
***U* Network: A Decentralized Protocol for Publishing and Valuing
Online Content**

White Paper

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Draft for open community review and subject to change.

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ABSTRACT

U Network ^① is a revolutionary protocol for publishing and valuing online content that helps online content platforms better align with the interests of their users. It does this by rewarding content creators more for their work, by letting users earn money for predicting popular content, by making it easier to discover high quality content, and by allowing all users to be part of content moderation and governance decisions.

The first online content community powered by *U Network* will be *U Community*, a digital asset information community.

U Network aims to build a prediction market of user-generated content. By constructing a robust pricing system for content, *U Network* incentivizes users to spot high-value content and share it with the network. *U Community* is layered on top of *U Network*. In *U Community*, there are four types of users: content creators, content explorers, community moderators, and regular users. By using a prediction market for content, *U Community* will sustainably generate high quality content, helping users interested in blockchain technology learn more about various digital assets. In return for their work, content creators, explorers, moderators will be rewarded with *Sugar*, the internal fuel of *U Network*, making it a positive-sum-game for all community users.

U Community will be deployed on the *U Network* native blockchain with high-accessibility, high-performance, and low latency. *U Network* will construct a decentralized, user-generated content ecosystem driven by fairness and quality.

Keywords: Digital Asset, Prediction Market, Blockchain, Content Reward

^① <https://u.network>

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Chap. 1 Introduction

1.1 Preface

In the age of information overload, people are overwhelmed by redundant content. It's also getting harder to judge the authenticity of content. This creates an environment where high-value information is hard to find and diluted by noise.

People are no longer worried about a lack of information but rather a repetitive abundance of it. This is one of the Internet's core problems - determining important information with speed and efficiency. *U Network* aims to build a blockchain community driven by quality and value, ensuring that high quality content can easily stand out and that content creators are rewarded accordingly.

1.2 Discover High-Quality Content

How to make high-quality content stand out?

We think it's optimal to use economic principles to construct a model in which content is priced according to its quality, and the price is an important indicator to measure content quality. We propose building a prediction market for content.

This idea is derived from the efficient markets hypothesis.^① The efficient market was first introduced by Bachelier, who recognized the efficiency of the market in selecting information. The discountings of past, present, and future events have their reflections in the prices of the market. We assume investors in the market are rational and are looking for their self interest in maximizing their own profits, and we can assume each individual has an independent analysis of the value of a content. Therefore, it's practical to use the wisdom of the crowd to set a price for each content, where the price is a close prediction of the true value of a content.

1.3 Construct a Prediction Market based on Content Value

How to construct a prediction market based on the content value?

A prediction market^② is a platform where people trade the outcome of events. People can predict and gain profit if the prediction is correct. The reward distribution follows a

① J. S. Jordan. On the efficient markets hypothesis. *Econometrica*, 1983, 1325-1343

② J. Wolfers, E. Zitzewitz, J. Wolfers, et al. Prediction markets. *J. Economic Perspectives*, 2004, 107-126

simple yet robust principle: Reward is transferred from inaccurate predictors to accurate ones. Knowing this rule, people would try their best efforts to gather more information to make their predictions logical in order to claim the reward.

Our construction of the *U Network* prediction market follows a simple yet robust idea. Users can vote to rate a content, and if a user thinks the current prediction price of a content is lower than the actual value, she can upvote to raise the price. The cost of upvoting goes to the increase of the price of the content. If the final price gets higher than the predicted price, the user can gain monetary reward.

$$\text{NewPrice} = \text{Current Price} + \text{Cost of UpVote}$$

The rise of blockchain technology has paved the ground for building a content-oriented prediction market that deploys perfect competition and fair rewarding to incentivize individuals to explore high-quality content.

The internal fuel of *U Network* reward system is *Sugarx*, similar to the Gas in Ethereum [3]. We hope users would spot high-quality content the same way bees spot ripe flowers for pollen and nectar.

1.4 A Brief History of Online Content and Monetization

Before diving further into *U Network*'s platform for online content, it's helpful to look at a brief history of online content and how it has been monetized over time. This helps us better understand the problems and solutions that have been encountered along the way, leading us to better judge the current situation and feasible solutions.

The first web page went live on August 6th, 1991. It was a simple site, without ads, that explained the vision behind the World Wide Web - to make "academic information freely accessible to anyone".^③ In the early 90s, most web pages were created by academic institutions or magazines, and mostly contained plain text and hyperlinks to other sites.

Over the next few years, the number of web pages grew exponentially, and online content providers started to think about ways to monetize. In 1994, hotwired.com (the online website for Wired Magazine) launched its site and introduced a new business model for the web: sponsored banner ads.^④ One of the first well-known ads on this site was a clickable banner ad for AT&T that took users to a page that listed all the museums in the world that had web pages. Over the next 20 years, digital advertising grew to become the

^③ <http://info.cern.ch/hypertext/WWW/Summary.html>

^④ <http://www.internethistorypodcast.com/2014/10/the-webs-first-banner-ads/>

dominant form of online content monetization. In 1996, Yahoo debuted search ads. In 2000, Google developed AdWords. In 2005 and 2006 Facebook rolled out social ads. In 2010, Twitter launched Promoted Tweets that appear in user feeds.^⑤ By 2017, the global digital advertising market had grown to over \$200B.^⑥ All of this supported a massive growth in content shared and consumed online.

1.5 A Countertrend to Online Ad Monetization

In 2013, Jack Conte founded Patreon, an online content site designed to help content creators raise money directly from fans for their work. He founded the site after noticing that a YouTube video he created in 2010 had amassed around 2 million views and cost \$10,000 to make. Even with all that traffic, YouTube only paid him \$963 in revenue share, cementing his belief that large platforms like YouTube weren't fairly distributing the value created by content creators.^⑦ And instead of monetizing Patreon with ads, Jack decided to monetize the site by taking a 5% share of the payments from supporters to creators, helping better align the platform to the interests of users and creators.

In 2017, Ev Williams, the founder of Twitter and Medium, shook the world when he announced that Medium would move away from its traditional ad-supported publishing model, stating that “ad-driven media on the internet [is a broken system]”.^⑧ His core belief was that advertising was not the right solution to the big problem of driving payment for quality content. What's needed, he said, is “a new model for writers and creators to be rewarded based on the value they're creating for people”. In place of its ad-driven model, Medium launched paid subscriptions to better reward its content creators.

1.6 New Reward Systems for Content Networks Emerge

In 2016, a small team launched a new online content platform named Steemit. Steemit was designed to be a social media and blogging platform that rewards both creators and users in digital currency for their value contribution to the network.

