

ARE COOPERATIVES READY FOR THE DIGITALIZATION OF SMALLHOLDER PALM OIL PLANTATIONS? ANALYSIS OF FARMER'S PARTICIPATION IN DIGITALIZATION OF A VILLAGE COOPERATIVE UNIT

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ABSTRACT

The cooperative behavior of palm-oil smallholders at Village Cooperative Organization (VCU) as participation is the primary perspective to examine the implementation of digitalization institutions by evolving the normative and cultural-cognitive pillars. Feedback from the organization, such as incentives and sanctions, becomes prominent as a context for members' attitudes and identity formation in the middle of a values exchange with the VCU's principles, such as market-oriented, memberships fees, annual business meetings, *sharia*, and solidarity bonds. This study observed how the organizational feedback renders cooperative behavior of members through *Group Engagement Model* in fortifying the digital readiness of palm oil smallholders at VCU. The surveys were conducted in August-September 2021 at 46 VCU's members in Riau Province. The data analysis technique applied was descriptive, correlation, and causality. Members' cooperative behavior as participation in digitalization correlated with their general attitudes toward the organization. Social identity was the factor that elevated the digitalization institutions at VCU, which correlated with members' general attitudes and was affected by the fairness perception of the VCU's performance. This finding verified that the organization's feedback could invoke the emergence of social identity and attitudes as the principles of reorganizing for the digitalization transformation of palm oil smallholders in VCU.

Key words: cooperative behavior, digitalization, identity, palm-oil smallholders, village cooperative unit

INTRODUCTION

Revolution 4.0 is interpreted as a transformation towards process improvement by integrating production lines and the cyber world, where all production processes go online through an internet connection as the primary support. Three instruments to prepare for digital transformation have been critically reviewed: the form of digital organization, the infrastructure of digital institutions, and digital institutional building blocks (Hinings et al. 2018). The digital economy is a sharing economy with the ability to boost many small and medium enterprises to enter the world of business. The wave of the digital economy is inclusive, comes with a sloping topography, and spreads equal opportunity. This characteristic has a competitive concept that becomes the industry spirit that is easily raised by startup players who focus on collaboration and synergy.

The palm oil plantation is the prime sector in Indonesia which cannot be separated from the effect of the rapid development of digitalization. Economic development in Indonesia, particularly in the palm oil subsector, is highly supported by the increasing productivity achievement, mainly due to the role of smallholder palm oil farmers. Crude Palm Oil (CPO) production from smallholder farmers is 15.5 million tons, 27 million tons from the large scale private-owned plantation, and 2.3 million tons from the large scale state-owned plantation (National Statistics Bureau 2020)

Palm oil digitalization includes efforts to meet the needs for information and capacity building for palm oil farmers related to palm oil production and marketing. The data reveal that the number of internet users in Indonesia increased in 2020 to 196,7 million and 171 million in 2019 (Ministry of Communication and Information Technology 2020). The power of digital institutionalization to digitize work processes with a digital basis will eventually strengthen institutions to digital transformation (Savic 2019). Digitalization institution in smallholders' palm oil plantation is still growing as an innovation to contribute to the productivity of smallholder palm oil plantations through the Farmer Group Association or Village Cooperative Unit (VCU). Even though it affects changes in members' digital culture, such as farmers accessing information about fresh fruit bunch (FFB) prices, it is not yet related fully to the input and production aspect (Falatehan et al. 2020; Falatehan et al. 2021).

This background leads this study to strengthen the normative and cultural-cognitive pillars of digitalization institutions in local organizations. Three pillars of institutions are: (1) the regulative, (2) normative, and (3) cultural-cognitive (Scott 2013). The less functionality of regulative pillars was found when VCU launched a digital program at the VCU's Annual Meeting. Still, it can not dispose of every member involved in the digitalization institution of the VCU (Falatehan *et al.* 2020). This study challenges the readiness of the VCU to provide the normative and cultural-cognitive pillars of digitalization institutions. Farmers identified less digital culture than the other groups and built the digital divide in rural areas (Mazya 2022).

