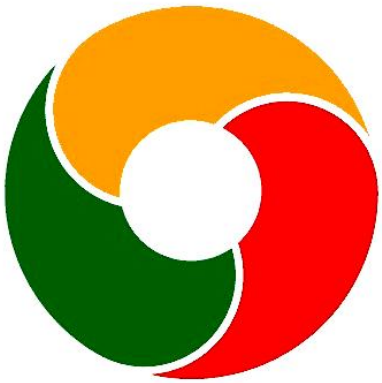
CONTENSYS



Content Publishing and Copyright Proof System
Based on Digital Terminal & Meta Information

Yellow Paper
Version 1.0
May 31, 2023

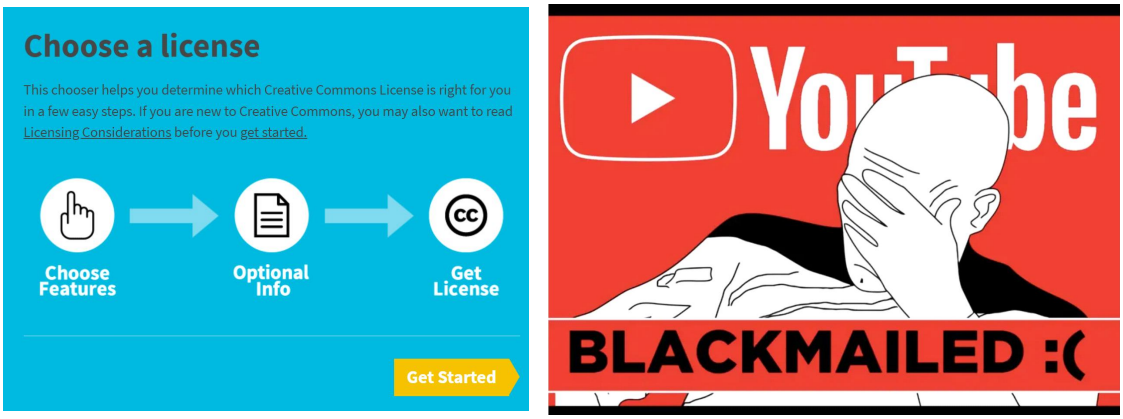
AHNIST
Network Neutrality Laboratory

1. Introduction

The development of the IT industry has led to many changes in daily life. The use of personal computers and smartphones has become common, and companies have contributed to improving utilization efficiency and convenience in various fields by launching services using them. This phenomenon, in which all daily services are fused into one system through the incorporation of information and communication technology, is called digital convergence. However, there are marginalized people in this process. In particular, working-level workers in the content industry have made clear contributions, but most of them have become narrower than before.

This ecosystem formation is largely caused by digital platforms. They are running their business in a custody way that stores data delegated to the author in a central network store. In this process, content is sold for free and used as a bait product to generate profits in other areas. It is common to unilaterally decide on discounts and pass on losses without the consent of the copyright holder, and it is difficult to find a movement to point out or improve this.

The reason why this phenomenon is fixed is also due to the generalization of the perception that digital copyright protection is impossible. In fact, in the case of the content market, it is characterized by rapid creation and disappearance according to popular trends, and it is applied and used in a wide range of ways. Even if the damage is clearly confirmed, the legal response cost is usually higher, so the measure is abandoned. If the dispute becomes public, it may interfere with other work activities, so it is often avoided to respond.



<Picture> Creative Commons business introduction page (left), difficulties in copyright arbitration on content platforms (right)

Despite this situation, private content transactions are exploding. In this process, many disputes arise, which are also caused by such distribution structure. This is

because most brokerage systems are dualized into content sellers and authority agents. However, it is virtually impossible for the person in charge of the agency to properly supervise the platform server where data distribution actually proceeds. This management structure may make it difficult to identify the location of responsibility in the event of hacking or illegal leakage damage. There is also a problem that copyright holders cannot actively grasp and cope with the current status. Nevertheless, as it becomes difficult to respond to increasingly complex and diverse platforms at the individual level, it is generally preferred to entrust the collection to public institutions and receive collective settlement of costs.

Meanwhile, digital copyright proof solutions are rarely found. In fact, if the data is distributed without permission, subsequent distribution path tracking is close to impossible. This has a technical problem that is difficult to set up an index, but there is also a problem of consumer backlash in terms of personal information protection. Therefore, most security companies are currently adding dedicated hardware devices or software to existing systems, mainly targeting platform operators. This method is often not practical in terms of small individuals and small production companies. In addition, various standards have been rampant due to competition for leadership among private companies, and it has rarely spread.

