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Enhancing the Activation of Digital Content Using Smart Contract in a Web 3.0 Environment : A Case Study of A3I®

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Abstract: Existing big-tech platforms have controlled the sovereignty of digital services and user data, limiting the opportunities for users to experience platforms. These platforms' control policies were no exception in the content area of the platform. Users can only engage with content by viewing, commenting, emoticons, and sharing. Users were limited to engaging with content in the functions and areas designated by the platform, which meant they could not interact with opinion leaders or content creators equally. Consequently, concepts of Web 3 and MyData have emerged with the idea that the sovereignty of platform users should be restored to the user, not the platform. However, many papers on blockchain and smart contracts that can implement these concepts are mostly engineering or focused on laws such as content copyright. This study examines two purposes as a case study of qualitative research methods for a content platform named A3I®. First, this study identified the feasibility of implementing a blockchain-based content platform with universal value. It refers to the universal value that anyone can access information (data) securely and transparently in a Web 3.0 environment, including the concept of MyData, which empowers users to control their data. Second, this study highlighted that the Article Value Evaluation Mechanism (AVEM), including reward and revenue sharing systems, can enhance digital content activation through automatic payment programs of smart contracts in the platform. Furthermore, the study found that A3I platforms based on blockchain and smart contracts have stronger performance on technical and user-centric factors than other platforms without these technologies. In addition, the A3I platform with innovative technologies and AVEM shows better digital content activation by increasing "feedback frequency" than other platforms that increase "content frequency." Therefore, this study has academic and social significance by reflecting the universal values of Web 3.0 in platform design. It also has industrial significance by presenting a feasible blockchain platform business model.

Keywords: Web 3.0, MyData, Blockchain, Smart Contract, Digital Content, Content Platform

1. Introduction

Web 3.0 is a topic of discussion around the world. Some believe it to be the future of the Internet and revolutionary technology, while others consider it to be empty venture capitalist marketing. The background of the discussion is the monopoly of existing big-tech platform companies[1]. This

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monopolization phenomenon is also present in the content area. Big-tech platforms have only allowed "limited engagement" to their users. Content users can only view, comment, react emoticons, and share. Users were limited to engaging with content in the functions and areas designated by the platform. Users can not interact with opinion leaders or content creators equally. Hence, Web 3.0 has emerged to avoid systems such as monopolies and limited engagement of these platform companies. In Web 3.0, there is an innovative technology called blockchain. Blockchain is a decentralized technology that records and co-manages transaction information (data) on multiple computers connected by a peer-to-peer (P2P) network rather than a centralized system like giant platforms[2]. Smart contract, the core technology behind blockchain-based applications, can be automatically signed or executed without the intervention of a third party when certain conditions are met. This feature enables transparent transactions, such as preventing forgery or altering contract content[3]. Blockchain and blockchain-based smart contracts have the feature of unlocking these limitations.

The innovative features of blockchain and smart contract allow users to predict a completely different paradigm shift. Existing studies on the features and advantages of the new technology are still quite active. However, it is still true that a few studies have been more biased towards technical fields such as engineering. The study on blockchain-enabled content platforms mostly focuses on the copyright issues of the produced content rather than the production or creation of content. Therefore, there is a need for studies with universal values that the public can create content and engage in.

This study aimed to explore a content platform model that enables users to participate and interact with universal values through a case study using blockchain and smart contract. This new technology provides transparency and trust to the users through distributed storage in a content platform. It is different from the existing big-tech platforms. This study is valuable because by deploying blockchain and smart contract in a content platform, it is possible to create the value of a content platform unlike any other: anyone can create content, react to it, be the owner, and be compensated for it. Furthermore, this study has business significance because it can be implemented as a platform model rather than just a declaration or vision.

This study is organized as follows. In Section 2, this study provides related studies of Steemit, a media blockchain, along with a theoretical background on blockchain, smart contract, Web 3.0, and MyData. Section 3 presents an A3I case study of a content platform using blockchain and smart contract. In Section 4, the contributing factors of the A3I are presented through a comparison with other platforms. In Section 5, conclusions and further study are presented.

2. Literature Review

2.1 Blockchain and Smart Contract

Blockchain is a network of data units connected in a chain structure[4]. It is a decentralized technology that can record and jointly manage transaction information (data) on multiple computers (nodes) connected by a peer-to-peer (P2P) network rather than the centralized system of existing platform companies[5]. So, it is also known as Distributed Ledger Technology (DLT)[6]. In addition, all nodes (users) in the network can share and manage the transaction history between each user so that each transaction can be trusted for its reliability[7]. Also, it is almost impossible to change or manipulate stored information (data) in a blockchain[8]. This feature has the advantage of enhancing the transparency of the transaction[9].