Improvement in these pillars of digitalization institutions may be extended with a cooperative behavior perspective. It is member attitude and behavior underneath the readiness to participate in digitalization in the palm oil business at VCU management. Attitude, as favorable to an object that can predict a consistency with behavior when a social context permits an individual to express it (Branscombe and Baron 2017). Attitudes among VCU members exist in the middle of social exchange and interactions with other members and are influenced by the VCU's performance. A more favorable attitude of members to VCU performance is assumed to lead a proper cooperative behavior which reflects a behavioral intention to be involved in the VCU's digitalization.

The predicted factor that evolve in the cooperative behavior of members in VCU, which is influenced by feedback from organization namely incentives and sanction, in responding to the digitalization of palm oil smallholders is social identity. Social identity is one predictors of collective action at the group and individual levels (van Zomeren *et al.* 2008). Cooperative behavior in the organization would pursue mandatory and discretionary behavior from their members (Tyler and Blader 2003). *The Group Engagement Model* proposes that people will engage in the organization if they maintain their favorable identity, which is underneath by fairness perception (Tyler and Blader 2003).

Fairness perception becomes the issue of digitalization at VCU because member participation needs to challenge the feedback from the organization where integrate socio-economic benefits, membership fees, business rewards annually, risk-seeking, and also maintaining collective solidarity, namely *kebersamaan*, to gain collective welfare. Fairness is an essential part of *The Group Engagement Model* states that identity formation is based on resource/distributive and procedural assessment and will lead to an attitude to VCU and finally lead the cooperative group behavior, especially digital

participation. The integrated model of fairness contributed to satisfaction in Indonesia's context built from distributive, procedural, and interactional fairness (Faturachman 2002; Tyler 1994).

This study sought to investigate smallholder palm oil farmer's participation in digitalization in VCU and its correlation with a general attitude toward VCUs' performance; identify the correlation between the general attitude of farmers to VCUs and social identity as a form of feedback from an organization; and determine the role of perception of fairness in the social identity.

METHODOLOGY

Location and time. This study was conducted in one VCU at Dayun Subdistrict, Siak Regency, Riau Province, from August to September 2021. This cooperative was selected as the model at the national level for palm oil smallholders, which changed its management system to Sharia in 2019.

Types of data. The data used in this study are primary data from several variables in a group through interviews and questionnaires. Several active members were mostly palm oil farmers. In total, the number of VCU's active members consisted of 100 members with ordinary status and 50 with extraordinary status. Membership system of the cooperative is based on the Law of The Republic of Indonesia number 25 of 1992. Based on this law, cooperative member's statuses are categorized into ordinary and extraordinary. Extraordinary members are people who want to receive services and become members of the Cooperative but do not fully meet the requirements as stipulated in the Articles of Association. They could become the member without paying for collateral or principal contribution. Extraordinary members did not have both principal and mandatory savings. The determination of respondents was proposed by applying the procedure of snowball sampling to 46 people from the cluster of ordinary status and extraordinary status, thus resulting in 26 and 20 respondents, respectively.

Research instrument. Four sets of questions were used to examine the behavior of the member: their participation in the last five years, social identity, attitude, and assessment of fairness concerning cooperative management during the period. Answer options used in cooperative behavior as part of the participation of mandatory and non-mandatory activities in the organization were Yes and No. Moreover, answer options for social identity, attitude, and fairness assessment were expressed on the Likert scale using six scales, including: strongly disagree, disagree, slightly disagree, slightly agree, agree, and strongly agree. The analysis method used was descriptive analysis using means and percentages. In contrast, mediation analysis on variables tested in this study was a correlation technique with Pearson and mediation analysis with an indirect effect.

Participation in VCU. General participation was constructed to operationalize cooperative behavior. In total, there were eight items used to measure participative behavior, such as saving for replanting program, sales of FFB, agricultural production facility, annual meeting, paying for a voluntary contribution, savings and loans, purchase of basic needs in cooperative store, and the digital participation (use of Sharia cooperative mobile application/social media namely *Whatsapp group*).

