



# User Commitment to Blockchain-Based Social Media Platforms from the Perspective of Perceived Justice Regarding the Token Reward System: the Mediating Role of Psychological Ownership

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## Abstract

**Purpose** – In this study, we aimed to theorize blockchain-based social media platform users' commitment by examining the impact of their perceived justice of the token reward system. In addition, this study applied psychological ownership theory to verify the underlying mechanism between users' perceptions of justice and their commitment to the platforms.

**Research design, data, and methodology** – To empirically test our conceptual framework in the study, we collected data through a web-based survey approach from the responses of 385 users who had experience with blockchain-based social media platforms. We employed a structural equation modeling approach to empirically test our proposed hypotheses.

**Result** – The results indicated that distributive justice and informational justice have positive effects on user commitment. The results also showed that psychological ownership plays an important role in mediating the relationship between users' sense of distributive justice and commitment, and between procedural justice and commitment. The findings provided a better understanding of the sense of justice and user commitment in a blockchain-based social media environment.

**Conclusion** – This study represents a preliminary attempt to theorize and empirically examine blockchain-based social media platform users' commitment. This study provided important contributions to the literature on how the effect of users' sense of justice in a reward system affects their commitment to blockchain-based social media platforms.

**Keywords:** Justice Theory; Psychological Ownership; Online Social Networks; Blockchain-Based Social Media Platforms; Commitment

**JEL Classification Code:** M10, M15, M31.

## **1. Introduction**

Blockchain technology, which is used to create the decentralized digital currency Bitcoin, impacts various IT services. One such service, social media platforms in the existing Web 2.0 era that emphasize user participation, is being strongly impacted. The number of third-generation social media platforms based on blockchain is growing. The Dapp website (Dapp) reported 224 blockchain-based social media apps and 1.51 million active wallet addresses for the past 30 days in July 2021. This quick increase implies that interest in blockchain-based social media platforms is growing and that the quality of these platforms is gradually improving. In the case of centralized social media, the service provider obtains information and profits from user participation, which the users are not compensated for. In contrast, on blockchain-based social media platforms, users are rewarded for their participation in content, which is one of the most significant contrasts between centralized and blockchain-based social media platforms. Steemit, for example, rewards content authors and curators. Author rewards are given to users who create posts, whereas curation rewards are given to users who vote for and comment on posts. Currently, there is a dearth of empirical research on blockchain-based social media platforms, notably on the effect of incentives on user commitment. The existing research on blockchain-based social media platforms is essentially case studies (Ba et al., 2021; Guidi et al., 2020, 2021; Kapanova et al., 2020; Kiayias et al., 2018; Kim & Chung, 2018; Li & Palanisamy, 2019; Li et al., 2021; Thelwall, 2018). Thus, this study aims to better understand the relationship between the characteristics of blockchain-based social media platforms and user commitment by employing organizational justice and psychological ownership theories.

Many scholars have proposed various approaches to understanding improved user commitment from different perspectives in an online context, for example, social presence or social capital perspectives (Bao & Wang, 2021; Lin & Chiang, 2019), the long-term social-exchange approach (Luo et al., 2021), user differences perspectives such as perceived benefit (Ryu & Park, 2020), trust-commitment (Wang et al., 2020), person-environment fit (Maruping et al., 2019), user gratification (Lim & Kumar, 2019) and platform affordances perspectives, such as media richness and system interactivity (Liao et al., 2020; Untarini et al., 2021). However, few attempts have been made to investigate user commitment from the perspective of the user-platform relationship. In addition, most of the existing research regarding commitment improvement has been conducted in centralized online contexts that typically do not offer rewards to social media platforms users. Consequently, the existing data and research can be considered outdated, and using them is inadequate for understanding user commitment to blockchain-based social media platforms, indicating the need for additional research.

Justice theory mainly explains an individual's capital and social power status in the workplace (Cropanzano et al., 2001). Distributive, procedural, interpersonal and informational justice have been typically utilized to evaluate organizational justice (Andersson-Stråberg et al., 2007; Colquitt, 2001; Greenberg & Cropanzano, 1993). When valuable rewards, resources and opportunities are distributed to recipients in a just manner, the recipients positively evaluate the organization that provides rewards and resources. Therefore, the justice evaluations of users in terms of a platform's distribution, procedure and information can potentially impact their commitment to the platform in the context of blockchain-based social media platforms' reward systems for user participation. To further analyze how organizational justice affects user commitment, this study also applied psychological ownership theory, which asserts (Belk, 1988, 2013; Pierce et al., 2001) that people can develop a possessive feeling over various physical, digital objects or platforms such as Airbnb, social media platforms, virtual learning environments (VLE), crowdsourcing and crowdfunding (Kim et al., 2016; Kwon, 2020; Lee et al., 2019; Lee & Suh, 2015; Yim et al., 2018; Yuksel et al., 2019; Zhao et al., 2016; Zheng et al., 2018). This sense of psychological possession further increases user's satisfaction with such objects. Therefore, in the context of blockchain-based social media platforms, positive and justice rewards may increase the content creator/curator's self-efficacy and create a sense of intimacy with the platforms, potentially inspiring a sense of psychological ownership of the platform and a long-term psychological commitment to it. The research questions to be answered in this study are briefly summarized below:

1) Do blockchain-based social media platform features that give rise to perceived justice improve users' commitment to the platform?

2) Why do the features that promote perceived justice improve users' commitment? What underlying mechanism mediates perceived justice and users' commitment to the platform?

The findings will provide a better understanding of how to increase users' commitment to blockchain-based social media platforms through building a sense of justice, consequently revealing the psychological mechanisms that motivate blockchain-based social media users. Furthermore, the present study extends the existing research on the psychological ownership of platforms to the blockchain-based social media platform context, demonstrating the critical mediating role of psychological ownership in perceived justice and commitment enhancement. Our results will provide new directions and guidelines for the future development of blockchain-based social media platforms.

## **2. Blockchain-based Social Media Platforms**

Social media platforms can be classified into Web 2.0 social media platforms and Web 3.0 social media platforms. However, a consensus on the concept of social media platforms in Web 3.0 has not yet been reached. Social media platforms in Web 3.0 differ from those in Web 2.0, with the service's underlying architectural design being the most significant difference. Blockchain technology, originally used to develop digital currencies, has advanced the decentralization of the web as well as social media platforms. Such platforms in Web 2.0 usually adopt a client-service method to operate the service, with centralized organizations always having complete control over the service, as well as the personal information about users. However, under Web 3.0, social media platforms can be operated in peer-to-peer networks, making it unnecessary for centralized commercial organizations. The technologies of smart contracts and web front-end user interfaces on the blockchain, as well as other decentralized components (such as decentralized storage protocols and platforms, data distribution protocols and transient data pub/sub messaging) constitute decentralized social media platforms' overall architecture. The access method of a "digital wallet" replaces the access method of "username and password" employed by the centralized service platforms (Guidi et al., 2021).

Blockchain-based social media platforms are operated by nodes through decentralized consensus protocols (Guidi et al., 2021; Li & Palanisamy, 2019; Li et al., 2021). In lieu of account-based access, a digital wallet is used to generate all transactions, such as social-related transactions, value transfers, account administration and witness network management (Guidi et al., 2020; Li et al., 2021). The majority of blockchain-based social networking sites use a public blockchain which anybody may access. Users' social activity data is stored on the blockchain, including whom they follow, what they post and how much they transfer in tokens. The public can also observe and confirm these operations, thereby improving the service's transparency and accountability.

Rewarding social media users for their participation in content is another important aspect that distinguishes Web 2.0 from Web 3.0 social media platforms. User token rewards an essential component of blockchain-based social media platforms. Such platforms compensate users for content creation, content curation (e.g., content voting, icon clicks), content consumption and other user activities (Guidi, 2020). User activities concerning content can be divided into content creation, content curation and content consumption (Fernández-de-Arroyabe-Olaortua et al., 2018; Livingstone, 2008; Shao, 2009). Common user-content interactions, such as liking, commenting, sharing and user-user interactions, can all be classified as content engagement behaviors (Khan, 2017; Shao, 2009). Social media platforms utilizing blockchain technology, unlike in Web 2.0, do not generate revenue by selling users' attention to marketers (Park & Ciriello). Their incentive systems pay the bulk of social user participation in content, including voting and symbols, which are regarded by users as the most important reward feature (Guidi, 2020; Pfeiffer et al., 2020). Steemit, PeakD and Dtube not only compensate content providers but also reward users for voting on content. In Web 2.0, social media platforms providers rely on user-generated content and massive user databases to earn significant revenues. Users of these social media platforms continue to participate in content creation and contribution activities without pay (Fuchs, 2014; Fuchs & Sevignani, 2013).

