EXPLORING THE COMPONENTS OF THE INTELLECTUAL CAPITAL IN TROSO WEAVING SMEs

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Abstract
This study aims to test and analyze the effects of intellectual capital to competitive advantage and company's performance at Troso traditional weaving business. The variables in this research are human capital as exogenous variable and structural capital, customer capital, competitive advantage, and company performance as the endogenous ones. The subject of the study was 200 sample consisting 572 craftmen. This research applies structural equation modelling. The result of SEM analysis fulfills Goodness of Fit Index criteria, i.e. chi-square value = 432.543, significance probability = 0.000, RMSEA = 0.070, CMIN/DF = 1.966, TLI = 0.885, CFI = 0.900, GFI = 0.849 and AGFI = 0.810. Based on the research result, it can be concluded that human capital, structural capital, and customer capital influence on competitive advantage and company performance.
Keywords: Intellectual Capital, Competitive Advantage, Company Performance
JEL classification: A, M12, J24

1. Introduction

The Indonesian micro and medium enterprises has an important and dominant roles in the country's economic growth. During the 1997 Indonesian economic crisis and global's in 2008, these enterprises were proven survived and they could even become the country's economic preserver. Considering the amount of these existing micro and medium enterprises as well as their dominant roles in the economic, thus the indicator of the Asean Economic Communities (AEC) success depends on their preparations.

To Indonesia, the establishment of AEC 2015 creates both internal and external challenges amongst the ASEAN nations themselves; in addition to the competition with other countries such as China or India. (Huang & Liu, 2005), describes that in order to prepare for the tough global market competition, intellectual capital has to be improved as a substantial strength to push the economic growth. With greater number of micro medium enterprises compared to another country, Indonesia has bigger chance to be able to compete in global market.

The world is fast moving from a production-based economy to a knowledge-based one (Drucker, 1993; Powell and Snelman, 2004 in Huang & Wu, 2010). This insists SME's to change business strategies from labor-based business to knowledge-based business, thus the main character of the company becomes knowledge based. In this knowledge-based economy, the competitive advantaged obtained by company is no longer determined by ownership or the functions of conventional production factors such as engines or labors, but more to the functions of production factors based on knowledge, innovation, and technology.

According to Ernst & Young (2006), such advanced country as The United States has 60 percent knowledge-based workers. By increasing the knowledge of the workers, a corporation is able to conduct more effective and efficient activities (Hernandez & Noruzi, 2010).

To improve the product competitiveness, micro medium enterprises should pay more attention on intellectual capital as one of their business strategies. The biggest capital owned by micro and medium business is intellectual capital. This capital is a source of creativity, innovation and business model. For example, textile micro medium business of *Tenun Ikat Troso* (weaving) implements this kind of capital to improve their competitiveness.

This *Tenun Ikat Troso* (Troso weaved clothing) product is one of Indonesian famous clothing product besides *batik*. It is originated from Troso village in Jepara, Central Java province. It has been the second famous product of the village after furniture. The residents of the village has possessed the skills to weave cloths since 1935 and the cloth was previously known as *Tenun Gendong* as their heritage. In 1943, *Tenun Pancal* (paddled weaving) started to operate and since 1946 up to now, people has been operating *Alat Tenun Bukan Mesin* (a non-engine weaving tools).

This research is unique because of the concept of intellectual capital is not known to most managers in the industry in Indonesia, especially weaving and textile industry in general.

The research of this case study is based on the findings of the previous research. Sharabati *et.al* (2010), Chen *et.al* (2004), Daud & Amri (2008), Majeed, S. (2011), Rezaian & Naeji (2012), Mananeke (2012), Obeidat *et.al* (2017) and Hamid *et.al* (2017) state that intellectual capital affects the corporate's performance; on the contrary, Kuryanto & Syarifuddin (2009) states that there is not any positive relation between the corporate performance and intellectual capital.

2. Literature Review

2.1. Organization Performance

The performance of an organisation has always created problems for profit or non-profit corporation. According to Horne and Wachowicz (2008), performance is a result in certain period. In order to perform well, everyone should conduct the best effort positively. It also applies for a company, when a company conducts the business activities well, it will result in good performance.