Attitude towards VCU performance. The questionnaire on attitude consisted of 19 statements covering cognitive, affective, and conative components. One of the reference tools for analysis to question assessment about cooperative performance is the Development Ladder Assessment which includes the dimension of vision, capacity, resource, and network (Firdaus and Baga 2019). Organizational performance should also measure the dimensions of behavior towards an organization, including existence, process, and result accepted by members because of organizational membership.

One of the dimensions of attitude and behavioral measurement is the extent of dimension to be measured from the behavior object (Azwar 2016; Sax 1980). The entail of digitalization in attitude measurement to cooperative behavior was extended through 27 items from 8 dimensions of cooperative

performance, namely (1) Program; (2) Accessibility; (3) Facilitation provided by cooperative management to fulfill the needs of the member; (4) Social relation in program services; (5) Benefit from participating in the VCU; (6) Digital performance; (7) Memberships financial obligation; and (8) Managerial capacity of VCU's management.

Social identity. This study used the identification of members to VCU with an organization to explore a social identity.

Perception of fairness. There are four items used to measure the evaluation of fairness which contain procedural (2 items), distributive (1 item), and interactional (1 item) fairness assessment. In the field context, the fairness aspect was investigated by profit sharing according to the contribution, organizational controls to propose an activity, and relational response when members experienced problems.

Data analysis. The statistical analysis techniques were applied to deliver the aims of this study. The Spearman rank correlation was used to identify the correlation between general attitudes toward organizations and participation in digitalization. The correlation between social identity and attitude to VCUs was analyzed using a Pearson Product-Moment. In contrast, regression analysis was used to identify the influence of the perception of fairness on social identity.

RESULTS AND DISCUSSION

Based on the membership status, respondents were Ordinary (56%) and Extraordinary (44%). The data presented characteristics of respondents according to their status and gender, the length of membership in Village Cooperative, and age (Table 1). The length of membership consisted of less than 20 years (52%) and more than 20 years (48%). It is seen from the data that female respondents from the age group of less than 40 years old have extraordinary status.

Table 1. Distribution of the number of respondents (%) according to length of membership in village cooperative, age group, gender, and membership status in VCU

Length of Membership	Age Group	Gender	Membership Status				Grand	
			Ordinary		Extraordinary		Total	
			N	%	N	%	n	%
Less than 20 years	Less than 40 years old	Male	3	50.0	3	50.0	6	100
		Female	1	9.1	10	90.9	11	100
	More or equal 40 years old	Male	1	33.3	2	66.7	3	100
		Female	1	25.0	3	75.0	4	100
	Total		6	25.0	18	75.0	24	100
More than 20 years	More than 40 years old	Male	15	100	0	0.0	15	100
		Female	5	71.4	2	28.6	7	100
	Total		20	56.5	2	43.5	22	100

The Group Engagement Model describes the cooperative behavior of members in an organization, namely participation in VCU's program (Table 2). Almost 90% of respondents participated in cooperative activities of replanting saving, agricultural production facility, sales of the FFB, savings, and loans. Several members, engaged since VCU was established in 1990, were affluent today which affected their involvement in the organization to attain an extraordinary status.

Two activities wherein members are less involved are digital participation and purchasing basic needs. VCU's readiness for its digitalization institutions becomes an issue based on the digital participation of its members.

However, only 70% of members used VCU mobile applications or WhatsApp social media. Benefits from VCU's digital participation are (1) Receiving information about FFB prices from VCU or the farmer group leader via the *Whatsapp* group; (2) Using the features of the VCU Sharia mobile application to transfer money to all state banks, top-up balance from provider and electricity, saving, and fertilizer information.