So far, in the digital environment, countless copies have been made in a single moment. However, there is no such risk in the blockchain because it is non-duplicable and irreversible, meaning that information and transactions cannot be modified or deleted once recorded[10]. In particular, non-duplicability is expected to be a device to protect the creative culture of content platforms and original

creators. Because of this, when significant information is stored on a blockchain, the users can transparently see and manage transactions, enhancing the platform's trustworthiness. This is supported by a study that the trust in the donation organization named "Happy Vision" was significantly higher when the message that it uses blockchain was exposed than when it was not[11].

A smart contract, a key blockchain application technology, is an automated contract that triggers the negotiation and execution of a contract with digital commands[12]. The smart contract uses blockchain technology to enable transactions between users without the intervention of a centralized authority[13]. It is also possible to perform immediately upon execution of clear contractual terms and conditions[14]. The smart contract can protect against unwanted events like withholding or delaying performance after a contract is completed. Users can autonomously see the entire process of invalidation, cancellation, and release of contract on the platform, enabling transparent transactions[15]. This can minimize the risk of friction between stakeholder transactions.

2.2 Web 3.0 and MyData

According to Jeong (2022), an associate research fellow at the Macroeconomic Research Center of the Bank of Korea, big-tech platform companies abuse their access to digital services and infrastructure, such as social media and advertising, to control consumer choice[16]. To communicate on the Internet, users must follow the rules set by the big-tech platforms, and in return, they must hand over their personal information and data. However, users now demand a “fair share” of their data from big-tech platforms[17].

Web 3.0 has emerged as a demand for a change in the market monopoly and the sovereignty of user data of big-tech platform companies such as Google, Amazon, and Meta[18]. Blockchain technology is the foundation of the Web 3.0 ecosystem that implements a secure and open method of user data management[19]. A reward system exists in blockchain businesses to respect user data sovereignty[20].

For example, Steemit, a blockchain media platform launched in March 2016, offered incentives for writing and evaluating articles, with higher rewards for quality content[21]. Users could join the Steemit ecosystem just by creating posts (articles), so Steemit gained many users quickly. However, Steemit, which attracted attention as a "money-making SNS," did not last long and was acquired by Tron, a Chinese blockchain platform, in 2020. The reason for this was the moral hazard of users who exploited the limitations of the reward system by self-upvoting their own posts and voting bots that voted in exchange for Steam tokens. As a result, Steemit's creative value was eroded, and it was eventually acquired[22][23].

This concept of respecting users' data and applying a reward system is consistent with the idea of MyData. In a study titled "Effects of MyData Service Attributes on Intention to Use[24]" it was found that "the controllability" of my data had the biggest impact on the intention to use MyData services. MyData also means that individual users are involved as business entities to execute their data sovereignty[25]. And the features of MyData include transparency, trust, control, and value[26]. Therefore, MyData can be best implemented by blockchain and smart contract because users (nodes) can see and manage all data stored in blocks.

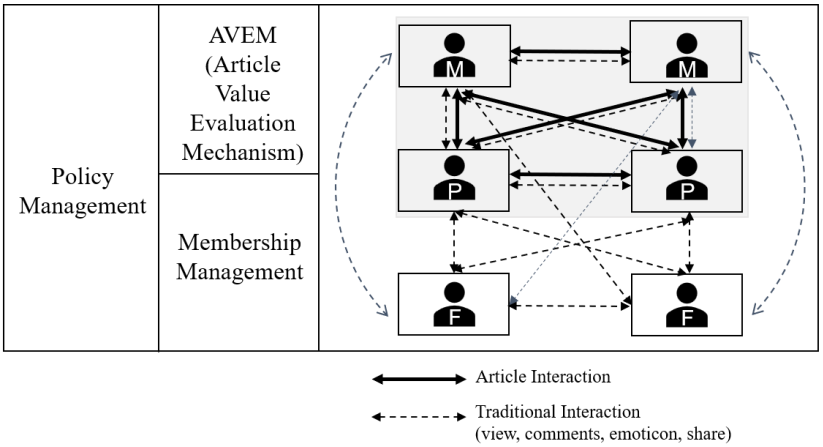
3. Blockchain and Smart Contract-Based Content Platform Model

3.1 A3I® Membership Management

Anyone’s Interactive Impact (A3I) is a blockchain-based content platform where users share their thoughts and respond to each other with their thoughts. Anyone can create an interactive impact with interesting, imaginative, important, and insightful thoughts. So, it can be described as an Opinion

Experience Platform. The A3I is a model designed by this author, Kim.

On traditional big-tech platforms, users have a "limited engagement" with content: views, comments, emoticon reactions, and shares. As shown in [Fig. 1]. A3I is a platform where anyone can respond with their thoughts just as much as the creator or author who publishes the content. A3I consists of three memberships: master members (M) who can write new perspectives, partner members (P) who can write articles interactively to master members' articles, and follower members (F) who can read all articles.