Organization has an important role in our daily lives and therefore, successful organization represents a key ingredient for developing nations. Thus, many economists consider organizations and institutions similar to an engine in determining the economic, social and political progress (Gavrea , Ilies, & Stegerean, 2011). Besides, performance is a result of the organization's objectives. The concept of business performance covers multi dimension. Pelham (1997) in Mananeke (2012) suggests that the indicators of performance cover: firstly, company's efficiency (relativity of product quality, new product success, and customer retention level). Secondly, the growth / market share (sales level, sales increase level and relativity of market). Thirdly, the connection of ROE, profit margin, and ROI.

Another opinion stated by Gharakhani, D and Mousakhani, M (2012) suggests that performance refers to the ability of the organisation to create certain level of results and activities. In the study of Majeed (2011), it is inspected that the relationship between the company's competencies and thier performance is examined. When reviewing the importance of current or potential competencies, the managers should have a clear interest in finalising that where these qualities will lead to choose different benefits. Almost in all organisations there is a good association between company's competitive advantage and its performance. These advantages lead the company towards attaining high profits.

2.2. Knowledge Management and Intellectual capital

In the knowledge-based economy, the nature of resources has been changed. In agriculture-based economy and industrial-based economy the organizations mainly based on tangible assets but now in a knowledge-based economy, intangible assets are considered as the vital resources for the success of organizations (Khalique, 2012). Knowledge in an organisation is a demand due to its ability to make it reliable, steady and competitive. Knowledge is a fusion of information, experience, values, organisations and expertises' opinions. These make knowledge become contextual, relevant, and executable information (Turban, McLean & Wetherbe, 2002) in Setiarso, et.al (2009). The ability of companies to manage intellectual capital (IC) assets is inseparably related to its knowledge management (KM) capability (Andreeva and Kianto, 2011; Rajesh et al., 2011; Ramadan et al., 2017). Intellectual capital is another term of knowledge including its financial knowledge. The term of Intellectual Capital, which was firstly stated by John Kenneth Galbraith in 1969, became popular with theoretical and industrial practical publications.

Understanding the intellectual capital embedded in an organisation requires organisational members to assess their core competencies; they can achieve or have achieved "best-in-the-world" status. The intellectual capital of an organization represents the wealth of ideas and the ability to innovate which later will determine the future of the organization (Sharabati et al., 2010).

Intellectual capital can be defined as intellectual material that has been "formalized, captured and leveraged" to create assets of higher value (Stewart, 1997), (Prusak, 1998). Intellectual Capital can be classified as human capital, organisational capital and customer capital (Edvinsson and Sullivan, 1996; Dumay, J., 2016; Roos and Roos, 1997; Stewart, 1995). Following the study of Edvinsson and Malone (1997), Sveiby (1997), Roos et.al (1997), Bontis (1999), O'Donnell et al. (2006), Curado and Bontis (2007), and Sharabati et.al (2010) among others, intellectual capital is defined as encompassing: human capital; structural capital; and relational capital.

Wu and Tsai (2005) extend the concept of intellectual capital in their research and identify two more components namely, social capital and technological capital. Ramezan (2011) argued that intellectual capital model is based on human capital, organisational capital, social capital, technological capital and business process capital or customer capital. Khalique et.al (2013), argued that intellectual capital covers six main components known as the (1) Human Capital, (2) Customer Capital, (3) Structural Capital, (4) Social capital, (5) Technological Capital and (6) Spiritual Capital. However, this study is at preliminary stage, therefore, the researchers used only three components namely human capital, customer capital and structural capital.

Human capital covers human resources, knowledge and competency, employee education, the job and age. Human capital refers to employees who work for the success of the organisation. It is considered as the main component of intellectual capital. It is also the crucial source of employees' knowledge, skills, competencies, capability, and innovation. (Khan, 2014; Isaac et.al, 2010; Shaari et.al, 2011; Choo & Bontis, 2002; Bontis et.al, 2000; Bontis, 1998; and Edvinson & Malone, 1997). Human capital basically means the knowledge acquired by a person who increases the value of his contribution to the firm and his own productivity (professional qualifications) (Fernandez et.al, 2000).