Table 2. The number of respondents by participated in the VCU

Activity	Total	%
Replanting saving	43	93
Agricultural production facility	44	96
Sale of the FFB	42	91
Savings and loans	44	96
Depositing voluntary deposits	42	91
Purchasing basic needs	32	70
The use of digitalization	32	70

Even though digitalization provided several benefits, such as simple to download, ease of business processes, extending networks, providing alternatives to fulfill needs, and less time consumed, some members with ordinary status did not participate in digitalization at VCU. They have adequate literacy about digital services from the organization. It is ubiquitous in cooperative members who are more than 40 years old. Farmers' young children usually helped their parents to engage in digitalization. In addition, many respondents of extraordinary status who were young (less than 40 years old and less than 20 years of membership at VCU) used the VCU mobile application for saving programs. They are near to the millennial generation who can be a potential digital user to support digitalization institutions at VCU through normative and cultural-cognitive pillars. Institutions pillars are interrelated and underpinned by regulative, normative, and cultural-cognitive (Scott 2013). The VCU's digitalization could be supported by the tendency of their extraordinary member schema and the group's operation standards, allowing an intensified usage of the VCU social media and mobile application. It is a practice in the middle of the formal launching of digitalization services at VCU. A similar concern is also found in organic and healthy paddy institutions, such as organizing the fertilizer and pesticide through cooperatives, farmers groups, work-labor, harvest, and post-harvest, which is not ultimately built from the cultural-cognitive pillar (Indriana et al. 2012).

The primary factor causing this slow response in digital behavior, where the normative and cultural-cognitive pillars of digitalization institutions at VCU are weak, is that the infrastructure of digital institutions, especially signal, is sometimes in poor strength. To support the readiness of VCU's digitalization, digital infrastructure is needed as it is the instrument of digital transformation (Hinings et al. 2018). With adequate robust signal, more members will be using and fulfilling their needs in plantation and household by VCU digitalization system.

The disruption of the fiber-optic installations causes a digital inequality which can be seen in rural areas than the city and in farmers and fishers groups than in other professions (Mazyra 2022). Without supportive infrastructure, digitalization will become immutable. Government and non-government could deliver digital infrastructure to avoid digital inequality (Dimaggio and Hargittai, 2001) between farmers and non-farmers.

There was a correlation between VCU's participation in digitalization and member's general attitude to VCU performance ($r=0.453$, $p=0.00$). The members with a higher degree attitude correlated with their involvement in digitalization. It implied that the respondent's who have a positive attitude toward various aspects of VCU performance, such as the Cooperative Program and the benefits of participating in the VCU, will tend to participate in digitalization, using the mobile application, or joining the VCU's social media.

The attitude toward VCU could predict a respondent's cooperative behavior in an organization. The respondents had favorable general attitudes to VCU's performance ($M=4.89$; $SD=0.53$). Respondents positively assessed VCU's performance for every dimension (Table 3). Three dimensions, (1) Cooperative Program, (2) Benefit from participating in cooperative, and (3) Managerial capacity of VCU's management scored less than 5 as a moderate category. The other two dimensions obtained beyond the score of 5 were Accessibility ($M=5.39$; $SD=0.54$) and Social Relation in cooperative program services ($M=5.11$; $SD=0.55$).

Respondents positively assessed that the program at VCU was attractive and satisfied its members. The program was considered adaptive to the current situation that changed, such as the Palm oil Replanting program that respondents mostly participated in. Respondents believed that the program was able to answer the problem of palm oil aging frequently faced by respondents. This Program was regarded as the best option and even exceeded the ability of other institutions related to economic programs for respondent welfare. However, the VCU program was considered to only slightly improve the capacity of participants for the last five years. This situation was different from that the Village Cooperative had established, where it functioned as the instrument to accommodate the needs of transmigrant respondents. The VCU usually prepared various skill development programs to create plasma farmers for the state-owned plantation enterprise. VCU was also considered to reasonably provide benefits for respondents through a sense of security due to the Sharia principle applied.

Table 3. Mean of respondents' attitude towards VCU

Dimension	Min.	Max.	Mean	Std. Dev.
Cooperative program	3.00	6.00	4.92	0.58
Cooperative accessibility	4.00	6.00	5.39	0.54
Facilitation provided by cooperative management to fulfill the needs of members	3.00	6.00	4.87	0.66
Social relation in program services	3.00	6.00	5.11	0.55
Benefit from participating in the cooperative	3.00	6.00	4.90	0.67
Digital performance	2.30	6.00	4.87	0.78
Memberships financial obligation	3.00	6.00	4.78	0.62
The managerial capacity of VCU's management	3.33	6.00	4.94	0.55
Total	3.33	5.89	4.89	0.53

The two most robust positive degree dimensions in cooperative program services were accessibility ($M=5.39$; $SD=0.54$) and social relation ($M=5.11$; $SD=0.55$). Concerning accessibility, respondents considered that VCU, which had moved to other locations, was quite strategic. This positive assessment could relate to the more vigorous intensity of respondents in accessing village cooperative services. In terms of relations, it was observed that respondents experienced convenient service, friendly, and excellent quality of relations provided by VCU's management. Further, this triggered positive emotions in respondents to connect to VCU.