Therefore, this study suggests that social media platforms in Web 3.0 are blockchain-based services in which all user interactions are controlled by a digital wallet and where users are rewarded for their contributions to the content.

The blockchain-based social media platforms are regarded as third-generation social media platforms that support users' digital wallet access and provide rewards for users' participation and contributions. This study used the 13-type classification of social media platforms proposed by scholars to classify social media platforms. The classification results for blockchain-based social media platforms, which reveal seven types of traditional social services (for example, blogs, business social network, forums, customer review, social bookmarking, social networking sites, video sharing) and three extra types of blockchain-based social media platforms (such as virtual community, online live-streaming and new online communication tools-instant messaging). There are nine sub-categories of services within the virtual community category: charity, tool [mint token, NFT maker], token curation, fitness, product hunting, travel, music, sports and polls. Detailed information about the categories is shown in Appendix 1.

Considering the recent change in the underlying technology of social media platforms from Web 2.0 to Web 3.0, research on user feedback and attitudes towards the service is still in the early stages of exploration. This study therefore targets social media users under Web 3.0 to explore their commitment to blockchain-based social media platforms.

### 3. Literature Review and hypothesis development

Justice theory has been widely researched in the field of organizational psychology, which mainly demonstrates an individual's capital and social power situations in the workplace (Cropanzano et al., 2001). Individuals typically evaluate the treatment they receive from an organization (online or offline) in terms of justice. Distributive, procedural, interpersonal and informational justice are used to assess organizational justice (Andersson-Stråberg et al., 2007; Colquitt, 2001; Greenberg & Cropanzano, 1993). The body of research on users' sense of justice in online contexts, such as online gaming communities, information sharing and crowd work, is expanding. The positive impact of users' perceptions of justice on community activity participation and knowledge contribution has been confirmed, and scholarly discussions on online users' perceptions of justice have gradually emerged (Chou et al., 2016; Kim & Kim, 2018; Wang et al., 2018).

#### 3.1. Distributive justice

According to Colquitt (2001), distributive justice is described as the justice perception of employees regarding the allocation of outcomes (e.g., pay, compensation, promotions, etc.). Distribution occurs when the allocator allocates valuable rewards, resources and opportunities to the recipient, and an exchange relationship exists between the allocator and the recipient (Cook & Hegtvedt, 1983; Eckhoff, 1974). Online users also perceive justice in their participation in community activities just as the employees of an organization do (Abubakar et al., 2019; Chou et al., 2016; Hameed et al., 2019; Kim & Kim, 2018; Tsai & Cheng, 2012; Wang et al., 2018). In virtual communities, online users perceive distributive justice when the outcomes they receive are in line with their participation in co-creation (Chou et al., 2016) or knowledge contribution (Abubakar et al., 2019; Wang et al., 2018). On Steemit, posted contents can receive votes from users after publication, and rewards are settled seven days later based on the accumulated votes the post receives. As that number of votes increases, the rewards the author receives increase as well (Guidi, 2020; Guidi et al., 2021; Li & Palanisamy, 2019). Regarding curator rewards, the smaller the reward-shares accumulated by the post before the curator votes, the greater the curator's reward percentage is. Voting for content as early as possible can help curators earn greater rewards (Li & Palanisamy, 2019). Thus, this study's examination of distributive justice concerns overall justice in allocation and defines users' perception of the degree of justice in rewards given their various contributions to content creation/curation on blockchain-based social media platforms.

Research regarding distributive justice's positive effects on employees' attitudes, such as pay satisfaction, job stress reduction, organizational commitment and involvement, have been extensively researched and confirmed in an organizational context (Fatt et al., 2010; Lambert et al., 2007; López-Cabarcos et al., 2015; Tang & Sarsfield-Baldwin, 1996). In an online context, providing services based on the input/output ratio of members' contributions has been found to encourage more active participation in online game community activities (Kim & Kim, 2018). From the efforts users put into the community, a sense of community is built when users believe that those efforts are fairly rewarded. This type of justice perception further motivates users to take actions that benefit the community (providing positive feedback, suggestions, assistance, etc.) and to become more engaged (Chou et al., 2016). Based on this, this study argues that when blockchain-based social media platform users perceive that their investment in high-quality content (such as posting, voting, etc.) is rewarded accordingly, a sense of distributive justice will arise. A high level of distributive justice will help users make more significant commitments to the platform. Our hypothesis is as follows:

**H1a:** Distributive justice is positively related to blockchain-based social media users' commitment.

#### 3.2. Procedural Justice

Procedural justice refers to the employee's perception of the justice of the policies and procedures used to determine organizational resource allocation. When deciding resource allocation, the main criteria for determining procedural justice are consistency across time and people, suppression of bias, the accuracy of the information, correctability of decisions, representativeness of the process, and moral and ethical rules (Barrett-Howard & Tyler, 1986). When backend systems adopt blockchain technology, procedural justice is usually associated with blockchain technology features. Falcone et al., (2021) indicate that the characteristics of a blockchain, such as distributed ledger technologies and peer-to-peer, increase managers' perception of perceived justice in a collaborative supply chain network. Procedural justice can be enhanced by software agents based on blockchain technologies, and through the contribution of blockchain features, consistency of process, justice, neutrality and procedural transparency can be achieved (Deutsch, 1986; Falcone et al., 2021). In the blockchain-based social media platform context, the rules of

the rewards and procedures (e.g., proof of brain) are implemented through a protocol that is considered a global agreement. The blockchain-based social media platform predefines the generation and distribution rules of cryptocurrencies, such as the source of tokens, the calculation mechanism of the reward amount, etc.

According to Guidi (2020) and Li and Palanisamy (2019), in Steemit, at the time of block creation, 65% of newly produced cryptocurrency is allocated to the reward pool for content authors and curators. From the reward pool, 75% of the payout is distributed to content authors for their contribution to high-quality content posting, and 25% of the payout is issued to curators for their support in screening the quality of the content. Rules regarding reward distribution are embedded in a smart contract through hard coding. Thus, the distribution and execution of the entire reward process is pre-determined and executed in an unbiased manner. These embedded features of the blockchain, which can be executed consistently free from the control of centralized organizations, can enhance the procedural justice regarding reward systems. In an online context, according to Kim and Kim (2018), a fair membership enhancement process helps community members build a long-term structural relationship with the community and to be more willing to engage in activities related to member problem-solving and promoting product adaptation. Chou et al. (2016) confirmed that the higher the perceived sense of procedural justice in value co-creation participation, the more positive the user's attitude towards the community. According to Leclercq, Poncin, Hammedi, Kullak, and Hollebeek (2020), community members have high expectations for procedural justice, regardless of their level of participation. When using gamification strategies to enhance the user experience, the perceived justice of the gamification process had a significant positive impact on the experience of members and the continued community contribution of users. The abovementioned studies suggest that procedural justice arises when social media platforms users perceive that the reward mechanism is unbiased and consistently implemented. This perception of perceived procedural justice increases users' commitment to the blockchain-based social media platform. Our hypothesis is as follows:

**H1b:** Procedural justice is positively related to blockchain-based social media users' commitment.

### **3.3. Informational justice**

In organizational settings, informational justice is often associated with procedurally relevant explanations, such as the reasons for using certain procedures and why outcomes are allocated in a certain way. Jap (2001) claimed that separating each user's input to high-quality content, such as content posting and voting, and then providing corresponding rewards can improve the quality of the relationship between the individual and the platform. When relevant procedural information is provided to the employee in a timely, sincere and reasonable manner, the employee may begin to perceive the justification behind the execution process (Andersson-Stråberg et al., 2007; Colquitt, 2001; Greenberg & Cropanzano, 1993). In an online context, prior research has revealed that informational justice also involved the degree of information exchange among members and the degree of openly sharing information (Chou et al., 2016; Kim & Kim, 2018). Extensively sharing bilateral information, providing complete information and thoroughly explaining the information posting rules can establish users' perception of informational justice (Chou et al., 2016).

Currently, most of the social media platforms running on the Steem and Ethereum blockchains are public blockchain platforms. Every action on a blockchain-based social media platform, such as following users, cryptocurrency transactions, posting or voting on content, is modeled as a transaction. Successfully verified transactions are packed into blocks and permanently recorded on the blockchain network. Consequently, the whole blockchain can be seen as a database where all historical transactions are recorded (Niranjanamurthy, Nithya & Jagannatha, 2019). According to the characteristics mentioned above, blockchain-based social media platforms share all information regarding its reward procedures with users. At the same time, all social media platforms users can access or confirm the information concerning the process and reward allocation freely on the blockchain-based social services. Thus, in this study, informational justice refers to the degree to which an individual's perceived explanation regarding the reward procedure is clear and such information is easily accessible by social media platforms users.