Customer capital is the another main component of intellectual capital and it is mainly based on the relationships between the enterprise and its customers (Khan, 2014; Shaari et al., 2011; Tai-Ning et al., 2011; and Edvinson & Malone, 1997). It is very important to organisation to have good relations with its customer, in which it could enjoy the competitive advantage (Roos et.al, 2001). Customer capital of an organisation is based on the knowledge embedded in its customers, suppliers, the government or related industry associations and its customer's relations (Khan, 2014; Mangena et.al, 2010; Bontis et.al, 2000; Bontis, 1999; Bontis, 1998). There is no ambiguity for any organisation that its main source of revenue generation is its customers; therefore it is obligatory for an organisation to create good relations with its customers and to win them by fulfilling the need (Tai-Ning et.al, 2011).

Customer capital refers to the customer satisfaction, customer loyalty to the organisation. It uses market information in order to attract customers and to maintain them. The main issue of customer capital is the available knowledge in marketing channels and relation to its customers. It also indicates the potential ability of organisation due to its external intangible factors (Skyrme, 2003 in Khajeh et.al, 2014).

Structural capital relates to the company's competencies in performing its routines, as well as its structures and processes which enable the employees to contribute their best to be more productive (Mangena et.al, 2010). According to Stewart (1997), structural capital covers the knowledge of information technology, the product copy right, the designs and the trademarks. While Chen et.al (2004) states that structural capital refers the systems, the structures, and the on-going procedures of a business in an organisation.

2.3. Competitive Advantage

A company can be stated to have competitive advantages when it can create higher economic values compared to other companies in the industry. Moreover, the most important thing to do is to keep the sustainability of the competitive advantages (Barney & Clark, 2007).

Competitive advantages is a result of abnormal profit (Peteraf, 1993) or the above average returns by using special features of the company (Lin & Huang, 2011). It can be classified into two advantages; first, the logistic-based advantages (Kamboj et al, 2015) and resource-based advantages (Barney, 1991). This study applies the second approach, the resource-based competitive advantages.

An organisation generally uses intellectual capital as a guide to create sustainable performance and competitive advantages (Cohen & Kaimenakis, 2007; Halid et al, 2018). Intellectual capital becomes an organisation's main source in terms of economic-based knowledge, to gain its competitive advantages and as its main pillar of economic-based knowledge. Intellectual capital management directs a company in making precise decision in its business activities, its investment, and its organisation management to achieve competitive advantages (Shaari et.al, 2011). It has been considered by an organisation as the main resource of competitive advantage which affects creativity and innovation level (Taliyang et.al, 2011).

3. Research model and methodology

Intellectual capital is not created one at a time from human capital, structural capital, or customers, but from the interactions among the capital (Stewart, 1998). Batgerson (2003, in Nawawi, 2012) states that knowledge management is a sistematic approach conducted to manage intellectual asset and other information so it gives competitive advantage to the company. The Depatment of the Navy (DON) of the United States, in their approach, states that the knowledge management improves an organisation's performance through effetiveness, productivity, quality and innovation improvement. (Ross & Sclzulte, 2005 in Nawawi, 2012). Cabrita & Vaz (2006) also describe intellectual capital as an intangible asset that can be used as a sustainable source of competitive advantage; though its components must make interactions to create values.

This study uses several variables. Human capital as an exogenous variable while structural capital, customer capital, competitive advantage and organisational performance are the endogenous ones.

Figure 1. Research design and Hypothesis
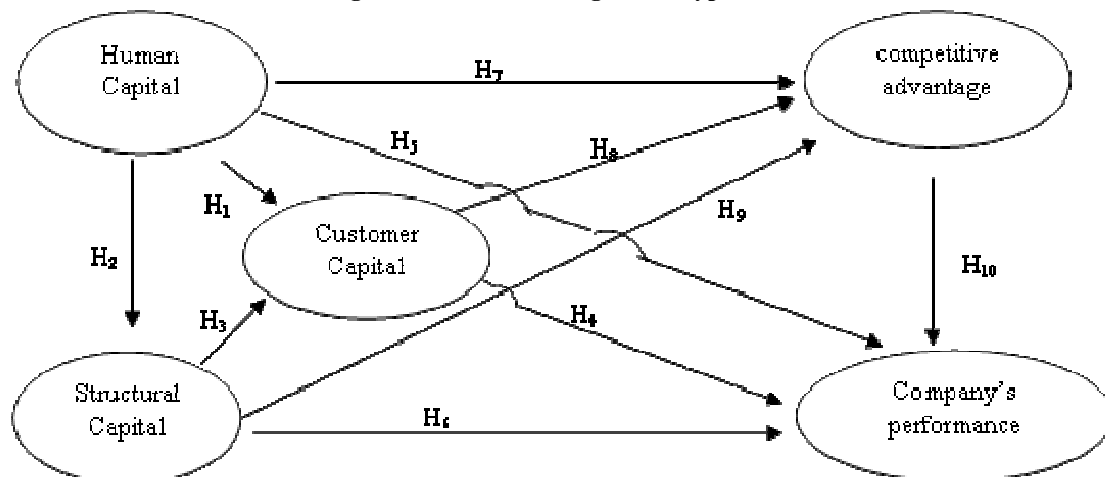
Sources : Sharabati et. al. (2010); Majeed (2011); Lakhal (2009); developed.

