ViewChain: A New Decentralized Content Distribution and Promotion Network, Powered by Blockchain and Token

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Abstract

Centralized systems dominate the current content distribution today's landscape. The prime examples of such systems are the Apple Store and Google Play store, YouTube, Toutiao and Kuaishou. However, there are three main challenges in these systems on cell phones. The first challenge is that they take the lion's share (45% or even 90%) of the income generated for their content distribution service. The second challenge is that they enforce tight censorship to minimize risk to their platforms, which is a self-serving practice. The third challenge is that viewers and the curators are not properly incentivized to promote content through their social connections.

We believe that there is a need for a new decentralized content distribution marketplace, where storeowners are authors and/or domain experts who promote their contents and take majority of the income generated from either advertisement or content sale. The built-in incentive system will motivate all involved parties to create a powerful person-to-person promotional network.It is our hope that the new decentralized content distribution network will increase the amount of private content shared and increase the amount creators selling directly to viewers without the need for a middleman. We also hope that it will increase the amount of viewers participating and gaining incentives for promoting the sale of content. In short, a decentralized content distribution system would create a new market, larger in scale and higher in efficiency than the current market.

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1.1 Introduction

Content Distribution Market

On the market, there are several successful content distribution systems. However, the Google Play Store and the Apple iTunes Store dominant it. Both of these platforms are hugely successful in terms of user retention rate and advertisement revenue. They are both prime examples of centralized platforms since they set the rules for content publication and the sharing of profits. They also determine the algorithms for how content is ranked in the market.

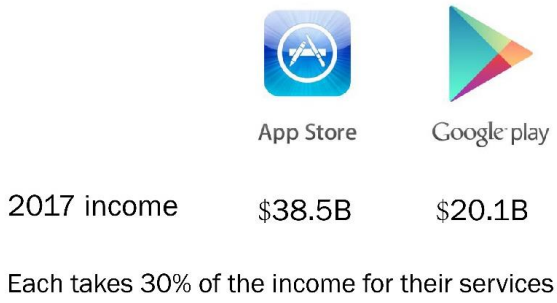

Figure 1. Google Play and Apple Store Revenue

Figure 2. YouTube and Toutiao Revenue

Content Distribution Challenges

There are a few challenges in the current content distribution systems on cell phones. One of the challenges is that YouTube (45-55% split), Toutiao, and Kuaishou hold the lion's share (typically 90% and above) of the income generated from their content distribution service. The current profit model heavily favors the dominant centralized content distribution platforms in the market. In contrast, although massive in number, content creators of short videos, apps, etc. are weak players individually and do not have collective bargaining power. The platforms even use dominant power to coerce the small content creators to agree on shared copyrights for the contents of their own creation. In an ideal system, content creators would be the copyright owners and the platforms are distributors of contents, with the latter paying the former a split of the revenue for use of the copyrighted contents.

Another challenge is that leading centralized systems enforce tight censorship to minimize risk to their platforms. Since they are dominant in developed countries, these systems set up and enforce strict censorships codes according to their corporate interests. As a direct result of this, they choose to exclude any contents that are deemed inappropriate according to their own rules, leaving content creators with no say in the process. While it is important to follow censorship codes, it limits the average person's freedom of speech. In reality, it is common for people to exchange content in private settings where they enjoy some degree of freedom and do not necessarily follow the self-serving rules employed by the current distribution systems. Sharing is a fundamental human need and the current systems are known to restrict everyone's ability to do so.

The third challenge is that stakeholders in content generation and distribution are not properly incentivized, which causes inefficiencies. The power to distribute revenue is strictly managed by the current platforms. Viewers are passive participants and the curators are marginal players in the content distribution process. The Google Play store and Apple's iTunes store have both set the rule that they receive a 30% cut of the income, whereas Toutiao and Kuaishou require 90% of the total income for their services. All four systems leave no negotiation room for content creators in how much they are paid. A proper incentive system for the massive number of content creators, recommenders, and small distributors

does not exist. In theory, every viewer could be a recommender and earn credit if a small profit is made. Thus, a new system is needed to fully incentivize all parties so that efficiency is maximized.

Besides stakeholders, domain experts on a subject are also not properly incentivized. Domain experts could provide in-depth recommendation of PGC (Professionally Generated Content) contents, but they are largely ignored in the current systems. The current machine recommendations of news and short videos are unable to match the quality of human recommendations.

Content discovery has become difficult in the current markets. Through centralization, top-ranking content is heavily favored and gives little room for other content to gain attention. Content that rise to the top typically does so by spending excessive amounts of money on advertisements. Therefore, centralized systems are discriminating against content creators who do not have the financial resources to pay for such advertising schemes in favor of those who do.

Most users do not have personalized content selections provided for them and feel overwhelmed by content stores that have too large of a collection. Content featured in the top ranking charts are more accessible to the user and thus continue to stay in power. In this manner, any content that is not already listed on the charts does not have the opportunity to gain a position on them.

1.2 Background

Zapya started out in 2012 as a file transfer tool that served countries with poor wireless network connections. Over the years, it has grown to have a total accumulative user base of 576 million that are mainly concentrated in Asia and the Middle East. *Zapya* users transfer files among themselves over the WiFi peer-to-peer link on their phones by setting one phone as WiFi hotspot and the other a WiFi client. *Zapya* experienced viral user growth due to users inviting friends to download the app in order to share content stored on their phone. The in-app transferring process thus has built-in networking effect, which explains the explosive growth of *Zapya* user base. *Zapya* still enjoys daily user increase in hundreds of thousands.

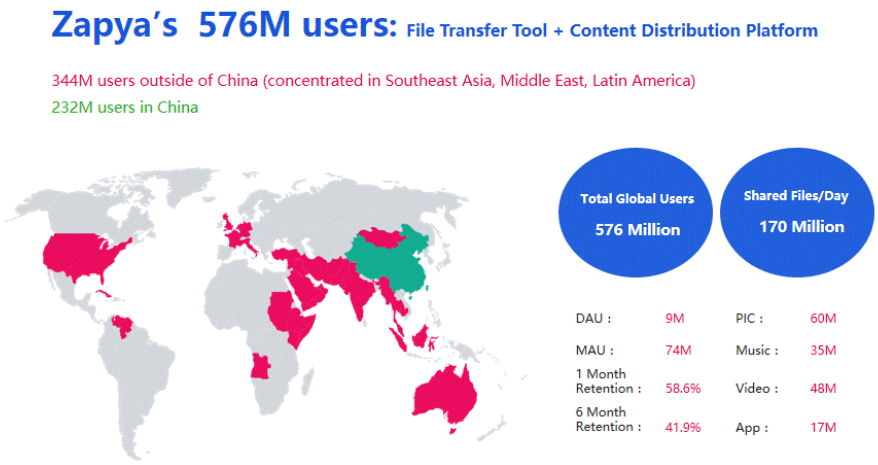

Figure 3. Zapya's User base Distribution

1.3 Opportunity

Considering the new trend of sharing content and the current market environment, we believe that the creation of a new content distribution system opens doors for new possibilities. A decentralized content distribution network where contents rise and fall based on their own merits instead of relying on favored ranking by the platform and the marketing prowess of the content creation company. It will also provide a platform where private content can be exchanged between the creator and the viewer. Content selections are richer. Curators can provide private content to viewers, and may potentially form closer relationships with their viewers (customers), enabling curators to provide more service for higher revenue.

A proper incentive system for the massive number of content creators, recommenders, and small distributors needs to be put in place. Every viewer could be a recommender and earn credit if a small profit is made. Thus, a new system is needed to fully incentivize all parties so that efficiency is maximized. Besides stakeholders, domain experts on a subject are also properly incentivized. Domain

experts could provide in-depth recommendation of PGC (Professionally Generated Content) contents. Specifically, a new system *ViewChain* based on *Zapya* combined with blockchain should properly incentivize content creators, curators, viewers and all parties in the system, to promote and sell copyrighted material directly to viewers, cutting out the middleman. Thus, more profit to the creators of content.

In *ViewChain*, content creators and domain experts control how the content are promoted and how the profits are shared. Specifically, the profits are shared between the content creator and their followers; the latter will be motivated to promoting the content on behalf of the owner. The curator can organize the followings into a powerful person-to-person promotional network. In the absence of dominant party's "invisible hand" to select and favor certain content creators, the contents will rise and fall based on their own merits and the forces of their curators/followers. This decentralized system should also enjoy a higher degree of freedom in terms of types of contents allowed. Base on the massive person-to-person content sharing network of *Zapya*. Blockchain handles copyright tracking and record the proper incentives for each party. Creators can incent their followers to jointly promote their contents.

It is our hope that the new decentralized content distribution will result in the increase in the sharing of private content due to the looser censorship standards employed under decentralization. Although the promotional material that sellers advertise in public will be subject to strict review, what is shared in private will not be as restricted as it currently is and will be protected by the freedom of speech. In this way, the content available on this system will differ from what is available on mainstream centralized stores. We also hope that there will be an increase in creators selling directly to viewers, similar to the way SoundCloud functions for distributing music, and an increase in viewers participating and gaining incentives for promoting the sale of content. In short, a decentralized content distribution system would create a new market, larger in scale and higher in efficiency than the current market(s).

2.1 Overview

A well-designed decentralized content distribution system should meet the following criteria:

1. Massive audience
2. Large amount of new types of contents on top of existing content
3. Sizeable amount of direct distributors of content
4. Proper incentives for all parties,

The first and most important step is securing an audience for this new system. The most viable audience for *ViewChain* has the same demographics as *Zapya*'s current user base. A majority of *Zapya*'s user base comes from developing countries that do not rely upon the Google Play store or Apple's iTunes store as their main source of content distribution. Thus, Myanmar, Pakistan, Iran, and Cuba have the largest potential for providing an audience and they also happen to be the countries where *Zapya* holds a place on their top ranking application lists.

