

# Supplier Development Program Through Knowledge Sharing Effectiveness: A Mentorship Approach

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**ABSTRACT** The market in which firms compete magnifies the need for buying firms to effectively manage and develop their supply chain. One of the important notions in the management and development of the supply chain is the implementation of supplier development program. Previous extensive literature review has identified various types of activity in the supplier development program, which categorized as low involvement activity to high involvement activity. Further, extensive literatures on supplier development program implementation and its implication on supplier's capability are also available. However, there is still limited empirical research for investigating the determinants of knowledge sharing effectiveness in supplier development programs. Aimed at bridging that gap, this study attempts to investigating the role of supplier's organizational culture, information and communication technology (ICT), and perceived behavioral control as the determinants of knowledge sharing effectiveness by mentorship in the supplier development program (SD). A survey questionnaire was employed to collect data from 200 suppliers after conducting mentorship training at the suppliers' site. The data were analyzed using bootstrap resampling method (with 5,000 resamples). The bootstrap samples are used to estimate the Partial Least Square (PLS) path model. The results of path analysis indicated that all variables are significantly associated with knowledge sharing effectiveness with mentoring mechanism (p-values < 0.05) except collaborative culture to knowledge sharing effectiveness which was insignificant. It was also observed that ICT and perceived behavioral control affected the effectiveness of knowledge sharing by mentorship in the SD program.

**INDEX TERMS** Supplier development, knowledge sharing, mentorship.

## I. INTRODUCTION

One of the important notions in the management and development of the supply chain is the implementation of supplier development program [33]. Supplier development programs have been defined as any effort by an industrial buying firm to improve the performance or capabilities of their suppliers [8]. As the strategic effort of the firms, various types of activities in the supplier development program are available [37]. Chen et.al. [29] found that all supplier development activities are heavily knowledge-based. Knowledge has been identified as the most strategically significant resource of a firm [42]. The fundamental role of an organization is to integrate various knowledge resource (Chen et.al., [29]). The concept of knowledge integration is subsumed in the

knowledge management ontology (Chen et.al., [29]) in which knowledge management is defined as structured activities aimed at improving an organization's capacity to acquire, share, and use knowledge in ways that enhance its survival and success [14]. Supply chain management (SCM) scholars recognizing the importance of knowledge as a strategic resource in supply chains (Chen et.al., [29]) it is because of intensive and efficient knowledge flows and knowledge sharing across organizations [45]. In a supply chain, information or knowledge flow is perceived to have a higher priority than product flow [7]. Therefore, the management of knowledge across inter-firm boundaries provides a primary significant source of competitive advantage in a supply chain (Chen et.al., [29]). The knowledge acquired through external relationships or networking is seen as more relevant to the development of new capabilities than internal knowledge interchanges [37]. The successful implementation of supplier

The associate editor coordinating the review of this manuscript and approving it for publication was Francisco J. Garcia-Penalvo<sup>1b</sup>.

development program as a platform of external mutually relationship between company and its supplier is highly depend on the quality of knowledge acquired through knowledge sharing activity [2], [10], [25], [33].

Knowledge sharing is defined as the behavior by which an individual voluntarily provides other members of the organization some kind of access to his or her knowledge and experiences (Ahkavan and Mehralian, [34]). Knowledge sharing in supplier development program is defined as a process where individuals of the company and its suppliers mutually exchange their implicit and explicit knowledge to create new knowledge [2], [3]. Arroyo-López *et al.* [37] defines explicit knowledge as the knowledge, which has been codified and expressed in formal language. On the other hand, tacit knowledge is harder to express, represent and communicate as it is intuitive, unarticulated and cannot be verbalized [32]. Previous works suggested that innovation is closely related to the concept of “knowledge creation” that is due to an important role of organizational knowledge not only in overall performance, but also in the competitiveness of an organization [18], [19], [47]. Knowledge sharing requires active-consultancy with colleagues to learn from their experiences. Sharing knowledge between companies and their suppliers allow the changing of traditional ideas about work styles and processes by providing new ideas, approaches, disciplines and cultures, thus constituting an organizational innovation [22]. Therefore, the effectiveness of knowledge sharing activities between company and its supplier is a critical endeavor to create the new invention in the supply chain.

Knowledge sharing effectiveness in the supplier development program is commonly defined as the extent to which knowledge sharing between companies and suppliers is beneficial in enhancing supplier capabilities [2]. Capability approach in supplier development attaches importance to making continuous improvement which becomes a key driven for invention and innovation [35]. Relevant literatures have identified several variables that determine knowledge sharing effectiveness in supplier development program. The first notable variable is organization culture. Cai *et al.* [44] found the impact of organization culture on the knowledge sharing behaviour in the individual level. Every firm has its own culture, which is shared and learned socially among its member [2]. This culture guides the members’ behaviour in dealing with external events [2]. Lee *et al.* [2] suggested positive impacts of organization culture on knowledge sharing activity in supplier development program. The second variable is information and communication technology (ICT) facilities, Hendriks [39] found that ICT facilities has important contributions in increasing motivation for knowledge sharing at the individual level. Moreover, ICT has a fundamental role in organization to integrate various knowledge resources (Chen *et al.*, [29], [35]). In supplier development program ICT is the key enabler to enhance knowledge flow between companies and their suppliers through improving access to knowledge and eliminating temporal and spatial obstacles among individuals [35], [39]. It is therefore suggested that tools and