Note: A3I is a platform that allows users to freely interact with each other in opinion articles and traditional engagement. These interactions work with Membership Management, AVEM, and Policy Management, which are different from any other platform.

[Fig. 1] A3I Interaction Structure

The value of the content and the reward system distinguish Steemit, which was introduced in Section 2, from A3I, as demonstrated in [Table 1]. First, they have different content values. A3I was designed to ask users for new perspectives, while Steemit asked for much content about lifestyle similar to the demands of the existing platform. Second, A3I is designed to reward based on AVEM, which evaluates the quality of content, while Steemit rewards based on the number of votes. Finally, there was a big difference in the reward system. A3I's reward design was a mix of points, digital vouchers, and cryptocurrency, while Steemit was paid exclusively in cryptocurrency.

[Table 1] Comparison between A3I and Steemit

	A3I	Steemit
Content	Outside the box	All about lifestyle
Policy	Rewards based on AVEM (Article Value Evaluation Mechanism)	More voting, more rewards
Reward	Reward Mix (Point, Digital Voucher, Cryptocurrency)	Cryptocurrency only

3.2 Article Value Evaluation Mechanism (AVEM)

This A3I platform has an Article Value Evaluation Mechanism (AVEM) to assess content value, including a content index, rewards, and a funding system. All users can vote on a value indicator called the A3I Index, which is reflected in their rewards. Also, users can invest content funding with a high A3I index and share the return. The higher the A3I Index, the higher the reward and the number of articles will contribute to the A3I Index, and then the A3I Index will contribute to the reward. This could be predicted to be an exponential graph.

While existing platforms reward users for their "activity," A3I rewards them for their "value," not their "activity" itself. Therefore, all users need to vote on the value of the content, and the results are

linked to rewards or revenue sharing. In other words, a blockchain-based A3I platform focuses on the flow of value rather than the flow of information. This is a big change from traditional platforms.

3.2.1 A3I Index

The A3I Index is an Article Value Evaluation index that judges the appropriateness of articles and platform values. A3I Index is an authority and rules that all users who read articles participate in, not the platform operator. As stated in [Table 2], users can rate each of the five indexes from one to five stars. The index rises with the number of stars. The total index is calculated by adding the indexes of the five categories.

[Table 2] A3I Index

Value Indicator	Unsatisfactory	Somewhat Satisfactory	Satisfactory	Very Satisfactory	Extremely Satisfactory
New	★	★★	★★★	★★★★	★★★★★
Useful	★	★★	★★★	★★★★	★★★★★
Innovative	★	★★	★★★	★★★★	★★★★★
Actionable	★	★★	★★★	★★★★	★★★★★
Polite	★	★★	★★★	★★★★	★★★★★

3.2.2 Reward System

For Master and Partner members, the total reward is determined by the sum of the A3I Indexes checked by all users. Follower members are not writing articles and are rewarded every time they check the A3I Index on someone else's post. A3I does not only pay out rewards in cryptocurrency like Steemit, but a stable reward mix of points, digital vouchers, and cryptocurrency. This protects against the risk that the platform, including content and community areas, may become unstable due to cryptocurrency's rapid rise and fall.

3.2.3 Funding System

A3I has a funding model. A3I can sell NFTs for keywords in high-A3I index articles. Furthermore, the profit is automatically distributed to the users who funded it. In addition, users can also promote DAO (Decentralized Autonomous Organization) through high-A3I index articles.

3.3 Policy Management

As a platform that pursues a healthy community with mutual experiences of diverse thoughts, A3I asks users to approach every article with new and innovative perspectives and methods different from typical stereotypes and conventions. Thus, A3I has policies to maintain content quality by delegating and sharing the platform's authority with users. In particular, the policies related to rewards and profit are all operated by smart contract, representing trust transactions. This policy of empowering users of the A3I platform is also connected to the concept of MyData introduced in the related studies.

3.3.1 Ethics Agreement

The ethics agreement policy requires all members to agree to the ethics pledge when signing up for membership. Master members need to sign a contract during the recruitment process, and partner and follower members need to check the ethics agreement when signing up for platform membership. This policy aims to minimize any damage to the platform's users or A3I brand image due to a member's lifestyle or behavior inconsistent with their articles.