The best way to leverage *Zapya's* user base is to evolve the original function of the application so that it becomes a platform for content distribution. The original function of *Zapya* was to transfer files from one device to another. In order for this function to evolve into a content distribution platform, content creators need to be allowed to register their copyrights on the blockchain. Once their copyright is registered, they can then publish content. As soon as that has occurred, existing content curators will need to be encouraged to, publish, and promote content in their domains of expertise. At the same time, new content and content curators will need to be found in order to enrich the experience. Help will have to be extended to promising collect curators in order for them to establish a group of followers that would act like repeat customers.

Meanwhile, transactions will have to be facilitated so that revenue is spilt fairly between creators and curators. As soon as there is no longer a need for administrative help in the process of sharing content, then will have evolved from a simple transfer tool into a content distribution platform that provides multiple services besides transferring files.

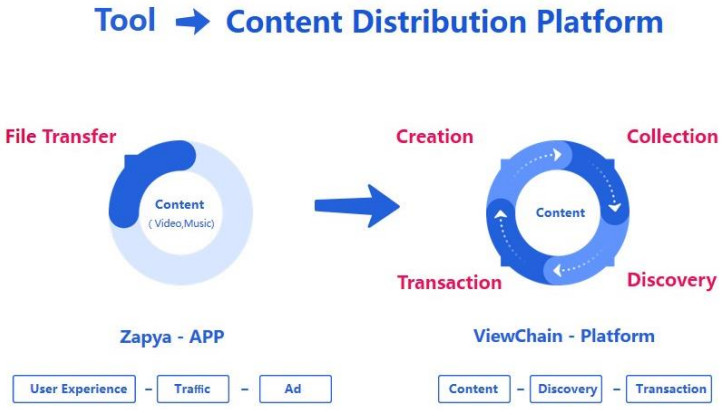

Figure 4. Transition from Tool to Platform

Architecture of ViewChain

If the barrier of publishing content on phones is lowered, then users will publish more content and attract more viewers. The main challenge to overcome for *Zapya* is the limitation of phone storage, which limits content selection. Our proposed solution to this challenge is to combine *Zapya* with IPFS. IPFS, short for interPlanetary files system, is a content-addressable, peer-to-peer method of storing and sharing hypermedia in a distributed file system. In other words, it is a P2P distributed file storage system, where files can be stored on anyone's PC, NAS, cloud storage, or network disk. Through combining *Zapya* with IPFS, the limitations posed by phone storage will be removed and users will be able to publish and promote content that has been stored in other locations besides their phones.

Another challenge that *Zapya* faces is how to ensure that the international payment system is easy to use. Our proposed solution is to combine *Zapya* with blockchain so that each party's contribution is recorded and duly compensated. When incentives were added in *Zapya* network, creators and curators of content came to *Zapya* as or content storeowner who serves followers in 1-to-N fashion. Our proposed

structure of *ViewChain* thus is the combination of *Zapya*, IPFS, and blockchain (see figure 5).

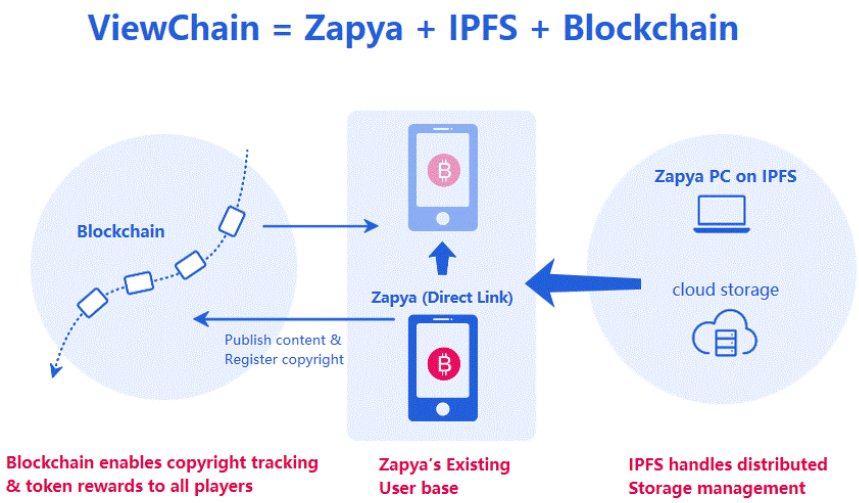

Figure 5. ViewChain Architecture

The proposed decentralized content distribution system has four main features. The first feature is that copyrighted contents are registered by its creator and tracked on the blockchain. The second feature is that any user can promote any content they see fit as a curator. Revenue can be from multiple sources, including native Ads in the content flow in the "news feed" fashion and content sale. Majority of revenue would be split between the copyright owners and the curators, with the platform taking a small share (1-10%), in sharp contrast to centralized system where platform takes 90% or more. A solution to the difficult issue of dealing with censorship is the third feature. To help viewers discover new contents, especially the curators' contents in their private collection, the curators put up public listings and advertisements, which would have to conform to society norms, decency standards, and legal standards. On the other hand, private exchange of contents between friends, on a 1-on-1 basis, should be left alone to respect their privacy. The fourth feature is a multi-level incentive system designed to attract followers to contents or content creators and curators would be employed in order to form an organized viral marketing effort to promote the sale of the content. Blockchain enables an incentive system that rewards all involved parties in promoting the sale of content.

Contribution to the P2P Layer in Blockchain Protocol Stack

Throughout the years, we observed network topology of *Zapya* users went through three stages of how they share content (see the figure 6 below). We call the first stage the "1-to-1" stage, which was the user using the application as a point-to-point network. Every user in this stage is viewed as a curator of content on their phone that they share with people in their proximity. Some users started to become "power users" who distributed content that attracted followers, which signaled the start of the second stage of "1-to-N". Power users began to have 9,000 to 540,000 other users following them. In order to better serve our users, we expanded two years ago to online file transfers so that power users could act as content stores. Power users collect content and then can share them to a network consisting of their followers.

Recently, we have noticed that users have moved onto a third stage of sharing content that we are calling the "N-to-N" stage. Power users have started to exchange content among themselves, establishing a circle of power users that share content between networks. Each power user serves a smaller circle of friends, family, and followers and shares content received from other power users with them.

The *ViewChain* system's contributions to the Blockchain protocol stack include the enhancements to the P2P layer above Blockchain layer. There are three layers related to P2P, the native *Zapya* phone to phone file transfer protocol, the open source IPFS for P2P storage, and finally, the user layer in *Zapya*, a people-people private file sharing protocol, where people share files 1-on-1, and KOLs (Key Opinion Leaders) have large followings. Interestingly, KOLs also exchange private files among themselves because they have long standing trust in the community.

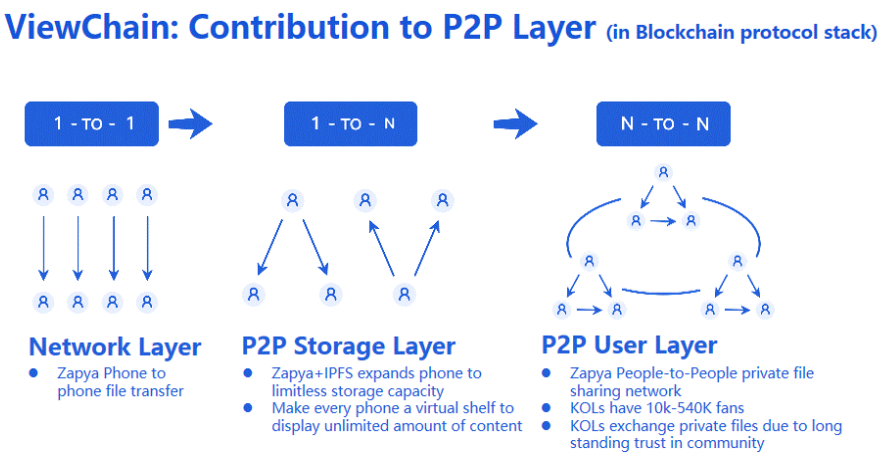

Figure 6. ViewChain's Contribution to P2P Layer in the Blockchain Protocol Stack

The enhancements are mainly in two areas. First, the lightweight IPFS client on phones, enabling users to put up content on store shelf with just one click, hiding details such as uploading, storage from the users. For average users, setting up servers and storage devices for a content store are daunting tasks. Our goal is to make the process dummy-proof. Second, IPFS nodes and the profiles of users are combined to selectively store contents for users who stated they are interested in this type of content for better usability and performance.

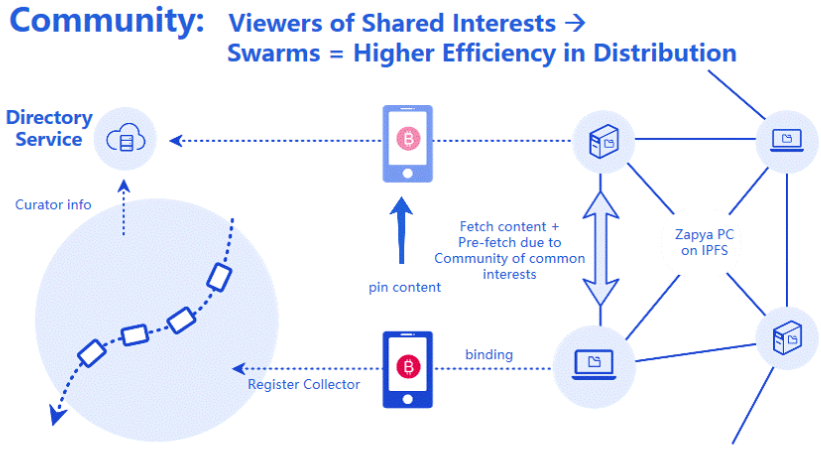

Figure 7. User Community and Profile Data Improve IPFS SWARMS

2.2 Content Store

Stakeholders

ViewChain greatly lowers the bar for opening a content store for users. There is no hassle of setting up a website, acquiring and populating on-line storage with content, and purchasing ad campaign on social media. Content storeowners on *ViewChain* save the time and cost of these barriers and simply focus on collecting fine content pertaining to a domain of their interest. Therefore, *ViewChain* storeowners are also called Curators.