Even though respondents could not feel discomfort since they were not ambivalent because the overall components were favorable (Fabrigar and Wegener, 2010), the three dimensions are categorized with the lowest degree. There are digital performance ($M=4.87$; $SD=0.78$), financial obligation ($M=4.78$; $SD=0.63$), and facilitation provided by cooperative management to fulfill members' needs ($M=4.87$; $SD=0.66$). The digital performance attitude of several respondents is favorable due to ease in downloading from the play store on their smartphone, the performance of FFB price information, multi-payment, transfer, saving, and fertilizer through mobile applications and Whatsapp groups. But several members thought that VCU should be modified by adding the receiving money feature and building a tower to provide access to a better signal. A recent feature provided in the mobile application is to transfer money only and this can only be done in an area in the village with good connectivity.

Financial obligations recently seen by members was not accessible to them. Even though this is an instrument for their access to VCU's system, they did not negatively evaluate this obligation. It is in line with economic crises that come from palm oil replanting programs where they can not afford many daily needs or savings. Facilitation provided by cooperative management was believed accommodate members' needs. The management's responsiveness can be seen by providing a space for respondents to express their opinion in yearly VCU meetings. But many members did not share a similar opinion since they have different interests from the dominant VCU related to the replanting program. It causes an unstable situation in VCU where many members change their memberships to become extraordinary or tend to exit from VCU.

The general attitude toward VCUs as cooperative behavior needs to be put in its social system as a local economy unit for smallholders. This vision will pursue an impact on normative and cultural-cognitive pillars of digitalization institutions. On one side, VCU is a place for smallholders to find a profit based on palm oil plantations as their business and build a social exchange of resources between them. On the other side, historically, their social identity as early transmigrants has high cohesivity and solidarity. Their attitude to VCU performance could be affected by social identity. Data confirmed a significant correlation between general attitude toward VCUs and social identity ($r=0,409$; $p=0.00$). The more robust member's social identification with VCU will provide them to engage a favorable attitude toward VCU.

In line with that, a social identity influenced by the perception of fairness is 17.7% ($p=0.00$). It means that fairness evaluation of VCU performances will construct the robustness of the social identity of respondents toward VCU. When fairness perception of VCU performance is increased by 1 degree, members' social identity will be more robust by 0,49. The Group Engagement Model covers the importance of social identity, which states that feedback from the organization, such as incentives and sanctions, will influence attitude and cooperative behavior (Tyler and Blader 2003). This study confirmed that a group is a context where the digitalization institutions in VCU are thriving and indirectly affected by fairness perception in members about VCU performance. Fair assessment by respondents, based on resources and procedures implemented at VCU, can provide them with a robust identification of VCU.

The fairness perception of respondents showed that distributive fairness was the lowest (M=4.82; SD=0.84); compared to procedural (M=5.00; SD=0.60) and interactional fairness (M=4.93; SD=0.69). The procedural fairness VCU's management, such as the replanting program and saving, is assessed as fair when implemented for their members. Interactional fairness appeared when VCU's management provided facilitative communication when respondents faced problems, for example, existing consultation related to palm oil replanting. It is consistent with earlier findings that found interactional fairness is significant in the fairness model in Indonesia (Faturochman 2002). It has shifted from collectivity issue in farmers to individuals (Riley et al. 2018). The respondents saw that the equity approach was not straightforward for them to accept in distributive fairness. This situation primarily existed when they could not access VCU's program, which will not provide them with many rewards. This result is related to a respondent's attitude about financial obligation as a VCU ordinary memberships, which is the least favorable among the other dimension of VCU's performance. Many members thought of modifying the reward system based on equality. Distributive fairness, according to Adams equity rules (1963) in Lind and Tyler (1988), is the outcome that could be based on proportional to contribution (equity), norms of equality obtained by individuals, and based on need.