3.3.2 User Pre-Review for Advertisement

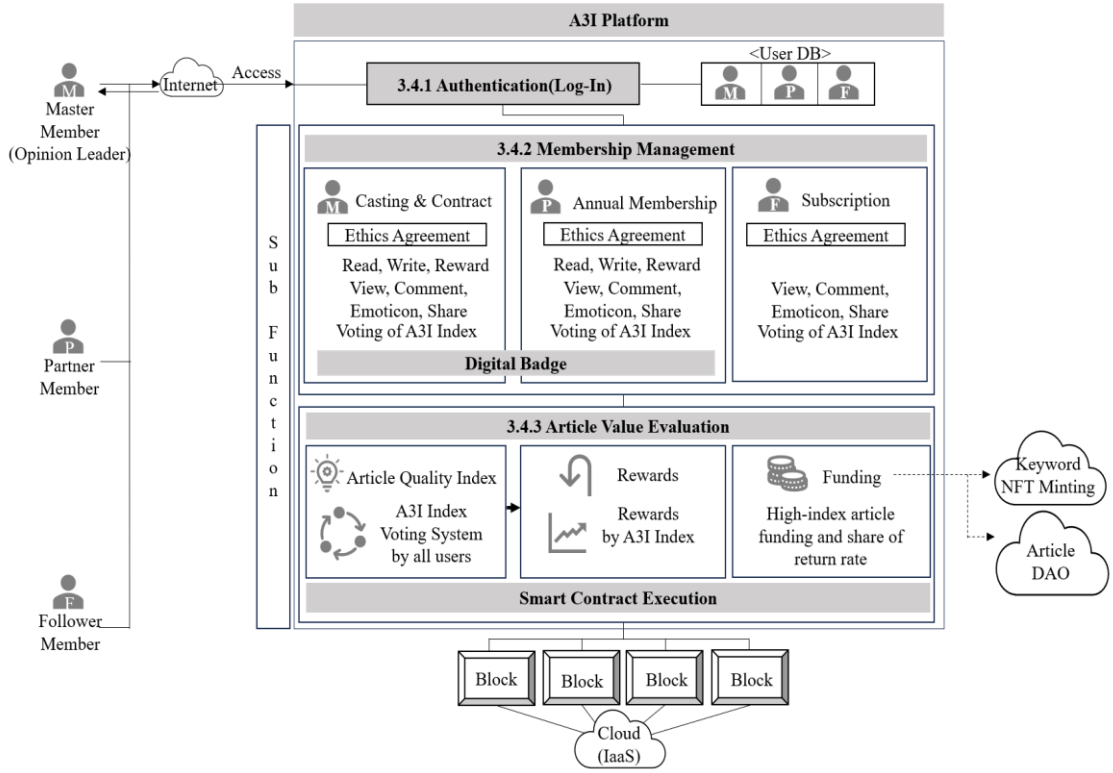
A3I gives users the authority to pre-review advertisements on the platform. Until now, big-tech platforms have monopolized ad reviews, forcing users to view ads one way. However, A3I has given users the authority to pre-review ads to prevent the risk of content quality being damaged by ads.

3.3.3 Content Copyright

This policy protects members' copyrights by storing their posts in a block. This policy goes beyond the limits of copyright protection for users in the existing Internet environment.

3.4 Architecture

A3I architecture is shown in [Fig. 2] below. All members access A3I via the Internet. The A3I platform is organized into three steps: (1) membership authentication and log-in; (2) membership management, and (3) AVEM, which includes content evaluation procedures.



[Fig. 2] A3I Architecture

3.4.1 Authentication (log-in)

The authentication step implements membership-based services, including membership registration and log-in, and user authentication when using the service. In this step, a person can sign up for membership, log in and out, modify and cancel membership.

3.4.2 Membership Management

In this step, all members are managed according to their respective membership structures: master members, partner members, and followers. Master and partner members can read, write, and earn rewards. All members can view, comment, create emoticons, and share everyone's posts. In addition, all

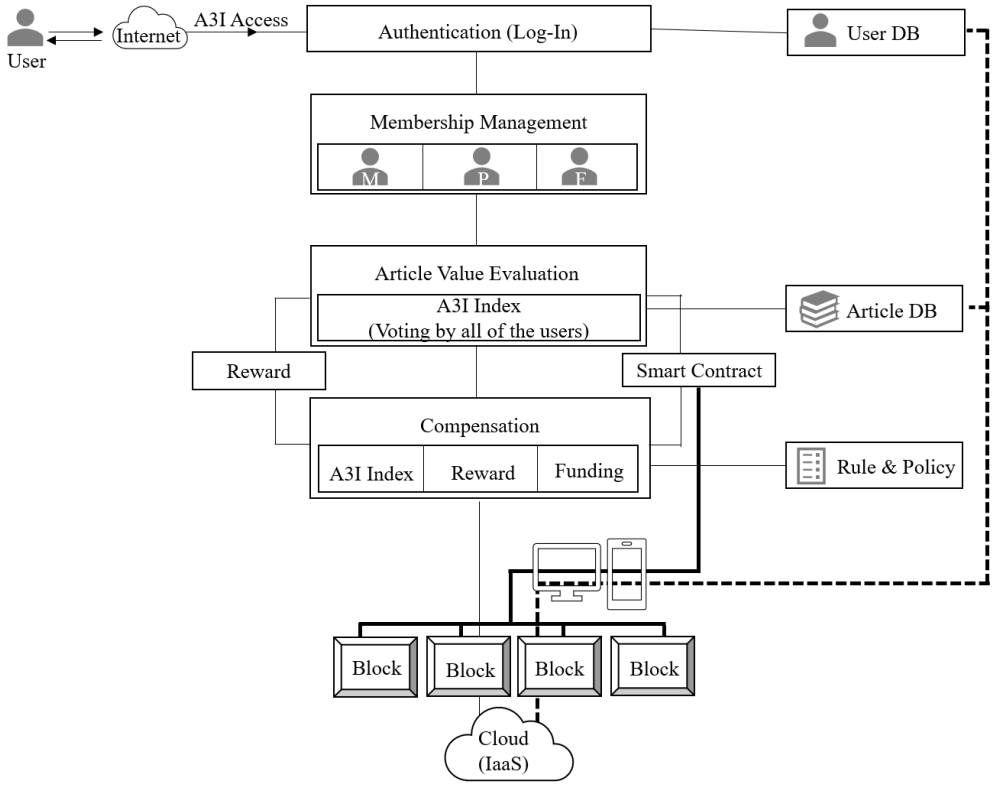
members need to sign an ethics agreement and check the A3I index. Digital badges are awarded to master and partner members as member management events for producing quality content. This enhances members' loyalty to A3I.