Steemit was unique for several reasons: first, it pioneered the creation of a decentralized online content network powered by a blockchain; second, it paid out rewards to

⑤ <http://www.adweek.com/digital/heres-timeline-showing-20-years-after-banner-ad-161000/>

⑥ <https://www.recode.net/2017/12/4/16733460/2017-digital-ad-spend-advertising-beat-tv>

⑦ <https://patreonhq.com/creators-have-made-100m-on-patreon-ddfcc9338662>

⑧ <https://blog.medium.com/renewing-mediums-focus-98f374a960be>

⑧ Steemit is not decentralized compared to a system like Bitcoin, but it is decentralized when compared with more traditional internet platform systems.

content creators based on the number of upvotes they received; third, it paid out rewards to commenters based on upvotes that they received; fourth, it paid out rewards to users who deposited money in the platform; and fifth, it allowed all users (content creators and consumers) to share in the value created by the platform through holding a digital currency whose value rose as demand for the service increased.

Steemit created a model that demonstrates the promise of the Decentralized Web : namely, that new types of networks powered by a blockchain and denominated in a cryptocurrency can enable more exciting incentives for user engagement, and that these networks allow users to finally share more equally in the value created by the growth of the platform.

That said, Steemit's model has some weaknesses. Specifically, Steemit doesn't charge users to upvote, leading to a tragedy of the commons outcome - the emergence of paid upvote bots . These are bots that authors can pay to mass upvote their content, artificially making it seem like many users have upvoted the content. If upvoting is supposed to be a way to rank higher quality content, then a system in which votes can be bought artificially will have a weaker content discovery mechanism, reducing value for the participants on the network.

1.7 A Brief History of Online Content Discovery Mechanisms

Content discovery has been a critical part of the internet ever since the World Wide Web grew in popularity during the 1990s. Some of the earliest highest-valued internet companies like Yahoo and Google started out by providing a better way for users to find and retrieve high quality, relevant content via a search engine.

1994 birthed many search engines like Yahoo that started off by manually adding web pages and their descriptions to an index that users could search. Soon, companies like Lycos began to innovate by designing relevance algorithms that indexed entire sites and matched for word proximity. By 1995, sites like AltaVista began to support natural language queries that made it easier for users find content they wanted.

The entire game changed in 1998 when Google launched. Google's PageRank algorithm took a more innovative approach to determining the quality of online content:

⑧ <https://techcrunch.com/2016/10/09/a-decentralized-web-would-give-power-back-to-the-people-online>

⑧ <https://steemit.com/steem/@fknmayhem/rethinking-the-position-of-upvote-bots-in-the-steem-ecosystem-without-smts>

⑧ <https://www.wordstream.com/articles/internet-search-engines-history>

measuring the number of links between pages. Google’s founders, then Ph.D students at Stanford University, were inspired by the fact that high quality research papers were usually cited by a large number of other papers. James Surowiecki, in the widely read book *The Wisdom of the Crowds*, described this innovation as below:

“In essence, Google interprets a link from page A to page B as a vote, by page A, for page B. Google assesses a page’s importance by the votes it receives. But Google looks at more than sheer volume of votes, or links; it also analyzes the page that casts the vote. Votes cast by pages that are themselves “important” weigh more heavily and help to make other pages “important.”

Given Google and PageRank’s success in organizing and delivering the world’s online information, it seems appropriate to say that high quality online content discovery can be achieved by measuring how nodes in a network are “voting” for each other, taking the influence of nodes into consideration. But, in order for this system to work, you must ensure a healthy, properly incentivized content voting system.

1.8 Problem Statement and *U* Network’s Purpose

As Ev Williams and Jack Conte pointed out, our current system of monetizing online content is broken. Ad-driven models fall prey to serving the needs of advertisers, and most online content platforms don’t distribute value fairly to their creators and users. Steemit has tried to solve these problems by cryptocurrency monetization and with more generous rewards to its content authors and users, but its content discovery mechanism (voting) has been devalued by bots.

With *U* Network, we are trying to revolutionize the online content industry by launching a solution that solves the following problems:

1. **Unequal Distribution of Platform Value**

Users are contributing content to online platforms, but these platforms are capturing an unequal amount of the value created by users’ content. Creators and readers deserve to be rewarded more for the content and data they contribute to an online network. Cryptonetworks like *U* Network provide a new way to share platform value more fairly.

2. **Ineffective Content Discovery**

People need a reliable way to find good content. Platforms like Steemit, which do a good job at giving more money to creators and users, have a problem with paid

upvote bots that harm content ranking quality. This makes it harder for users to quickly find good content.

3. **Centralized Content Moderation**

Moderators form an important part of online communities as they decide whether or not content should stay on the platform, whether or not people should get banned, etc. But this centralized control means that other users don't have a formal way to dispute decisions made by moderators. *U Network* seeks to change this.

1.9 *U Network's* Solution, Benefits, and Differentiated Approach

U Network is a prediction market and publishing protocol that helps online content platforms better align with the interests of their users. It does this by rewarding content creators more for their work, by letting users earn money for predicting popular content, by making it easier to discover high quality content, and by allowing all users to be part of content moderation and governance decisions.

For users, these are the four key benefits that *U Network* provides:

Get More Money for Your Work
Earn Money by Predicting Popular Content
Discover High Quality Content Faster
Be a Part of Content Moderation and Governance

From a high-level perspective, *U Network* has three key protocols that power these benefits:

1. **Token Rewards Protocol** - Solution to the unequal value distribution problem. An on-chain protocol for managing token rewards to authors, users, and moderators and allowing users to spend tokens on the network.
2. **Content Pricing Protocol** - Solution to the ineffective content discovery problem. An on-chain prediction market protocol for pricing upvotes and downvotes.
3. **Governance Protocol** - Solution to the centralized moderation problem. A governance protocol that enables users to participate in content moderation and governance decisions.