technology that are perceived to be highly available and easy to use positively influence buyer’s and supplier’s perceived behavioral control towards knowledge sharing activity in the supplier development program [36]. The third variable that determines knowledge sharing effectiveness is the knowledge sharing mechanism itself [37]. Knowledge sharing activities involve transfer of knowledge, which requires the use of complex mechanisms [37]. Lee *et al.* [2] identified that mentorship mechanism can increase the effectiveness of knowledge sharing in supplier development program. This mentorship mechanism in knowledge sharing involves direct interaction between individuals as senders and recipients of knowledge. Individuals with more knowledge and skills directly share those knowledge and skills with individuals who have less knowledge and skills, both verbally and in practice [6]. According to [42], the effectiveness of knowledge sharing is highly dependent on how to communicate knowledge through verbal and direct practice means.

As presented in various studies, there are extensive literatures related to knowledge sharing in supplier development (Modi and Mabert, [2], [29], [35]–[37], [46]). However, these studies generally focus on the effectiveness of supplier development programs based on knowledge sharing in improving supplier performance and capability from the perspective of the companies or buyers. There is still limited research that specifically examines the factors influencing the effectiveness of knowledge sharing as an activity in which knowledge flows across the organization in supplier development program, particularly from the suppliers’ perspective. Nagati and Rebolledo [15] suggested that in addition to focusing on company, as the provider of supplier development program, the effectiveness of knowledge sharing in the supplier development program also needs to be identified through assessment of the suppliers. The assessment of the suppliers allows a more objective analysis on the effectiveness of knowledge sharing in the supplier development program [2].

Related to the mechanism, some studies have suggested that knowledge sharing activities require appropriate knowledge transfer mechanism [2], [37]. However, to our best knowledge, the role of knowledge transfer mechanism in realizing the effectiveness of knowledge sharing has been limitedly studied. Therefore, aimed at bridging above-mentioned gap, this research focuses on robust identification of the role of the supplier’s organization culture, ICT facilities, and perceived behavioral control as the factors that influence knowledge sharing effectiveness through mentorship mechanism in the supplier development program from the suppliers’ perspective.

## II. LITERATURE REVIEW

This section is divided into six parts: the supplier development; knowledge management and supply chain management; knowledge sharing; information and communication technology; mentorship mechanism; and organization culture.

### A. SUPPLIER DEVELOPMENT

Supplier development in the field of supply chain management research include the initiation and the investment of the company in improving performance and capabilities of its suppliers [8]. There are various types of activities in the supplier development program ([37], Chen et al., [29]). These range from low-involvement activities, such as creating competitive pressure and evaluating a supplier's performance regularly, to high-involvement activities, such as providing a supplier with specific training programs and involving the supplier in new product development (Chen et al., [29]). These kinds of activities require investment from the company that includes time, human resource, and technology (Chen et al., [29]). The most effective strategy to improve supplier performance and capability through supplier development is competency transfer [33]. The transfer of competencies can be carried out by companies through the transfer of knowledge and skills. This competency transfer gradually develops basic skills of the supplier which can further drive the increase of supplier performance index and can ultimately create sustainable development and innovation [10], [25], [33]. Chen et al. [29] found that the management of knowledge between companies and their suppliers provides a primary significant source of competitive advantage.

### B. KNOWLEDGE MANAGEMENT AND SUPPLY CHAIN MANAGEMENT

Knowledge management is defined as an entity's systematic and deliberate efforts to expand, cultivate, and apply available knowledge in ways that add value to the entity, in the sense of positive results in accomplishing its objectives or fulfilling its purpose (Chen et al., [29]). Similarly, Bock *et al.* [14] define knowledge management as structured activities aimed at improving an organization's capacity to acquire, share, and use knowledge in ways that enhance its survival and success. Both definitions suggest that knowledge management includes a set of specific goal-driven activities or efforts that create value via processing knowledge (Chen et al., [29]). Integration of specialized knowledge involves multiple knowledge processors, and therefore, when a knowledge processor cannot accomplish a particular knowledge management activity, then a knowledge management episode is triggered (Chen et al., [29]). A knowledge management episode refers to a pattern of activities performed by processors with the intent of satisfying a knowledge need or opportunity (Chen et al., [29]). A knowledge management episode may be independent of, or interdependent with, other episodes at a given time within an organization. In order to explain how knowledge management activities occurring in supplier development, Chen et al. [29] leverage the knowledge chain theory to capture buyers and suppliers knowledge management activities in supplier development. Analogous to Porter's value chain theory, knowledge chain theory identifies and characterizes five classes of first-order knowledge management activities that organizations per-

form. The five first-order classes of knowledge management are knowledge acquisition, knowledge selection, knowledge generation, knowledge assimilation, and knowledge emission (Chen et al., [29]). A knowledge acquisition activity receives knowledge from the external environment, which includes buyers and suppliers, and then delivers the acquired knowledge to assimilation, generation, and/or emission activities. Obtaining knowledge from an entity's knowledge resources, a knowledge selection activity delivers the selected knowledge to generation, assimilation, and/or emission activities. Upon receiving knowledge flows from knowledge selection or acquisition, a knowledge generation activity may deliver the knowledge it derives or discovers to assimilation and/or emission activities. A knowledge assimilation activity delivers knowledge to the entity's knowledge resources, subject to considerations such as filtering, validity, and security, after it receives knowledge flows from the knowledge acquisition, selection, and/or generation activities. Knowledge emission receives knowledge flows from knowledge selection, acquisition, and/or generation activities and, then, delivers it to targets in the environment, such as suppliers (Chen et al., [29]).