3.4.3 Article Value Evaluation Mechanism (AVEM)

AVEM (Article Value Evaluation Mechanism) is a mechanism that promotes high-quality content and helps activate interactive content: (1) All A3I users should check the A3I index corresponding to Article Value Evaluation. The five indexes are comprehensively calculated and reflected in rewards. (2) Funding is available for all users to participate in creating high-index articles. (3) DAO for specific topics or members can also be developed. The funding, rewards, and revenue distribution of the A3I Index are all automatically executed by the smart contract. This helps activate content on the platform, an important factor in earning trust assets.

3.5 Data Flow & User Scenario

There are three data types in A3I, as shown in [Fig. 3]. It consists of user data through registration and login, content data written by master members and partner members, and data related to rewards. User and article data are stored in blocks and IaaS (Infrastructure as a Service) clouds. The A3I Index, rewards, and funding are automatically executed through smart contract.



[Fig. 3] A3I Data Flow

As shown in [Table 3], A3I users experience slightly different scenarios based on each membership qualification. However, the A3I Index and rewards are the same for all members. The scenario of the funding system is also the same for all users. The smart contract automatically executes both rewards and profit sharing.

[Table 3] A3I User Scenarios(example)

Step	Master Member	Partner Member	Follower Member	Funding System
1	Casting opinion leader	Create A3I account (including an ethics agreement)	Create A3I account (including an ethics agreement)	Select investment percentage on the Funding Page
2	Opinion Leader accepts the offer	A user pays a membership fee	A user pays a subscription fee (monthly, yearly)	A user pays for the investment
3	Sign up a contract (including an ethics agreement)	Become a Partner Member	Become a Follower Member	Execute the investment
4	Create A3I account as a Master Member	Write a post (article)	Read articles	Receive frequent notifications on the progress of the NFT marketplace (or DAO)
5	Write a post (article)	Write an interactive post on another user's post or give feedback on another user's post (view, comment, emoticon, share)	Check A3I Index on other user's posts	Close the investment
6	Write an interactive post on another user's post or give feedback on another user's post (view, comment, emoticon, share)	Check A3I Index (after reading another user's post)	Leave feedback on other users' articles (view, comment, emoticon, share)	Announce the funding result
7	Check A3I Index (after reading another user's post)	Convert himself(herself) A3I Index to reward	Convert activity of A3I index check to reward	Automatically execute the smart contract
8	Convert himself(herself) A3I Index to reward	Automatically execute smart contract	Automatically execute smart contract	Share the profit with the funders
9	Automatically execute smart contract	Pay reward	Pay reward	
10	Pay reward			

3.6 Implementation

3.6.1 Voting of A3I Index

The A3I Index voting system allows users to rate the A3I Index after reading each article. All users can choose from one to five stars for five indexes: New, Useful, Innovative, Actionable, and Polite.

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.0;

contract ContentVoting {
    struct Vote {
        uint8 new;
        uint8 useful;
        uint8 innovative;
        uint8 actionable;
        uint8 polite;
    }

    mapping(address => Vote) public votes;
    mapping(address => bool) public hasVoted;

    event VoteSubmitted(address indexed voter);

    modifier hasNotVoted() {
        require(!hasVoted[msg.sender], "Already voted");
        _;
    }

    function submitVote(uint8[5] calldata scores) external hasNotVoted {
        require(isValidScoreArray(scores), "Invalid vote");
```