H1   : Human Capital positive influence to Customer Capital
H2   : Human Capital positive influence to Structural Capital
H3   : Structural Capital positive influence to Customer Capital
H4   : Customer Capital positive influence to company's performance
H5   : Human Capital positive influence to company's performance
H6   : Structural Capital positive influence to company's performance
H7   : Human Capital positive influence to competitive advantage
H8   : Customer Capital positive influence to competitive advantage
H9   : Structural Capital positive influence to competitive advantage
H10 : Competitive advantage positive influence to company's perfomance

Table 1: Variables and research indicator

| Variables	Indicators	Symbols
Human Capital	Employees' capabilities & experience	X_1
	Employees' satisfaction	X_2
	Employees' creativity & innovation	X_3
	Employees' education & training	X_4
	Employees' value & culture	X_5
	Loyality & commitment	X_6
Structural capital	Organisation's culture	X_7
	Organisation's process efficiency	X_8
	Information system	X_9
	Organisation's structure	X_{10}
	Organisation's research & development	X_{11}
	Knowledge retains	X_{12}
Customer Capital	Basic marketing capability	X_{13}
	Customer loyalty, suppliers & partners	X_{14}
	Customer's satisfaction, suppliers & partners	X_{15}
	Market intensity	X_{16}
	Knowledge on customers, suppliers, & partners	X_{17}
	Strategic companionship, legality & arrangement	X_{18}
competitive advantage	Innovative product	X_{19}
	Better quality of product & service	X_{20}
	Reliable shipping	X_{21}
	Lower company costs	X_{22}
	Inventories	X_{23}
	Competitiors new product launch	X_{24}
Company's performance	Company's efficiency	X_{25}
	ROI	X_{26}
	Growth or ROI	X_{27}
	Growth of sales	X_{28}
	Market share growth	X_{29}
	Profit margin on sales	X_{30}
	Whole competition position	X_{31}
	Market share	X_{32}

Source : Li et.al (2004), Chen *et.al* (2004), Cohen & Kaimenakis (2007), Sharabati *et.al* (2010), Shih *et.al* (2010), Mananeke (2012), and Rezaian &Naeiji (2012), development

The study uses Confirmatory Factor Analysis and Full Model of Structural Equation Modelling (SEM) as data analysis, covering seven steps of criteria evaluation goodness of fit. (Ferdinand, 2016). They are: (1) Theoretical Model Development, (2) Path Diagram Development, (3) Path Diagram Conversion to Model of Structural Equation Modelling, (4) Designation of Input Matrics & Proposed Model Estimation, (5) Identification Problem Chances, (6) Goodness of Fit Criteria Evaluation, and (7) Interpretation of Test Result & Model Modification.

Goodness of Fit Criteria Evaluation covers Proper & Statistic Test: Likelihood ratio chi-square statistic (χ^2), Root Mean Square Error Approximation (RMSEA), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), The Minimum Sampel Discrepancy Function or Degree of Freedom (CMIN/DF), Tucker Lewis Index (TLI) dan Comparative Fit Index (CFI), Reliability Test, Validity Test & SEM Assumptions.

Moreover, we have to oversee other fit criteria: RMSEA, GFI, AGFI, CMIN/DF, TLI and CFI, which show proper fit values recommended. The test result of endogenous construct confimatory shows that indicators X_7, X_8, X_{10}, X_{11}, X_{14}, X_{15}, X_{16}, X_{17}, X_{20}, X_{21}, X_{22}, X_{23}, X_{24}, X_{28}, X_{29}, X_{30}, X_{31} and X_{32} are valid.

The result of Full Model SEM process shown in figure 2.