The stakeholders in the ecosystem of the content store business include creators, curators, actors, storeowners, viewers, storage keepers and accountants. Creators are people who create the original content and therefore own the copyright to the material. Curators screen quality content out of an enormous base with their domain expertise and choose best ones for sale. Very often the curator will also play the role of an actor to add commentary to selective content for promotion. Storeowners could be creators, curators or both, who run stores with a phone app to manage the display on shelf and stock in the inventory. Viewers are followers of the curator and are the potential viewers. Storage keepers are

IPFS repositories operated by participants who have spare storage space for rental. Accountants are blockchain nodes that do the bookkeeping of all transactions and profit allocation according to smart contracts.

A curator is a domain expert who selects and promotes content to viewers. *ViewChain* enables curators to run a content store with a lightweight front-end management and a heavy-duty backend support. The storefront is public to the world and completely manageable with just a phone. With one-touch the selected content is bookmarked and published for sale. There is no need to mind the physical location of the content. In fact, there probably is not a fixed location of the content storage. It will be partitioned and duplicated among many distributed IPFS nodes for high availability and efficient deliverability. *Viewchain* also offers storeowners a multi-level incentive system to promote content in an organized way for maximum reachability to potential viewers.

Building a Store Front on the Phone

The curator, usually also the storeowner, with just one click can post content on the store front, without worrying about the logistics of storage and payment. The curator chooses content from the directory service and "tag" selected content to the store shelf. The "tagged" content is not moved physically to the store on the phone, but is none-the-less on display in the store and ready to be sold. This is made possible by the IPFS backend, which handles the details of distributed content management, with *Zapya* extensions to make IPFS work on the phone. It enables the store on the phone to have unlimited storage space for all sorts of content regardless of the actual repository. The Store Front app UI takes storeowner's operations and translate into control protocol to coordinate activities on *ViewChain* and the IPFS. The built-in blockchain feature of *ViewChain* powers the payment and accounting system. The storeowners thus do not need to worry about logistics and can focus more on their domain expertise of choosing the best content.

Figure 8. Tools to Build Content Store

2.3 Operation of Content Stores

The Store and Services

Curators (storeowners) organize the store similar to a physical video rental store, where there are open shelves displaying films in a variety of genres, posters of hits in promotion, and a backroom for private viewing. Typically a curator's content store may consist of following elements. First, a storefront: promotional materials, e.g. movie trailers, short clips, etc. These are on the public display section, and are subject to social norm, decency standard and law. Second, backroom VIP private viewing: curator's 1-to-1 sharing of private content. Third, co-star edited video with on-camera promotion: An actor, could be the curator, may shoot a selfie video and overlay that onto any video clip or movie trailer to appear as an on-camera TV anchor. It personalizes the promotion of the content, and is known to attract followers, similar to what popular YouTubers do. Fourth, a multi-level incentive system enabled by *ViewChain*, where a curator organizes followers in master-apprentice fashion. The master provides apprentice with content and incentive (part of the sales proceeds). The apprentice gets content and incentive, and in

exchange, agrees to promote the curator's store to friends to get rewarded in tokens for their efforts. This master-apprentice system can go a few levels deep. A successful apprentice can become a new master when they can attract a large enough group of followers to be profitable for their work. The system thus powers itself until it reaches saturation.

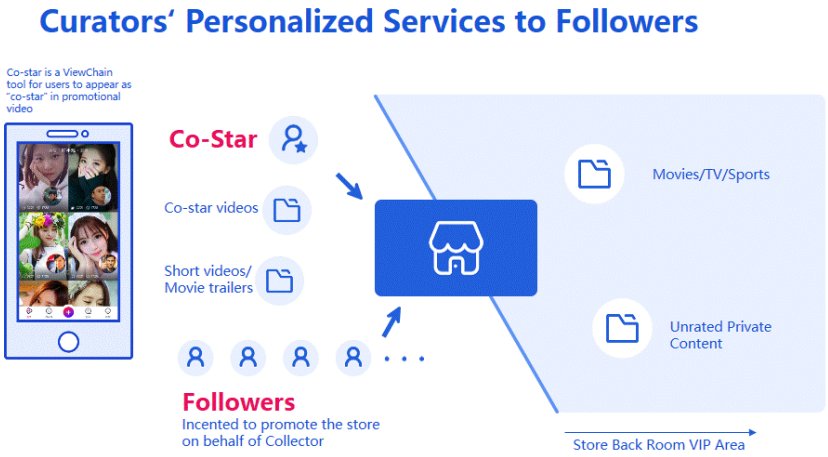

Figure 9. Curator Serves Followers with Contents and Incentives

Content Discovery

Content discovery is a virtually insurmountable task of matching tens of millions of worthy content to hundreds of millions of users. Luckily, it can be facilitated by deliberately designed directory service. The directory service is powered by *Zapya*'s content recommendation and matching engine as a third party service to *ViewChain*. The service monitors *ViewChain* at all time and learns newly published content and registered curators. It serves hundreds of thousands curators to filter and pick potential content from tens of millions candidates. On the other hand, it serves hundreds of millions users to find the best matched curators of the user's interest for the user to follow and to get future updates.

The content initiation originates from the content registration to *ViewChain* and content publishing to the storage keeper by the creator. The directory service picks it up from *ViewChain* and makes it available for search and recommendation under the scope of curators. Once a curator chooses and pulls the content to the Store Front, their followers will see the update and potentially purchase and consume it. In summary, curators pivot the content discovery with aids from the directory service to realize the grand matching from content to users.

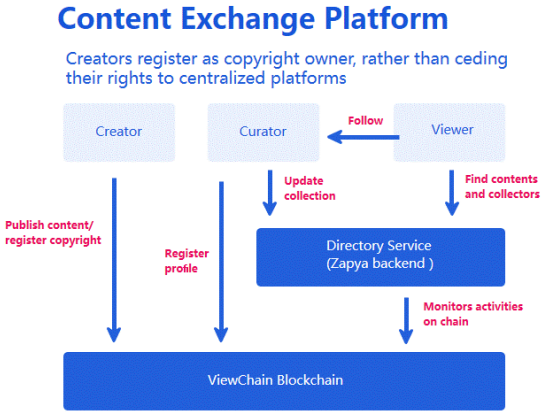

Figure 10. Content Exchange Platform

Store Reputation Recorded on the Blockchain

Each store's "reputation" is measured by the following metrics, include:

- Number of visitors
- Quality of contents, measured by ratings
- Number of followers
- Number of interactions, likes, comments
- Number of rewards
- Number of punishments

The store "reputation"(metrics) is updated to the blockchain on a regular basis, hourly, or daily, depends on the throughput to process transactions on the blockchain. Since these reputation metrics take time to earn and are slow changing, they are well suited for the distributed ledger mechanism on blockchain. In blockchain terminology, to earn the "reputation", or store metrics, curators (or store owner) work in a way similar to dPoW. Once earned, the store metrics for curators are similar to dPOS, where curators who participates in the ledger are randomly elected.

Each viewer is recorded on the blockchain in a similar fashion. A viewer can be seen as a small virtual "store" of their own collection of contents, thus the store metrics apply to individual viewer. Also, a viewer has more attributes such as ID, viewing habits, friends list, etc. A viewer's ID is used in public services such as name services for other viewers to find each other. Other attributes such as viewing habits and friends list are privacy data in their digital rights repository, only used to enhance the user experience of the viewer.

Community Rules

The priority of the content community is to foster an environment for copyright protection and encouragement of appropriate content, and discouraging illegal and inappropriate content. In *ViewChain* authors can publish their contents and register copyrights on the blockchain, curators can register as "first publisher" of the contents. Hence the basic mechanism for copyright protect is in place. However, after careful study, our current conclusion is that full cycle copy protection needs some time to fully take shape. Reasons for this include many factors, we'll just list two of the examples: first, authoritative entities who own massive copyrights need to participate, including Hollywood, Tencent, iQiyi, who bought a high concentration of copyrighted materials in movies, songs, etc. Second, DRM technologies need to be widely adopted.