```
        votes[msg.sender] = Vote(scores[0], scores[1], scores[2], scores[3], scores[4]);
        hasVoted[msg.sender] = true;

        emit VoteSubmitted(msg.sender);
    }

    function calculateIndex() external view returns (uint256) {
        uint256 totalVotes;
        uint256 weightedSum;

        for (uint8 i = 0; i < 5; i++) {
            uint256 criteriaCount;
            for (uint256 j = 0; j < votes.length; j++) {
                criteriaCount += votes[j][i];
            }
            totalVotes += criteriaCount;
            weightedSum += criteriaCount * (i + 1);
        }

        return weightedSum / (totalVotes * 5);
    }

    function isValidScoreArray(uint8[5] calldata scores) internal pure returns (bool) {
        for (uint8 i = 0; i < scores.length; i++) {
            if (scores[i] < 1 || scores[i] > 5) {
                return false;
            }
        }
        return true;
    }
}
```

3.6.2 Reward System

Below is the code for a smart contract that pays rewards in Ethereum (ETH) based on the A3I Index. The variable rewardPerVote indicates the amount of reward per vote.

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.0;

contract ContentVoting {
    struct Vote {
        uint8[5] scores; // 투표 점수 배열로 변경
    }

    mapping(address => Vote) public votes;
    mapping(address => bool) public hasVoted;

    uint256 public rewardPerVote = 0.01 ether; // 투표 당 보상 금액

    event VoteSubmitted(address indexed voter);
    event RewardClaimed(address indexed voter, uint256 rewardAmount);

    modifier hasNotVoted() {
        require(!hasVoted[msg.sender], "Already voted");
        _;
    }

    function submitVote(uint8[5] calldata scores) external hasNotVoted {
        require(isValidScoreArray(scores), "Invalid vote");

        votes[msg.sender] = Vote(scores);

        hasVoted[msg.sender] = true;
```

```
        emit VoteSubmitted(msg.sender);
    }

    function claimReward() external {
        require(hasVoted[msg.sender], "No vote submitted");

        uint256 totalScore = getTotalScore(msg.sender);
        uint256 rewardAmount = rewardPerVote * totalScore;

        // 보상 지급
        payable(msg.sender).transfer(rewardAmount);

        emit RewardClaimed(msg.sender, rewardAmount);
    }

    function setRewardPerVote(uint256 newRewardPerVote) external {
        rewardPerVote = newRewardPerVote;
    }

    function isValidScoreArray(uint8[5] memory scores) internal pure returns (bool) {
        for (uint8 i = 0; i < scores.length; i++) {
            if (scores[i] < 1 || scores[i] > 5) {
                return false;
            }
        }
        return true;
    }

    function getTotalScore(address voter) internal view returns (uint256) {
        uint8[5] memory voterScores = votes[voter].scores;
        uint256 totalScore;

        for (uint8 i = 0; i < voterScores.length; i++) {
            totalScore += voterScores[i];
        }

        return totalScore;
    }
}
```

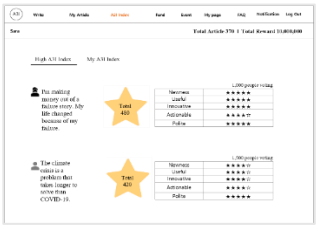
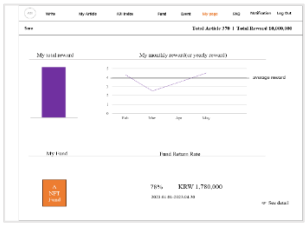
3.6.3 Profit Sharing System

Below is the code for a smart contract for funding and profit sharing for NFT and DAO. Users can share profits based on the percentage of their investment.

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.0;

contract FundingContract {
    address public nftContract;
    address public daoContract;
    mapping(address => uint256) public fundingAmounts;
    uint256 public totalFunding;
    bool public isFundingClosed;

    event Funded(address indexed funder, uint256 amount);
    event ShareClaimed(address indexed funder, uint256 amount);

    modifier onlyNFTorDAO() {
        require(msg.sender == nftContract || msg.sender == daoContract, "Only NFT or DAO can perform
this action");
        _;
    }
```

```
    constructor(address _nftContract, address _daoContract) {
        nftContract = _nftContract;
        daoContract = _daoContract;
    }

    function fund() external payable {
        require(!isFundingClosed, "Funding is closed");
        require(msg.value > 0, "Invalid funding amount");

        fundingAmounts[msg.sender] += msg.value;
        totalFunding += msg.value;

        emit Funded(msg.sender, msg.value);
    }

    function claimShares() external {
        require(isFundingClosed, "Funding is still open");
        uint256 share = (fundingAmounts[msg.sender] * 100) / totalFunding;
        uint256 shareValue = (address(this).balance * share) / 100;

        delete fundingAmounts[msg.sender];

        (bool success, ) = msg.sender.call{value: shareValue}("");
        require(success, "Share payment failed");

        emit ShareClaimed(msg.sender, shareValue);
    }

    function closeFunding() external onlyNFTorDAO {
        require(!isFundingClosed, "Funding is already closed");
        isFundingClosed = true;
    }

    function withdrawRemainingFunds() external onlyNFTorDAO {
        require(isFundingClosed, "Funding is still open");