Additionally, *U Network* is creating its own online content platform, *U Community*, to demonstrate the unique benefits that *U Network* provides. Imagine *U Community* as a combination of Medium, Reddit, and Steemit, but with several big differences:

1. **Fairer distribution of value capture.** In traditional content platforms like Medium, Reddit, etc, users and creators create enormous value through their intellectual efforts, but that value is mostly captured by the platform. *U* Community upends that model by paying users more for quality upvotes, paying authors more for quality content, and paying moderators more for accurate judgements.
2. **Skin-in-the-game content curation.** In other crowdsourced content communities like Steemit, users and authors are rewarded but upvoting and downvoting is free. This has led to the emergence of “paid upvote bots” which artificially pump up the number of votes for content, harming the use of votes as a quality content discovery mechanism. By using *U*Network’s prediction market protocol, *U*Community eliminates this problem by creating a market for votes. Users pay in Points or Tokens to vote, and those who accurately judge the future popularity of content are rewarded for their prediction accuracy.
3. **Decentralized content moderation.** In traditional platforms, moderation of content is centralized and decisions are not transparent. *U*Community changes this by creating a staking system where users can become moderators by staking a deposit. This democratizes access to moderation and incentivizes moderators to act in the best interest of the community.

1.10 *U* Community - A Blockchain Community

1.10.1 A Content-Value Driven Blockchain Community

With the high-speed development of blockchain technology and increasing adoption by the crowd, digital assets, especially bitcoin [4] are no longer a minority investment. Investors in digital currency are growing exponentially.

We firmly believe that blockchain technology will revolutionize the way how value is transferred in our society. As a network effect, more and more people will start investing in digital assets.

One major problem of making blockchain mainstream is that we are lacking a content-oriented community that is friendly to beginner digital asset investors. It’s hard to get high-quality, and reliable blockchain technology related information. Excessive amounts of information make it difficult to find an entry point in knowing a project. Meanwhile, the global aspect of digital asset adds to the barrier for beginners to learn about projects in other countries.

It's our intention to solve such problems. We strive to build *U* Community so that it provides users with useful information about digital assets, and guidance in making investments. After acquiring knowledge and profits, users would be willing to pay for helpful content. This is our first step in building a content-driven blockchain community.

U Community is designed and operated by a team with a strong prior experience in content-related products. *U* Community team will utilize blockchain technology, create a robust economic mechanism to promote content creation and distribution while ensuring fairness and competition. We aim to incentivize contributing users and infuse content with rewards.

U Community provides a reliable way for beginner investors and blockchain enthusiasts to obtain advice from seasoned professionals. By giving rating to each content, we construct a trustworthy blockchain community, giving professional individuals and institutions an opportunity to stand out.

Chap. 2 Design

2.1 System Design

U Network follows two critical principles in building an efficient content-value prediction market

Principle 1 There Ain't No Such Thing As A Free Lunch

In a regular efficient market, there ain't no such thing as a free lunch. One has to pay to gain. In *U* Community, to incentivize users to discover good-quality content, upvoters will be rewarded with *Sugar* at the early stage.

This is a game in which a return is expected, thus it has to come with an initial cost to balance the expected return. Therefore, each upvote would cost a given amount of *Sugar*, to prevent BOT cheating or spamming.

Principle 2 Be Fair

Inspired by Steem, it's imperative to treat everyone just and fair to build a free and ordered market. Each user of the community should be able to get proportional rewards according to their contributions. The same way as a start-up assign its stocks to its employees with major contributions.

Every form of "labor" should be valued equally. Contributing time and attentions to create, discover and distribute content should be valued equally as if one is contributing money.

Based on the principle of fairness, we need a consistent mechanism to reward those who are creating quality content. High-quality content tends to inspire others and results in further generation of more high-quality contents. Therefore, when users spend *Sugar* to upvote, the community needs to assign a reasonable portion of *Sugar* to content creator to reward their contributions.

Similarly, content discoverer (Upvoter) should also be rewarded for accuracy in predicting the value of a content. The community implements a mechanism that redistribute *Sugar* from late upvoters to early upvoters. In this way early stage upvoter have a higher expected return of *Sugar*.

What's more, *U* Community should be easily accessible to every user. Would the cost of upvote discourage users without spare *Sugar* from being part of content discovering?

The answer is no, users without *Sugar* can contribute time and attention instead of

paying *Sugar*. Based on Principle No.1 (There Ain't No Such Thing As A Free Lunch), users can receive points by spending time and energy in completing meaningful tasks for the community. For example, referring a friend or distributing the content to other social media channels. These points can be used in voting.

We can consider content-discovery as traditional crypto-mining. Mining requires 'electricity', and the 'electricity bill' in this case can be paid either by *Sugar* or labor for the betterment of the community.

We can call the process of content-evaluation and prediction model 'Proof of Foresight'. The basic principle behind is that user assign *Sugar* to content author according to the judgment of the content, and assign *Sugar* to content explorer base on the foresight of each upvoter.

2.2 Mechanism behind Content-Value Prediction Market

Like said previously, the goal is to create an efficient content-value driven prediction market. If a user finds the current upvotes (price) is lower than their predicted price or valuation, users can 'upvote' to 'long' the content. Every 'upvote' would cost a small amount of *Sugar* (or equivalent points). In this way, users participating in this prediction market have a chance of gaining profit, as a reward for them discovering quality content.

2.2.1 Basic Reward Schema

According to the order of upvoting, the *Sugar* spent by all users will be reassigned to the author of the post and the people who upvoted in the earlier stage. We could adopt a basic reward schema similar with Yours.org [6], the formula of author reward is derived from harmonic series:

$$R = C * \sum_{k=1}^n 1/k$$

n is the total number of upvotes within a given period of time. k is the rank of each upvote. C is the *Sugar* required for each upvote. The first person would contribute all the *Sugar* he is paying to the author, the second person upvoting will contribute half of the cost to the author.

In addition, good articles should get additional award from content reward pool.

The reward formula for content explorer is below

$$R_s = C * \sum_{k=s+1}^n 1/k$$

s is the rank of upvoters. If the total number of upvoters is fixed, the earlier one upvotes, the higher expected return it is. This mechanism gives incentives to users upvoting in an early stage. Like previous, the second upvoter would only contribute $1/2$ *Sugar* to the author, the rest $1/2$ *Sugar* would go to the first upvoter. The third upvoter would give $1/3$ to each of author, first upvoter, and the second upvoter. It's mathematically provable that the first 35% of upvoters have positive expected return.

$$R_s = C * \sum_{k=s+1}^n 1/k \geq C$$

if and only if

$$s \leq 0.35 * n$$

In other words, if one predicts a content value (number of upvotes) would rise at least three times, then it's profitable to upvote at that time. The author would take the largest piece of the cake. In the meantime, early upvoters, aka early investors in the prediction market will have positive expected returns, as a reward for exploring quality content.

2.2.2 Adjustable Reward Scheme

It's mathematically provable that in the basic reward schema, that first 35% of upvoters have positive expected return. We propose another reward scheme that we could adjust the ratios of upvoters who could have positive expected return.