For these reasons, in *ViewChain*, we choose to focus on distributing contents with little copyright disputes, including short video, APPs and mobile games. Short video can be sizable business, as illustrated by Youtube, Toutiao, Kuaishou, etc. APPs and Mobile games revenues are also in Billions of dollars, as shown by Google Play Store and Apple iTunes store. For the last five years, *Zapya*'s business has been in distributing APPs, Mobile games; hence we are combining our experience with the new possibilities brought forth by blockchain. On *ViewChain*, content creators and curators as "first publisher" of content A receives credits for it from all the curators and viewers who subsequently forward content A on their store front, because all references of content A point back to "first publisher". This is the benefit of blockchain. There are rewards and punishments for various types of behaviors. Each store's "reputation" has these additional metrics, include:

- Number of punishments received and for what types of behaviors
    - Illegal and/or inappropriate contents
- Number of rewards received and for what types of behaviors
    - Creators for creating and self-publishing original contents
    - Curators for "first publisher"
        - And for incentivizing followers to promote the store
        - Example: Star-fan network
    - Actors for creating new UGC on top of the existing PGC
    - Selfie UGC video in the original movie clips
    - Whistle blowers for helping piracy down

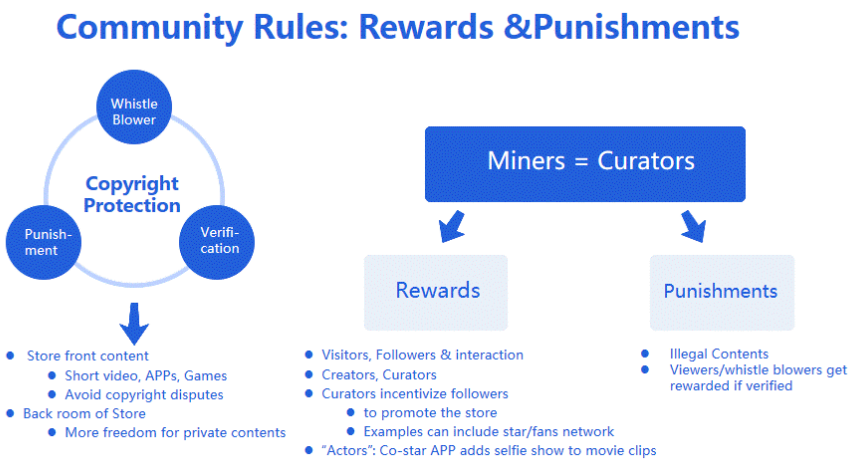

Figure 11. Community Rules

Token Flow

Ad revenue from content/Ad viewing may benefit multiple parties involved in the deal. First of all, the curator receives tokens for running the store and finding the content. The creator receives tokens for the royalty of the copyright content. The accountants, elected leaders among curators in DPoS consensus are rewarded as well. Finally, the curator pay the delivery fee asked by the storage keepers (IPFS nodes).

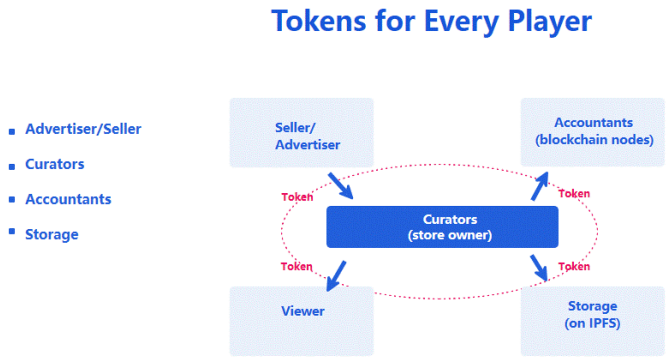

Figure 12. Incentive System in Token Economy

Token Economy

In the following section, advertisement revenue is used as an example for simplicity's sake. This does not mean the token economy design does not also apply to other revenue streams, such as virtual goods sale in mobile game distribution, proceeds from APP distribution, etc.

There is two design goals of the token economy: to attract more and more users to join the network and participate in content exchanges, and to generate more income from these users.

The token economy is a two-part system that involves ViewCoins and VIEW tokens. ViewCoins are virtual currencies that can be converted to hard currency, and vice versa. VIEW tokens are internal points in the incentive system and cannot be directly converted to actual money.

In order for the *ViewChain* economy to grow, the income needs to increase, making a growing basis for the entire economy. As an example, an advertiser announces an Ad campaign, with $1M budget. The *ViewChain* platform accepts the task, and converts the $1M to 10M ViewCoins. Curators saw the announced tasks and enter into smart contracts with *ViewChain* to finish $100K each. Curators then incentivize their followers to complete the tasks in the smart contracts and followers earn their shares of the rewards. The total amount of ViewCoin is fixed, and therefore creates upward pressure to increase the value of ViewCoin with increasing economic activities.

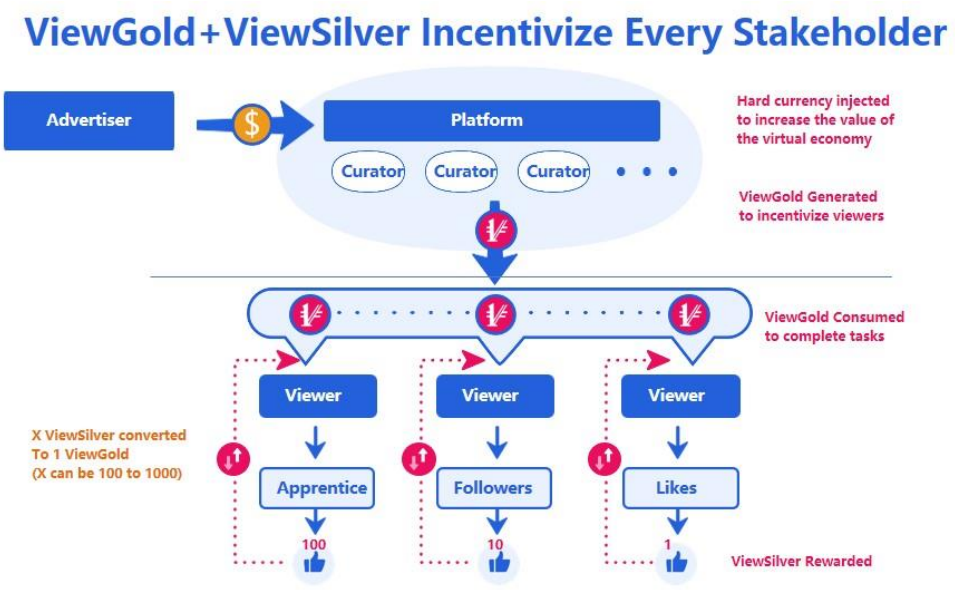

Figure 13. Token Economy

On the other hand, a VIEW token is used to incentivize viewers/followers in various ways, which might involve increasing the number of rewards and recipients. Potentially, with more participants, demand for VIEW tokens will increase. With the increase in demand, the total supply of VIEW token might also increase and should not be capped. When followers finish their tasks and earned the tokens, we can employ a dynamic convert ratio in order to convert VIEW tokens into ViewCoins, e.g., initial conversion ratio of 100 VIEW token to 1 ViewCoin, later changing to ratio of 1000 VIEW tokens for 1 ViewCoin. The dynamic conversion rate will help balance the creation and consumption of ViewCoins, while keeping the incentive system vibrant.

Decentralized Content Promotion

3.1 Overview

Leveraging on our experience and expertise in on-line and off-line content sharing, we are proposing a decentralized content promotion technology to facilitate content advertisement and delivery. Figure 14 and 15 depict the high level architecture.

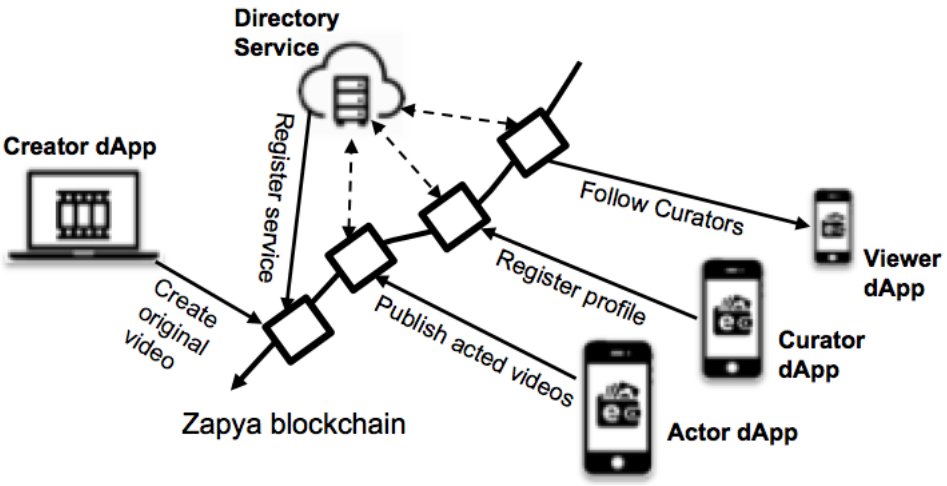

Figure 14. DPN architecture diagram for content advertisement

Figure 14 shows the DPN architecture for content advertisement. Creators create the original content and publish the metadata of the content to *ViewChain*. By doing so the copyright of the content is secured by the immutability nature of the blockchain. However, without significant advertisement, it would be difficult for those content to be discovered by vast viewers. To improve the visibility of the original content, actors add their stylish commentary and performance to a trailer of the original content to produce introductory video clips. The metadata of those video clips are also published to the chain with reference to the original content. Directory Service is a 3rd-party operator, which continuously monitors the chain and classifies content metadata into a variety of genres. With the aid of the service, curators are able to preview and accumulate selective content of their interest. In the other way, curators also update their collections with the Directory Service so that they could be listed under the corresponding categories of gurus accordingly. Curators also register their profiles on the chain so that new services get to learn existing curators. By subscription to the Directory Service, viewers could browse the genre catalog to locate content and learn which curators recommend it. Or, they could directly browse the guru catalog and follow interested curators.

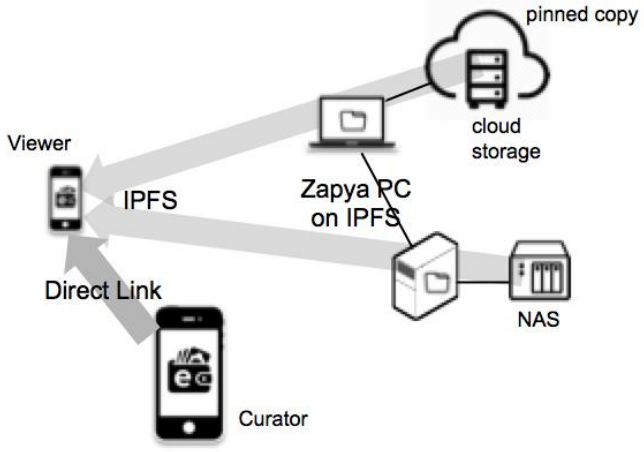

Figure 15. DPN architecture diagram for content delivery

Note that many of above roles are not mutually exclusive. An actor is often a curator as well, and they both could also be viewers. Therefore a role is not discriminated by the identity but by the function performed at specific time.