### C. KNOWLEDGE SHARING

Based on the knowledge management perspective, there is always a flow of knowledge from supplier to the buyer and from the buyer to the supplier in the supplier development program [35]. The research conducted by Lee *et al.* [2] found that knowledge flow in the supplier development program is closely related to knowledge sharing activity between the company and its suppliers. As an activity that includes the exchange of knowledge through interactions between individuals, knowledge sharing has been identified as a major focus area for knowledge management [39].

Ahkavan and Mehralian [34] defined knowledge sharing as the behavior by which an individual voluntarily provides some kind of access to his or her knowledge and experiences to others. Knowledge sharing presumes a relation between at least two parties, one that possesses knowledge and the other that acquires knowledge. The first party should communicate its knowledge, either consciously and willingly or not, in some form or other (either by acts, by speech, or in writing, etc.). The other party should be able to perceive these expressions of knowledge, and make sense of them (by imitating the acts, by listening, by reading the book, etc.) [39]. Hendriks [39] divides the process of knowledge sharing into two sub-processes. First, the act of externalization by the party with the knowledge and second is the act of internalization by those seeking to acquire the knowledge. In this process, barriers exist that may distort the internalization of (previously or simultaneously) externalized knowledge. These barriers could be straight forward, such as barriers of space and time, but they could also be more fundamental, such as barriers of social distance, culture, and inappropriate mechanism [37], [39]. The effectiveness of external knowledge internalization can be achieved by minimizing or eliminating these barriers. The effectiveness of knowledge sharing

according to Hendriks [39] is a compatibility between the knowledge gained in the knowledge sharing process and the objectives to be achieved.

#### D. INFORMATION AND COMMUNICATION TECHNOLOGY

The effectiveness of knowledge sharing in supplier development program can also be achieved by maximizing the role of ICT facilities to eliminate spatial and time limitation [52]. ICT facilities define as a user-friendly technological tool that can simplify the knowledge sharing processes and reduce the time necessary for engaging in knowledge sharing behaviors [1]. ICT facilities enhance motivation for knowledge sharing at the individual level [39]. In the supplier development program, ICT have a fundamental role to integrate various knowledge resources from buyers and their suppliers (Chen et.al., [29], [35]). ICT is the key enabler to enhance knowledge flow between companies and their suppliers through improving access to knowledge and eliminating temporal and spatial obstacles among individuals [35], [39]. The use of ICT can further improve individual perception regarding the ease of sharing knowledge [36], broaden the understanding of supplier organization culture to determine supplier responses toward knowledge sharing in the supplier development program [2], and assist in selecting the appropriate knowledge sharing mechanism [5], [37].

#### E. MENTORSHIP

Mentorship is a relationship in which a more experienced or more knowledgeable person helps to guide a less experienced or less knowledgeable person [6]. Mentorship includes mentoring activity [5] that requires bidirectional communication between mentor and mentee, where the mentee should be proactive in receiving and implementing the knowledge [21]. In knowledge sharing activity of the supplier development program, knowledge adheres to mentors as the firm members performing the mentoring [2]. Knowledge, experience, and skills possessed by mentors are shared with suppliers through knowledge sharing activities to improve supplier performance and capability. According to [42], the effectiveness of knowledge sharing is highly dependent on how to communicate knowledge through verbal and direct practice. Lee *et al.* [2] suggested the mentorship as an effective mechanism to increase the effectiveness of knowledge sharing in supplier development. This is due to the mentorship mechanism in knowledge sharing involves direct interaction between individuals as senders and their recipients, where individuals with more knowledge and skills directly share with individuals who have less knowledge and skills both verbally and in practice [6].

#### F. ORGANIZATIONAL CULTURE

Organizational culture is defined as norm that guides the behaviour of organizational member [31]. It influences every aspect of organizational life and it has both stable and dynamic components. The former supports the organization to survive while the latter helps the organization to evolve

and adapt to a new environment (Hofstede et.al., [13]). Hofstede's [12] cultural model, which further developed by Hofstede et.al. [13], has been widely cited in management research because it is concise and comprehensible [12]. Hofstede divides the dimensions of organizational culture into four dimensions, they are power distance, collectivism versus individualism, femininity versus masculinity, and uncertainty avoidance. Power distance (PD) and uncertainty avoidance (UA) affect the thinking about the organization and the rules and procedures to achieve goals and response to external events [2]. Given that supplier development by firms is an external event to the supplier, Hofstede et.al. [13] cultural model is a useful concept to explain the behavior of the supplier in response to the supplier development [2]. For this reason, PD and UA are included in this study. In addition, several studies have identified collaborative culture as an influential dimension of organizational culture in determining the success of supplier development program implementation [2]. Power distance, uncertainty avoidance, and collaborative culture as dimensions of suppliers' organizational culture determine the effectiveness of knowledge sharing activity, along with mentorship mechanism, in supplier development program [2].