<Picture> A scene from 'Matrix 3' released as an homage to 'Nothing to see about the circumstances' (left),
Logo of the Chinese entertainment program "Yuku," which caused controversy over plagiarism of the logo of "Squid Game" (right)

However, there are also technologies that have the potential to solve these problems.

First of all, it is the Physical Uncolonable Function (PUF), a standard standard for identifying physical uniqueness. It is also called the 'fingerprint of a semiconductor chip' because it has uniqueness like a human fingerprint. Although the mainstream method is to generate security keys using the principle that nano-scale semiconductor microstructures are randomly generated, there are more than 40

methods such as VIA, Arbiter, MEMS, and Board. It has been adopted as an official standard of the International Organization of Standards (ISO) and the International Semiconductor Federation (GSA), and is actively applied to various fields such as SIM cards, IoT products, credit cards, and electronic passports of smart devices.

It is also necessary to pay attention to Digital Forensics, which tracks digital equipment or analyzes data and uses it as legal evidence. This is because hash values, which are known as "fingerprints of digital evidence," are used. The hash value is determined by the application of hash functions such as AES, SHA, and CRC, and the result value is completely different just by the subtle difference in the input value of the input. Since it is mostly applied to existing file systems, it is widely used to determine whether data is duplicated or falsified.

The device security standard is the Trusted Execution Environment (TEE) announced by the non-profit organization Global Platform. It is a security system design method that considers both hardware and operating system (OS). Currently, it is applied to most smart terminals and is mainly used in authentication areas such as PIN numbers, biometric information, and passwords. It is also applied to private standards in a way that combines additional functions, and ARM's Trust-Zone (TZ) specification, which is famous for mobile processors, can be cited as a representative.

In addition, there is Digital Rights Management (DRM), a system protocol that only authorized users can access. Currently, digital content is issued in various files depending on the media type, and documents are represented by EPUB, PDF, TXT, and visual images by JPEG, PNG, GIF, and BMP standards. The sound sources are MP3, WAV, FLAC, and the videos are mainly used by MP4, MOV, and AVI. Usually, DRM applies various security algorithms such as encryption or watermark to these various file formats so that they can be used only in dedicated systems.

On the other hand, there is also an attempt to implement a different system structure in terms of data authority and identity authentication. Non-profit organizations related to MyData, Gaia-X, Decentralized Identity (DID), and Self-Sovereign Identity (SSI) are representative. However, development has stagnated as most of the projects have not been able to come up with clear solutions for many years after the launch of the project. Some of them have even shown signs of collapse as members have left the organization since accepting companies that are contrary to the purpose of establishment.