Figure 15 shows the DPN architecture for content delivery. There are two ways for a viewer to retrieve content from a curator. If they are in proximity, a direct link could be established to exploit the abundant bandwidth for file transfer. Otherwise, several Zapya PCs running IPFS protocol could respond to the viewer's request of specific content blocks. Usually popular content has a great number of pinned copies at different locations. The downloading of popular content therefore is efficient due to higher chances of geographically near copy and the availability of multiple sources.

A Zapya PC running IPFS protocol not only utilizes local devices for storage, but logically aggregates network attached storage (NAS) on the local area network (LAN) and cloud storage via Internet. In addition to storing collected content locally, a specified portion of free space could be optionally made available for content caching of other transactions to improve the system-level efficiency. dApps of creators, actors, and curators could store created or collected content in a local Zapya PC, or they could rent other's free space. A viewer dApp may consume content blocks on the fly for streaming media, or a local Zapya PC could also be employed for the storage of purchased content. Later when the viewer dApp associates with the same LAN as the PC, new content will be synchronized automatically from PC to dApp.

It is recommended to pair a dApp and a PC to equip the dApp with virtual extended storage. With such binding a dApp may conduct content shipping, acquisition, and exchange by delegating the actual content movement to the paired PC. Moreover, when a dApp conducting a transaction involving content delivery, it will require service from other PC nodes to assist the optimal path sourcing. The service eventually accumulates charge to the dApp, though the amount typically very tiny. By pairing a PC and making it available to the community, the cost and gain in a long run cancel out so the crowd-sourcing service becomes literally free.

3.2 Register Content to Chain

A creator or an actor actually creates content and therefore should own the copyright of their creation. To declare the origination of the copyright, a chronically ordered immutable record must be kept somewhere and open to public validation. Such requirement makes blockchain technology a perfect choice to record copyright registration. On registering content, the dApp stores the content to an IPFS node and obtains the hash value of the file, and then encrypts the value with the user's private key. After that a piece of metadata including the hash and the encrypted hash, description of the content, keywords, and optionally a thumbnail is formed. The metadata are submitted along with the user's public key to a node of the chain.

metadata = { hash, encrypted hash, description, keywords, thumbnail, public key }

Once the record of the metadata becomes permanent on the chain, the unique binding of the content and the user identity is assured by the cryptographically proofed linkage from the file to its hash, to its encrypted hash, and finally to the public key. As a result, the file retrieved from IPFS using the hash can be trusted to be an identical copy as originated from the identity stated in the public key of the metadata.

3.3 Instant Content Publishing

Adding content to an IPFS node could be done in no time! This is made possible by running an IPFS daemon right on the device hosting the content. It could be a mobile device running the dApp or a PC associated with the dApp. In a typical setting a user has the dApp installed on a mobile phone and a partner application running on a PC, and the two devices are bound and trusted each other. Whenever the dApp publishes a video shot by the phone, it completes immediately as there is no actual content movement needed. The IPFS daemon running on the phone simply adds the hash value of a local file to the IPFS database without uploading the file to any remote node.

Another case is adding contents on the PC through inter-device control commands issued from the dApp. In this case the list of content on PC is viewable from and phone. As soon as a file is picked for publishing, the user command is relayed to the PC. The IPFS daemon on the PC adds the hash value of the file locally. As there is no duplication of the content, the publishing is done immediately.

Though theoretically the IPFS daemon can run on a mobile device indefinitely, it is not realistic due to the continuous high-volume demand of data exchange. A practical implementation is to have the bound PC pin the file as soon as it was added to IPFS on the mobile device. Once the pinning is done, the PC has

a physical copy of the file so that the IPFS daemon on the mobile device could be stopped. In most cases the bound PC sits in the same LAN as the phone very often, the process of pinning should be able to complete very quickly.

As a mobile device may not always have a bound PC to serve as an IPFS proxy, an alternative conduct is to leverage on another people's PC. For those PCs having spare storage and bandwidth, their bound dApps will offer an option to rent the IPFS service to the mobile devices needing the service. Such on-demand rental comes with incentive reward. Whenever its storage and bandwidth are used on behalf of other people to host their IPFS daemons, it will receive reward in terms of tokens.

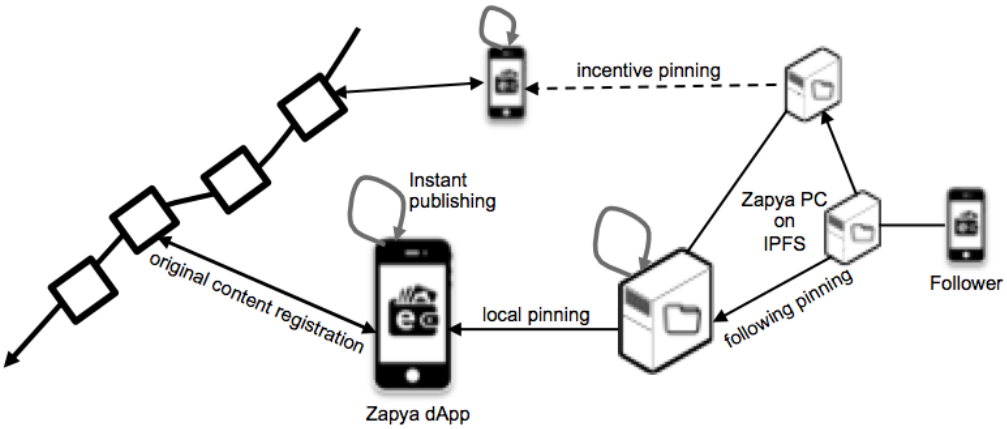

Figure 16. dApp enables instant publishing of local content and content on PC

3.4 Data Mining from Chain

As the chain is available to the public, a 3rd-party directory service provider may traverse the whole chain and poll every new block to learn all existing and upcoming content and curators. This enables an ecosystem of algorithm-based services, which enhance dApp user experience degradation due to decentralization. Without these services, a Viewer would have to browse content description and curator's profiles from the chain in an irrelevant order. It would be unrealistic to hope for a good match with the expected enormous amount of content, curators, and viewers.

A directory service classifies content into genres according to the keywords included in the metadata. Similarly, curators are classified into different guru categories based on the registered profiles. The service benefits all roles mentioned above. For example, creators get to see opportunities under specific genres whose content are either very popular or in low visibility. In both case a creator would like to supplement more content in that context to share popularity or to improve visibility. Actors may refer to the service to select content fitting best to their style of commentary and performance. curators definitely locate content much more efficiently with the aid of the service. And, viewers easily find their interested curators to follow with the personalized ordering offered by the service.

Data mining is a branch of data science techniques. Many algorithms in this domain have been greatly enhanced over years with improved software frameworks and hardware processors for parallel computation. The paradigm of parallelism implies distributed computing; meaning the era of using a huge centralized database and a monolithic computing giant is gone. Creating an ecosystem for service providers employing machine-learning and deep-learning algorithms running in a decentralized fashion is the trend to embrace those technologies.

3.5 Content Collection and Advertisement

Curators are content resellers who select and source fine content for sale. The quality of selection is assisted by the directory service followed by expertise accumulated in this domain. Reviewing and Sifting through content on the directory and pinning good ones is a curator's daily work. The action of pinning results in a pinned copy of the content got cached to the curator's own IPFS storage. Requesting the hash from the metadata of the content to IPFS nodes accomplishes this. All nodes having a copy of the content matching the hash will respond to initiate the duplication.

With curators and services both register themselves to the chain, it enables a service and a curator finding each other. Afterward, the curator would customize the introduction of their collections on the directory to be most visible to viewers. Though, the updating of the collection needs not being centralized around the directory service. The change could be published to IPFS as a file and the corresponding hash value is posted on the directory. A visiting viewer would obtain the hash from the directory service and request IPFS to retrieve the file of update.

3.6 Content Discovery

Viewers usually discover content through the introduction of curators. After following a curator, a viewer synchronizes updates of content recommendation from the curator regularly. This is done by pulling curator's portal from the directory on demand. If the response is a hash value, then the actual content of portal is already cached on IPFS, so request accordingly. The process will be repeated for each of curators followed by the Viewer. The viewer dApp then shuffles recommended content from different curators to form a content flow for better user experience.

3.7 Content Delivery and Decryption

The common way to deliver content to a viewer is through the IPFS network. From the metadata of content, the viewer has the hash of the content that could be used to request the IPFS linked-list object of the content file. The list contains an ordered series of hash values to index partial content blocks of the file.

{ (hash: H1, size: 262158), (hash: H2, size: 262158), (hash: H3, size: 262158), ... }

Following the list the viewer may request IPFS to source each block of content and eventually restore the content file. Since copyright content in IPFS are encrypted by default, the restored file is usually yet decrypted. Depending on the reseller contract between the Creator of the content and the Curator, the decryption key may be held by the Creator or the Curator. After payment, the decryption key will be encrypted by the Viewer's public key and sent to the Viewer dApp. The encrypted content will be decrypted on the fly by the dApp's content playback module.

In the setting that the Viewer is in proximity of the Curator, the content may be pushed by the Curator to the Viewer through a direct link between the two devices. Under such case the delivery will be the most efficient way. Even if the direct transfer happens to be interrupted and unable to finish, the Viewer could fall back to IPFS and continue from the content block where the interrupt occurred.

3.8 Implicit Swarm Networking

IPFS is neutral on the storage and bandwidth utilization regardless of the file content. Not only IPFS is not able to understand the content of a file, but even it is, it has no preference of discriminate one file type over another. As a result, there is not a systematic approach to organize different nodes into swarms. A swarm in the context of decentralized file sharing is an optimized gathering of nodes to enhance the efficiency of file delivery. When a file has multiple copies on different nodes, requesting different file blocks from different nodes concurrently could accelerate the downloading process. Current IPFS protocol, however, does not duplicate file blocks with a purpose, nor it connects swarm peers due to an algorithmic strategy.