#### III. METHODOLOGY

The purpose of this study is to investigate the role of suppliers' organizational culture, information and communication technology, and perceived behavioral control as the determinants of knowledge sharing effectiveness by mentorship in the supplier development program. Research model including the design and type of the study is presented in Fig.1. In the following part, the research design, hypotheses, the sampling procedures along with the criteria used are presented. Next, the results of the study along with the reliability and validity of the results are further discussed.

##### A. HYPOTHESIS AND DEVELOPMENT MEASURES

There are three types of organizational culture (Hofstede et.al., [13] and [2]): collaborative culture, power distance, and uncertainty avoidance. Lee *et al.* [2] explored the impact of supplier development (SD) on supplier's performance by sharing implicit knowledge in mentorship under the influence of supplier's organizational culture. The findings indicated that the three dimensions of supplier's organizational culture increased the effectiveness of knowledge sharing activity with mentorship mechanism in the supplier development program. Hendriks [39] identified how information and communication technology could enhance the effectiveness of knowledge sharing among individuals. Hendriks [39] suggested that tools and technology, which are perceived to be highly available and easy to use, positively influence individual's perceived behavioral control toward knowledge sharing

##### 1) THE INFLUENCE OF COLLABORATIVE CULTURE ON KNOWLEDGE SHARING EFFECTIVENESS

Collaborative culture is the culture of pursuing common goals among individuals and supply chain partners during



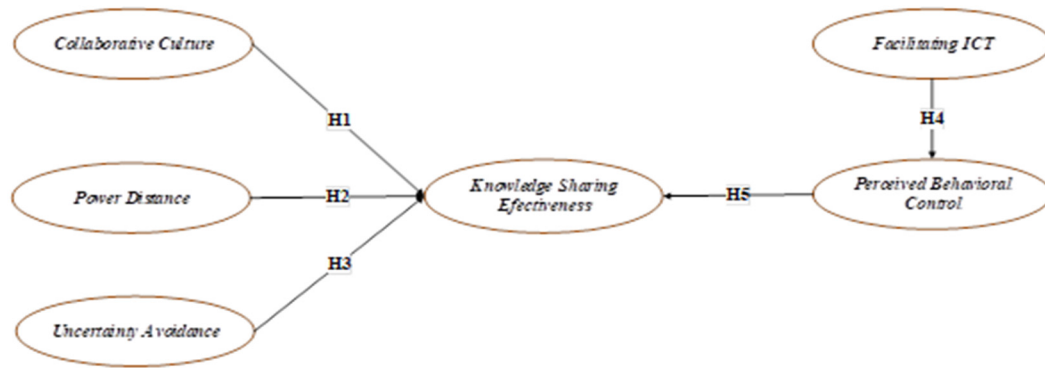


FIGURE 1. Research model.

interaction (Ashkenas [2], [44]). This should be built upon trust, commitment, and accountability [27]. Collaborative culture is the norm in guiding the individual's behaviour during interaction with other that rests on mutual and reciprocal action [31]. It promotes collaboration with each other but suppresses opportunistic behaviour [15]. Provision for more efficient transaction, reduction in cost, less control and monitoring, and smooth knowledge transfer are allowed in the collaborative culture [2]. It is also considered to be an important antecedent to successful supplier development such as those achieved by mentorship that involves human interaction to enhance performance [44]. Collaborative culture should exist at an individual level to promote knowledge sharing within the organization [27]. Thus, the hypotheses is:

**H1.** Collaborative culture is positively related to the knowledge sharing effectiveness

## 2) THE INFLUENCE OF POWER DISTANCE ON KNOWLEDGE SHARING EFFECTIVENESS

Power distance (PD), a dimension of social culture, is the extent of unequal distribution of power from the perspective of a member having less power in the organization. As suggested by Hofstede and Hofstede [13], the difference in power is employed for managing firms and to suppress confrontational behavior of the members. Power distance exists in paired relationships such as boss–employee, supervisor–subordinate, teacher–student, etc. It also exists when there are resources as well as capability difference in the customer–supplier paired relationship [2]. Power distance determined the agreement to the supplier development initiated by the focal firm [2]. High level of power distance will increase the motivation of the supplier to improve their capability [2]. Supplier with high level of power distance will be more proactive in participating in the mentoring activities [21]. Thus, it is hypothesized that:

**H2.** Power distance is positively related to the knowledge sharing effectiveness

## 3) THE INFLUENCE OF UNCERTAINTY AVOIDANCE ON KNOWLEDGE SHARING EFFECTIVENESS

Uncertainty avoidance is the extent to which members of an organization or society strive to avoid uncertainty by

relying on established social norms, rituals, and bureaucratic practices (House et al., [2]). Uncertainty avoidance determined the usefulness of the knowledge shared, which leads to the substitution of knowledge [28]. Lee et al. [2] identified that high level of uncertainty avoidance would increase the effectiveness of knowledge sharing by mentorship in supplier development program. Zadjabbari and Husein [4] suggested that both senders and recipients are equally important in knowledge sharing. The main activities of knowledge sharing involve transmission and absorption [4]. The transmission activity includes effective and correct knowledge presentation to the potential knowledge recipients and the proactive responses of the recipients in substituting the knowledge. Thus, it is hypothesized that:

**H3.** Uncertainty avoidance is positively related to the knowledge sharing effectiveness

## 4) THE RELATIONSHIP BETWEEN FACILITATING INFORMATION AND COMMUNICATION TECHNOLOGY, PERCEIVED BEHAVIORAL CONTROL, AND KNOWLEDGE SHARING EFFECTIVENESS

ICT facilities is a user-friendly technological tool that can simplify the knowledge sharing processes and reduce the time necessary for engaging in knowledge sharing behaviors [1]. ICT facilities enhance knowledge sharing through improving access to knowledge and eliminating temporal and spatial obstacles among individuals [39]. Ahkavan et al. [36] also suggested facilitating ICT that easy to use is positively influence individuals' perceived behavioral control towards knowledge sharing. It is, therefore suggested that tools and technology, that are highly available and easy to use, positively influence individual's perceived behavioral control toward knowledge sharing. The effectiveness of knowledge sharing dependent on effectively sending and correctly presenting knowledge to the potential knowledge recipients [39]. Potential recipients are knowledgeable recipients who have the ability, resources, and opportunity to share the knowledge [39]. Perceived behavioral control refers to people's perception of the ease or difficulty of performing the behaviour of interest, which is influenced by the availability of resources and opportunity [16]. Individuals with high level of perceived behavioral control have the resources, opportunities,

and ability to perform certain behaviour [16]. According to [4] the more the individuals perceive that they have the resources, opportunities, and abilities in performing knowledge sharing, the more effective the activities will be [2] suggested that the success of knowledge sharing activities with the mentorship mechanism in supplier development program is highly dependent on the ability of the suppliers to substitute knowledge and maximize the usefulness of the resources and opportunities. Thus, it is hypothesized that:

**H4.** Facilitating information and communication technology is positively related to perceived behavioral control

**H5.** Perceived behavioral control is positively related to knowledge sharing effectiveness

After the research hypothesis was formulated, a structured questionnaire was adopted to gather primary data through distribution of questionnaires. The questions for the questionnaire were mostly based on available literatures. In measuring items for constructs power distance and uncertainty avoidance, questions were adapted from Bortolotti et.al. [2], collaborative culture questions from [27], perceived behavioral control from [36], facilitating ICT (ICT) from [36], and questions related to knowledge sharing effectiveness with mentoring mechanism were adapted from [30]. The original measuring instruments were expressed in English and then translated into Indonesia, which were reviewed by several laypersons to ensure the meaning was appropriately translated and comprehensible. The five-point Likert scale was used to measure each item with strongly disagree = 1 and strongly agree = 5 (Sekaran, [49]). To avoid the acquiescence bias, the sequence of measurement items was randomized in the survey questionnaire. The questions can be seen in Appendix.

## B. SAMPLES AND DATA COLLECTION

This research was conducted in West Sulawesi Province, Indonesia. Based on the statistical data from Ministry of Industry (2018), Indonesia is the third largest cocoa producing country in the world after Pantai Gading and Ghana, where Sulawesi is the largest cocoa producing region in Indonesia. Supplier development program are carried out intensively in West Sulawesi Province to improve the performance and capability of cocoa bean suppliers. The survey was conducted from July to August 2019 by distributing 200 questionnaires in hardcopy to cocoa bean suppliers in West Sulawesi, Indonesia who had participated in the supplier development program with a mentorship mechanism. Following the data collection, a total of 200 questionnaires were obtained, which gives a response rate of 52.5%. Only 105 questioners were returned, resulting in a total of 105 usable questionnaires for further analysis. Table 1 shows demographic information about the respondents. This study uses convenience sampling method, which is done at the most possible and easiest place for the respondent to provide the requested information [49].

**TABLE 1. Demographic information.**

Item	Category	Amount	Percentage
Gender	Man	70	66.7
	Woman	35	33.3
Age	≥ 18 Years	0	0
	19-25 Years	4	3.8
	26-30 Years	8	7.6
	31-40 Years	39	37.1
	41-50 Years	42	40
	> 50 Years	12	11.4
Education	Junior High School	56	53.3
	Senior High School	27	25.7
	Bachelor Degree	8	7.6
	Elementary School	14	13.3
Experience as a supplier	≤ 5 Years	34	32.4
	> 5 Years	71	67.6
Experience as a supplier for buyer company	≤ 5 Years	93	88.6
	> 5 Years	12	11.4
Years of using ICT facilities	≤ 1 Year	0	0
	> 1 Years	105	100

## IV. ANALYSIS AND RESULTS

### A. MEASUREMENT MODEL

The indicator variables of constructed power distance, uncertainty avoidance, collaborative culture, perceived behavioral control, facilitating ICT, and knowledge sharing effectiveness with mentorship mechanism are reflected in their respective original measurement instruments.