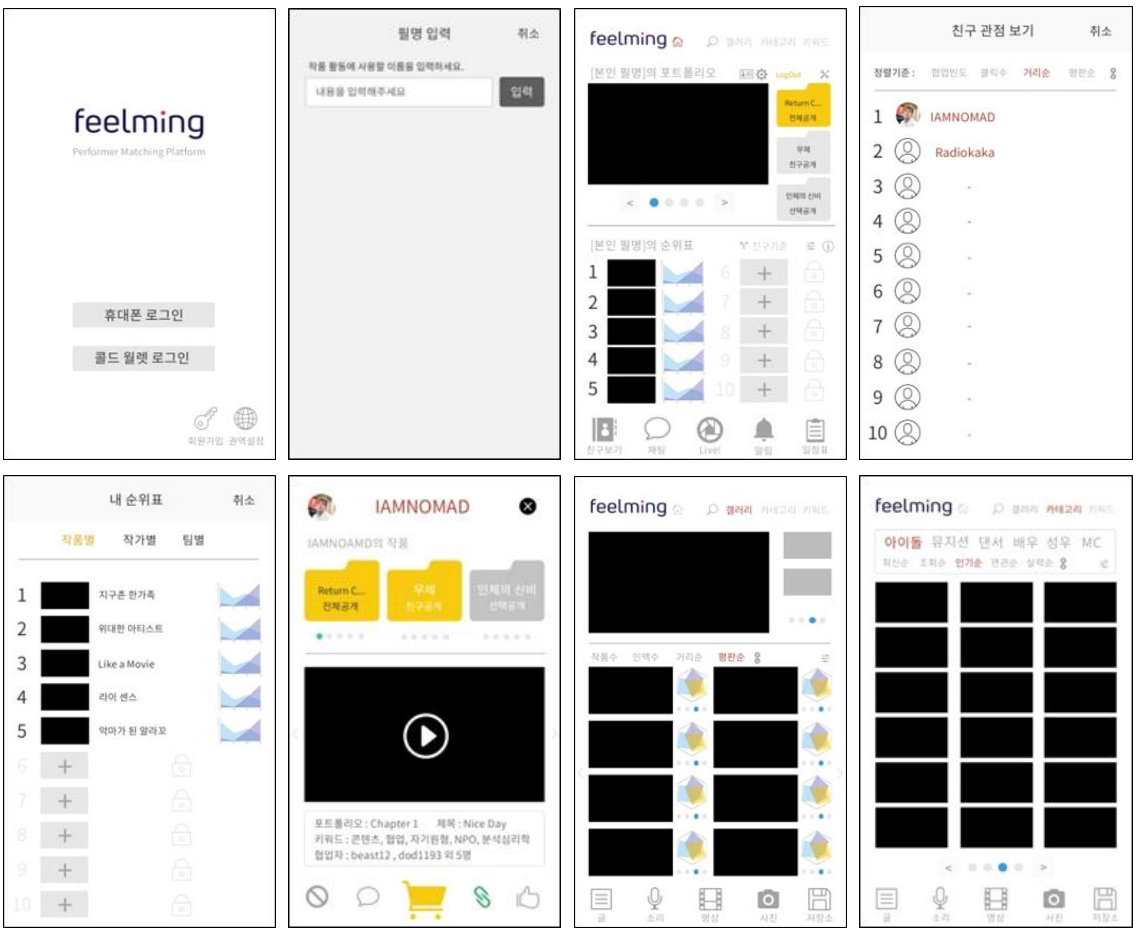
The issue of digital copyright infringement has long been widely noted. In the meantime, there have been many attempts to solve the problem, focusing on legal professionals, administrators, and IT industry workers, but the situation is getting serious. For reference, most of them are engaged in industries that need to exert more arbitration capabilities than creative capabilities.

In the end, in order to fundamentally solve the problem, a proposal from someone who can put copyright first is needed. In addition, it is necessary to accurately grasp the needs of creators and actively reflect the characteristics of the practice. Only when these conditions are met can the establishment of a system for copyright holders be discussed.