Prior research has suggested that high levels of knowledge sharing and information exchange promote a more dynamic bond between users and the community (Chou et al., 2016) by strengthening their economic and structural relationships (Kim & Kim, 2018), which leads to more knowledge-contributing behaviors and more engagement in an online community. According to Fang and Chiu (2010), a high level of informational justice increases users' trust in management. This trust strengthens users' willingness to reciprocate, increases citizenship behavior and motivates more participation in knowledge sharing. In the context of employee performance appraisals, informational justice has been shown to increase employee trust in and the accuracy of performance appraisal systems' evaluations, which further improves employee performance (Roberson & Stewart, 2006) and enhances employee engagement (Gupta & Kumar, 2013). Based on the above, we postulated that the informational justice of the reward systems used on

blockchain-based social media platforms can influence the relationships between content creators/curators and the platform. The stronger users' perception of informational justice is, the more committed to the platform they become, with this greater attachment making them more interested in its long-term development. Our hypothesis is as follows:

**H1c:** Informational justice is positively related to blockchain-based social media users' commitment.

### **3.4. The Mediating Role of Psychological Ownership**

Psychological ownership refers to the "state in which individuals feel as though the target of ownership or a piece of that target is 'theirs'" (i.e., "It is MINE!") (Pierce et al. 2003). The concept of psychological ownership emphasizes the sense of possessiveness and of being psychologically tied to an object (Pierce et al., 2001, 2003). Prior studies indicated that people can gain feelings of possession toward materials and digital objects which satisfy their psychological desire for efficacy, self-identity and having a place (Hulland, Thompson & Smith, 2015; Karahanna, Xu & Zhang, 2015; Lee et al., 2019; Zhao et al., 2016). According to Pierce et al. (2001), the routes of controlling the target, coming to intimately know the target and investing the self in the target can generate a sense of psychological ownership toward an object. Research on psychological ownership in the online area demonstrates that the use of a media service is associated with the psychological ownership needs of users (Karahanna et al., 2015).

Prior research has confirmed that perceived justice can be seen as an antecedent of psychological ownership. When employees actively participate in organizational activities (Chi & Han, 2008; Sieger, Bernhard & Frey, 2011) and knowledge sharing (Hameed et al., 2019; Li, Yuan, Ning & Li-Ying, 2015), they conduct distributive, procedural and interpersonal justice evaluations to judge whether they have received fair treatment. Justice perceptions arise if people have perceived that their investments to the object, such as physical and intellectual inputs, have been rewarded accordingly. If this sense of justice is validated, individuals become more willing to self-invest, which leads to the development of psychological ownership. In addition, when procedures are implemented consistently and employees are given the opportunity to participate in decision-making, they develop a sense of justice concerning the process as well as a psychological bond to the organization. Related studies have found that candid explanations and a high degree of transparency can facilitate a good relationship between buyer-supplier or service provider and user (Lee et al., 2019; Liu, Huang, Luo & Zhao, 2012). In addition, Pierce and Jussila (2011, p. 68) argue, "Attributes such as attractiveness, accessibility, openness and manipulability play a particularly important role in terms of making potential targets of ownership a candidate for the attachment of ownership feelings." Therefore, this study claims that the distributive, procedural and informational justice perceptions of blockchain-based social media platform users help to form a just relationship between users and the platform. This perception of justice may make the platform attractive and an object of psychological ownership by users. We therefore make the following hypotheses:

**H2a:** Distributive justice is positively related to psychological ownership.

**H2b:** Procedural justice is positively related to psychological ownership.

**H2c:** Informational justice is positively related to psychological ownership

Commitment refers to the strength of an individual's sense of belonging to and involvement with an organization (Lin et al, 2016). For example, numerous studies have demonstrated that psychological ownership increases students' commitment to college (Asatryan et al., 2013). Similarly, a crowdfunding project revealed positive relations between the sponsor's psychological ownership of the project and the sponsor's commitment to the project (Zheng et al., 2018). All findings indicated that commitment can be seen as an outcome of psychological ownership. Furthermore, Sieger et al. (2011) have shown that psychological ownership mediates the relationship between perceived justice and affective commitment and job satisfaction. For instance, non-family employees' distributive and procedural justice perception can lead to their psychological ownership of a family business. This psychological ownership increases employees' job satisfaction and affective commitment to the family business (Sieger et al., 2011). Thus, we propose that the relationship between perceived justice (distributive, procedural and informational justice) and commitment to blockchain-based social media platforms can be explained by psychological ownership. Our hypotheses are as follows:

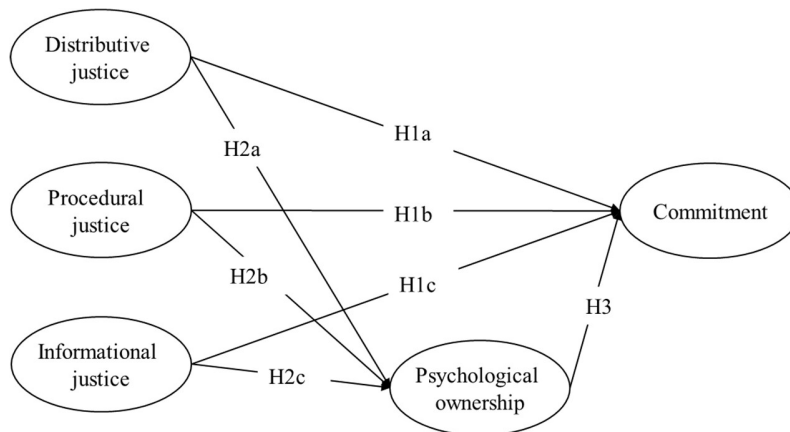
**H3:** Psychological ownership is positively related to blockchain-based social media users' commitment.

**H4a:** The influence of distributive justice on blockchain-based social media users' commitment is mediated by their psychological ownership.

**H4b:** The influence of procedural justice on blockchain-based social media users' commitment is mediated by their psychological ownership.

**H4c:** The influence of informational justice on blockchain-based social media users' commitment is mediated by their psychological ownership.

The research model proposed in our study is shown in <Fig. 1>.



**Figure 1:** The Proposed Research Model

## 4. Research Methods

### 4.1. Data Collection

Respondents were recruited through a web-based survey distributed by Amazon Mechanical Turk (Mturk), and a small monetary compensation was paid for their participation. The survey batch was launched in May 2021, and data collection was completed within 24 hours. Only users who had experience in participating in blockchain-based social media platforms were allowed to complete the survey, and the data from 399 responses were collected.

### 4.2. Measures

#### 4.2.1. Measurements

Distributive justice was measured using four items adapted from Colquitt (2001). The items were modified slightly because the original items aimed to measure employees' distributive justice in an organizational context. Therefore, the wording of the items was slightly modified to measure content creator/curator's distributive justice in a blockchain-based social media platform context (e.g., "I think the rewards given to me on blockchain-based social media platforms reflect the effort I have put into the content I created/curated"). The four items were measured on a seven-point Likert scale (1=strongly disagree, 7=strongly agree).

Procedural justice was also measured using four items slightly adapted from Colquitt (2001). The original items that related to expressing one's views about or appeals to the procedures were removed from Colquitt (2001). Since on a blockchain-based social media platform, no network participants can influence or change the procedures' execution unless the entire network's collective consensus is obtained, three items were removed (e.g., "Have you been able to express your views and feelings during those procedures?", "Have you had influence over the (outcome) arrived at by those procedures?" and "Have you been able to appeal the (outcome) arrived at by those procedures?"). The remaining four items were measured on a seven-point Likert scale (1=strongly disagree, 7=strongly agree).

Informational justice was measured using seven items; one was adapted from Colquitt (2001), three were adapted from Dapko (2012) and the last three were adapted from Nelson et al. (2005). Informational justice, according to

Colquitt (2001), is perceived when the information received by an individual is reasonable and specific. Therefore, we collected the items related to clear explanation information accessibility from previous studies through a careful literature review. The informational justice used in this study contains two aspects: clear explanation and accessibility of information. The seven items were measured on a seven-point Likert scale (1=strongly disagree, 7=strongly agree).