Figure 2. Confirmatory Factor Analysis Structural Equation Model (SEM).
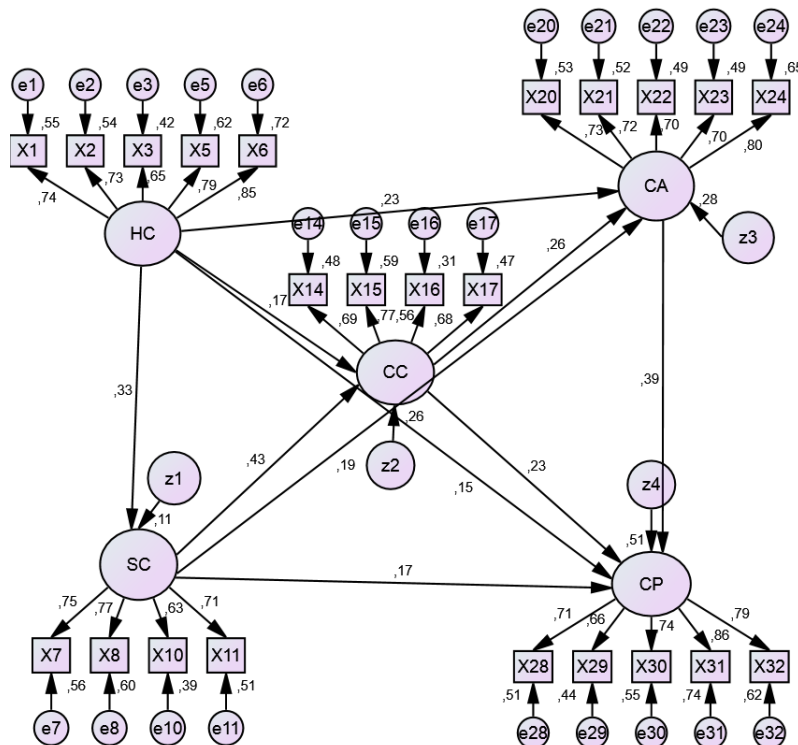
source: development result, 2018

The test of models show that it fits to the data used in the study, eventhough probability is 0.000 and significance of chi-square is 432,543. On the other hand, the values of RMSEA, GFI, AGFI, CMIN/DF, TLI and CFI range on the expected values. Based on the goodness of fit criteria, it can be concluded that SEM specified in this study fits the data.

From the data process, we can see that each indicator or dimension of model from each underlying variable shows a good result (CR > 1.96). All values of loading factor for each indicator is smaller than 0.05. With this result, it can be stated that these underlying construct indicators have shown strong indicators in the underlying variable measurements. Moreover, based on the analysis on confirmatory factor, this reasearch model can be used for future studies without any modification.

3.1. Assumption test

Data normality can be shown with the existence of Critical Ratio (CR) with treshold value of ± 2.58 on significance level 0.01 (Ferdinand, 2016). The data process showing multivariate CR 2.240 means that the research data was normal distributed.

Outliers multivariate evaluation can be conducted by using the mahalanobis distance measure to each variables equally in a multidimension room. The mahalanobis distance measure is based on the value of chi-square in the distribution table $\chi 2$ on free level as many as variables used in the research. This research uses p<0.001 which is $\chi 2$ (23; 0.001) = 49.73. That makes the data with mahalanobis distance bigger than 49.73 is considered as multivariate outliers. This evaluation uses no data considered as outliers.

In the evaluation of multicollinearity or singularity in variables combination, we need to observe covariant matrix determinant. A tiny determinant indicates the existence of multicollinearity or singularity (Tabachnick & Fidell, 1998 in Ferdinand, 2006) so the data is not valid for the research. From data process, the result of covariant matrix determinant values away from zero, 0,108. It can be concluded that multicollinearity or singularity does not exist making the data valid for research.

The Convergent Validity test can determine whether each indicator validly estimated measures dimension of the tested concept or not; by knowing that each indicator has a critical ratio twice bigger than its error standard. The result of the study shows that all indicators

make estimation value with critical error bigger than twice its error standard. Thus, it can be concluded that the variable indicators are valid.

The result of reliability test shows that all reliability values are above 0.70. This means that SEM model measurement fulfills the requirements of measurement reliability. It is similar to extracted variance value which is above 0.50. This means that SEM model measurement is qualified as a good extracting factor.