        (bool success, ) = msg.sender.call{value: address(this).balance}("");
        require(success, "Withdrawal failed");
    }
}
```

3.7 Prototyping

Log in	Members read articles
	
A3I Index	**Reward Status**
	

[Fig. 4] A3I Screen Design

The A3I screen design is shown in [Fig. 4]. Users can log in through various channels. After logging in, individuals can read articles written by other users and view the ranking of each article's A3I index. Finally, users can see the status of their rewards.

4. Contribution

A3I's platform design uses blockchain and smart contract and has several contributing factors, as shown in [Table 4] and [Table 5] below. This study divided the contributing factors of A3I into technical aspects (see [Table 4]) and user aspects (see [Table 5]). First, the technical factors are analyzed, and this study compares A3I to 15 content platforms, including ten centralized and five decentralized platforms. Ten centralized platforms are video content platforms such as YouTube and TikTok to Instagram, Meta, Digital New York Times, Medium, Google, Naver, Kakao, and the recently launched Threads on July 6, 2023. Moreover, five decentralized platforms are content platforms such as Odysee, DLive to text, Gab, Mastodon, and Mirror. Decentralized platforms are based on the top 5 in 2023, according to Similarweb and CoinGecko. These are Odysee (1st with 5.3 million visitors), Steemit (2nd with 3.11 million visitors), Gab (3rd with 1.25 million visitors), Mastodon (4th with 1.19 million visitors), Mirror (5th with 1.1 million visitors), and DLive (6th with 99 million visitors). The number of visitors mentioned here is the average number of unique visitors per month. This analysis excludes Steemit, which has been investigated in the related studies. On the other hand, the contribution analysis used the following methods: examining published white papers and checking out UX (User Experience) for each platform. However, it was not possible to identify platforms that do not have published white papers.

Firstly, this study is compared based on the following five technical factors: (1) cannot be changed arbitrarily; (2) privacy and security; (3) automatic completion of financial settlement; (4) user copyright and reward policy; (5) reducing administrative and service costs.

This study analyzed the contributions by focusing on four factors from the user's perspective: (1) For the factor that data or content cannot be changed arbitrarily, A3I, which is based on the blockchain, can never be changed. Threads also aim to be decentralized and apply technology that does not allow posts to be changed arbitrarily. Therefore, A3I and Threads are double-circled, and other platforms are triangular rather than circled because there is a possibility that they can be changed arbitrarily. The study also found that decentralized platforms Odysee and Mirror are double-circled, while Gab and Mastodon are decentralized structures that do not store in blocks, allowing content to be changed at any time. DLive is being serviced for live use only, and its storage period is limited. (2) A3I has excellent privacy and security capabilities because it stores information in distributed blocks. Threads has announced that it aims to be decentralized, but the reality has not yet been revealed. In consequence, privacy is unverified and security is strong. Other platforms centralize all user data, so privacy is not supported, and security is strong. The other five decentralized platforms are strong on privacy and security; (3) Regarding automatic payment, only A3I uses smart contract, so automatic payment is possible, but Threads is still unverified, and other platforms do not apply smart contract, so it is not possible. And Threads, which pursues decentralization, has not yet announced anything regarding its benefits. And it is also unverified if the five decentralized platforms apply smart contracts; (4) In terms of user copyright protection and compensation policies, A3I covers both policies. The remaining platforms are separated by their policies. YouTube and TikTok have copyright protection and compensation policies like A3I while Threads has not yet published and therefore, it was unverified in this study. Gab and Mastodon identify that they do not offer rewards on decentralized platforms. The other three decentralized platforms identify that they offer rewards.

The study also found contributing factors from a business perspective. (5) Regarding reducing operation and management costs, A3I can achieve cost efficiency using blockchain-based smart contract. However, Threads, which pursues decentralization, has not yet made a related announcement,

so it cannot be found in this study. Other platforms are operated as a centralized system, and this study found that they are less cost-effective than A3I. This is also an important factor in the platform's operation. Based on blockchains, Odysee, DLive, and Mirror can be considered cost-effective in the decentralized platform category. However, it is not easy to verify the cost-effectiveness of Gab and Mastodon, which are not blockchain-based.

[Table 4] A3I Technology Contribution Factors

			Main features of smart contract				
			User side				Platform side
Category		Platform	cannot be changed arbitrarily	Privacy & Security	automatic completion of financial settlement	user copyright & reward policy	reducing administrative and service costs
Case model		A3I	◎	Privacy ◎ Security ◎	◎	◎	◎
Centralized (10 platforms)	Video Content	YouTube	△	Privacy X Security ○	X	○	X