2. Main Idea

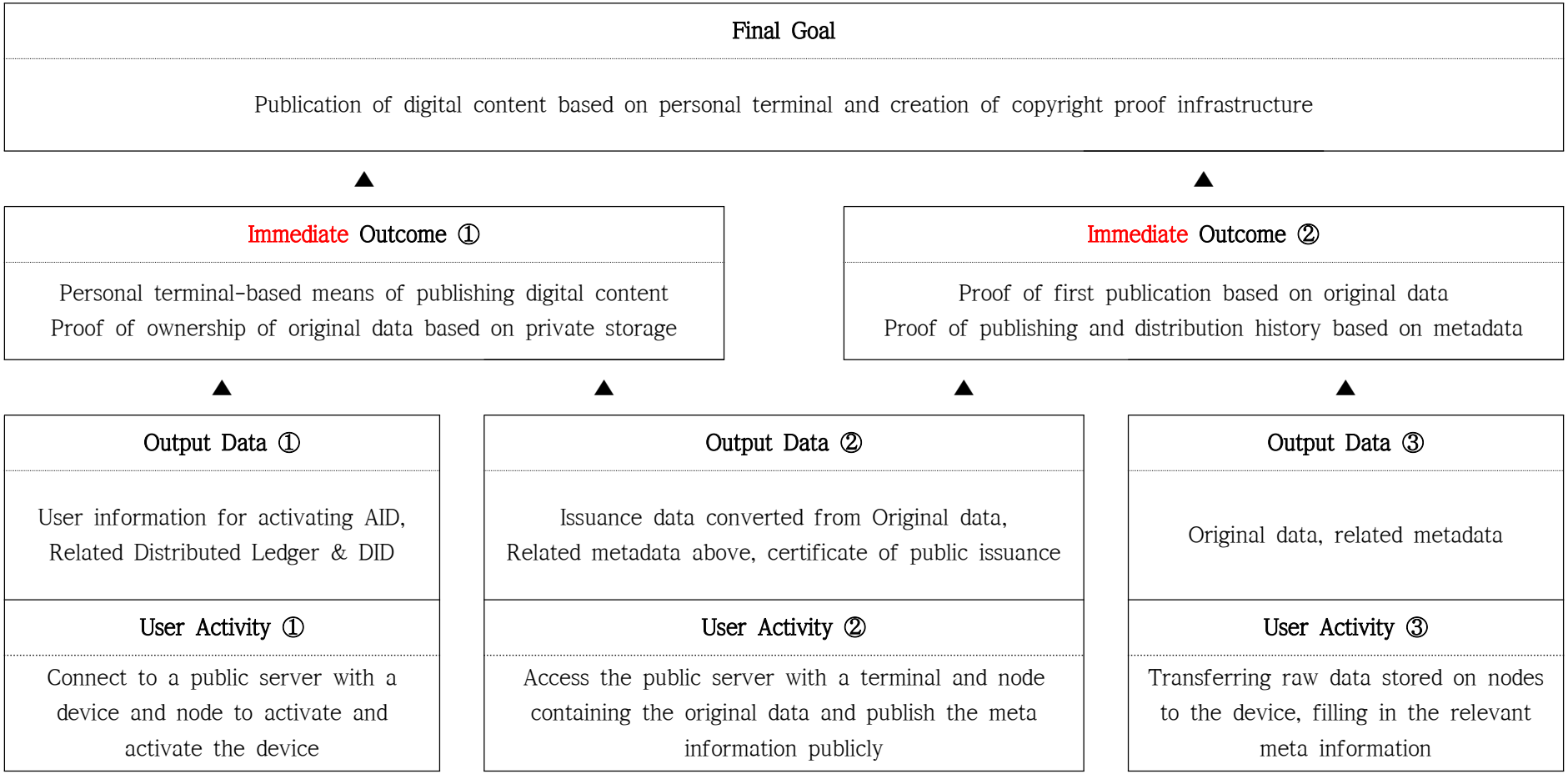
Prior to the explanation of this idea, it is necessary to point out the meaning of publication and copyright for accurate content delivery.

In Korean, publishing means to release books, paintings, etc. to the world by writing birth letters and book plates. English publication is a combination of 'public' which means many people and the state-changing verb 'sh' which takes a similar etymological form. On the other hand, copyright is a term that refers to authority derived from newly created work, which indicates clarity. The English word CopyRight is a combination of Copy, which means copy, and Right, which means authority, which is somewhat different from the Korean language. However, it is similarly used to recognize the value of creative efforts and to recognize their rights. Related legislation is led by developed countries in the United States and Europe, which are generally divided into personal rights and property rights. Authoring personal rights include the right to publish, the right to indicate names, and the right to maintain identity that enforces content or format. Property rights include the right to reproduce, exhibit, and distribute money value.