The basic idea is that tokens is no longer evenly distributed to previous upvoters.

C is the *Sugar* required for each upvote. For the k_{th} upvoter, there are an author and $k - 1$ upvoters before him.

The stake of upvoter with rank s is

$$y = a * s^2 + b * s + c$$

where

$$s < k$$

We also assume the stake of author for the k_{th} upvoter is

$$y = a * k^2 + b * k + c$$

The k_{th} upvoter will distribute $V(k, s)$ tokens to upvoter with rank s .
where $V(k, s)$ is

$$V(k, s) = C * (a * s^2 + b * s + c) / \sum_{v=1}^k (a * v^2 + b * v + c)$$

The reward formula for content explorer is below, where s is the rank of upvoters.

$$\begin{aligned} R_s &= \sum_{k=s+1}^n V(k, s) \\ &= \sum_{k=s+1}^n (C * (a * s^2 + b * s + c) / \sum_{v=1}^k (a * v^2 + b * v + c)) \end{aligned}$$

The reward formula for the author is

$$\begin{aligned} R_s &= \sum_{k=1}^n V(k, k) \\ &= \sum_{k=1}^n (C * (a * k^2 + b * k + c) / \sum_{v=1}^k (a * v^2 + b * v + c)) \end{aligned}$$

For example, if we set $a = 1, b = 1, c = 10$, we could guarantee the first 50% of upvoters have positive expected return as long as we have enough upvoters.

2.2.3 Content Reward Pool

We set up a content reward pool (20% of total *Sugar*) to give out additional awards to good articles. By design, a content reward pool will get allocations when *Sugar* is first distributed to help bootstrap the community.

Our content reward could be sent out on daily or/and weekly basis. Top upvoted articles (under certain topics) will be eligible to get additional *Sugar* reward.

The *Sugar* reward could be a certain percentage of the total number of upvotes. For example, if a content gets 1000 upvote and is eligible to get content reward, and the systems give out 30% reward, then the author will get 300 upvote equivalent *Sugar* reward.

2.2.4 Receiving Points

Based on the principle of fairness, our community should be open and accessible to everyone. One without spare *Sugar* should also have a way to participate. A perfect solution would be to enable users to exchange their time and attention for points. Signing in daily, sharing content to other social media, referring a friend, and taking part in dispute settlement would all gain users points.

To prevent malicious spam sign-up and web-bot attack, we impose a restriction: the points can not be converted to *Sugar*, which is liquid and tradable. Also there is a dynamic hard-cap on how many points one can earn given the community economy and user activities.

Points can be used in voting. They are generated by the community, so it's only logical it is used within the community. Only when the points are used in the *U* Community content prediction market can it be converted to *Sugar*. In this way, points are becoming monetary rewards to both content explorer and content creator.

2.2.5 Delayed Settlement

After each content creation, there is a period of time in which the topic is open to critique by community users.

If the content violate the community rule, the rewards to the author might be cancelled or redistribute to the *U* Network Reward Pool.

The length of the waiting-period is set to be 7-days but can be changed dynamically

by the community of users if needed.

Users could always upvote and downvote afterwards, and the rewards will also settled after a period.

2.2.6 Downvote

Not all systems have downvote options. In our design, we do allow downvote options.

In our design, “Downvote” requires *Sugar*, G is the cost of downvote, the first G is collected by the platform, and the second G is divided in halves, one goes to platform and the rest goes to the first downvoter. The third downvoter would divide G into three parts, one to platform, one to first downvoter and one to the second downvoter.

$$R_s = G * \sum_{k=s+1}^n 1/k$$

Chap. 3 Functionality Design

3.1 Information Discovery

Based on the definition of ‘Information’, the purpose of ‘Information’ is to eliminate uncertainty. Meanwhile the cost of getting information is different for different individuals.

Facing complicated blockchain technology and booming blockchain currencies, regular investors are ‘blinded’ by the explosion of information. It’s hard for one to get reliable information about a project with time-efficiency.

U Community solves the content-rating problem with prediction market. Under this information filtering mechanism, quality content will stand out. *U* Community is powered by blockchain, inheriting all the advantages of blockchain technology. The developed payment system paved the ground for features like ‘Paid Q&A’, ‘Paid Subscription’, ‘Pay to message’, ‘Pay to survey’, and ‘Sending gift reward’. All those features encourages the distribution of valuable information, and paid information exchange.

3.2 Infuse Content With *Sugar*

U Community dedicates to create a content platform that is by the users, of the users and for the users. The creators should have a place when it comes to profit sharing.

U Community is designed and operated by a team with a strong prior experience in content-related products. *U* Community team will utilize blockchain technology, create a robust economic mechanism to promote content creation and distribution while ensuring fairness and competition. We aim to incentivize contributing users and infuse content with rewards. Authors of quality content can receive *Sugar* reward from their fans, and can take shares of *Sugar* from upvoters. In this way the system encourages the production of quality content with economic incentives.

3.3 Internet Fans-Celebrity Economy

Internet Celebrity Economy was popular during the traditional internet age. Internet celebrity attracts the attention of Internet fans users, which can translate into profit through e-commerce and online advertising. For example, Facebook are the social networking platform that takes most of the advertisement cuts, 97

U Community aims to modify such economic model, and make both fans and celebrity gain profit out of the interactions. In *U* Network, professional investors can save their trading strategies and records onto the blockchain, and could further disclose such strategies and make it visible to the community. One can set the visibility of the record and other users have to pay to view the records along with the technical analysis. Meanwhile, experienced investors can cast predictions for the future market movement, other users need to spend *Sugar* to view.

With the help of smart contract, *U* Community provides a decentralized, reliable way for users to control their own assets. It also enables for a new function which allows users to automatically and completely imitate/clone professional investor's strategy. If the following user made profit by doing so, the smart contract will settle part of the profit to strategy creator. All in all, *U* Community is a information-oriented community, a value-driven community. *U* Community provides a reliable way for users to trade information for monetary profit, and facilitate the spread of insightful, quality content.

Chap. 4 *U* Community System Solution

4.1 Product Design

4.1.1 Topic Mechanism

U Community content is organized by topic mechanism, similar to XUE QIU [7], each digital asset will become a topic, under which aggregates user generated contents and platform generated content. Users can not only see market movements, news, announcements, but will also be able to see other users who have similar interests in any particular digital assets.

4.1.2 Follow and Subscribe

U Community content distribution is based on the follow and subscribe. Users can follow a single digital asset, and each topic would show the most influential users. We will redirect users from digital currency page to a community of other users following the same currency.

