to appear making competition fierce. However, with the endless emergence and continuous expansion of other application platforms, communities will face continuous operational pressure and certain market competition risks.

Risk of loss of personnel
Adrealm has attracted a group of technical and business experts with rich experiences in their own domains, including professionals who have been engaged in the blockchain industry for a long time and those involved in internet product development and operations. The stability of the team and its resources are critical to Adrealm’s competitiveness in the industry. The loss of core team members may impact the platform’s operations and may negatively affect future development.

Risk of development failure due to lack of funds
The sharp decline of token value raised by the founding team or extended development time may all cause funds to fall short. This may cause risks in realizing development goals in the lack of funds.

Risk of loss of password
Once a token is purchased and transmitted to a digital wallet address, in order to access this address would be to access it with a private password (wallet password). The user is responsible for guarding this password as it is used to prove asset ownership during the transaction. The user needs to understand and accept that if his/her private documents or passport is lost or stolen, the tokens related to that account will be lost forever as it cannot be restored. The safest way to store this login information will be for the account holder to separately store it in multiple secure storage locations, and not on a public computer.

Risk of hackers or theft
Hackers or other organizations or countries may try to interrupt Adrealm’s application or its token functions in any way possible, including but not limited to service rejection attacks, Sybil attack, visitor attack, malicious software attack, consistent attack, etc.

Risk of uninsured loss
Unlike bank accounts or accounts opened in other financial institutions, the deposit in Adrealm’s account or relevant blockchain network is usually uninsured, and losses under any circumstances will not be compensated by any public individuals or organizations.

Risks related to core protocols
The Adrealm platform is currently developed based on Ethereum. Therefore, any malfunctions of Ethereum, unexpected functional problems or attacks may lead to the paralysis of the platform or token malfunctions.
Systematic risks
Neglected fatal flaws in open resource software or risks caused by large-scale faults of global network infrastructure. Although some of the risks will be greatly reduced with time, e.g. loophole repair and computational bottleneck breakthrough, other risks are still unpredictable, e.g. political factors or natural disasters which may interrupt regional or global Internet connection.

Loophole Risks or Risk of Accelerated Development of Cryptology
The accelerated development of cryptology or the development of science and technology, e.g. the development of quantum computer, may uncover risks to the Adrealm Platform, which may result in the loss of tokens.

Risk of lack of awareness to its application
Adrealm’s applications may potentially not be adopted by enough individuals or organizations, which means that the public does not have enough interest in developing this type of distributive application. The lack of interest may have negative impact on the tokens and Adrealm’s applications.

Risks of Not Being Recognized or lack of user adoption
Tokens should not be treated as an investment despite its accumulated value after a period of time. Token value can drastically drop in the case that Adrealm is not recognized or valued by the market. In circumstances including but not limited to marketing and sales failures and business partnership failures (or any other possible reasons), Adrealm may not be able to achieve success after series of funding and marketing. If this happens, the platform will no longer sustain and no leads will follow.

Risks of application malfunction
Out of various known and unknown reasons, the Adrealm platform may malfunction (i.e. large-scale outage) and can no longer provide normal service. Depending on the level of severity, it may cause the loss of tokens.

Risk of product not meeting expectations of users or Adrealm
Adrealm’s applications are still in the development phase, meaning that until the official release date, there can still be major changes made. There may be unmet expectations towards Adrealm application, token functionality or form (including participant behavior) by PST itself or the users. In addition, wrongful analysis or any changes in design may also cause this to happen.

Unforeseeable risks
Cryptographic currency is a brand-new technology which remains untested. Apart from the risks aforementioned in this whitepaper, there are some risks we may have missed or cannot predict. These additional risks may occur or may present itself in combination with risks outlined above.
11. Disclaimer

All contents communicated in this whitepaper act only as a point of reference, it does not constitute investment advice, solicitation or offer to the selling and buying of stocks and shares from Adrealm and affiliated companies. Offers must be done confidentially and according to relevant legal terms.

Contents in this document are not a means of coercion for participation in the public issuance of tokens. Any behaviors related to this whitepaper shall not be viewed as participation in token public issuance, including the request for a copy of this whitepaper and/or sharing this whitepaper with others.

Any participants or groups willing to invest in the Adrealm token must be qualified investors. Adrealm does not accept investment from American and Chinese investors. The Adrealm team will continuously revise and update information within this whitepaper to ensure informational accuracy.

Platform updates may occur throughout the development process, including but not limited to platform mechanism, token structure and token distribution. Contents within this document may be updated and adjusted according to the actual development of Adrealm, in which case our team will release the content changes or newer versions of the whitepaper on the official website. All participants are encouraged to download the latest version of the whitepaper and be aware of your own investment decision.

The team will try our best to achieve the goals outlined in this document. However, given situations that may fall beyond our hands, we cannot make a complete promise.

As the official token issued by Adrealm, it is not designed to be an investment product but rather an important tool for the platform to become effective. The ownership of ARM tokens does not mean the ownership, controlling rights as well as decision-making authority to the platform. ARM token is an encrypted token used within Adrealm and does not belong to any of the following currencies: (a) stocks; (b) legal shareholder equity; (c) shares, bonds, notes, warrants, certificates or other documents granting any rights.

The value of ARM tokens is decided upon market forces and actual scenario usage. Its value may be impacted by market participants. Our team does not promise token value growth and is not responsible for consequences pertaining token value fluctuations.
Adrealm abides all regulatory rules and policies that are beneficial to the health of the industry. Through participation, participants are considered to also fully abide by such rules and necessary checks and balances. Participants must also disclose all information required for complete inspections to ensure credible information.

Adrealm clearly states all potential risks to those choosing to participate with the platform. Once engaged with the public issuance of tokens, participants enter into tacit agreement with all rules and clauses stated as well as risks involved and will bear all following consequences.