

BLOCKCHAIN TECHNOLOGY IN INCREASING TRANSPARENCY AND ACCOUNTABILITY OF SAVINGS AND LOAN COOPERATIVES IN INDONESIA

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Keywords:

Blockchain, transparency ,
accountability , cooperatives
save borrow ,

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ABSTRACT

This study explores the role of blockchain technology in increasing transparency and accountability in cooperatives that save and borrow in Indonesia. The decentralized and secure nature of blockchain technology provides a powerful solution to enhance trust and ensure the verification of financial transactions in cooperatives. Using a qualitative case study approach, data is collected through interviews, observations, and document analysis on several cooperatives that have adopted or considered adopting blockchain. Findings show that blockchain enables real-time transaction recording that is durable and resistant to manipulation, making it accessible to all members and thereby significantly increasing transparency and accountability in cooperative management. However, challenges related to technology literacy and the costs of initial implementation still exist. This study contributes to the theoretical understanding of blockchain applications in financial management for cooperatives and provides practical insights for cooperative managers and policymakers. The research emphasizes the importance of technology education for cooperative members to support effective blockchain adoption. Furthermore, it suggests expanding the analysis of the long-term impacts and applications of blockchain in various cooperative sectors Indonesia.

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1. INTRODUCTION

Blockchain technology has develop be one of innovation the most promising technologies in the 21st century, esp in increase transparency , accountability , and efficiency in various sectors , including sector finance . With its decentralized nature and its non - record-keeping based nature can changed , blockchain offers solution revolutionary in overcome global challenges that have been This difficult solved , such as transparency in public fund management and accountability in system finance . At the global level , the issue transparency and accountability become attention main , especially in management finances involving Lots parties , such as cooperative save borrow , which often faces challenges structure management closed and minimal supervision from party external (Ali et al., 2020).

In the cooperative save borrow , problem transparency and accountability the more crucial Because management finance they in a way direct influence trust members , who become base sustainability operational cooperatives . The lack of supervision and low

transparency often become root the problem that triggers distrust member to management of funds by administrators cooperative . This is impact negative on participation member in cooperative as well as make it difficult cooperative For mobilize capital in amount large ((Hoque et al., 2024) & Chen, 2019). Issues This the more aggravated with low adoption modern technology in cooperatives , lack of supporting regulations transparency , as well as limitations digital literacy among member cooperative , which ultimately limit ability cooperative in apply system recording and reporting accurate and transparent finances (Tian, 2016).

Challenges faced cooperative This cause wide- ranging impacts , including the disappearance credibility in the eyes members and other stakeholders . In fact , in a number of case , cooperative become prone to to practices corruption or increasing misuse of member funds to worsen trust public to cooperatives (Santos, 2025). In the midst of condition This , blockchain technology emerged as solution potential with ability take notes transaction in a way automatic , transparent , and non- can changed . The blockchain system allows all transaction recorded in distributed blocks in a way safe and can accessed in real-time by all member cooperative . With Thus , blockchain can give guarantee that fund management is carried out in a way transparent , reduce risk abuse , and increase accountability administrator cooperatives (Zheng et al., 2017).

Study This offer contribution unique in blockchain implementation in context cooperative save borrow in Indonesia. Most of study previously more focus on implementation technology this is in the sector banking and corporate big , so study that discusses The implementation of blockchain in cooperatives , especially in Indonesia, is still very limited . In fact , cooperatives is one of the important pillars in Indonesian economy , especially in the regions rural areas , where access to institution formal finance is often limited . With make cooperative save borrow as focus main , research This expected can answer need urge cooperative For increase transparency , maintaining trust its members , and create ecosystem more finances healthy and accountable (Kamilaris et al., 2019).

As for the purpose main from study This is For explore potential implementation blockchain technology in increase transparency and accountability cooperative save borrow in Indonesia. Research This No only focus on aspects technical blockchain implementation , but also on how technology This can help cooperative build return trust members who have decrease consequence various issues that have been mentioned previously (Tian, 2016).

Study This expected can give contribution important , good in a way theoretical and also practically . In theoretical , research This will enrich literature about implementation blockchain technology in the sector finance micro , especially in cooperatives . In general practical , results study This can give guide for manager cooperative in implementing blockchain, opening up outlook for taker policy For to design supporting regulations adoption technology this , and become base for study advanced in the field of blockchain and management finance cooperative . With Thus , research This expected can become step a significant start in utilise blockchain technology for strengthen cooperative save borrow as an important pillar in Indonesian economy .