4.1.3 Content Ranking

U Community constructs a content-value prediction market to make quality content stand out. Yet we still need to rank the stream of information base on the time ordering of the post. The ranking algorithm can be represented by the formula $f(t_s, y, z)$

$$f(t_s, y, z) = \log_C z + \frac{y t_s}{45000}$$

t_s denotes how latest the post is.

$$t_s = \text{Posted time} - \text{Wired-in timestamp.}$$

$$y \in \{-1, 0, 1\}$$

$$y = \begin{cases} 1 & \text{if } x > 0 \\ 0 & \text{if } x = 0 \\ -1 & \text{if } x < 0 \end{cases}$$

x is the difference in the number of upvoters and downvoters

$$x = U - D$$

U is the weighted sum of upvotes, while D is the weighted sum of downvotes.

$$U = \sum \text{weighted sum of upvotes}$$

$$D = \sum \text{weighted sum of downvotes}$$

The weight of each vote is calculated by taking the logarithm of total upvotes, adding it with the deposited *Sugar* t . U Community users can purchase *Sugar* and by locking the capital away, users can enjoy extra rights. Only locked *Sugar* are added to the extra voting power.

The weight of each vote is calculated by taking the logarithm of total upvotes, adding it with the deposited *Sugar* t . U Community users can purchase *Sugar* and by locking the capital away, users can enjoy extra rights. Only locked *Sugar* are added to the extra voting power.

By reducing the liquidity of *Sugar*, the stakeholders' interests are tied with the community. This way, users are more cautious while voting because they would be acting in their self-interest. Arbitrary votes would jeopardize the utility and effect of the platform. Therefore, *Sugar* stakeholders are likely to make prudent judgment. They should be given more voting power when it comes content ranking.

Meanwhile, the logarithm operation prevents major stakeholders from having unchecked dictating powers. All of these combined with the number of upvotes one receives can objectively show the expertise of a user.

$$\text{User voting weight} = \max(0, \log_M r) + \max(0, \log_N t)$$

M and N are two constants, subjects to changes by the community z is the larger one between x absolute value and 1.

$$z = \begin{cases} |x| & \text{if } |x| \geq 1 \\ 1 & \text{if } |x| < 1 \end{cases}$$

C denotes cool-down constant. To make it clear, inside $\log_C z$, C is the base. For example when $C = 10$ it means $z = 10$ can result in 1 point, $z = 100$ will result in 2 points. To put it another way, the first ten voters share a similar weight with the following 90 voters, (and even 100th to 900th voters). It means that for a popular post, the weight is decreasing as the rank of voters is increasing. The larger the C is, the less of an effect a late upvote

has. The unit of 45000 in the denominator is second, which equals to 12.5 hours. It means posts one day old would have 2 more points in ranking. In other words, posts one day older need to have 100X more votes to sustain the original ranking.

4.2 Community Roles

U Community is composed of regular users, content creators, content explorers, and community moderators.

4.2.1 Regular Users

Regular users can receive points by completing a given set of tasks. Also, they can transit into content creators by posting new content. And by discovering and upvoting topics, they can be content explorers. They can also be chosen as community moderator.

4.2.2 Content Creators

Content creators are core member in the development of the community. They will receive *Sugar* as rewards according to the quality of generated content.

4.2.3 Content Explorers

Content Explorers are users upvote a content after viewing it thoroughly. Content explorers can upvote topics to discover quality content for the community. If agreed by more users, one can receive *Sugar* as rewards.

4.2.4 Community Moderators

Community moderators are selected periodically from regular users. The probability of a user being selected is proportional to the *Sugar* one is staking. Meanwhile, being selected by the moderator will result in *Sugar* rewards. Community moderators ensure *U* Community is operating smoothly without turbulence, and have privilege in determining future movement of the community. One of the most important privilege of moderator is the ability to delete improper topics. To prevent abuse of such power, authors of deleted content can appeal. The appeal request would require a significant amount of *Sugar* deposit. Users in the community can vote on the incident. Each vote would cost small amount of *Sugar* to prevent spam voting. After appeal period, if more than half of participants supports the deletion, the appeal initiator would lose the deposit and the users who supported the appeal would also lose their *Sugar* spent in the voting process. Vice-versa.

The formula to assign rewards for the majority voter is calculated as follows.

$$p = (N * c - F) / N_w$$

p is the reward for each users winning the appeal. N is the total number of the users voting for the appeal. c is the cost of casting a vote. F is the processing fee goes to the platform. N_w is the number of majority. This formula ensures each voter will have to use her best judgment to analysis the situation to gain rewards at the end. Therefore preventing trolls casting arbitrary votes.

After the first appeal voting period there is a cool-down period, in which if either the appeal initiator or the community moderator is unsatisfied by the result. She can start a second round of appeal. The extra appeal would require exponentially more deposit than the previous one. If the latest appeal is different from the previous one, the reward allocation for the previous one is voided and the final rewards are allocated based on the latest appeal result.

This process is repeated until both party reach an agreement or either one is unwilling or unable to put down appeal deposit. Community moderators will automatically assign part of *Sugar* to users supporting them. However if the appeal overturns the original deletion, those *Sugar* would be rewarded to users who disapproved of the deletion.

4.3 Functionalities of *Sugar*

Sugar represents the right to use *U* Community and its related applications. It's the link between value and content and the link between users. *Sugar* is the value carrier of the *U* Community. The larger users *U* Community attracts, the more quality content is produced. *Sugar*, with limited total supply, would benefits all the *Sugar* stakeholders when the market demand increases. *U* Network users are not only customers of the platform, but also beneficiaries if the community thrives.

4.3.1 Incentives for Content Creators, Explorers, and Moderators

To match 'Content contribution' with 'reward incentives', in *U* Community content-based prediction market, both quality content creator and content explorer will receive *Sugar* as rewards. Each user can both 'upvote' and 'downvote' a post. Posts being down-

voted would be contained. Thus trolling content would not be spread across the network. There are two major sources of *Sugar* rewards for content creators and content explorers. One is user purchased *Sugar*, the other one is *Sugar* converted from reward points for completing community tasks. Those points are gradually released from the system, ‘content-reward pool’. There is a limit on the daily release. So all the contents have to contend with each other for the limited daily rewards. The ‘content-reward pool’ will shrink yearly. This policy is set to attract users at an early stage, and aims to develop a network effect to build user base.

The platform will charge 5% of commission for the reward assigned to content creators and explorers, to ensure the stability of the *U* Community economy model.