The measurement model and structural relationships were examined using the two-stage analytical procedures [23]. To validate the measurement model, convergent and discriminant validity were evaluated. For evaluating convergent validity, extracted composite reliability and average variance were calculated. The partial least squares (PLS) method was used to test the relationships among the constructed model. PLS was selected for its suitability for examining the relationships among latent variables when the sample size is small [23]. Additionally, PLS does not necessarily require normal distribution of variables and it is suitable for highly complex predictive models [23]. Aimed at analyzing the measurement and structural model, the Smart PLS 3 was used along with the

**TABLE 2. Reliability and validity results.**

Variable	Item Indicator	Indicator Loading	AVE	CR
Collaborative Culture	CC5	0.635	0.532	0.818
	CC7	0.839		
	CC9	0.76		
	CC16	0.668		
Facilitating ICT	ICT1	0.625	0.589	0.895
	ICT2	0.807		
	ICT3	0.701		
	ICT4	0.721		
	ICT5	0.865		
	ICT6	0.857		
Knowledge Sharing Effectiveness	KSM1	0.662	0.552	0.895
	KSM2	0.767		
	KSM3	0.914		
	KSM4	0.732		
	KSM5	0.671		
	KSM6	0.759		
Perceived Behavioural Control	PBC1	0.773	0.624	0.832
	PBC2	0.728		
	PBC3	0.863		
Power Distance	PD2	0.824	0.682	0.811
	PD4	0.829		
Uncertainty Avoidance	UA2	0.899	0.674	0.858
	UA4	0.9		
	UA5	0.635		

bootstrap resampling method to determine the significance of the paths within the model. In the studies that used the PLS analysis. We set 0.7 as the minimum recommended level of reliability while 0.5 was set as the minimum acceptable level of average variance extracted [23]. Table 2 below shows composite reliabilities ranging from 0.811 to 0.895, and the average variance which ranged om 0.532 to 0.682 which exceeded the threshold values for satisfactory convergent validity. In the initial setup, 12 out of 37 reflective indicators with outer loading (OL) less than the threshold value of 0.6 were removed [17].

**B. STRUCTURAL MODEL**

When estimating structural models, some form of common method bias may be present. This is an issue that leads to the underestimation or overestimation of the structural coefficients, or of the relations between latent variables. This

bias occurs mainly because the method itself is the common cause between the dependent and independent variables [40]. In this line, researchers suggested to apply exploratory factor analysis (EFA) considering all the observed variables [38]. CMB is anticipated to presents if EFA’s results extraction of single factor including all the observed variables, or if the first extracted factor demonstrates equal to or above 0.50 cumulative variance [40]. In this study, EFA’s extracted eight distinct factors with eigenvalues higher than 1.0. The extracted factors explain 72.717% cumulative variance, and the first factor explains only 26.079% variance, which is not majority as below 0.50 as presented in Table 3. This result confirmed that there is no problem with common method bias in this data [40].

In addition, to evaluate the discriminant validity, each variable’s squared root value of the average variance was compared with the correlations among variables. As seen in Table 4, for every variable, the squared root value of the average variance was larger than any correlation values with other variables, proving the discriminant validity of the study.

The bootstrap resampling method (with 5,000 resamples) was used to determine the significance of the path coefficients as well as to test the hypotheses. The structural equation model results are shown in Figure 2. Results of path analysis indicated that power distance, uncertainty avoidance, and perceived behavioral control are significantly associated with knowledge sharing effectiveness with mentoring mechanism (H2, H3, and H5 with  $T_{\text{statistic}} > T_{\text{table}}$  (1.990) and  $p\text{-values} < \alpha$  (0.05)). Facilitating ICT has also significant positive impact on the perceived behavioral control (H4). Thus, all of the research hypotheses, except H1, were proven. Summary of hypotheses testing results is presented in Table 5. Figure 2 shows the explanatory power of the research model, which explains 35.5% of the variance in knowledge sharing effectiveness and 11.0% of the variance in the perceived behavioral control. All  $R^2$  values exceed 10%, indicating an acceptable explanatory power [24].

**V. DISCUSSION**

This study found that the dimensions of supplier organizational culture and the availability of information and communication technology (ICT) facilities have important roles in achieving the effectiveness of knowledge sharing with mentorship mechanism in the supplier development program. Based on suppliers’ perspective, power distance and uncertainty avoidance as organizational dimensions are identified to have significant impact on the effectiveness of knowledge sharing with the mentorship mechanism in the supplier development program. These results are based on data processing analysis, which shows that H2 and H3 are significant and positive.

H2 acceptance statistically shows that power distance has positive impact on the effectiveness of knowledge sharing with the mentorship mechanism in the supplier development program, which is consistent with previous research as presented in [2] and [28]. Demographically, respondents in this

**TABLE 3. Harman’s single factor test.**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.520	26.079	26.079	6.520	26.079	26.079
2	3.072	12.289	38.368			
3	2.319	9.278	47.646			
4	1.631	6.523	54.168			
5	1.291	5.164	59.333			
6	1.215	4.858	64.191			
7	1.102	4.407	68.597			
8	1.030	4.119	72.717			
9	0.810	3.241	75.957			
10	0.764	3.055	79.013			
11	0.647	2.589	81.602			
12	0.539	2.158	83.760			
13	0.523	2.093	85.852			
14	0.454	1.816	87.668			
15	0.447	1.786	89.454			
16	0.433	1.731	91.185			
17	0.387	1.549	92.735			
18	0.337	1.349	94.084			
19	0.332	1.327	95.411			
20	0.270	1.081	96.492			
21	0.226	0.905	97.397			
22	0.208	0.834	98.231			
23	0.170	0.682	98.913			
24	0.149	0.596	99.510			
25	0.123	0.490	100.000			