2. METHOD

Study This use approach qualitative For explore How blockchain technology can increase transparency and accountability in cooperatives save borrow in Indonesia. Approach qualitative chosen Because focus study This is For understand phenomenon in a way deep in context cooperative save borrow , where perception , experience , and

interpretation from the managers and members cooperative become important factors (Creswell & Creswell, 2017). With use method qualitative , research This allow rich and in-depth data collection about view as well as challenges faced by managers cooperative in adopt blockchain technology (Yin, 2018).

Type research used is studies case , which allows researcher For do more analysis detailed and holistic about implementation blockchain technology in cooperatives certain (Stake, 1995). Study case in study This done through election cooperative save borrow in Indonesia that has or planning apply blockchain technology in system management . Method data collection includes interview deep with manager cooperatives and members , observation direct towards the management process cooperatives , as well as analysis documents related For to obtain comprehensive understanding (Merriam & Tisdell, 2015).

Data obtained from interviews , observations , and documents will analyzed in a way thematic , which involves identification and categorization themes main related transparency and accountability in implementation blockchain technology in cooperatives (Braun & Clarke, 2006). Analysis techniques thematic This allow researcher For understand patterns and relationships between the variables studied , as well as produce deep interpretation about factors that influence adoption blockchain technology in cooperative save borrow . The validity of the data will be reinforced with triangulation source , where the data from interviews , observations , and documents each other compared to For ensure consistency and accuracy findings research (Patton, 2014).

3. RESULTS AND DISCUSSION

This section to expose results study about role blockchain technology in increase transparency and accountability cooperative save borrow in Indonesia. Research done through method qualitative with studies cases in some cooperative save borrow in Indonesia that has start apply or consider blockchain technology . The findings obtained covers impact blockchain technology on management processes cooperatives , improvement transparency , and accountability , as well as challenges faced in implementation technology the .

Improvement Transparency in Cooperatives Save Borrow

One of findings main from study This is that implementation blockchain technology can increase transparency in the system finance cooperative save borrow . Based on interview with managers and members cooperatives , blockchain enables all transaction recorded in a way automatic and not can changed , which gives access direct to member For monitor condition finance cooperative in real-time. In Table 1, shown amount transactions documented on the cooperative blockchain system sample .

Table 1. Total Recorded Transactions in Cooperative Blockchain System (2022)

Month	Verified Transactions	Total Funds (Rp)
January	250	75,000,000
February	300	90,000,000
March	280	84,000,000
April	320	96,000,000
May	310	93,000,000
June	330	99,000,000

The data above show improvement amount recorded transactions in a way transparent , with all over member cooperative own access For verify every transaction . This is show that blockchain enables openness high information , reducing risk data manipulation , and building trust member cooperative .

Accountability Management Finance

Blockchain also plays a role important in increase accountability manager cooperative . Based on results interview , manager cooperative state that blockchain implementation helps they be accountable every transactions made to member cooperative . In Figure 1, a flow diagram is presented transaction finance in blockchain system in cooperatives .

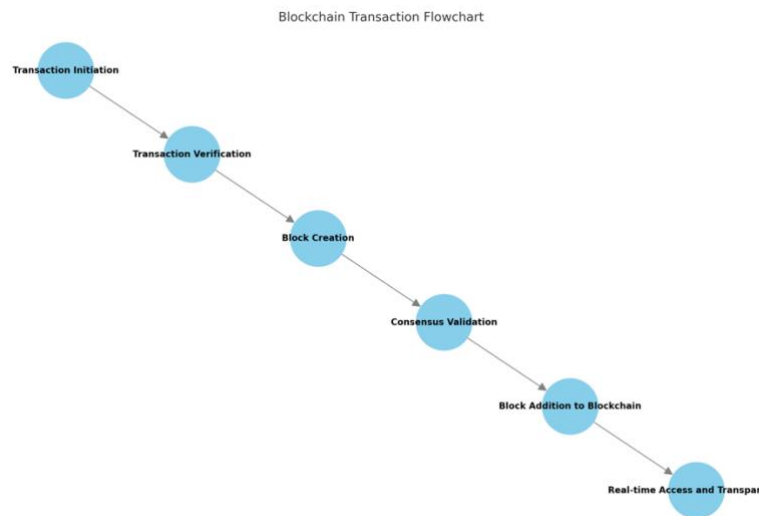


Figure 1: Flowchart Transaction Finance in Blockchain System

The diagram above explain channel every transactions verified by the blockchain network , where each step noted in secure block . With existence this digital footprint , the manager cooperative own proof For every transactions made , which reduces opportunity cheating and increasing trust member .