4.3.2 Socialized Investment, Smart-contract based Co-investing

Investors can choose to upload trading strategies and order history to *U* Network to make future decisions in an organized fashion. Also, seasoned investors can share their trading strategies with the whole community, and provide relevant technical or fundamental analysis. Other users can pay to view such content, and become an co-investor of such strategies. With the help of smart contracts, *U* Community provides a decentralized, reliable way for users to control their own assets, and automatically, completely imitates/clone professional investor’s strategy. If the following user made profit by doing so, the smart contract will carry part of the profit to the author of the original strategy. In the future, users can use *Sugar* to purchase *U* Community platform investment advice from trusted third party applications.

4.3.3 Survey, Voting, Prediction Market

U Community will provide a way for user to pay to do survey and vote to gain more insights into the information of blockchain assets. *U* Community will release products with built-in prediction market. *U* Community will support native prediction markets that are extensible, efficient and accurate.

4.3.4 Advertisement

Good content deserves to be spread. Users can promote information to targeted readers. While spreading fake or irreverent content will be punished. Off site collaborators will also be able to publish advertisements inside *U* Community. However, the content will be strictly reviewed by the community moderators. All the revenue will contribute to

the content-reward pool.

4.3.5 Gift

Sending *Sugar* as a reward is an efficient way of interaction between community celebrities and fans. It's good community culture to pay reward to those who you have been receiving help from. Posts receiving higher rewards will have a higher exposure in the community. Users can pay *Sugar* to unlock extra features like medal and skins. 5% of the reward will go to 'content-reward pool'. The rest will be received by the beneficiaries.

4.3.6 Paid Subscription, Paid Q&A, Pay to Message

Users can pay *Sugar* to request private interactions with influential professionals, and receive personalized advice. There are three forms of interaction: paid Subscription, paid Q&A, pay to message. Paid subscription provides a way for influential individuals to make monetary profit with their knowledge and influence. After receiving a given amount of upvotes, content creators can setup a private group or private channel to provide more insightful information to those who are willing to pay *Sugar* as an entry fee.

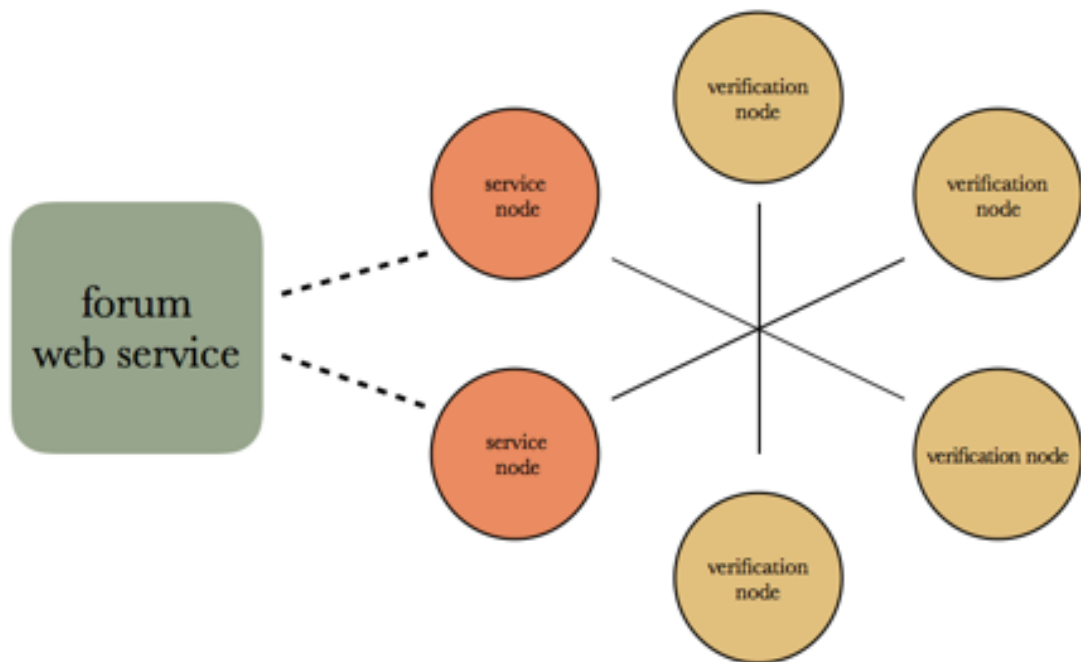
Users can also choose a more active way of interaction. After paying a certain amount of *Sugar*, users can ask specific questions to a specific individual. The answer can be set visible to the public or private, in which other parties need to pay to 'peek'. The payment is awarded proportionally to the initiator based on the quality. To filter unsolicited messages, users can set minimal payment that has to come with a private message. Money is an effective way to filter unworthy communication and harassment. The platform takes 5% commission from paid subscription, paid Q&A, pay to message.

Chap. 5 *U* Network Public Chain

To achieve high concurrency in *U* Network applications, we will develop a native *U* Network public chain, which is highly accessible and extensible, with low latency. We expect it to be able to confirm a transactions as fast as 6 seconds and could concurrently process up to 3000 transactions per second. We will support high-frequency micro payments in *U* Network public chain. And we will provide a easy-to-use smart contract interface.

More details of the implementations will be released in our upcoming technical white paper.

5.1 System architecture



The product is shown above. There are three major parts

- a) Blockchain network verification node
- b) Blockchain network service node
- c) Web service node

Blockchain verification nodes and service nodes constitute the low level blockchain network. Verification nodes are used for verifying transactions and generating new blocks.

Service nodes are designed to provide higher level service. Inside community system, service nodes are subjected to the community web service nodes, which provides necessary API for combining the community with the blockchain. Community web service nodes are user-orientated web service. It's responsible for new user registration and posting a new thread.

Our blockchain supports specialized *Sugar* minting, distribution, and reward.

Our blockchain supports self-defined blockchain system, p2p network, distributed storage, consensus algorithm, smart contract. different types of nodes:

- a) Verification nodes: verify transaction, generate next block
- b) Service nodes: provide basic services like block explorer, transaction search, system info search.

5.2 Consensus Protocol

The consensus algorithm is derived from a improved Practical Byzantine Fault Tolerant (PBFT) algorithm [1]. It combines voting mechanism with Byzantine theorem. This algorithm have a fault tolerant rate up to $1/3$. Verification node is produced by voting. Only *Sugar* stakeholders have the right to vote.