Psychological ownership was measured using three items adapted from Kwon (2020) and one item from Brown et al. (2014). The original items from Kwon (2020) were designed to measure users' psychological ownership toward social media platforms. In a blockchain-based social media platform context, the input and use of multiple types of tokens complicate platform and user ownership. In a traditional ownership economy, the ownership of the platform is centralized to the social media platform owner. However, in a blockchain-based social media platform, tokens supplied on the entire blockchain platform are represented as a particular asset or a utility. Taking Steemit as an example, there are two methods of ownership: liquid (steem) and vesting (steem power). Thus, in the questionnaire item selection phase, we removed one item ("Although I do not legally own the social media platform, I have the feeling that it is mine") from Kwon (2020) and adapted one item ("I sense that this job is MINE") from Brown et al. (2014), with the wording of the items used slightly modified to match the current research context (e.g., "I sense that blockchain-based social media platforms are MINE"). The four items were measured on a seven-point Likert scale (1=strongly disagree, 7=strongly agree).

Commitment was measured using three items adapted from Lin et al. (2016) and Liang et al. (2011). The original items aimed to measure an individual's commitment toward social media platforms (e.g., "I am proud to be a member of social media platforms"). Therefore, the wording of the items was slightly adapted to measure the content creator/curator's commitment toward blockchain-based social media platforms (e.g., "I am proud to be a member of blockchain-based social media platforms"). The three items were measured on a seven-point Likert scale (1=strongly disagree, 7=strongly agree).

#### 4.2.2 Common Method Bias

We checked for the potential presence of common method variance (CMV) which may occur when measuring independent and dependent variables from the same method or resources (Podsakoff, MacKenzie, Lee & Podsakoff, 2003; Podsakoff & Todor, 1985). Based on such notion that the CMV problem likely exists (Richardson, Simmering & Sturman, 2009), this study empirically assessed the possible CMV by performing Harman's single-factor analysis. In doing so, we loaded all used measurement items into an unrotated factor analysis and ran a principal component analysis (PCA) (Chang et al. 2010). The PCA results showed that no single factor emerged and is dominant by accounting for the majority (more than 50 percent) of the total variance among the items. The first factor only accounted for about 46 percent of the total variance, which is below the suggested threshold of 50 percent (Ylitalo, 2009). These results indicated that common method bias was not a substantial problem in our study.

#### 4.2.3. Measurement Model Test

CFA is considered to occupy an important place in SEM analysis by, for example, helping us observe the quality of our constructs (Brown, 2015; MacCallum & Austin, 2000). Therefore, in this study, a CFA was used to test our measurement model to ensure that our data had an acceptable level of reliability and validity. Descriptive statistics, and reliability coefficients for the constructs used in this study are presented in Table 1. Based on the measurement model criteria proposed by Fornell and Larcker (1981) and Hair (2009), we removed two items with factor loadings less than 0.7 from the measurement model ("I think X is candid" and "X makes information regarding reward procedures very accessible"). For an item with a factor loading extremely close to 0.7, for example 0.69 ("I think X explains the procedures thoroughly"), we believe that the item has a certain reliability and makes a certain contribution in reflecting the meaning of the latent variables, so we cautiously retained this item. The factor loadings for all items met the criteria for the measurement model. In assessing the measurement model's fit, we used the  $\chi^2/df$ , GFI, CFI, TLI, NFI and RMSEA metrics and, based on the model acceptance criteria proposed by previous studies for GFI, CFI, TLI and NFI scores greater than 0.90 and RMSEA values below 0.08, our model results indicated a good fit ( $\chi^2/df=2.163$ ,  $\chi^2=346.051$ ,  $df=160$ ,  $GFI=0.917$ ,  $CFI=0.960$ ,  $TLI=0.952$ ,  $NFI=0.928$  and  $RMSEA=0.055$ ). Furthermore, as shown in Table 1, our measurement model demonstrated good reliability, with the constructs having compositional reliability values ranging from .82 to .91. Moreover, the AVE values for all constructs were greater than 0.5 for the average variance extracted. To examine discriminant validity, we calculated the correlations between variables and the square root of the AVE for all variables according to the discriminant method proposed by Fornell and Larcker (1981). The square root value of the AVE was greater than the correlations between variables, demonstrating good discriminant validity, which can be seen in Table 2.



**Table 1:** Measures, Descriptive Statistics, and Validity Assessments of the Constructs

Constructs and indicators	Factor Loadings	CR	AVE
Distributive justice (DJ); adapted from (Colquitt, 2001)			
dj1) I think the rewards given to me reflect the effort I have put into the content I created/curated.	0.76	0.85	0.58
dj2) I think the rewards given to me are appropriate for the content creation/curation I have completed.	0.72		
dj3) I think the rewards given to me reflect what I have contributed to content creation/curation.	0.79		
dj4) I think the rewards given to me are justified, given the content I created/curated.	0.77		
Procedural justice (PJ); adapted from (Colquitt, 2001)			
pj1) In X, the reward rules and procedures are free of bias.	0.7	0.82	0.54
pj2) In X, the reward rules and procedures are applied consistently	0.77		
pj3) In X, the reward rules and procedures are based on adequate information	0.75		
pj4) In X, the reward rules and procedures uphold ethically and moral standards	0.71		
Informational justice (IJ); adapted from (Colquitt, 2001;Dapko, 2012;Nelson et al., 2005)			
ij1) I think X explains the procedures thoroughly.	0.69	0.85	0.52
ij2) I think X is candid.	N.A.		
ij3) I think X is clear with me.	0.71		
ij4) I think X is straightforward in telling me what I want to know.	0.72		
Ij5) X allows information regarding reward procedures to be readily accessible to me.	0.73		
Ij6) X makes information regarding reward procedures very accessible.	N.A.		
Ij7) X makes information regarding reward procedures easy to access.	0.76		
Psychological ownership (PO); adapted from (Brown et al., 2014;Kwon, 2020)			
po1) The X incorporates a part of myself.	0.77	0.91	0.73
po2) I feel a very high degree of personal ownership for the X.	0.85		
po3) I sense that this is my X.	0.89		
po4) I sense that X is MINE.	0.89		
Commitment (COM); adapted from (Liang et al., 2011;Lin et al., 2016)			
commit1) I am proud to belong to the membership of X.	0.76	0.83	0.61
commit2) I feel a sense of belonging to X.	0.81		
commit3) I care about the long-term success of X.	0.78		

Note: AVE indicates average variance extracted; CR indicates composite reliability; X indicates the blockchain-based social media platform. N/A indicates not applicable.

**Table 2:** Means, Standard Deviation, Cronbach's Alpha and Squared Correlations

Constructs	Mean	STD	Cronbach's alpha	1	2	3	4	5
Distributive Justice	5.421	0.927	0.847	<b>0.763</b>				
Procedural Justice	5.538	0.926	0.82	0.640**	<b>0.732</b>			
Informational Justice	5.47	0.895	0.844	0.618**	0.712**	<b>0.722</b>		
Psychological Ownership	4.909	1.357	0.911	0.550**	0.524**	0.432**	<b>0.852</b>	
Commitment	5.35	1.049	0.825	0.648**	0.618**	0.604**	0.763**	<b>0.783</b>

Note: STD =standard deviation.

Values in italicized bold denote the square root of the AVE of each construct,

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## 5. Results

### 5.1. Sample Descriptions

After instructional manipulation checks (IMCs), a method of measuring whether or not respondents are reading the questionnaire's instructions in their entirety (Oppenheimer et al., 2009), 14 (3.5%) careless data were removed due to the 14 respondents completing their answers by entering the service name of a centralized social service (e.g., Facebook), which did not accurately address this study's purposes. Therefore, the data from 385 responses were used to test the hypotheses presented in this study. Table 3 presents the characteristics of the respondents (sample size=385), of whom 59.5% were male and 40.5% were female. Regarding how long they had been using a blockchain-based social media platform, 29.4% of the respondents reported that they had used the blockchain-based social media platform for 1–6 months, with 25% saying they had been using it for 1–2 years. Asked how often they checked the blockchain-based social media platform, 26.8% of the respondents answered once a day, while 33% said several times a week. Regarding how many hours a week they spent on the blockchain-based social media platform, most respondents reported spending less than 5 hours a week (35.6%) and 6-10 hours a week (36.4%). The respondents' ages mainly ranged from 25–34 years old (41%) and 35–44 years old (30.6%). Most respondents reported having completed a high level of education with 60.5% holding a bachelor's degree and 23.6% holding a master's degree. Regarding their employment, 34.8% of the respondents reported that they were currently in an IT-related occupation, followed by management (22.9%) and business and finance (22.6%).