		TikTok	△	Privacy X Security ○	X	○	X
	Photo & Video Content	Instagram	△	Privacy X Security ○	X	Copyright ○ Reward X	X
	Photo, Text & Video Content	Meta	△	Privacy X Security ○	X	Copyright ○ Reward X	X
	News Content	Digital New York Times	△	Privacy X Security ○	X	Copyright ○ Reward X	X
	Text Content	Medium	△	Privacy X Security ○	X	○	X
		Threads	◎	Privacy Unverified / Security ○	Unverified	Copyright ○ Reward Unverified	Unverified
	Search focused	Google	△	Privacy X Security ○	X	Copyright ○ Reward X	X
	Search & Content focused	Naver	△	Privacy X Security ○	X	Copyright ○ Reward X	X
	Search & Content focused	Kakao	△	Privacy X Security ○	X	Copyright ○ Reward X	X
De-Centralized (5 platforms)	Video Content	Odysee	◎	Privacy ◎ Security ◎	Unverified	Copyright ◎ Reward ◎	◎
		DLive	Live Only	Privacy ◎ Security ◎	◎	Copyright ◎ Reward ◎	◎
	Text Content	Gab	X	Privacy ○ Security ○	Unverified	Copyright ○ Reward X	Unverified
		Mastodon	X	Privacy ○ Security ○	Unverified	Copyright ○ Reward X	Unverified
		Mirror	◎	Privacy ◎ Security ◎	◎	Copyright ◎ Reward ◎	◎

Note: A double circle indicates a very strong technical factor in this table. A single circle indicates strong, and a triangle indicates moderate, where the technology factor is present but not operationalized strongly and may create a risk. X means the technology is not available or not operational.

This study also analyzed the contributing factors for A3I's users. The analysis focused on text-based platforms like A3I. First, the study found that A3I, NYT, Medium, and Mirror had high-quality content. The other platforms were evaluated as medium or low due to biased, political, or privacy-invasive content. Regarding posting frequency, all platforms except A3I focus on content frequency in publishing

original content. In contrast, A3I focuses on its “feedback frequency of partner members,” providing interactive feedback on original content.

[Table 5] A3I Contribution Factors for Users (based on text service platform)

Category		Platform	Standard of Content Quality	Frequency type
Case model		A3I	High	Feedback frequency
Centralized (4 platforms)	Photo, Text & Video Content	Meta	Middle	Content frequency
	News Content	New York Times	High	Content frequency
	Text Content	Medium	High	Content frequency
		Threads	Middle	Content frequency
Decentralized (3 platforms)	Text Content	Gab	Low	Content frequency
		Mastodon	Middle	Content frequency
		Mirror	High	Content frequency

5. Conclusion and Further Study

This study identified the feasibility of implementing a blockchain-based content platform where anyone can access information (data) securely and transparently in a Web 3.0 environment. Moreover, this study identified how to enhance digital content activation through automatic payment programs of smart contracts in the platform.

Traditionally, big-tech platforms have operated with closed structures like security, privacy, and data management policies. However, blockchain and smart contract utilize the technical features of openness to enhance the platforms' strength further. Therefore, the significance of this study are as follows. Blockchain and smart contracts have trust features that anyone can verify and manage. By deploying these technologies in a content platform, the study found that it is possible to create the value of a content platform unlike any other: anyone can create content, react to it, be the owner, and be compensated for it. So, this has three values: The first is that users own certain rights on the platform and have freedom of expression, the second is that users' creations are recognized, and the third is that the platform business is now a community oriented toward value beyond information. Furthermore, this study has business significance because it can be implemented as a platform model rather than just a declaration or vision.

Indeed, this "trust" and "transparency" creates additional value. As shown in the A3I contribution in Section 4, A3I's technical advantage is superior. But it does not stop at a technical advantage, it creates a "feedback frequency" of users. This is a very important change. Up until now, platform companies have been focused on "data quantity" itself. But A3I focuses on the "quality and value of data," which is why the platform's design of "autonomous interactions" rather than "limited engagement" is designed to elicit valuable thoughts from users. Because of these value-orientated data, Don Tapscott, chairman of the Blockchain Research Institute, explained blockchain as a “trust protocol” in his TED talk.

However, this study has several limitations. Future studies should confirm the utility and effectiveness of the platform through content interaction, Article Value Evaluation Mechanism, and reward system because the conceptual model is still in the design phase. Moreover, as it is a new technology, it is necessary to verify the technology itself because ensuring that technology can be operated in a stable condition is just as crucial as the design and theory of the technology.

Nevertheless, this study has the potential for new changes. It applied blockchain and smart contract to create "trust" in technology, and based on this trust, it focused on "feedback frequency" rather than

content frequency. Therefore, this study anticipates that when Artificial Intelligence (AI) becomes widely used and relied upon by many users, A3I will become a potent complementing platform for critical thinking.

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