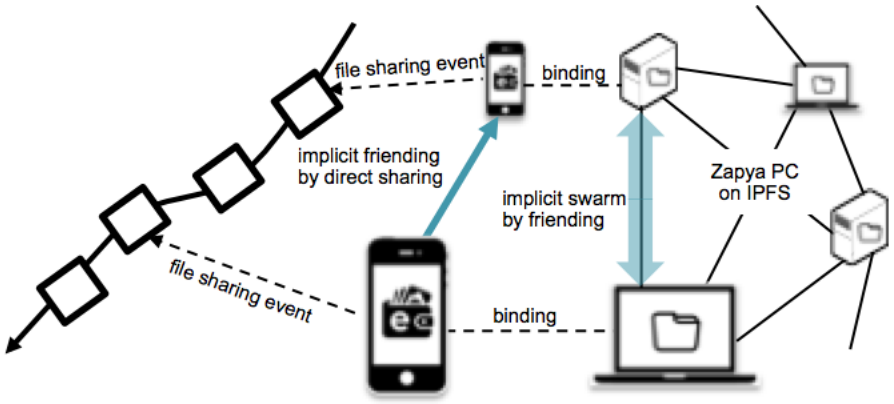

Figure 17. Implicit swarm building originated from human networking

This shortage could be complemented by introducing human relationship inferred from the interaction of dApps to the IPFS engine. First, a file sharing dApps usually exchanges files over a direct link. Establishing such a direct link indicates the proximity of the two devices and therefore the mutual friendship could be assumed after certain frequency is observed. Second, a viewer may use the dApp to follow a curator to form a unidirectional relationship. Multiply the two factors and a network of followers and their friends pertaining to a curator could be deduced.

The follower network of a curator implies a group of users potentially being interested on the topic of contents built up by the curator. As a result, the bound PCs of this group of dApp users could be organized to form a swarm of contents under this topic. With the arrangement, storage and bandwidth are prioritized to service people having a common interest and therefore the user experience of the update and the delivery of content will improve significantly.

The relationship-inferred IPFS swarm is especially effective in rapidly spreading popular content. The lightweight (hash value only) sharing amplified by dApp's multi-level propagation regardless of online or offline settings substantially grow the viewer base. Additionally, efficient content delivery is achieved by IPFS swarms formed by duplicating content over the nodes of the common interest. Finally, phenomenon hype is reinforced by bandwagon effect as directory service aggregates distributed frenzy to influence more people following the topic.

3.9 Enabling a dWeb of Shared Content

To further decentralize the mechanism of content sharing and access, the approach mentioned above of following a curator's update through the directory service could be optimized by adopting a decentralized Web (dWeb) framework. With dWeb the update of a curator's collection needs not posting to a centralized directory service. Instead, the update is published to the rather decentralized IPNS so that the requirement of static content under IPFS is lifted. By visiting a decentralized Web URL in the user's IPFS ID, the latest version of the homepage could be retrieved.

A dApp first registers content on the ViewChain and publishes them locally in an instant. The bound PC, if any, host shared content over IPFS, including own and proxy publishing. Up to this point, the shared contents are still individual files stored in the IPFS. Then, we leverage on dApp's features to organize the pool of contents into a customized dWeb homepage. The homepage again is added to the IPFS and the update is published to the IPNS. The PC basically hosts the homepage for all access globally.

A dWeb Portal is a gateway website to refer to individual dWeb homepages. The portal page is usually in a format of personalized recommendation of trending contents. Once a specific content is viewed and the corresponding content owner is followed, the URL is forwarded to the owner's individual homepage to enable accessing more collection of content shared by the owner. Since it's now a point-to-point decentralized browsing, the shared content is expected to be richer due to minimal censorship.

At this point, all it requires is a regular browser on any platform to freely access individual dWeb pages. The base of viewers therefore gains remarkably by including regular Web browsing users in addition to dApp users.

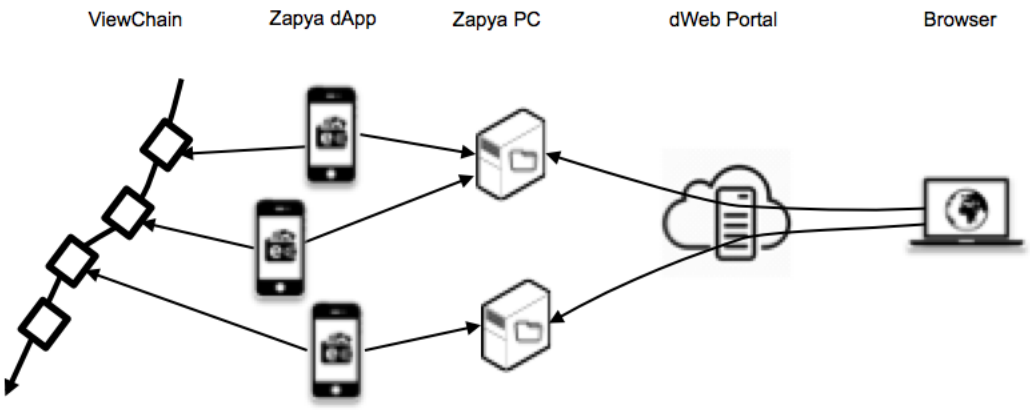

Figure 18. Components to construct a decentralized Web with ubiquitous access

3.10 Promotion Mechanism

We have introduced the advertisement of content, which details how Viewers discover interested content; and the delivery of content, which explains how Viewers receive the actual content. However, this simply satisfies the Viewers who actively look for certain content. In this section we will introduce a promotion mechanism, which would motivate Viewers to relay advertisement to others Viewers for a multiple level marketing.

Figure 19 shows an example of propagating advertisement of content by Viewers. Three Viewers follow a curator and once learnt an advertisement of content from the portal of the curator. The first Viewer, Customer 1, purchased the content. One (Forwarder 1) of the other two Viewers, though not buying, forwarded the advertisement of content to another two Viewers (Forwarder 2 and Forwarder 3). Although they did not purchase either, again they forwarded the advertisement of content to more Viewers. Eventually, after getting the advertisement from Forward 2, Viewer 2 made the purchase.

To create a network effect of the advertisement, a promotion mechanism is designed to encourage sharing advertisement of content to friend Viewers with incentive. For example, each forwarder relaying the advertisement from the curator to a Viewer will be awarded x tokens. In this example the awarded forwarders are Forwarder 1 and Forwarder 2. The amount of award could be designed to favor the forwarder closest to the Viewer and decay gradually toward the curator. For instance, Forwarder 2 has x tokens while Forwarder 1 has $x/2$ tokens only. The reasons are, first, to encourage more to the forwarder who convinced a friend Viewer making a purchase; second, to consider the forwarders in the early positions of a relay are likely to have more descendent forwarders to result in a Viewer. Besides, to encourage forwarding to maximize chances of purchase, all forwarders are awarded a fixed amount of reward, say, $x/4$ tokens. The rule will award Forwarder 3 in this case to appreciate their forwarding. Though in the end their forwarding did not result in a purchase, his did contribute to increase the chance.

The promotion mechanism is a powerful tool to initiate a hype of multiple level marketing. By deliberately allocating reward, the propagation tree could grow to involve a great number of viewers. Note that the reward is not the purpose but just the fuel to expand the scope of searching viewers who may like the content in promotion. The ultimate goal of the mechanism is to leverage human network helping curators reach out the most matching right viewers for the right content.

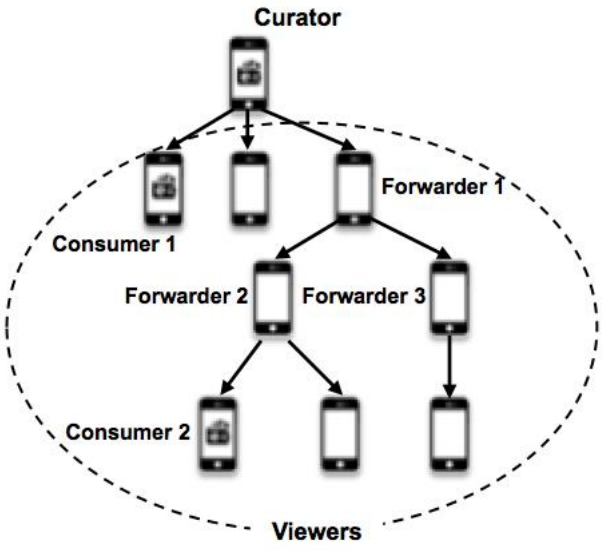

Figure 19. Advertisement of content forwarding by participating Viewers

Benchmark: Decentralized iTunes Store in Developing Countries

4.1 Benchmark – iTunes Store, Youtube, Toutiao

With years of data and experience in developing countries, we found the following notable characteristics:

- Wireless networks, the main network infrastructure, are often poor in connection quality and high in toll charges. But the networks in these countries are rapidly improving.
- Facebook, iTunes store, Google Play store, although important, have not yet reached dominance. As examples, *Zapya*'s user penetration in Myanmar, Cuba are allegedly higher than Facebook, according to local sources.
- Offline file transfer enjoyed a few years of explosive growth, and short video is rapidly on the rise.
- Penetrations of iPhone and Apple iTunes store, short video services such as YouTube and Toutiao are not high in these countries.
- There is no central go-to place for users to do one-stop-shopping for APPs/videos/music/movies, etc.
- In many such countries, users in close proximity are typically acquaintances who love to show and share the entertainment contents on their phone, as illustrated by a Cuban news report describing *Zapya* as the top "social app" in Cuba.