**Table 3:** Characteristics of the Respondents

<b>Gender</b>	male	59.50%	<b>Age</b>	18-24	6%
	female	40.50%		25-34	41%
<b>How long</b>	less than a month	6.20%		35-44	30.60%
	1-6 months	29.40%		45-54	16.40%
	6-12 months	21%		55-64	4.20%
	1-2 years	25.20%		65 or older	1.80%
	2-4 years	14.30%		high school	12.50%
<b>Frequency</b>	a few times a day	19%	<b>Education</b>	bachelor's degree	60.50%
	about once a day	26.80%		master's degree	23.60%
	a few times a week	33%		doctoral degree	1.60%
	about once a week	4.70%		other	1.80%
	a few times a month	11.90%	<b>Occupation</b>	management	22.90%
	once a month	3.60%		business and financial	22.60%
	less than once a month	1%		community and social service	5.70%

<b>How many hours</b>	less than 5 hours	35.60%	IT related	IT related	34.80%
	6-10 hours	36.40%		office and administrative support	8.80%
	11-15 hours	15.60%		other	5.20%
	16-20 hours	5.50%			
	21-25 hours	2.90%			
	26-30 hours	3.10%			
	more than 30 hours	1%			

Note: N=385.

As can be seen in Table 4, Steemit was the most popular blockchain-based social media platform (27.7%), followed by Hiveblog (22.7%), Yup (18.5%) and Dtube (14.3%).

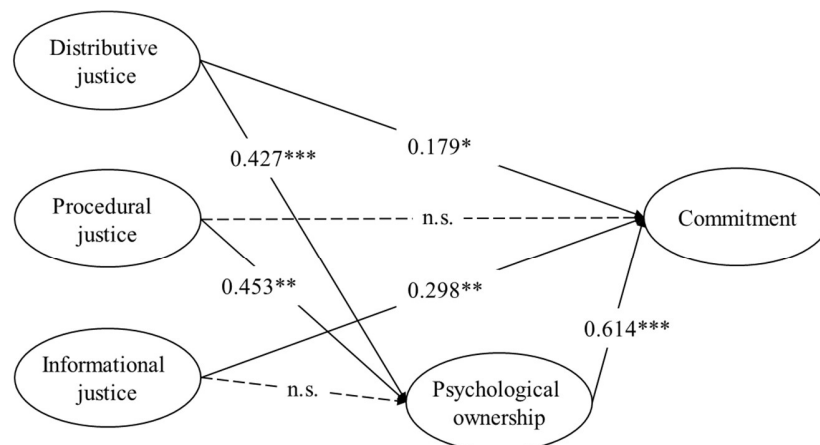
**Table 4:** Profile of the Blockchain-Based Social Media Platforms in Use

	Service Name	Number	%
<b>Using experience of blockchain-based social media platforms</b>	SNS1_Steem	195	27.70%
	SNS1_Yup	130	18.50%
	SNS1_PeaKD	74	10.50%
	SNS1_HiveBlog	160	22.70%
	SNS1_Dtube	101	14.30%
	SNS1_Ecency	36	5.10%
	SNS1_Other	8	1.10%

## 5.2. Estimation Result to Main Hypothesis

### 5.2.1. Justice Perception and Commitment

After the measurement model was validated, structural equation modeling (SEM) was conducted to analyze the hypotheses by using AMOS. The results indicated that our structural model showed a good fit with our data ( $\chi^2/df=2.163$ , GFI=0.917, CFI=0.960, TLI=0.952, NFI=0.928 and RMSEA=0.055). The analytical results of the estimated structural model are shown in <Fig. 2>.



Note: \*p<0.05, \*\* p<0.01, \*\*\*p<0.001. n.s. = nonsignificant.

**Figure 2:** Structural Model Analysis Result for The Full Sample

Distributive justice ( $\beta = 0.179$ ;  $p < 0.01$ ) and informational justice ( $\beta = 0.298$ ;  $p < 0.002$ ) were positively related with users' commitment to blockchain-based social media platforms, supporting hypotheses H1a and H1c. Procedural justice ( $\beta = -0.004$ ;  $p < 0.971$ ) was found to be not significantly associated with commitment; hence hypothesis H1b was not supported. Distributive justice ( $\beta = 0.427$ ;  $p < 0.000$ ) and procedural justice were found to be positively related to psychological ownership of platforms ( $\beta = 0.453$ ;  $p < 0.002$ ), supporting H2a and H2b. Informational justice ( $\beta = -0.219$ ;  $p < 0.091$ ) was found to be not significantly associated with psychological ownership; therefore, H2c was not supported. Psychological ownership ( $\beta = 0.614$ ;  $p < 0.000$ ) was found to be positively associated with the commitment to blockchain-based social media platforms, supporting hypothesis H3. The results are summarized in Table 5.

**Table 5:** Summary of Results

Hypothesized Path		Results
Full sample model (n=385)	H1a: Distributive Justice ->Commitment	Supported
	H1b: Procedural Justice ->Commitment	Not supported
	H1c: Informational Justice ->Commitment	Supported
	H2a: Distributive Justice -> Psychological Ownership	Supported
	H2b: Procedural Justice -> Psychological Ownership	Supported
	H2c: Informational Justice -> Psychological Ownership	Not supported
	H3: Psychological Ownership ->Commitment	Supported

### 5.2.2. The Mediating Effects of Psychological Ownership

We performed a bootstrap analysis in SEM-Amos to estimate the mediation role of psychological ownership on 5,000 bootstrap samples with a confidence level of 95%. If zero was not included between the upper and lower bounds, we proposed that the indirect effect was not zero with 95% confidence (Hayes, 2009; MacKinnon, 2012). The results are shown in Table 6. Our findings indicate that distributive justice and commitment are partially mediated by psychological ownership (95% CI=[0.113, 0.481]), supporting hypothesis H4a. The relationship between procedural justice and commitment is completely mediated by psychological ownership (95% CI=[0.063, 0.659]), supporting H4b. The indirect effect of psychological ownership on commitment was not significant (95% CI=[-0.431, 0.084]), thus hypothesis H4c was not supported. A summary of the mediating results is provided in Table 7.

**Table 6:** The Estimation Results of the Mediation Model

Model pathways (n=385)	Point estimate	Bias-corrected percentile 95% confidence intervals		Two-tailed significance
		Lower	Upper	
<b>Indirect Effects</b>				
Distributive Justice -> Psychological Ownership ->Commitment	0.276	0.113	0.481	0.001***
Procedural Justice -> Psychological Ownership ->Commitment	0.327	0.063	0.659	0.02*
Informational Justice -> Psychological Ownership ->Commitment	-0.142	-0.431	0.084	0.24
<b>Direct Effects</b>				
Distributive Justice ->Commitment	0.189	0.007	0.404	0.04*
Procedural Justice ->Commitment	-0.005	-0.33	0.329	0.97
Informational Justice ->Commitment	0.315	0.037	0.568	0.03*

Note: The 95% confidence interval does not include zero;  
 Total effect=indirect effect + direct effect;  
 Standardized estimating of 5,000 bootstrap samples.  
 \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

**Table 7:** Summary of the Mediating Results

Hypothesized Path		Results
Mediating model (n=385)	H4a: Distributive Justice -> Psychological Ownership ->Commitment	Supported, partial mediation
	H4b: Procedural Justice -> Psychological Ownership ->Commitment	Supported, full mediation
	H4c: Informational Justice -> Psychological Ownership ->Commitment	Not supported, no mediation

## 6. Discussion

Numerous content producers and curators are actively engaged in social media sites. Prior research has demonstrated that the active content posting and discovery behaviors of content creators and curators (e.g., likes, dislikes and comments) improve a platform’s content quality, attract more social media users and facilitate interaction among platform users (Gillespie, 2018;Khan, 2017). All these content-related actions substantially boost the content ranking weight; hence, they increase the quality of content search query results. However, with Web 2.0 social media platforms, there are essentially no compensation structures for content authors and curators. In Web 3.0 social media, blockchain-based social media platforms compensate users for their contributions to high-quality content, which may influence the attitudes of their users. Unfortunately, previous studies have not discovered the possible effects of a reward system on users' commitment to blockchain-based social media platforms. Thus, the initial purpose of the present study was to determine if users' commitment to a blockchain-based social media platform is influenced by their impression of justice in the platform’s incentive systems (distributive, procedural and informational justice).

The first goal of this study was to investigate how three aspects of perceived justice (distributive, procedural and informational justice) can improve users' commitment to a platform. In the routes between organizational justice and commitment, the hypotheses on the relationships between distributive and informational justice and commitment were confirmed. The overall findings were well aligned with justice theory (Colquitt, 2012). The results of this study demonstrated the significant role that the incentive mechanism of blockchain-based social media plays in managing the platform-user relationship. The sense of justice that content creators and curators have regarding the incentive system of blockchain-based social media influences their level of commitment to the platform.