3.2. Hypothesis Test

The hypothesis test was conducted buy examining CR value and P value on the result of Regression Weights Full Model as shown on the table compared to required statistic limit, which is above 2.00 (CR) and below 0.05 (P). The research hypothesis is accepted when Regression Weights Full Model result show the required value (Byrne, 2016).

Table 2. Hypothesis Test Result Summary

Hypothesis	CR & P value	Test Result
H_1: Human Capital influence to Customer Capital	CR = 1,886 P = 0,059	Not Accepted
H_2: Human Capital influence to Structural Capital	CR = 3,792 P = 0,000	Accepted
H_3: Structural Capital influence to Customer Capital	CR = 4,435 P = 0,000	Accepted
H_4: Customer Capital influence to company's performance	CR = 2,507 P = 0,012	Accepted
H_5: Human Capital influence to company's performance	CR = 2,061 P = 0,039	Accepted
H_6: Structural Capital influence to company's performance	CR = 2,057 P = 0,040	Accepted
H_7: Human Capital influence to competitive advantage	CR = 2,787 P = 0,005	Accepted
H_8: Customer Capital influence to competitive advantage	CR = 2,644 P = 0,008	Accepted
H_9: Structural Capital influence to competitive advantage	CR = 2,021 P = 0,043	Accepted
H_{10}: Competitive advantage influence to company's perfomance	CR = 2,507 P = 0,012	Accepted

source : Proccessed Primary Data, 2018

4. Conclusion

From the results of hypothesis test it can be concluded that human capital does not significantly influence the customer capital. This illustrates that customers are not affected by industry resources. Customers have believed that craftsmen have had the ability and high experience and commitment to troso woven products. The quality of weaving from Troso has been well known.

Human capital have a positive and significant effect on structural capital. This shows that ability and loyalty and commitment of human resources will determine structural capital. Besides that human capital also has a positive and significant effect on company performance and also influences competitive advantage. The management must be able to channel the capabilities, ideas and innovations of employees into the company's work system. In addition, the higher employee loyalty to the company, the more attention to efficiency, culture, structure, and company development. In addition, the better the ability, experience and commitment of weaving craftsmen will increase the market share of the results of Troso woven products. In addition, it will also increase competitive advantage. This study also supports the results of research including Daou et al. (2013), Ning et al. (2011), Shih et al. (2010), Sharabati et al. (2010), Uadiale & Uwuigbe (2009), Cohen & Kaimenakis. (2007), Cabrita & Vaz (2006), Chen et al. (2004), and Bontis (1998).

Furthermore, Structural capital have a positive and significant effect on customer capital. In addition, it also has a positive and significant effect on company performance and also on competitive advantage. This shows that the work process in producing efficient and fast weaving products and various types of products will maintain customer loyalty. In addition, it will also increase company profits and market share. With production efficiency will reduce production costs, so as to increase competitive advantage in a sustainable manner. This study supports the results of research from Daou et al. (2013), Soret et al. (2010), Sharabati et. Al (2010), Uadiale & Uwuigbe (2009), Yusuf & Sawitri (2007), Cabrita & Vaz (2006), Astuti & Sabeni (2005), Chen et. Al (2004), and Bontis (1998).

Then, Customer capital have a positive and significant effect on company performance and also have a positive and significant effect on competitive advantage. This illustrates that customer satisfaction and loyalty is very important to increase sales growth and market share of troso woven products. For this reason, it should be noted that troso weaving products not only provide a standard model, but need to keep abreast of consumer tastes, so that customer loyalty is maintained. This will increase the company's profits and increase the competitive advantage of weaving products both at national and international levels. The results of this study are also supported by the results of the study of Daou et al. (2013), Sharabati et. Al (2010), Soret et. Al (2010), Uadiale & Uwuigbe (2009), Cabrita & vaz (2006), Chen et.al (2004), and Bontis (1998).

The results of this study also showed that the competitive advantage of troso weaving had a positive and significant effect on the performance of the troso woven SMEs. This shows that the higher the attention to product quality, product diversity, product availability and distribution speed will increase profit margins, market share and sustainable company performance. This is in accordance with the results of a study from Prasetya et al. (2007), Li et al. (2004), Chen et al. (2006), and Purnama & Setiawan (2001).

Local government is expected to keep giving trainings to the weavers equally, and to everybody without exceptions. Central government is also expected to help lifting up the trend of traditional weaving of Troso as well as other weaving products around Indonesia.

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