Based on these findings, we can conclude that farmers' digital participation will enhance the readiness of digitalization institutions at VCU, especially through the normative and cultural-cognitive pillars. It can be drawn that members' involvement in digitalization, as a part of cooperative behavior, is correlated with their general attitude to VCU. The issue is that the general attitude to VCU correlates with social identity, while social identity is significantly predicted by fairness perception (modified to distributive, procedural, and interactional). VCU members who think fairness is practiced at the VCU will have a strong identity connection with VCU. It will indirectly stimulate a broader context in their decision-making to either participate or not in VCU digitalization as cooperative behavior through their attitude to VCU. Overall description of our findings to identify a farmer's participation in digitalization in VCU based on the *Group Engagement Model* can be seen in Fig. 1.

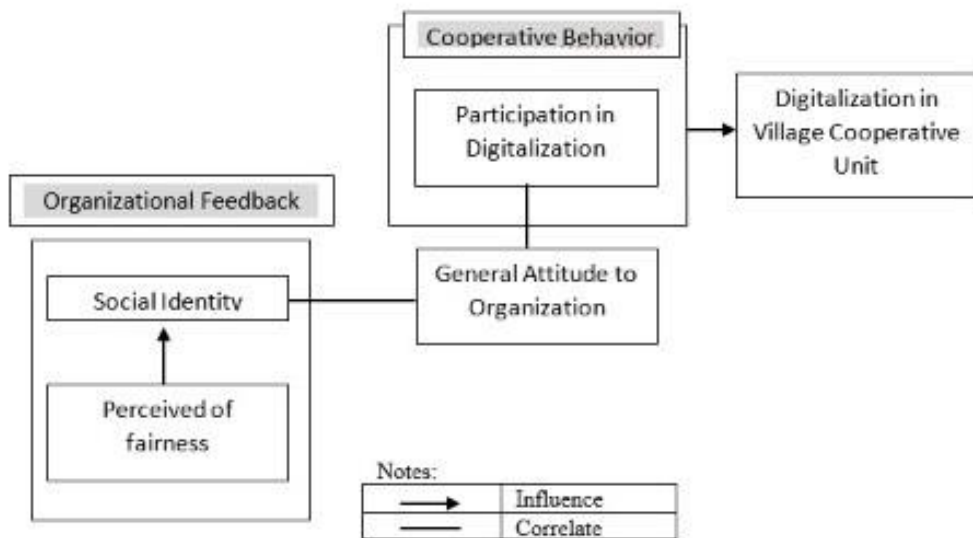


Fig. 1. Farmer's participation in digitalization at VCU

CONCLUSION AND RECOMMENDATIONS

This study constructed the role of farmers' cooperative behavior in an agricultural organization, VCU, to enhance digitalization institutions in palm-oil smallholders. The cooperative behavior perspective highlights the members' participation in support of digitalization at VCU. Around 70% of members participate in digitalization, such as using VCU mobile applications or WhatsApp social media related to FFB prices from VCU and economic transactions. It identified that VCU members' general attitudes to VCU performance were significantly correlated with participation in digitalization. It instills that VCU's performance should be reorganized in a more suitable process to build a more positive attitude for members.

The *Group Engagement Model* is feasible in this study to describe how organizational feedback could influence members engagement through social identity construction. Social identity significantly correlates with members' general attitudes toward many aspects of VCU's performance. The social identity of VCU's members is impacted by their perception of fairness in VCU's performance. Concerning VCU's member's attitudes, participation, social identity, and fairness perception will generate more supportive normative and cultural-cognitive pillars in digitalization institutions at VCU.

If VCU or other stakeholders take no action to increase digital culture or digital literacies, palm oil smallholders will be eroded since they fail to gain value-added from digitalization. Government and non-government stakeholders could take part in delivering digital infrastructure to avoid digital inequality between farmers and non-farmers, including digitalization in production areas.

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