In terms of distributive justice, monetary rewards for users' participation in content creation/curation have a positive effect on users' commitment to social media platforms. The results of this paper validated the idea proposed in Jap (2001), which claimed that a user's inputs in high-quality content, such as content posting and voting, and providing corresponding rewards can improve the quality of the relationship between the individual and the platform. The incentive model of blockchain-based social services permits all content contributors to share rewards proportional to their contributions. This utilization of distributive justice demonstrates the attention and importance that blockchain-based social platforms place on the contributions of all types of content participants. It also improves the invisible exploitation between the platform and users, such as the problem of zero payments from a platform to its social users, as well as the quality of the platform-user relationship. The results show that the greater the perceived justice of the distribution, the greater the commitment of social users to blockchain-based social media platforms.

Informational justice, which allows free access to relevant details in reward distribution and provides explanations on procedures, has a positive effect on the user's commitment to the platform. When the justice of information is perceived, the user's commitment to the platform will increase. Because the distribution and execution information of rewards are candidly displayed to users, the accessibility of the information enhances the informational justice perception of the blockchain-based social reward mechanism. At the same time, providing verifiable and viewable reward information can improve the transparency of the reward procedures, increase the credibility of the reward mechanism and improve the information asymmetry between users and the platform regarding the implementation of rewards. In other words, allowing anyone to access and provide clear explanations regarding procedures will reduce the uncertainty of the reward procedures, enhance the accuracy of the outcome allocation and strengthen the affective commitment of social media platforms users to blockchain-based social media platforms. This process confirms information’s feedback role in user motivation (Roberson & Stewart, 2006).

As for procedural justice, contrary to our expectations, we found that the content creators/curators' perceived procedural justice did not have a positive effect on their commitment to a blockchain-based social media platform, which was incompatible with previous studies (Fatt et al., 2010; Lambert et al., 2007; López-Cabarcos et al., 2015). In

terms of blockchain-based social media platforms, technology-enhanced procedural justice did not play an effective role in increasing commitment. This demonstrates the limitations of relying on technology-enhanced procedural justice to increase a platform's user involvement and long-term relationship retention. The low impact of autonomy regarding reward procedures may result in procedural justice exerting an insignificant impact on users' commitment to a blockchain-based social media platform. Technically, the reward allocation process was defined as hard-coded before the blockchain-based social media platform began operations (Pereira et al., 2019), and after the service was operational, the reward procedure was difficult to modify. As a result, the ability to give social media platforms users a voice or participation related to the execution of the reward system is low. Since process control and voice expression are two important aspects of procedural justice (Barrett-Howard & Tyler, 1986; Erdogan, 2002), low user affordance may lead to the insignificance of the relationship between procedural justice and commitment.

To address the second research question, this study examined the role of psychological ownership in the relationship between perceived justice and user commitment. The results in this study indicate that psychological ownership well explained the relationship between perceived distributive justice and platform commitment, as well as the relationship between procedural justice and platform commitment. These results demonstrate that the relationship between distributive justice and commitment is partially mediated by psychological ownership, which is compatible with previous studies conducted in both offline and online contexts (Ahmed, 2014; Chou et al., 2016; Liu et al., 2021).

The positive effect of psychological ownership on users' attitudes is confirmed in our study, especially in the blockchain-based social media platform context. When social media platforms users perceive that the reward distribution is impartial, this justice perception can increase their sense of psychological ownership of the platform and create a sense of intimacy with the platform. The greater the degree to which consumers view a blockchain-based social media platform as a part of themselves, the greater their commitment to the platform. Furthermore, this study found that the relationship between procedural justice and commitment was completely mediated by psychological ownership. Procedural justice does not directly lead to an increase in commitment; only when users perceive psychological ownership of a platform can procedural justice lead to their commitment to it. When content creators and curators feel that the procedural justice of a blockchain-based social media platform responds to their own internal needs and self-concept in terms of justice, they consider the platform an extension of themselves. In addition, according to the theory of psychological ownership, the more time and effort are invested in an object, the more people learn about decentralized operations while using the service. When feelings of a consistent, unbiased reward system are generated, users are likely to be more closely knit with the platform. Therefore, generating psychological ownership creates a closer relationship between the user and the platform and increases the user's commitment to that platform.

Contrary to the above discussion, this study found that psychological ownership did not explain the relationship between informational justice and platform commitment. As informational justice does not affect psychological ownership, the mediating effect of psychological ownership has not been verified in the relationship between informational justice and commitment to a platform. Informational justice, in the form of detailed descriptions, honest explanations and free access to information does not give users a sense of psychological ownership of a platform, indicating that there are still limitations to generating psychological ownership through clear explanations and information accessibility. In Steemit, the reward allocation information (e.g., how much is allocated, when it is allocated and how many votes are received) can be seen as a transaction database that is updated when a reward is issued. This repeated reward information presentation may eventually bore users, which could have led to the informational justice being unlinked to the psychological ownership of a platform (Jussila et al., 2015; Kwon, 2020).

In summary, this study examined the impact of multiple dimensions of perceived justice on blockchain-based social media platforms. The important role of psychological ownership in determining the platform commitment of blockchain-based social media members was examined. The findings contribute to the blockchain-based social media platform literature and suggest implications for the management of blockchain-based social media platforms.

## **7. Implications**

### **7.1. Theoretical Implications**

The present study's results suggest several theoretical implications.

First, this study filled a gap in the empirical research on blockchain-based social media platforms from the standpoint of blockchain-based social media users.

Second, from the perspective of justice theory, this study presented justice perception in a social media environment based on blockchain technology from an organizational perspective, confirming that justice theory can be applied in a blockchain-based social media context. Moreover, operating procedures based on smart contracts and applied technologies such as public ledger can help users to feel a sense of justice, which improves user commitment to the platform. Therefore, based on this study, more active complementary developments between blockchain-based social media-related research and organizational justice theory is to be expected in the future.

Third, from the perspective of psychological ownership, this study has confirmed that the psychological ownership theory can be successfully applied under the social media environment based on blockchain technology. In addition, psychological ownership plays an important role in improving commitment. In a blockchain-based social media environment, reward distribution and fair procedures can increase users' psychological ownership, leading to higher commitments by inducing users' psychological ownership.

## **7.2. Practical Implications**

The findings in the present study have several important practical implications. Our findings can be applied to a wide range of blockchain-based application designs, which could be helpful for creating an efficient reward system on social media platforms. Providing rewards cannot necessarily undermine users' intrinsic motivations. Implementing a consistent reward mechanism without prejudice in consideration of social users' contributions (e.g., content creation/curation) helps increase their commitment to the media platform. Therefore, it is desirable to establish a fair compensation system.

Regarding the formation of positive relationships among users on social media platforms, rewarding according to users' contributions and providing an open and transparent explanation of the reward distribution process can build healthy relationships among platform users. In other words, when providing a service, it is recommended that compensation be based on users' contributions and that information explaining the reward distribution mechanism is accessible to users. Based on the study's findings related to psychological ownership theory, the service design should focus on the role of ownership in the user's mind, using multiple elements such as fair rewards to promote psychological ownership generation and to reinforce the long-term commitment of the user to the platform.

## **7.3. Limitations**

However, some of the study's limitations are worth noting. First, the data collection in this study was done using the self-reported questionnaire method, and the data were collected mainly in the United States. Therefore, it may be difficult to generalize our results in the contexts of other countries. Second, when discussing the reward system of blockchain-based social media platforms, we did not consider the token-exchange rules, which may affect users' justice perception and behaviors. Third, because this study employed a cross-sectional design, the results may not accurately reflect changes in users over time in a timely manner. Users' sense of justice and platform commitment may change when considering their familiarity with token reward mechanisms and that token trading is continually allowed. Finally, our result data comes from user questionnaires and not from the analysis of transaction history data on the blockchain network. Therefore, in future research, we plan to combine data analysis from user questionnaires and blockchain network transaction history to investigate users' commitment to the platform.