<Figure> Example of a portfolio-driven partner matching Application's UI/UX

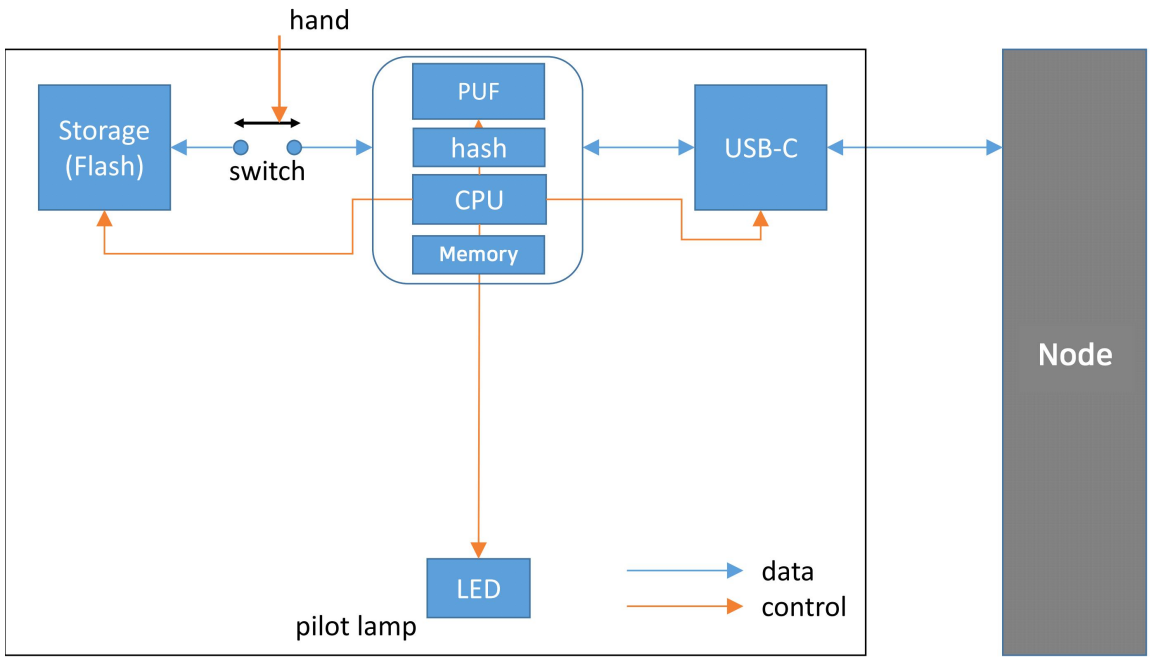
Currently, many content platform companies mark copyrights even though they can only use copyrights excluding copyrights. This is an act that violates the important rights and interests of the original content creator, and may be legally sanctioned in relation to it. Therefore, when using the copyright of others, special attention is required to select related terms.



<Table> Logical Model of the entire system (Order: User Activity → Output Data → Immediate Outcome → Final Goal)

※ Quote: PDM Guidelines of the Korea International Cooperation Agency, p.12

An overview of the operation of the entire system is as follows. The user directly connects the dedicated terminal and the node device. After that, the content is transmitted and stored to the terminal-side memory. In this process, metadata containing related copyright proof information is generated together. Metadata is basically stored in a node-side memory. The node can transmit it externally, and if it is publicly posted through a public server, the publication is completed. Afterwards, the user will be able to perform the relevant fact-finding procedure based on these metadata, and can authenticate himself/herself as a copyright holder with the original data in the terminal and memory.



<Figure> Illustration of the main module block of the content wallet

The technology implementation of the present invention needs to be largely divided into two aspects: a terminal and a system network. First, terminals that record and store original data, and allow users to check and manage the status thereof in real time should be distributed. Thereafter, it is necessary to implement a system network in which each terminal may be used independently.

The advantages of users of each terminal when such infrastructure is established are summarized as follows.

First, it is possible to specify the subject of publishing data in the real world through the assignment of physical unique identity values.

Second, you can store your data in a personal data store and Self-Sovereign authenticate whether you have it or not.

Third, anyone can easily universally check copyrights through the posting

information of content publicly posted on public servers.

The following is a detailed description of the functions that the aforementioned dedicated terminal should have.

A. Digital Content Issuing Device

(Non-disclosure)

(Non-disclosure)

(Non-disclosure)

(Non-disclosure)

(Non-disclosure)

(Non-disclosure)

(Non-disclosure)

Next, a detailed description of a network authentication system supporting the use of the terminal is provided.

B. Digital Publishing & Copyright Proof System

(Non-disclosure)

(Non-disclosure)

(Non-disclosure)

(Non-disclosure)

(Non-disclosure)

(Non-disclosure)

(Non-disclosure)

(Non-disclosure)

3. Conclusion

Currently, eight of the top 10 companies in the global stock market are IT companies. Their cloud and digital platform services are leading the data-driven economy by creating a job called big data. Recently, fintech technology has taken the lead in the financial and payment markets, further expanding its influence.

However, there are opinions that this trend will not continue. In the existing data custody platform system, it was virtually impossible for the parties to identify and control the data leakage damage of the subscriber on their own. Even if the negligence of the platform was confirmed, it was extremely rare for related damage compensation to be carried out. As these problems are highlighted, the movement to utilize sensitive personal information or large amounts of data through personal data storage is increasing. The distribution of personal computers and smartphones suitable for this method is becoming common. It is naturally shifting from a company or institution-centered system to an individual user-centered system.

<Figure> Controversy over NFT-based copyright proof system (left), and the need for a node-centered decentralized authentication system (right)

Recently, the blockchain industry is drawing keen attention. Some say it is a technology that will lead the fourth industrial revolution, but the outlook is not bright. There are three reasons for that.