**TABLE 4. Fornell-larcker criterion.**

Variable	Collaborative Culture	Facilitating ICT	Knowledge Sharing Effectiveness	Perceived Behavioural Control	Power Distance	Uncertainty Avoidance
Collaborative Culture	0.730*					
Facilitating ICT	0.333	0.768*				
Knowledge Sharing Effectiveness	0.305	0.189	0.743*			
Perceived Behavioural Control	0.14	0.331	0.374	0.790*		
Power Distance	0.332	0.359	0.415	0.343	0.826*	
Uncertainty Avoidance	0.204	0.102	0.459	0.206	0.309	0.821*

study have a fairly low level of education. As described in Table 1, 53% of the respondents are junior high school graduates and only 7.6% respondents are undergraduates. Suppliers with low level of knowledge, skill, and experience would perceive that there is a large power distance in the organization (Lee et.al., [2]). This encourages suppliers to improve their knowledge and capability through supplier development program in order to reduce perceived gaps [28]. Motivation to reduce their perceived gaps

by improving knowledge and capability makes suppliers enthusiastic in participating in knowledge sharing activities with mentorship mechanism in the supplier development program [2]. Such high level of enthusiasm will increase the proactivity of the supplier in participating in mentoring activity [2], [21], which will eventually lead to the effectiveness of knowledge sharing activities with the mentorship mechanism in the supplier development program [2].



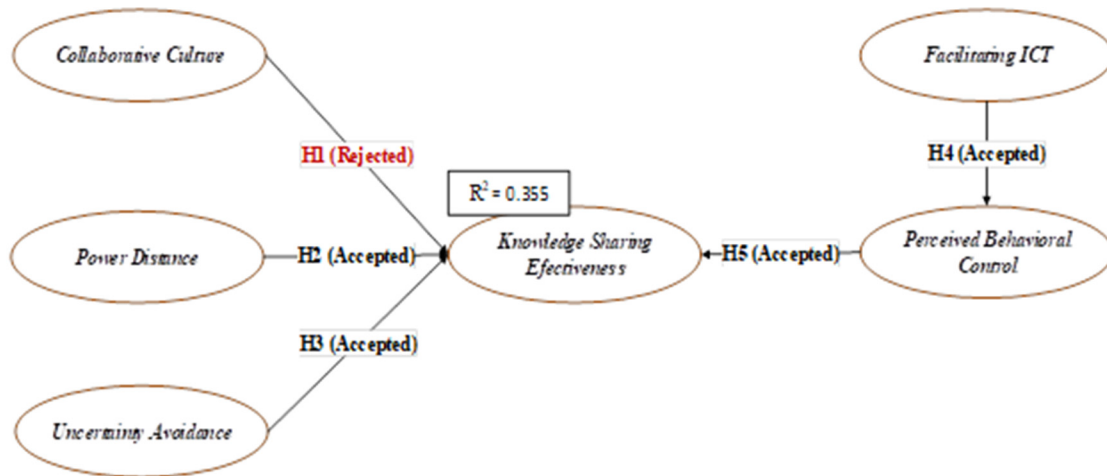


FIGURE 2. Path coefficient result.

TABLE 5. Evaluation and structural model.

Path	Path Coefficient	T Statistics	P -Values	Result
Collaborative Culture -> Knowledge Sharing Effectiveness	0.14	1,295	0.2	Not Supported
Power Distance -> Knowledge Sharing Effectiveness	0.19	2,367	0.02	Supported
Uncertainty Avoidance -> Knowledge Sharing Effectiveness	0.32	3,159	0	Supported
Facilitating ICT -> Perceived Behavioural Control	0.33	3,586	0	Supported
Perceived Behavioural Control -> Knowledge Sharing Effectiveness	0.22	1,984	0.05	Supported

Furthermore, the significant and positive statistical value of H3 shows that the level of uncertainty avoidance is positively related to the effectiveness of knowledge sharing with the mentorship mechanism in the supplier development program. The level of uncertainty avoidance related to the extent to which the suppliers are able to identify the required knowledge to be substituted [28]. Suppliers with a high level of uncertainty avoidance will be more proactive in identifying and substituting the knowledge [2], [21].

This study also shows that the suppliers' power distance determined the agreement to the supplier development program initiated by the focal firm, whereas uncertainty avoidance determined the usefulness of the knowledge shared, which leads to the substitution of knowledge. It urges the companies to identify the level of supplier's uncertainty avoidance before implementing supplier development program with mentorship mechanism in order to achieve the effectiveness of knowledge sharing activity.

A surprising result is that collaborative culture has not significant effect on the effectiveness of knowledge sharing with mentorship mechanism in the supplier development program, a contradictive finding with the previous studies [2], [27] (H1 rejected). One possible interpretation for this result might be the effect of the cultural background in which the respondents are located. Respondents in this study are cacao beans suppliers in West Sulawesi (Indonesia). Indonesia has a relatively low Hofstede ranking in individuality, which means Indonesian society is considered to be more collectivist rather than individualist [13]. Collaborative culture in the collective society discourages the communities from expressing their opinions and thoughts [13]. This makes suppliers tends to be more passively participating in knowledge sharing activities with the mentorship mechanism. For this reason, this research indicates low contribution of suppliers' collaborative culture has to achieving the effectiveness of knowledge sharing with mentorship mechanism in the supplier development program.