In developing countries, there is a need for decentralized content distribution services, handling both offline and online content distribution.

Decentralized Content Distribution: ViewChain

	Centralized Content Distribution(iTunes, Youtube, Kuaishou, toutiao)	ViewChain
Architecture	Content, storage centralized. Personalized recommendation.	Decentralized content creation/curation/storage. Virtual shelf on Phone = limitless contents
Business Model	Ad revenue, took most of income, less for content creators	Direct. Higher Split of Ad revenue for all stakeholders
Barrier to use	Low.	Low.
Region	Developed countries	Developed + can expand to poor network links in Developing Countries: South East Asia, Middle East
Share Economy	NA	Virtual shelf for rent, time and space for endorsed contents: Anyone can "rent" virtual shelf to make money

Figure 20. Decentralized Content Distribution

4.2 New Land of Opportunity in Uncharted Territory

In developing countries, where centralized stores have not yet dominated, there are huge opportunities for a new breed of content stores.

The following scenarios could be likely:

- More private contents due to looser censorship standards under decentralization.
- More creators can sell direct to viewers, similar to SoundCloud for music.
- More viewers can participate and get incentives for promoting the sale of contents.

The results of a decentralized market would that it is larger in scale and higher in efficiency than the current centralized markets.

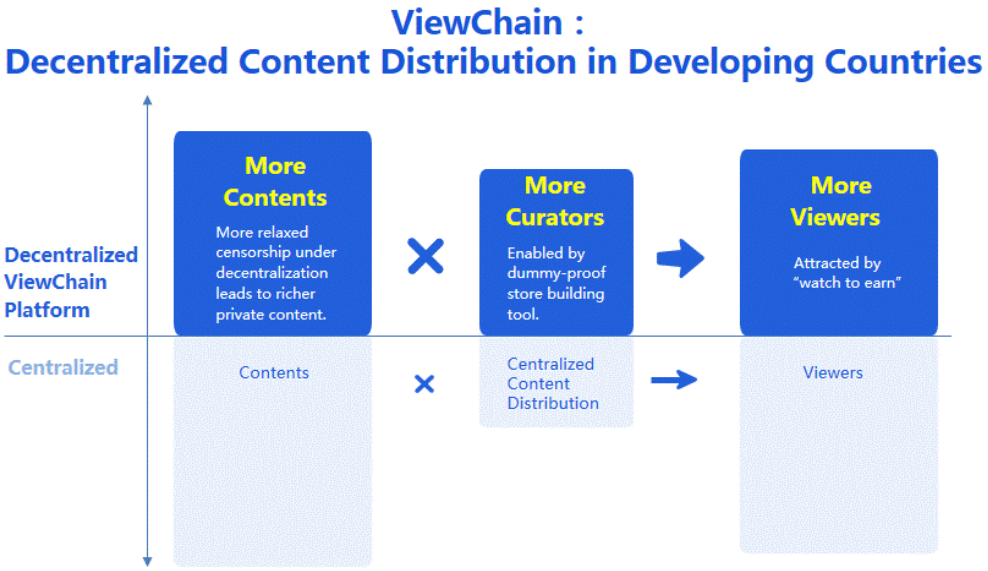

Figure 21. New Eco-system for Decentralized Content Distribution

Roadmap

March, 2018	dApp prototyping, PC App design
April, 2018	Branching IPFS GitHub for dApp and PC App customization Branching Elastos GitHub for ViewChain development
May, 2018	Functioning IPFS modules in dApp and PC App
June, 2018	Automatic IPFS pinning among dApp, PC App, and proxy PC App dApp wallet integration test with ViewChain
July, 2018	Design IPFS swarm of common interest Patent filing
August, 2018	dApp UX/UI Alpha Release Directory Service of Store Front design
September, 2018	Content copyright registration on ViewChain Curator profile registration on ViewChain
October, 2018	Store Front censoring service Store Front layout UX/UI
November, 2018	IPFS swarm of common interest general release Directory Service of Store Front on line
December, 2018	dWeb Portal infrastructure building dApp and PC App Beta Release
January, 2019	dWeb Portal content recommendation system on line dApp user store UX/UI Beta Release
February, 2019	dWeb Portal to user stores open test
March, 2019	ViewChain per-store Ads Reward Plan Alpha Release
April, 2019	ViewChain per-user MLM Ads Reward Plan Alpha Release
May, 2019	dWeb implementation of dApp functionality ViewChain per-store Ads Reward Plan Beta Release
June, 2019	ViewChain store-to-store trading announcement
July, 2019	ViewChain per-store Ads Reward Plan Beta Release PC App as cloud storage IPFS proxy general release
August, 2019	ViewChain FCS for the 1st for-profit ad campaign

Founding & Advisory Team

The founding members of the *ViewChain* are:

- **Frank Wang**

Mr. Wang is the co-founder and CEO of DewMobile, Inc., founded in Silicon Valley with offices in China. DewMobile's main product is *Zapya* APP, with hundreds of millions of users. The inspiration of creating *Zapya* came from Mr. Wang's previous experience in P2P wireless networking when at Azalea Networks in San Jose, CA, a company he sold to Aruba Networks (now part of HP). His passion has always been in designing decentralized P2P system, starting from OSI layer2 mesh, to mesh routing on layer3, then finally to the application layer, where he coined the word *Zapya* "person-to-person" protocol (or Zapper). His current focus is to combine P2P networking with the possibilities opened up by blockchain. Mr. Wang earned his B.S.EE from Tsinghua University and MS from Stanford University.

- **Shangpin Chang**

Mr. Chang is the co-founder and CTO of DewMobile. He leads Dewmobile's AI and machine-learning lab in Silicon Valley. He was also the co-founder and CTO of Essence Technology, where he developed a 192-bit network ASIC for accelerating VPN, firewall, and router all-in-one systems. His earlier work at Cisco Systems included AES/RSA/3DES encryption algorithms, Public Key Infrastructure, and secured multimedia streaming. He received MEng in EECS from University of California, Berkeley and MS+BS in Electronics from National Chiao-Tung University, Taiwan.

- **Steve Gu**

Steve Gu is the co-founder and Senior Vice President of Dewmobile, Inc. Prior to starting Dewmobile, Inc., Steve is a software professional in Silicon valley with years of experiences in developing wireless mesh equipments at Firetide, developing optical switch at Ciena and developing wireless PBX and ATM switches at Nortel. Steve graduated from University of California, Berkeley with a bachelor degree in Electrical Engineering and Computer Science and from Stanford University with a master degree in Computer Science.

The advisory team to *ViewChain* is:

- **Rong Chen**
  - Chief Advisor
  - Chairman of Elastos Foundation
  - Director of Tsinghua University iCenter

- **Feng Han**
  - Co-Chief Advisor
  - Board member, Elastos Foundation
  - Visiting Scholar & Research Associate at Columbia University
  - Advisor at Huawei Central Institute

- **Jihan Wu**
  - Advisor
  - CEO of Bitmain

- **Jiangtao Sun**
  - Advisor
  - Founder and CEO of Goopal Goup, Chairman of 神州数字（HK8255）

Arrangements

7.1 Token Distribution Plan

ViewChain Token, orViewCoin, is the intrinsic token on *ViewChain*. It's symbol is VIEW. It can be used for trading, investing in digital assets, paying for blockchain processing fees and so on. VIEW is the basic unit.

ViewChain will issue certain amount of tokens with an upper limit. Due to the large number of content exchange and transactions among hundreds of millions of *Zapya* users, we need to keep the VIEW unit price low and total amount of VIEW high enough for circulation among a large user group. It would be a good idea for *ViewChain* to create a total of 10 Billion VIEW. The VIEW distribution plan and implementation procedures are as:

VIEW (units: 1 Million)	Purpose	Notes
4000 (40%)	Ecosystem Development	• VIEWs are used to support the open source community of the ViewChain eco-system. • VIEWs are used to support the content community by incentivizing the contributors • All the VIEWs that are not claimed will be invested in ViewChain.They will not be used for the daily operation of the ViewChain Foundation
500 (5%)	Angel Investors	• ViewChain angel investors are made up of ViewChain founders and key partners. The Bitcoin proceeds will go to the ViewChain Foundation
2500 (25%)	Private & Public Crowdfunding	• The investor community is the backbone of ViewChain, and it will support and facilitate ViewChain development. All the raised cryptocurrency will belong to the ViewChain Foundation, and it will be used to develop the ViewChain platform. The Bitcoin proceeds will go to the ViewChain Foundation
1400 (14%)	ViewChain Foundation	• These funds are pre-allocated for supporting ViewChain Foundation operation and investing in the ViewChain ecosystem
800 (8%)	Existing Investors	
800 (8%)	Team	

Anticipated use of proceeds will be as follows:

- 40% software development R&D
- 40% marketing, community development
- 20% operational, legal expenses and overhead

List of Figures

Risk Statement

9.1 Disclaimer

This document is for informational purposes only and does not constitute any opinion regarding the sale or purchase of digital assets. Any similar proposals or recommendations will have to be made under a credible term and with the consent of applicable laws. The above information or analysis does not constitute investment decisions or specific recommendations. This document does not constitute any investment advice, investment intentions or abetting investments in digital assets.

This document does not constitute and should not be understood to provide any offer or sale, nor any offer to buy or sell any form of digital asset, nor is it a formal contract or undertaking. VIEWCHAIN does not assume any responsibility of loss during the participation in VIEWCHAIN token (VIEW) project, which includes but not is limited to:

1. The reliability of all information provided by this document
2. Any resulting error, neglect or inaccurate information
3. Or any resulting behavior

In addition, those who do not use VIEW correctly, such that they lose the wallet's private key, may lose all their rights to use and even to own VIEW. VIEW is not a type of ownership or control. Having VIEW does not represent ownership of persons associated with VIEWCHAIN's decentralized platform, and VIEW does not grant any individual any rights to participate, control or otherwise make any decision about VIEWCHAIN's efforts to centralize the platform.