First, it is a methodological problem. Most of these platforms set the computer computation process of mining as the first value creation. Most of the cryptocurrencies acquired in this way are used only for digital investment purposes. This means that it is an authority structure that subordinates users to the computational result of the virtual world. There is a limit to the application of the real economy, which prioritizes the ability and utilization of the real world.

Second, the Oracle Problem. Most of their databases are anonymous. This means that it is very difficult to determine who is responsible when a problem occurs. NFT (Non Fungible Token) and SBT (Soul Bound Token), which have recently

attracted attention, also use a method of writing address values without directly storing original data. This is because it is difficult to handle the traffic of the huge blockchain. This means that the original data is an off-chain method rather than a blockchain method. This method is also vulnerable to data replacement attacks at the address, which has great security disadvantages.

Third, it is the Incongruence Problem. The blockchain industry has grown by criticizing the unfair ecosystem promotion of vested interests and emerging as an alternative to check the centralized system. However, the vast majority of the industry currently relies on centralized exchanges. In addition, it is common to exchange or acquire stakes with existing forces, showing the opposite of decentralization.

The terminal of this system enables to secure clear physical evidence for the proof of ownership through its own data store. It also strictly excludes data custody other than the trading party. This means that the information delivery process between the real world and the digital world is free from the Oracle Problem. These personal data store-based DBMSs are expected to provide a technical foundation for activating sensitive information transactions that have not been easily handled. In addition, edge processing of the terminal is mainly utilized at the system level. It is to use a type of a turing machine specialized only in specific operations for copyright proof purposes as the core of the operation. The use of coding random number value injection (RNG) algorithms in software development is also thoroughly excluded. This is to be faithful to the purpose of brokerage that conveys a specific individual's intention to others without distortion. In addition, in the actual service utilization stage, the disadvantages of the machine's lack of judgment are recognized and supplemented through human judgment. This implementation is based on Gödel's Incompleteness Theorem and Alan Turing's Proof of Halting Problems.

At the system network level, there is an advantage of mitigating the problem of network neutrality.

First, logical network neutrality. The present terminal may pre-block malicious users using false identity and anonymity. Through this, unfair practices represented by fake news, comments, and real-time search operations distributed by content providers (CPs) can be prevented. In addition, there are problems such as ranking manipulation of private for-profit platforms and hoarding music. Through this, it is possible to ease economic isolation and gentrification of self-directed small business owners and artists.

Next is physical network neutrality. The present system induces the use of node-centered terminals and utilizes them as a reference point for a personal system. This means that it is possible to aggregate network traffic for each

terminal owner of Internet service providers (ISPs). Therefore, it is expected to be the basis for solving irrationality by sharing the network cost of heavy users who cause exponential traffic through streaming or downloading high-capacity data equally.

<Picture> Cases of manipulation of public opinion by large broadcasters, (left) and reports on the status of hoarding music by famous singers (right)

This idea is a kind of system design proposal that proposes different uses of existing technologies. Therefore, strictly independent operations are required until users adapt and become accustomed to the new methods.

The roles of exclusive non-profit organizations established for this purpose are as follows.

First, it is authorization to use the terminal. This means granting the right to use various verification services, including authentication of the terminal and user registration. In addition, a terminal-specialized customer center shall be operated to immediately respond to reports of failures or losses.

Second, it is an agency for content brokerage. The server of this system serves as an index provider such as unique identification information of the terminal and metadata of the original data, and should support the development of CDN (Content Delivery Network) protocols and various technical standards suitable for the P2P method.

Third, it is the medium of copyright notarization. To this end, the public server should serve as a digital square that publicly posts various meta-information of content. In addition, the dedicated platform should provide a publishing information viewing service that can be easily accessed and checked by the universal majority.

There is a certification system called a licensed real estate agent. It is a system to ensure trust in real estate transactions through third parties with expertise and public confidence. However, there have been many disputes at a time when real estate prices have changed rapidly recently. This is because a third party, the

subject of trust, doing arbitration not mediation.

Humans have the ability that machines can never do. There are many areas where artists show strength. In order to gain popularity among the public, it is important to have a passive attitude of wanting someone to approach you. But the case of rights is different. This is because the parties must actively step up and win.

Through this proposal, I hope that more unique and talented contents will be come out to the world. And I hope that one day, a social culture that can truly respect creative suggestions will be established.