Therefore, the cultural background of the society in which the suppliers are located should be a fundamental consideration for the companies in implementing supplier development program with mentorship mechanism. This is due to different roles of collaborative culture in determining the success of knowledge sharing by mentoring activity between the collective and individual society. In collective society, collaborative culture tends to discourage the two-way communication in terms of exchange of knowledge.

Consistent with the previous studies, ICT facilities are proven to be able to increase the suppliers perception of ease in participating in knowledge sharing activity with the mentorship mechanisms. This makes mentoring activities between companies and suppliers to share knowledge in supplier development program more effective (H4 and H5 are proven). Companies need to ensure the availability of easy and flexible ICT facilities for both mentors as knowledge providers and suppliers as knowledge recipients in implementing a supplier development program with a mentorship mechanism. This is important due to the dependency of user perception of ICT use in facilitating knowledge sharing.

The effectiveness knowledge sharing activity between company and its supplier enhanced the capability of the supplier [2]. Thus, it is important for the company to create the innovation and maintain the competitive advantage [41].

## VI. CONCLUSION

The purpose of this study is to investigate the impact of suppliers' organization culture and ICT facilities on the effectiveness of knowledge sharing with mentorship mechanism in the supplier development program, particularly from the suppliers' perspective. The survey results from 105 suppliers of cocoa beans who had participated in the supplier development program with a mentorship mechanism show that two of the three dimensions of supplier's organizational culture, power distance and uncertainty avoidance, are proven to be able to increase of knowledge sharing with mentorship mechanism in the supplier development program. In addition to organizational culture, ICT facilities are also identified as the determinant of knowledge sharing effectiveness in the supplier development program.

This study also emphasize that knowledge is a key building block for the innovation process [41]. Mutually sharing knowledge among of individuals across the boundaries of the organization plays an important role not only in the overall performance, but also in the competitiveness of an organization and in particular for innovation management [47]. The findings in this research are momentous for firms intending to adopt supplier development based on knowledge sharing activity by mentorship mechanism in agroindustry companies. Only four antecedents, namely collaborative culture, power distance, uncertainty avoidance, and perceived behavioral control have to be assessed to determine the effectiveness of knowledge sharing activity in the supplier development program. The assessment is reasonably simple and requires less time to implement. Moreover, this research

illuminate how the cultural background of the society in which the suppliers are located impacted supplier organizational culture. Cultural background and demographic factors can determine the extent to which each dimension of organizational culture impacted supplier development program. This can be seen clearly from the results of this study which is different from previous studies. The result of this study found that collaborative culture has insignificant contribution to knowledge sharing activities in supplier development program. This can be an important consideration for companies to identify and learn more about cultural background before implementing supplier development program based on knowledge sharing activity.

The model proposed in this study can be applied to supplier selection with three cultural elements as the selection criteria, as shown in Figure 1. The proposed selection criteria provide the firms advanced understanding of potential suppliers to changes before engaging in business. A low-level of collaborative culture suggests the supplier being difficult in collaboration while low-level power distance demonstrates equal power distribution, suggesting that decision-making tends to be consultative [13]. However, a lower uncertainty avoidance level may suggest an inevitable extended supplier development period. Thus, firms can collect data on three cultural elements for deciding on whether to develop the supplier to continue the engagement or to switch to others. The focal firm can also assist the supplier to enhance the level of power distance and uncertainty avoidance to achieve exceptional improvement in capability trough mentoring activity.

Furthermore, this study results show that the effectiveness of knowledge sharing activity with mentorship mechanism in supplier development program is highly dependent on user perception of ICT use in facilitating knowledge sharing. Thus, the companies need to ensure the availability of easy and flexible ICT facilities as the key enabler for sharing knowledge. This research has several limitations therefore future studies are recommended to complement the gaps. First, the sample size is relatively small, which may restrict the generalizability of the findings. Second, industries investigated in this study were limited to the agroindustry company. Hence, the applicability of the findings may need further research in other industries, such as the food and beverage industry, petrochemical industry, electronic industry, etc. Third, this study does not examine in more detail how supplier organizational culture and perceived behavioral control affect the effectiveness of the each of process in knowledge sharing activity. Fourth, this study only identifies the influence of three dimension of organizational culture on knowledge sharing effectiveness.

In retrospect, and as we look forward to future research endeavors, we are interested in expanding our examination of knowledge sharing and supplier development. The further investigation of the impact of four dimension of organizational culture which developed by Hofstede et.al. [13] to each proses in knowledge sharing, such as donating and collecting [52] are of interest as researchers attempt to develop

better insights into this topic. Furthermore, it is important to be noted that virtual knowledge sharing has become more popular in many sectors around the world. Identification the impact of this revolutionary change on knowledge sharing is worth researching. Systematic research on its field may provide guidelines to practitioners to identify the appropriate technological strategy for supplier development.

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