- a) There will be no soft-fork. One confirmation is enough for a transaction.
- b) No mining is needed, energy friendly.
- c) Adjustable block time. We expect the block time around 6 seconds.
- d) Highly concurrent in comparison to traditional blockchain.

5.3 Transaction Protocol

In blockchain, transaction is defined as the change of ledger. We aim to make transaction types extensible, thus making it forward-compatible to applications.

Due to the huge variety of UGC product form, we especially emphasis the extensibility of the system, as the growth of the decentralized UGC could be booming one day. Therefore, by making transaction types extensible, we guaranteed the whole network is extensible without the need to change core internet protocol and consensus algorithm or storage structures.

The system will support following major transaction types based on different scenario:

- a)Asset register: used for coin mint
- b)Asset publish: allocate users digital assets
- c)Asset transfer: traditional UTXO transfer
- d)Smart contract deploy: deploy compiled smart contract byte code to block chain
- e)Smart contract message call: call deployed smart contract
- f)Asset lock down: asset owner can lock the blockchain height

5.4 Application Use Case

There is a huge market behind the industry of culture and content. It's a huge opportunity and revolution to empower content reader, distributor and creator with the right to profit with the help of blockchain technology.

5.4.1 Platform for Paid Digital Literature

For platforms that constantly update series literature contents, it's imperative to rate the published content and incentivize the author to keep up the quality in the following release. By introducing *U* Network rating and rewarding system, top-selling authors can get a long-term incentive and reasonable returns.

5.4.2 Blockchain Content Platform

Traditional Blockchain info community are infamous for the mixture of authentic and fake news, and the inability to filter information and to make good content stand out. By using *U* Network pricing system, quality content can be discovered easily. *U* Network utilizes investment features pertinent to blockchain, creates a robust business model for the community.

5.4.3 Q&A Content Platform

There are problems with communities like Quora and Zhihu. Authors have no direct way to convert their knowledge into monetary profit. *U* Network native rating and reward incentive mechanism will give top-writer proportional returns for their work. Also, *U* Network value-based reward mechanism will effectively prevent internet trolling contents, hence clearing the stage for the content with real values.

5.4.4 Blog, Forum UGC Content Platform

Blog forum are two major ways for regular internet users to post content. By transplanting *U* Network rating mechanism into those already existing social media, creating profits for the users in the original platform. Even revitalizing the community by publishing *U* Network based tokens.

5.4.5 Content Aggregating Platform

Platform can use *U* Network built in content ranking feature to filter quality content of the same kind and provide aggregating features like Reddit.

5.4.6 Social Media Platform

By using *U* Network content incentive mechanism, platform can construct content-based social media like *Steemit*.

5.4.7 Music, Audio, Short Video, Long Video, Stream

Nearly all the content products that involve content rating and fans interaction can have *U* Network reward mechanism introduced, which can provide content creator and platform with extra profits.

Chap. 6 Business Vision

6.1 *UGC* Community for global digital assets holders

World-Economic-Forum-Report predicts that by 2025, there will be 10% GDP being part of blockchain related technology. According to RTx projection, there will be more than 200 Million digital assets holder by 2024. At present in China, there are 4 millions digital assets users. We believe with the booming of the blockchain technology, this number will grow exponentially. Hence, we focus on creating returns to digital assets holders and providing valuable information to investors and blockchain enthusiasts.

6.2 *U* Network Evolution

We believe *U* Network is the ultimate solution for the problems of traditional *UGC* platform. *U* Network can not only provide reasonable economic model to incentivize content creators, but also can benefits content customers and explorers. *U* Network presents content-value oriented prediction market, from the perspective of content customer, incentivize users to discover quality content, hence recommending valuable content to the whole network. This model takes the monetary return of content creators, content customers and content moderators into consideration.

6.3 Future of *U* Network

As a content oriented public blockchain, *U* Network is going to start by aggregating global digital assets information, following constructing a highly content-value driven *UGC* community. We will fully utilize distributed storage protocol of the blockchain to further decentralize the the platform service. We aim to attract more *UGC* community to our decentralized services, ultimately we aim to build a decentralized *UGC* ecosystem.

Chap. 7 Sugar Issuance Plan

7.1 Sugar Distribution

Sugar(UUU) will be issued during the contract deployment phase, with a total of 10 billion units. Table 7 - 1 shows the allocation plan of *Sugar*.

Users will get *Sugar* through airdrop, exchange and content reward pool. We will allocate 20% of *Sugar* to content reward pool. U Network employees will be granted restricted *Sugar* upon employment. These *Sugar* will be eligible to vest upon the satisfaction of a service condition. The service condition is vested over four years, with the first 30% vested upon one-year anniversary of token issuance, second 30% vested on the second year monthly and the rest of 40% vested monthly thereafter, subject to continued employment.

- Vest 30% *UUU* after one-year cliff after token issuance
- Vest additional 30% *UUU* monthly in the second year
- Vest 40% *UUU* monthly in the third year

Fund Percentage	Allocation
40%	Issued to Investors
8%	Early investors and Advisors
20%	Founding Team
32%	Community Development, 20% are Content Rewards

Table 7-1 UUU Allocation

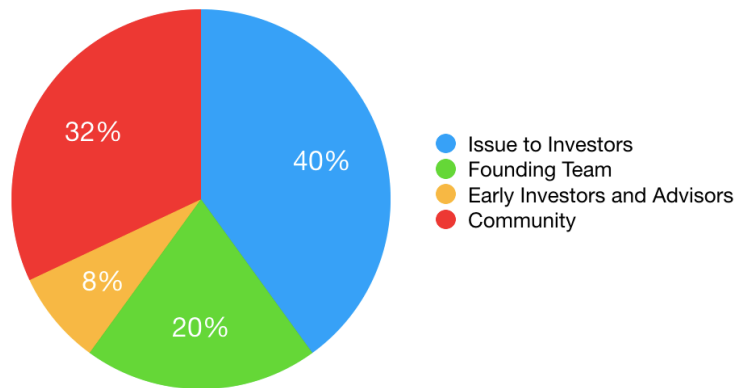


Figure 7-1 UUU Allocation

7.2 Token Sale Fund Allocation

In case UGC foundation sells some *Sugar (UUU)*, the budget from token sale fund will be allocated for the following purposes by the foundation, see Table 7-2.

1) Research & Development: U Network Blockchain and U Community are sophisticated systems that consist of a large number of subsystems. Sufficient funding needs to be allocated for recruitment, team building, and research and development.

2) Operations and Marketing: Branding and marketing operations are important pieces to promote U Network to UGC community for growth. We will allocate funding for promoting U Network platform and U Community in general.