Attachment 1: Status of Intellectual Property Rights Holding

-	Intellectual property name	Application(registration) number / (date)	Inventor
Patent (Application)	Content wallet, original data issuing and anti-illegal sharing devices	PCT/KR2022/015958 (2022.10.19)	GWON, OhGyoung
		CN/ 202211369394.9	
		KR/ -	
		US/ -	
		JP/ -	
		EU/ -	
Patent (Application)	CONTENTS TRADING SYSTEM USING CONTENTS WALLET AND THE CONTROLLING METHOD THEREOF	KR/ Application to be filed	
Patent (registration)	CONTENTS WALLET APPARUTUS AND SELF-SOVEREIGN IDENTITY AND COPYRIGHT AUTHENTICATION SYSTEM USING THE SAME	KR/10-2288971 / (2019.12.18)	
		US/11,386,196 / (2021.12.8.)	
Patent (Application)		PCT/KR2020/016341 / (2020.11.19.)	
		EU /20903698.7 (2022.03.09)	
		CN/202080077447.2 / (2022.05.06)	
		JP/2022-535165 / (2022.06.09)	
Patent (registration)	CONTENTS WALLET, TERMINAL APPARATUS AND CONTENTS SELLING SYSTEM	KR/10-2188862 / (2020.12.03)	
Patent (Application)		PCT/KR2020/006768 / (2020.05.25)	
		US/17/615,372 / (2021.11.30.)	
		EU/20815091.2 / (2021.12.06.)	
		CN/202080038906.6 / (2021.11.25.)	
		JP/2021-571414 / (2021.11.29.)	
Patent (registration)	Evaluation system for personal characteristics and evaluation method of thereof	KR/10-2231479 / (2021.03.18.)	
Patent (Application)		PCT/KR2019/010057 / (2019.08.09.)	
		US/17/292,227 / (2021.05.07.)	
		CN/201980073601.6 / (2021.05.07.)	
		EU/19882474.0 / (2021.06.07.)	
Patent (registration)	IDENTITY AUTHENTICATION TERMINAL DEVICE	KR/10-2021-0050963 / (2021.04.20)	
Trademark (registration)	FixUni	KR/40-1507723 / (2018.10.17)	
	Feelming	KR/40-1662083 / (2019.09.24)	
	CONLET	KR/40-1841023 / (2020.11.06)	

(2023. 5. 16)

 # Attachment 2: Reference Materials

KOREA COPYRIGHT COMMISSION - https://www.copyright.or.kr/education/main.do

Book ‘Computer System Architecture’

YouTube channel ‘OpenTutorials’ - https://youtu.be/8R0FUF_t_zk

YouTube channel ‘충북대학교_ 소프트웨어학부’ - https://youtu.be/qz-8SHus1zQ

YouTube channel ‘bRd 3D’ - https://youtu.be/Fg00LN30Ezg

YouTube channel ‘김필산의 사이언스비치’ - https://youtu.be/THocNNqgqeQ

YouTube channel ‘블파스 - 블록체인 파헤치는 스터디’ - https://youtu.be/cN60DgSHixs

YouTube channel ‘TechNote with 알렉’ - https://youtu.be/dF1BHjt3Bdc

YouTube channel ‘스티브쌤 TV with JJ’ - https://youtu.be/zTl6PvI-xiA

YouTube channel ‘MIT OpenCourseWare’ - https://youtu.be/W06Le8fw0

YouTube channel ‘Korea Testing Laboratory’ - https://youtu.be/2wzFUzFAP3w

Wikipedia - https://en.wikipedia.org/wiki/Physical_unclonable_function
https://en.wikipedia.org/wiki/Central_Equipment_Identity_Register
https://en.wikipedia.org/wiki/Trusted_execution_environment
https://en.wikipedia.org/wiki/Decentralized_identifier
https://en.wikipedia.org/wiki/Distributed_ledger

Personal Blog - https://hyolo.tistory.com/

Personal Blog ‘CodingFactory’ - https://coding-factory.tistory.com/758

DIF ‘Encrypted Data Vaults’ - https://identity.foundation/edv-spec/

YouTube channel ‘Ystreet’ - https://youtu.be/0L-eD1_BU0I

YouTube channel ‘DUFE.KR’ - https://youtu.be/5bcrh4meD1o

YouTube channel ‘THEELEC’ - https://youtu.be/39zRFRvZKNs