## References

- Abubakar, A. M., Behraves, E., Rezapouraghdam, H., & Yildiz, S. B. (2019). Applying artificial intelligence technique to predict knowledge hiding behavior. *International Journal of Information Management*, 49, 45-57.
- Ahmed, H. T. (2014). Impact of organizational justice on affective commitment: mediating role of psychological ownership and organizational identification. *IOSR Journal of Business and Management*, 16(1), 58-63.
- Andersson-Stråberg, T., Sverke, M., & Hellgren, J. (2007). Perceptions of justice in connection with individualized pay setting. *Economic and Industrial Democracy*, 28(3), 431-464.
- Asatryan, V. S., Slevitch, L., Larzelere, R., Morosan, C., & Kwun, D. J. (2013). Effects of psychological ownership on students' commitment and satisfaction. *Journal of Hospitality & Tourism Education*, 25(4), 169-179.
- Ba, C. T., Zignani, M., & Gaito, S. (2021). Social and rewarding microscopical dynamics in blockchain-based online social networks. *Proceedings of the Conference on Information Technology for Social Good*, 127-132.
- Bao, Z., & Wang, D. (2021). Examining consumer participation on brand microblogs in China: perspectives from elaboration likelihood model, commitment-trust theory and social presence. *Journal of Research in Interactive Marketing*, 15(1), 10-29.
- Barrett-Howard, E., & Tyler, T. R. (1986). Procedural justice as a criterion in allocation decisions. *Journal of Personality and Social Psychology*, 50(2), 296-304.
- Belk, R. W. (1988). Possessions and the extended self. *Journal of Consumer Research*, 15(2), 139-168.
- Belk, R. W. (2013). Extended self in a digital world. *Journal of Consumer Research*, 40(3), 477-500.
- Brown, G., Pierce, J. L., & Crossley, C. (2014). Toward an understanding of the development of ownership feelings. *Journal of Organizational Behavior*, 35(3), 318-338.
- Brown, T. A. (2015). *Confirmatory factor analysis for applied research*. Guilford publications.
- Chang, S.-J., Van Witteloostuijn, A., & Eden, L. (2010). From the editors: Common method variance in international business research. In: Springer.
- Chi, N. W., & Han, T. S. (2008). Exploring the linkages between formal ownership and psychological ownership for the organization: The mediating role of organizational justice. *Journal of Occupational and Organizational Psychology*, 81(4), 691-711.
- Chou, E.-Y., Lin, C.-Y., & Huang, H.-C. (2016). Fairness and devotion go far: Integrating online justice and value co-creation in virtual communities. *International Journal of Information Management*, 36(1), 60-72.
- Colquitt, J. A. (2001). On the dimensionality of organizational justice: a construct validation of a measure. *Journal of Applied Psychology*, 86(3), 386-400.
- Colquitt, J. A. (2012). *Organizational justice*. Oxford University Press.
- Cook, K. S., & Hegtvedt, K. A. (1983). Distributive justice, equity, and equality. *Annual Review of Sociology*, 9(1), 217-241.
- Cropanzano, R., Byrne, Z. S., Bobocel, D. R., & Rupp, D. E. (2001). Moral virtues, fairness heuristics, social entities, and other denizens of organizational justice. *Journal of Vocational Behavior*, 58(2), 164-209.
- Dapko, J. L. (2012). *Perceived firm transparency: Scale and model development*. University of South Florida.
- Dapp. Retrieved from <https://www.dapp.com/topics/decentralized-social-network#banner>
- Deutsch, M. (1986). Cooperation, conflict, and justice. In H. W. Bierhoff, R. L. Cohen, & J. Greenberg, *Justice in Social Relations* (pp.3-18), New York : Plenum Press.
- Eckhoff, T. (1974). *Justice: Its determinants in social interaction*. Rotterdam University Press.
- Erdogan, B. (2002). Antecedents and consequences of justice perceptions in performance appraisals. *Human Resource Management Review*, 12(4), 555-578.
- Falcone, E. C., Steelman, Z. R., & Aloysius, J. A. (2021). Understanding Managers' Reactions to Blockchain Technologies in the Supply Chain: The Reliable and Unbiased Software Agent. *Journal of Business Logistics*, 42(1), 25-45.
- Fang, Y.-H., & Chiu, C.-M. (2010). In justice we trust: Exploring knowledge-sharing continuance intentions in virtual communities of practice. *Computers in Human Behavior*, 26(2), 235-246.
- Fatt, C. K., Khin, E. W. S., & Heng, T. N. (2010). The impact of organizational justice on employee's job satisfaction: The Malaysian companies perspectives. *American Journal of Economics and Business Administration*, 2(1), 56-63.
- Fernández-de-Arroyabe-Olaortua, A., Lazkano-Arillaga, I., & Eguskiza-Sesumaga, L. (2018). Digital natives: Online audiovisual content consumption, creation and dissemination. *Comunicar. Media Education Research Journal*, 26(2), 61-69.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.



- Fuchs, C. (2014). Digital prosumption labour on social media in the context of the capitalist regime of time. *Time & Society*, 23(1), 97-123.
- Fuchs, C., & Sevignani, S. (2013). What is digital labour? What is digital work? What's their difference? And why do these questions matter for understanding social media? *TripleC: Communication, capitalism & critique. Open access journal for a global sustainable information society*, 11(2), 237-293.
- Gillespie, T. (2018). *Custodians of the Internet*. Yale University Press.
- Greenberg, J., & Cropanzano, R. (1993). The social side of fairness: Interpersonal and informational classes of organizational justice. In Cropanzano, R., Ed., *Justice in the Workplace: Approaching Fairness in Human Resource Management* (79-103), Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Guidi, B. (2020). When blockchain meets online social networks. *Pervasive and Mobile Computing*, 62, 101-131.
- Guidi, B., Michienzi, A., & Ricci, L. (2020). Steem blockchain: Mining the inner structure of the graph. *IEEE Access*, 8, 210251-210266.
- Guidi, B., Michienzi, A., & Ricci, L. (2021). Analysis of Witnesses in the Steem Blockchain. *Mobile Networks and Applications*, 1-12.
- Gupta, V., & Kumar, S. (2013). Impact of performance appraisal justice on employee engagement: a study of Indian professionals. *Employee Relations*, 35(1), 61-78.
- Hair, J. F. (2009). *Multivariate data analysis*. Faculty Publications.
- Hameed, Z., Khan, I. U., Sheikh, Z., Islam, T., Rasheed, M. I., & Naeem, R. M. (2019). Organizational justice and knowledge sharing behavior: The role of psychological ownership and perceived organizational support. *Personnel Review*, 48(3), 748-773.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76(4), 408-420.
- Hulland, J., Thompson, S. A., & Smith, K. M. (2015). Exploring uncharted waters: Use of psychological ownership theory in marketing. *Journal of Marketing Theory and Practice*, 23(2), 140-147.
- Jap, S. D. (2001). "Pie sharing" in complex collaboration contexts. *Journal of Marketing Research*, 38(1), 86-99.
- Jussila, I., Tarkiainen, A., Sarstedt, M., & Hair, J. F. (2015). Individual psychological ownership: Concepts, evidence, and implications for research in marketing. *Journal of Marketing Theory and Practice*, 23(2), 121-139.
- Kapanova, K., Guidi, B., Michienzi, A., & Koidl, K. (2020). Evaluating posts on the steemit blockchain: Analysis on topics based on textual cues. *Proceedings of the 6th EAI international conference on smart objects and technologies for social good*, 163-168.
- Karahanna, E., Xu, S. X., & Zhang, N. (2015). Psychological ownership motivation and use of social media. *Journal of Marketing Theory and Practice*, 23(2), 185-207.
- Khan, M. L. (2017). Social media engagement: What motivates user participation and consumption on YouTube? *Computers in Human Behavior*, 66, 236-247.
- Kiayias, A., Livshits, B., Mosteiro, A. M., & Litos, O. S. T. (2018). A puff of steem: Security analysis of decentralized content curation. *Tokenmics*, 3, 1-21.
- Kim, M., & Kim, J. (2018). The effects of perceived online justice on relational bonds and engagement intention: Evidence from an online game community. *Computers in Human Behavior*, 84, 410-419.
- Kim, M. S., & Chung, J. Y. (2018). Sustainable growth and token economy design: The case of steemit. *Sustainability*, 11(1), 167-189.
- Kim, S., Kim, S.-G., Jeon, Y., Jun, S., & Kim, J. (2016). Appropriate or remix? The effects of social recognition and psychological ownership on intention to share in online communities. *Human-Computer Interaction*, 31(2), 97-132.
- Kwon, S. (2020). Understanding user participation from the perspective of psychological ownership: The moderating role of social distance. *Computers in Human Behavior*, 105, 1-12.
- Lambert, E. G., Hogan, N. L., & Griffin, M. L. (2007). The impact of distributive and procedural justice on correctional staff job stress, job satisfaction, and organizational commitment. *Journal of Criminal Justice*, 35(6), 644-656.
- Leclercq, T., Poncin, I., Hammedi, W., Kullak, A., & Hollebeek, L. D. (2020). When gamification backfires: The impact of perceived justice on online community contributions. *Journal of Marketing Management*, 36(5-6), 550-577.
- Lee, H., Yang, S.-B., & Koo, C. (2019). Exploring the effect of Airbnb hosts' attachment and psychological ownership in the sharing economy. *Tourism Management*, 70, 284-294.
- Lee, J., & Suh, A. (2015). How do virtual community members develop psychological ownership and what are the effects of psychological ownership in virtual communities? *Computers in Human Behavior*, 45, 382-391.
- Li, C., & Palanisamy, B. (2019). Incentivized blockchain-based social media platforms: A case study of steemit. *Proceedings of the 10th ACM conference on web science*, 145-154.