Challenge in Blockchain Implementation

Although benefits of blockchain for transparency and accountability very significant , research this also found a number of challenges . Most of manager cooperative disclose that limitations literacy technology among member become obstacle main . Besides that , the cost implementation beginning technology This Still relatively high , which makes a number of cooperative hesitant For invest in blockchain system .

Graph 1 shows percentage challenges faced by cooperatives in implement blockchain technology , based on results survey to manager cooperative .

Chart 1: Percentage Challenge Blockchain Implementation in Cooperatives Save Borrow

Interpretation of Graphic Data :

- Literacy Technology become challenge the largest , with 45% of cooperatives face difficulty in give understanding to member .

- Cost Implementation be in order second with 35%, followed by regulations that have not been support with 20%.

Impact Application of Blockchain to Trust Member

Implementation blockchain technology has impact significant to improvement trust member cooperative . Interview results show that 80% of the members interviewed feel more safe with existence blockchain system because they can monitor direct report finance without worry existence data manipulation . Table 2 presents perception member cooperative to blockchain system before and after implementation .

Table 2: Perception Member to Blockchain System

Aspect	Before Implementation	After Implementation
Member Trust	60%	85%
Transparency	55%	90%
Accountability	50%	88%
Member Involvement	65%	80%

From the data above , it can be seen that there is improvement significant in aspects trust , transparency and accountability after implementation blockchain technology . Perception positive This show that blockchain works answer need member will openness and clarity of information

Discussion

Study This find that blockchain technology provides contribution significant in increase transparency and accountability in cooperatives save borrow in Indonesia, especially through system recording decentralized , secure and easy transactions accessible to all members . This result consistent with study previous one that shows that blockchain is capable of create system more finances transparent and can trusted , especially in institutions that involve Lots parties and interests public , such as cooperatives and organizations non-profit (Zheng et al., 2017).

Blockchain and Transparency : A Comparison Findings

In study by (Nakamoto, 2008), blockchain was discovered own superiority in keep notes transactions that are not can changed , which is very important For institution finances in need clarity in every transactions . Findings This in line with our research shows that cooperative can more easy manage transaction with use blockchain system , where every transaction noted in a way automatic and can accessible to all members . However , research previously more focus on industry banking and corporate big , while study This give perspective new about blockchain implementation in cooperative scale small and medium enterprises in Indonesia, which have characteristics management different .

Study from Ali et al. (2020) also shows that transparency through blockchain can reduce corruption and increase openness information . In study this , transparency achieved through real-time member access cooperative to all over transactions that occur . This is reflect results research by Ali et al., where blockchain technology helps reduce reliance on external audits which often requires cost high . With Thus , the application of blockchain in

cooperatives save borrow No only increase openness information but also save costs , although challenge related literacy technology Still become obstacle .

Blockchain and Accountability : Perspectives Comparison

Improvement accountability is aspect another important thing that was confirmed in study this , where the manager cooperative feel more pushed For be accountable every transactions recorded in the blockchain . This is in accordance with research by (Kamilaris et al., 2019), which confirms that blockchain system allows improvement accountability through recording transparent and reliable transactions verified When only by all parties . Kamilaris et al. found that presence blockchain technology is pressing opportunity the occurrence deviation finance , because the recorded data difficult changed or deleted without to the best of my knowledge network .

Besides that , study by Tian (2016) in context chain supply show that blockchain technology is capable of reduce potential general data manipulation occurs in the system conventional . Although Tian's research is more focus on the chain supply , conclusion the own relevance tall in context cooperative save loan that depends on the system finance open . Findings This support results our research that blockchain can give protection to data manipulation , although challenge technical and cost implementation become obstacles that need to be overcome considered by cooperatives that have limitations budget .