9.2 Risk Warning

Digital asset investment constitutes as a new investment model and involves a variety of different risks. Potential investors need to be careful when evaluating risks of each investment and self-assessing their own risk tolerance.

Risks include and are not limited to:

- **Risk of losing VIEW due to loss of private key**

  The loss of these vouchers will result in the loss of the VIEWCHAIN currency (VIEW) due to the relevant login credentials of the VIEW buyer. The best way to store your login credentials safely is to have the purchaser keep the credentials safely in one or more locations and preferably not store it in a hazardous location. After extracting buyer's VIEWCHAIN currency (VIEW) from buyer’s digital wallet address, the only way to manipulate its content contained in the address is through the buyer-related key (ie, the private key or the wallet password). The user is personally responsible for protecting the relevant key and for signing and verifying the ownership of the asset. User understands and accepts that if his or her private key file or password is lost or stolen separately, the VIEWCHAIN currency (VIEW) associated with the user's account (address) or password can not be recoverable and will be permanently lost. The best way to store login credentials safely is to have the purchaser securely store the keys in one or more locations, preferably not on a public computer.

- **Buyer Voucher Related Risks**

  In order for any third party to obtain the purchaser's login credentials or private key, it is possible to directly control the purchaser's VIEWCHAIN currency (VIEW). In order to minimize this risk, the purchaser must protect their electronic devices against unauthorized access requests to access device content.

- **Token Sales Market Risks**

  Due to the environment of the token sales market is inextricably linked with the entire digital asset market situation, such as the overall underactive market conditions or the impact of other uncontrollable factors, it may cause the tokens themselves to be undervalued for a long time, even though they have good prospects status.

- **Regulatory Risks**

  As the development of the blockchain is still in its early stages, the relevant laws and regulations in the world such as pre-requisites, circulation requirements, disclosure requirements and lock-in requirements in the VIEWCORP process are not yet fully developed. And it is unclear how the current policy will be implemented. All these factors may have an uncertain impact on the investment and liquidity of the project.

While blockchain technology has become the main target of regulation in all major countries in the world, the VIEWCHAIN platform may be affected if the regulatory body intervenes or exerts influence, such as statutory restrictions on the use of sales tokens, such as VIEWCHAIN Coin (VIEW) Limited, hindering or even ending the development of the VIEWCHAIN platform and VIEWCHAIN Coin (VIEW) directly.

- **Competition Risk**

  With the development of information technology and mobile Internet, the digital assets led by Bitcoin are gradually emerging. Various types of decentralized applications continue to emerge, and the competition in the industry is becoming increasingly fierce. However, as other application platforms emerge incessantly and continuously, the community will face ongoing operational pressure and certain market competition risks.

- **Risk of Underdevelopment Due to Lack of Funding**

  Due to a substantial decline in the price of digitized assets (USDT) raised by the founding team, or due to the time of research and development exceeding beyond expectations, there is a risk that the team will be underfunded. This may result in an extremely underfunded team not being able to achieve its original development goals risk.

- **Hacking and/or Theft Risk**

  Any attempt by hackers or other organizations or countries to attempt to interrupt the functionality of the VIEWCHAIN Platform includes, but is not limited to, denial of service attacks, Sybil attacks, attacks, malware attacks, or conformance attacks.

- **Uninsured Loss Risk**

  Unlike bank accounts or other financial institution accounts, there is usually no insurance coverage stored on the VIEWCHAIN Platform account or the associated blockchain network, and under no circumstances will there be any public organizations liable to cover your losses.

- **Core Agreement Related Risks**

  The VIEWCHAIN platform is currently based on Wells Link, which means that any failure, unpredictable functionality, or attack on any of the Wells Link main chain could potentially cause the VIEWCHAIN platform to stop working or lose functionality in an unpredictable way.

- **Systemic Risk**

  Fatal flaws that are overlooked in software or the risks of large-scale global network infrastructure failures. While some of these risks will be substantially reduced over time, such as fixing loopholes and breaking computational bottlenecks, other parts of the risk remain unpredictable, such as political or natural disasters that could cause partial or global Internet outages.

- **Vulnerabilities or Cryptography Accelerate Development Risk**

  The accelerated development of cryptography or developments in technology such as the development of quantum computers or the risk of cracking to the VIEWCHAIN platform may result in the loss of VIEWCHAIN currency (VIEW).

- **Risk of Lack of Public Attention**

  VIEWCHAIN platforms do not have the potential to be used by a large number of individuals or organizations, which means that the public is not interested enough to develop and develop these related distributed applications. The lack of interest may have an effect on the VIEWCHAIN platform and the VIEWCHAIN currency (VIEW) Negative impact.

- **Risk of Lacking Users**

  First, VIEWCHAIN currency (VIEW) should not be considered as an investment. VIEWCHAIN currency (VIEW) may have some value after a certain amount of time, but if the VIEWCHAIN platform is not recognized by the market and thus lacks users, this value may result in a very small amount. It may happen that for any possible reasons, including but not limited to the failure of a business relationship or marketing strategy, the VIEWCHAIN platform and all follow-up marketing supported by crowdfunding will not be successful. If this happens, then there may not be any follow-up market, which is obviously not good for this project.

- **Application Failure Risk**

  The VIEWCHAIN platform may fail due to various causes, such as large node downtime and incapability of providing service normally, which may lead to loss of

VIEWCHAIN Currency (VIEW) users in severe cases.

- **Risk of Failure to Meet Buyer Expectation(s)**

  The VIEWCHAIN platform is currently in an iterative development phase and any expectation of any VIEWCHAIN currency (VIEW) viewer or buyer regarding the functionality or form of the VIEWCHAIN Platform or VIEWCHAIN Currency (VIEW), including its participants, may not be met as expected. Inaccurate analysis, design changes, etc. are likely to cause this situation.

- **Other Risks**

  Cryptography-based digital tokens are a brand new and untested technology that, aside from the risks mentioned in this white paper, involves risks that are not yet mentioned or unexpected by the founding team. In addition, other risks may also appear suddenly or in a combination of several of the already mentioned risks.

9.3 Supplementary Instructions

Unless stated in this Agreement, we will not make any representation or warranty regarding this VIEWCORP sale, VIEWCHAINcoin (VIEW). Each participant decides to participate in VIEWCORP sales and receive any VIEWCHAIN currency, based on the VIEWCHAIN platform, VIEWCHAIN currency and the information disclosed herein.

- **No Responsibility**

  The Foundation hereby declares that it will not be liable to anyone for the following circumstances: Anyone involved in VIEWCORP sales violates any anti-money laundering, anti-terrorist financing or other regulation in any jurisdiction.

- **Required**
  - Anyone participating in the program in violation of any statements, warranties, obligations, indentures or other provisions under this program, and the resulting failure, and unable to retrieve their payment or obtain the relevant VIEWCHAIN currency purchased; for any reason to early termination of VIEWCORP sales;
  - VIEWCHAIN platform failed to develop or exit, resulting in failure to deliver TTI to subscribers for VIEWCHAIN currency subscriptions; postponing or rescheduling VIEWCHAIN platform resulted in failure to meet any expected milestone;
  - Any error, defect, or other error in the VIEWCHAIN platform source code;
  - Any failures, crashes, rollbacks, or hard forks on the started VIEWCHAIN platform;
  - VIEWCHAIN platform or VIEWCHAIN currency fails to meet any particular purpose or is not suitable for any particular purpose;
  - VIEWCORP sales revenue use;
  - Failure to fully disclose in a timely manner any information regarding the development of the VIEWCHAIN Platform;
  - Any VIEWCORP sales participant who divulges, loses or destroys the private key of his / her VIEWCHAIN wallet;
  - VIEWCHAIN currency are classified by any government, quasi-government, authority or public body or deemed to be a currency, securities, commercial paper, negotiable instrument, investment or other terms that may be prohibited, regulated or subject to certain laws;
  - Listing or withdrawing VIEWCHAIN currency from any Encrypted Conversion; anyone trading or speculating on VIEWCHAIN currency;
  - Any application, smart contract, or other program on the VIEWCHAIN Platform;
  - Any risk factors disclosed in this plan, as well as any damages, losses, claims, liabilities, penalties, costs or other adverse effects related to this risk factor.

- **Taxes**

  Each VIEWCORP Sales Participant shall declare, assume and pay any jurisdictional taxes and levies due to possession, use, purchase, acquisition of VIEWCHAIN currency (whether purchased or otherwise acquired during the VIEWCORP Sales), and each VIEWCORP Sales Participant shall be fully responsible for all fines, claims, penalties, liabilities or otherwise for any non-payment, under-payment, improper

payment or overdue payment of any applicable tax. The Company does not make any recommendation or make any statement about the tax intentions of any buyer participating in the sport.

- **No Exemptions**

  The Company's failure to require or enforce any provision strictly enforced by VIEWCORP sales participants, or the Company's failure to exercise this Agreement, shall not be construed as a waiver of the rights of the Company or reliance on any such terms or rights. Any express waiver by the Company of any of the conditions or requirements of this plan does not constitute a waiver of any obligation or obligation to comply with the provisions in the future.

- **Separability**

  If any part (whether wholly or partially) of the Program is illegal or invalid under the laws of any jurisdiction, it shall not affect the lawfulness or validity of any other plan in the jurisdiction, nor shall it affect the plans of any other jurisdiction legitimacy or validity.

- **Title**

  The headings used in this plan are for reference only and are not considered when explaining or explaining this plan.

- **Jurisdictions**

  This VIEWCORP sale is launched around the world and has nothing to do with any particular jurisdiction. Buyers may come from any jurisdiction in the world.

- **The Power of Interpretation**

  The VIEWCHAIN Foundation reserves the final interpretation of this plan