3) Community and Ecosystem: We will allocate funding to help build U Network Community and Ecosystem.

4) Legal Consulting and Risk Control: U Network is an innovation which is able to disrupt many industries, but is also a highly-regulated area and therefore legal service is needed to ensure the regulatory compliance (in particular, in the areas of securities law). We will allocate funding for general legal advice and emergency legal services. In this regard, we have instructed specialist counsel in Singapore from Tzedek Law LLC to advise on the UNetwork token sale.

5) Miscellaneous: Miscellaneous expenses that exclude all above expenses.

UUU Percentage	Allocation
30%	Research & Development
30%	Operations and Marketing
20%	Community and Ecosystem
10%	Legal Consulting and Risk Control
10%	Miscellaneous

Table 7-2 Token Sale Fund Allocation

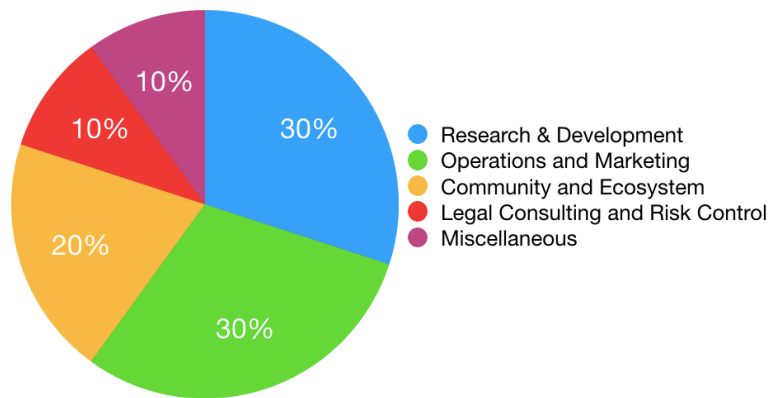


Figure 7-2 Token Sale Fund Allocation

Chap. 8 Roadmap

- i Jun 2015 to now, *U Network* team has been focusing on creating and operating technology content, our wechat channel has attracted more than 4 million active users.
- ii Aug 2017, partnered with Huobi, we presented ‘From 0 to 1, learn blockchain technology in a comprehensive way’. Over 10,000 paid students have completed the program.
- iii Sept 2017, we initiated ‘Smart Contract Development’ program. We trained more than 180 blockchain developers.
- iv Jan 2018, We will be holding ‘Blockchain Connect’ China-US blockchain summit
- v Aug 2018, *U Network* Testnet release
- vi Nov 2018, *U Network* Mainnet release
- vii Dec 2018, *UCommunity* Alpha version release.
- viii Feb 2019, *U Network* optimized Mainnet release
- ix May 2019, *UCommunity* Beta version release, supports co-investing functionality
- x Aug 2019, Completing *U Network* Mainnet and developer tool kits,
- xi Dec 2019, Build *UGC* ecosystem, import *U Network* into existing *UGC* platforms

RISKS

You acknowledge and agree that there are numerous risks associated with purchasing *Sugar*, holding *Sugar*, and using *Sugar* for participation in U Network.

1. Uncertain Regulations and Enforcement Actions

The regulatory status of *Sugar* and distributed ledger technology is unclear or unsettled in many jurisdictions. The regulation of virtual currencies has become a primary target of regulation in all major countries in the world. It is impossible to predict how, when or whether regulatory agencies may apply existing regulations or create new regulations with respect to such technology and its applications, including *Sugar* and/or U Network. Regulatory actions could negatively impact *Sugar* and/or U Network in various ways. The Foundation (or its affiliates) may cease operations in a jurisdiction in the event that regulatory actions, or changes to law or regulation, make it illegal to operate in such jurisdiction, or commercially undesirable to obtain the necessary regulatory approval(s) to operate in such jurisdiction. After consulting with a wide range of legal advisors and continuous analysis of the development and legal structure of virtual currencies, the Foundation will apply a cautious approach towards the sale of *Sugar*. Therefore, for the crowdsale, the Foundation may constantly adjust the sale strategy in order to avoid relevant legal risks as much as possible. For the crowdsale, the Foundation is working with Tzedek Law LLC, a boutique corporate law firm in Singapore with a good reputation in the blockchain space.

2. Inadequate disclosure of information

As at the date hereof, U Network is still under development and its design concepts, consensus mechanisms, algorithms, codes, and other technical details and parameters may be constantly and frequently updated and changed. Although this white paper contains the most current information relating to U Network, it is not absolutely complete and may still be adjusted and updated by the U Network team from time to time. The U Network team has no ability and obligation to keep holders of *Sugar* informed of every detail (including development progress and expected milestones) regarding the project to develop U Network, hence insufficient information disclosure is inevitable and reasonable.

3. Competitors

Various types of decentralised applications are emerging at a rapid rate, and the industry is increasingly competitive. It is possible that alternative networks could be established that utilise the same or similar code and protocol underlying *Sugar* and/or U Network and attempt to re-create similar facilities. U Network may be required to compete with these alternative networks, which could negatively impact *Sugar* and/or U Network.

4. Failure to develop

There is the risk that the development of U Network will not be executed or implemented as planned, for a variety of reasons, including without limitation the event of a decline in the prices of any digital asset, virtual currency or *Sugar*, unforeseen technical difficulties, and shortage of development funds for activities.

5. Security weaknesses

Hackers or other malicious groups or organisations may attempt to interfere with *Sugar* and/or U Network in a variety of ways, including, but not limited to, malware attacks, denial of service attacks, consensus-based attacks, Sybil attacks, smurfing and spoofing. Furthermore, there is a risk that a third party or a member of the Foundation or its affiliates may intentionally or unintentionally introduce weaknesses into the core infrastructure of *Sugar* and/or U Network, which could negatively affect *Sugar* and/or U Network. Further, the future of cryptography and security innovations are highly unpredictable and advances in cryptography, or technical advances (including without limitation development of quantum computing), could present unknown risks to *Sugar* and/or U Network by rendering ineffective the cryptographic consensus mechanism that underpins that blockchain protocol.

6. Other risks

In addition to the aforementioned risks, there are other risks (as more particularly set out in the Terms and Conditions) associated with your purchase, holding and use of *Sugar*, including those that the Foundation cannot anticipate. Such risks may further materialise as unanticipated variations or combinations of the aforementioned risks. You should conduct full due diligence on the Foundation, its affiliates and the U Network team, as well

RISKS

as understand the overall framework and vision for U Network prior to purchasing *Sugar*.

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