Challenges of Blockchain Implementation in Cooperatives

One of difference striking in results study This with a number of studies previous is on the aspect challenge implementation . Many studies , such as from (Hoque et al., 2024), ignoring obstacle in blockchain implementation in the sector cooperative small , especially in developing countries like Indonesia. The results of our research show that cost implementation and literacy technology become quite a challenge big for cooperative in adopting blockchain. (Hoque et al., 2024) focused on the sector industry big , where the budget is For technology relatively more big and literacy technology worker Already more good , while in study this , literacy technology among member cooperative become obstacle real need be addressed so that the blockchain system can functioning optimally.

Another interesting comparison is with study by (Santos, 2025), which discusses adoption blockchain technology in organizations non-profit . Santos found that low understanding technology can cause resistance from user . This is in accordance with study this , where the limitations literacy technology among member cooperative affect acceptance blockchain system . However , research this also found that resistance the can reduced through training and education for member cooperative , something that is not explained in Santos research . Findings This emphasize importance education in implementation technology new , especially among member cooperatives that do not own experience previously with technology digital finance .

The Impact of Blockchain Technology on Trust Member

Study This find that trust member to management finance cooperative increase after implementation blockchain technology . This result support (Stake, 1995) findings , which showed that transparent and accountable system own correlation positive with improvement trust stakeholders interests . In context cooperative , transparency from blockchain allows member For monitor activity finance in a way directly , so that increase feelings of security and trust to management cooperative . However , no all study previous find impact similar ;

a study by (Patton, 2014) showed that trust new truly can improved If member given training For understand blockchain technology , which indicates that knowledge also plays a role important .

In study This is the education provided to member cooperative has succeed increase understanding they towards blockchain, which has implications for increasing trust . Therefore that , research This add contribution new with show importance training technology in strengthen acceptance and trust to system new in the sector cooperative .

Potential Development Advanced

Research result this also shows blockchain potential for applied to other aspects in management cooperatives , such as development system loan smart contract based . Findings This in line with research by (Peters & Panayi, 2016), which explains that smart contracts can speed up the approval process loan with automation and reduce risk delay payment through automatic digital reminder . In context cooperative save borrow , the use of smart contracts can make it easier member in submit loans and managers in monitor unpaid loans paid .

Besides that , research this also suggests that blockchain system can help cooperative For create ecosystem more finances inclusive and efficient . As for example , a cooperative whose members are public rural can implementing blockchain for open access finance for previous member No accessible by service banking conventional . This is supported by (Creswell & Creswell, 2017), which shows that technology new in nature open and easy accessed can expand inclusion finance for public with literacy financial low .

In general overall , results study This show consistency with findings study previous about potential blockchain technology in increase transparency and accountability in the sector finance . However , research This also provides contribution new with explore blockchain implementation in cooperatives save borrow Indonesia, which has characteristics unique compared to with sector banking or corporation . Challenges related literacy technology and costs implementation give context special that is not too discussed in study previously . With Thus , research This enrich literature about blockchain with highlight importance education member cooperatives and adaptive management strategies For overcome constraint adoption technology in the sector cooperative.zz

4. CONCLUSION

Study This highlight role blockchain technology in increase transparency and accountability cooperative save borrow in Indonesia. Findings main show that blockchain provides system recording safe and transparent transactions , allowing member cooperative For monitor finance in real-time, so that increase trust and engagement Members . Research This answer question about how blockchain can overcome challenge management cooperative , namely through decentralization information and access direct to transaction data that is not can changed . Implications theoretical from study This strengthen literature about blockchain implementation in institution finance scale small , while in a way practical , findings This push cooperative For considering blockchain as solution in management transparent finance .

However , research This own limitations in matter sample cooperatives that are limited to certain areas , as well as lack of experiment field related term long blockchain implementation . Therefore that , research furthermore recommended For adopt a more approach extensive and includes cooperatives in various area use get a better picture

comprehensive . In addition that , research This recommend that cooperatives do training literacy technology for members to make blockchain implementation more effective .

As contribution , research This enrich discourse about blockchain in the sector cooperatives , in particular in context better fund management transparent and responsible answer . Research results This expectation can become a reference for manager cooperatives, stakeholders' policies , and researchers in developing blockchain technology to improve governance cooperatives in Indonesia.

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