- Li, C., Palanisamy, B., Xu, R., Xu, J., & Wang, J. (2021). SteemOps: Extracting and Analyzing Key Operations in Steemit Blockchain-based Social Media Platform. *Proceedings of the Eleventh ACM Conference on Data and Application Security and Privacy*, 113-118.
- Li, J., Yuan, L., Ning, L., & Li-Ying, J. (2015). Knowledge sharing and affective commitment: the mediating role of psychological ownership. *Journal of Knowledge Management*, 19(6), 1146-1166.
- Liang, T.-P., Ho, Y.-T., Li, Y.-W., & Turban, E. (2011). What drives social commerce: The role of social support and relationship quality. *International Journal of Electronic Commerce*, 16(2), 69-90.
- Liao, G.-Y., Huang, T.-L., Cheng, T., & Teng, C.-I. (2020). Impacts of media richness on network features and community commitment in online games. *Industrial Management & Data Systems*, 120(7), 1361-1381.
- Lim, H., & Kumar, A. (2019). Variations in consumers' use of brand online social networking: A uses and gratifications approach. *Journal of Retailing and Consumer Services*, 51, 450-457.
- Lin, T. T., & Chiang, Y.-H. (2019). Bridging social capital matters to Social TV viewing: Investigating the impact of social constructs on program loyalty. *Telematics and Informatics*, 43, 101-236.
- Lin, X., Zhang, D., & Li, Y. (2016). Delineating the dimensions of social support on social networking sites and their effects: A comparative model. *Computers in Human Behavior*, 58, 421-430.
- Liu, Y., Huang, Y., Luo, Y., & Zhao, Y. (2012). How does justice matter in achieving buyer-supplier relationship performance? *Journal of Operations Management*, 30(5), 355-367.
- Liu, Y., Qu, Z., Meng, Z., & Kou, Y. (2021). Environmentally responsible behavior of residents in tourist destinations: the mediating role of psychological ownership. *Journal of Sustainable Tourism*, 1-17.
- Livingstone, S. (2008). Taking risky opportunities in youthful content creation: teenagers' use of social networking sites for intimacy, privacy and self-expression. *New Media & Society*, 10(3), 393-411.
- López-Cabarcos, M. A., Machado-Lopes-Sampaio-de Pinho, A. I., & Vázquez-Rodríguez, P. (2015). The influence of organizational justice and job satisfaction on organizational commitment in Portugal's hotel industry. *Cornell Hospitality Quarterly*, 56(3), 258-272.
- Luo, C., Lan, Y., Luo, X. R., & Li, H. (2021). The effect of commitment on knowledge sharing: An empirical study of virtual communities. *Technological Forecasting and Social Change*, 163, 1-11.
- MacCallum, R. C., & Austin, J. T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology*, 51(1), 201-226.
- MacKinnon, D. P. (2012). *Introduction to statistical mediation analysis*. Routledge.
- Maruping, L. M., Daniel, S. L., & Cataldo, M. (2019). Developer centrality and the impact of value congruence and incongruence on commitment and code contribution activity in open source software communities. *MIS Quarterly*, 43(3), 951-976.
- Nelson, R. R., Todd, P. A., & Wixom, B. H. (2005). Antecedents of information and system quality: an empirical examination within the context of data warehousing. *Journal of management information systems*, 21(4), 199-235.
- Niranjanamurthy, M., Nithya, B., & Jagannatha, S. (2019). Analysis of Blockchain technology: pros, cons and SWOT. *Cluster Computing*, 22(6), 14743-14757.
- Oppenheimer, D. M., Meyvis, T., & Davidenko, N. (2009). Instructional manipulation checks: Detecting satisficing to increase statistical power. *Journal of Experimental Social Psychology*, 45(4), 867-872.
- Park, J., & Ciriello, R. F. The Differential Effects of Cryptocurrency Incentives in Blockchain Social Networks.
- Pereira, J., Tavalaei, M. M., & Ozalp, H. (2019). Blockchain-based platforms: Decentralized infrastructures and its boundary conditions. *Technological Forecasting and Social Change*, 146, 94-102.
- Pfeiffer, A., Kriglstein, S., Wernbacher, T., & Bezzina, S. (2020). Blockchain Technologies and Social Media: A Snapshot. *ECSM 2020 8th European Conference on Social Media*, 196, 1-15.
- Pierce, J. L., & Jussila, I. (2011). *Psychological ownership and the organizational context: Theory, research evidence, and application*. Edward Elgar Publishing.
- Pierce, J. L., Kostova, T., & Dirks, K. T. (2001). Toward a theory of psychological ownership in organizations. *Academy of Management Review*, 26(2), 298-310.
- Pierce, J. L., Kostova, T., & Dirks, K. T. (2003). The state of psychological ownership: Integrating and extending a century of research. *Review of General Psychology*, 7(1), 84-107.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879-903.
- Podsakoff, P. M., & Todor, W. D. (1985). Relationships between leader reward and punishment behavior and group processes and productivity. *Journal of Management*, 11(1), 55-73.

- Richardson, H. A., Simmering, M. J., & Sturman, M. C. (2009). A Tale of Three Perspectives: Examining Post Hoc Statistical Techniques for Detection and Correction of Common Method Variance. *Organizational Research Methods, 12*(4), 762-800.
- Roberson, Q. M., & Stewart, M. M. (2006). Understanding the motivational effects of procedural and informational justice in feedback processes. *British Journal of Psychology, 97*(3), 281-298.
- Ryu, S., & Park, J. (2020). The effects of benefit-driven commitment on usage of social media for shopping and positive word-of-mouth. *Journal of Retailing and Consumer Services, 55*, 1-9.
- Shao, G. (2009). Understanding the appeal of user-generated media: a uses and gratification perspective. *Internet Research, 19*(1), 7-25.
- Sieger, P., Bernhard, F., & Frey, U. (2011). Affective commitment and job satisfaction among non-family employees: Investigating the roles of justice perceptions and psychological ownership. *Journal of Family Business Strategy, 2*(2), 78-89.
- Tang, T. L.-P., & Sarsfield-Baldwin, L. J. (1996). Distributive and procedural justice as related to satisfaction and commitment. *SAM Advanced Management Journal, 61*(3), 25-32.
- Thelwall, M. (2018). Can social news websites pay for content and curation? The SteemIt cryptocurrency model. *Journal of Information Science, 44*(6), 736-751.
- Tsai, M.-T., & Cheng, N.-C. (2012). Understanding knowledge sharing between IT professionals—an integration of social cognitive and social exchange theory. *Behaviour & Information Technology, 31*(11), 1069-1080.
- Untarini, N., Lie, T., & Fcw Sutrisno, T. (2021). Intention to continue participating: system interactivity, virtual sites, community commitment in online hijabs community. *Jurnal Aplikasi Manajemen, 19*, 141-155. doi: <https://doi.org/10.21776/ub.jam.2021.019.01.131>.
- Wang, N., Sun, Y., Shen, X.-L., & Zhang, X. (2018). A value-justice model of knowledge integration in wikis: The moderating role of knowledge equivocality. *International Journal of Information Management, 43*, 64-75.
- Wang, X., Tajvidi, M., Lin, X., & Hajli, N. (2020). Towards an ethical and trustworthy social commerce community for brand value co-creation: A trust-commitment perspective. *Journal of Business Ethics, 167*(1), 137-152.
- Yim, J. S.-C., Moses, P., & Azalea, A. (2018). Effects of psychological ownership on teachers' beliefs about a cloud-based virtual learning environment. *Research and Practice in Technology Enhanced Learning, 13*(1), 1-19.
- Ylitalo, J. (2009). Controlling for common method variance with partial least squares path modeling: A Monte Carlo study. *MIS Quarterly, 33*, 1-37.
- Yuksel, M., Darmody, A., & Venkatraman, M. (2019). When consumers own their work: Psychological ownership and consumer citizenship on crowdsourcing platforms. *Journal of Consumer Behaviour, 18*(1), 3-11.
- Zhao, Q., Chen, C.-D., & Wang, J.-L. (2016). The effects of psychological ownership and TAM on social media loyalty: An integrated model. *Telematics and Informatics, 33*(4), 959-972.
- Zheng, H., Xu, B., Zhang, M., & Wang, T. (2018). Sponsor's cocreation and psychological ownership in reward-based crowdfunding. *Information Systems Journal, 28*(6), 1213-1238.