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Research paper

Application of Information System Technology and Learning Organization to Product Innovation Capability and Its Impact On Business Performance of Leather Tanning Industry

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Abstract

Information system technology and learning organization play a strategic role in the development of small leather industry performance. Even so, most of small leather industries in Garut assume that technology is a big investment that cannot have a direct impact on business performance. This study applied a quantitative explanatory survey method. The samples were 95 tanners in both formal and home industries located in Sukaregang, Garut, West Java. Data were analyzed using PLS-SEM. Based on the results of data analysis, it was concluded that the application of information system technology had a positive impact on the innovation ability of leather tanning products. On the other hand, the learning organization had no effect on the product innovation ability. Nevertheless, both information system technology and learning organization directly affected the business performance.

Keywords: *Information System Technology; Learning Organization; Innovation*

1 Introduction

In Indonesia, hides are the main raw materials used for leather and artwork industries. Hides can be used to make parchments or tanned to produce leather. Leather industries have begun to develop in Indonesia since the 1970s. In the upstream sector, there was a growing number of factories, both large and small, from 37 in 1975 to 112 in 1995. In 1975-1990, leather industries sprang up in Magetan, Garut, and Madiun. In Indonesia, there are many areas that produce quality leather such as Sidoarjo, Magetan, Yogyakarta, Cibaduyut, Garut and other areas outside of Java. Garut is one of the finest leather producers in Indonesia, especially leather jackets. Garut's leather products are of import quality, but with an affordable price. Garut's leather products are also rich in terms of modifications.

The leather industries in Garut have undergone a long historical journey and have existed since the Japanese colonial era. It was the tanners in a tanning industry in Jatayu, Bandung, who then moved and began to work independently in Garut. That was when leather industries began to develop in Garut.

Leather crafts in Garut are normally made of sheepskin. This is due to the fact that there are many sheep farms in Garut. Sheep even become the icon of Garut, which is well-known as "Domba Garut." Domba Garut in Latin is called ovis aries, which is a crossbreeding result between local sheep, South Africa's Capstaad sheep, and Australia's Merino sheep. The Capstaad sheep came first before the Merino sheep were imported to Garut in the 19th century. This crossbreeding gave birth to a new variety called Domba Garut.

Garut leather industrial products have penetrated into overseas markets; however, the exports are still limited due to lack of raw materials, lack of innovation, lack of technology applications, and limited access to information. Currently, there are 736 leather tanning and craft business units with a workforce of 5,067 (Yulianto, 2015).

The decline in turnover of leather industry in Garut is due to several aspects such as quality issues, technology applications, marketing and organizational capabilities in adjusting to changing times. Changes in systems and technologies are unavoidable. A quick and proper decision making is required in order not to be a victim of this disruptive change. Improvement and transformation are accelerated by some companies to compete with their rivals. Although conventional business model can still survive, it is inevitable that we will soon enter the era of digital technology. The changing behavior of consumers who use digital technology applications enables business people to get new sources of information about their consumers that they have never obtained before. In-depth information in the digital world can be used to predict behavior, find suitable target consumer, or even serve as the basis for new solutions. Majamäki and Akpinar (2014) suggest that the disrupted innovation requires companies to be able to seize opportunities and adopt technology in order to compete. Changes in consumer behavior allows the purchase of products by using online media (Tallud, 2014). According to Kula and Tatoglu (2003), technology applications and information systems are used by SMEs to improve innovation and sales, markets and networks.

Due to rapid technological changes, companies are required to have innovative and adaptive capabilities to compete. In the era of knowledge and technology, every organization will face increasing uncertainty as a consequence of rapid business environmental and technological changes. In order to survive and have competitive advantage, every organization is required to adapt and transform into a leaning organization, which is a company that facilitates the learning of its members and continuously transforms itself. In this respect, Coughlan and Coughlan (2006) emphasize

the importance of learning organization to generate company adaptive capabilities so as to maintain organizational performance. According to Farrukh and Waheed (2015), the following are the determinant factors in the success of learning organization: innovation ability, leadership, self-development ability, and information sharing.

Innovation is something leather industries in Garut need to pay attention to because innovation built upon creativity can generate competitiveness to improve business performance (Reguia, 2014). Dotun (2015) analyzed factors that can influence innovation such as research and development, government factor, leadership and organization. Fazlzadeh (2010) suggest that innovation in small industries are determined by research and development and organization factors. Meanwhile, Abereijo, Ilori, Taiwo, and Adegbite (2007) analyzed innovation based on internal factors including technology, manager and organizational capabilities and external factors.

Therefore, in order to survive and even improve their business performance, small leather industries in Garut must be able to adapt the learning organization culture and adopt the current existing technology so that innovation can be well-developed.

2 Literature Review

Information and communication technology consists of two inseparable aspects: information technology and communication technology. Information technology includes all things related to its process, its use as a tool, manipulation, and information management. And communication technology is associated with the use of tools to process and transfer data from one device to another (Ghobakhloo, Hong, Sabouri, & Zulkifli, 2012). Furthermore, they analyzed the internal and external factors that influence the application of ICT in SMEs. The internal factors included management, human resources, information systems, and the external factors included the business environment and government. Fong (2011) mentioned that the implementation of technology applications in small industries in China were restricted by human capabilities. Therefore, the preparation of skilled human resources who can master the application of information technology is necessary.

The use of technology applications enables business transactions with the international markets. In this respect, Ongori and Migiro (2010) state, "ICTs adoption and assimilation in SMEs is critical to enhance their competitiveness. In addition, ICTs usage in SMEs will enhance accessibility into the international markets." Ladokun, Osunwole, and Olaoye (2013) state that it takes real effort from the government in providing training, hardware, and networks in order for the technology application can be well implemented.

According to Zoroja (2016), ICTs adoption significantly affects innovation. Along the same line, Ernesto and Peñalba (2015) suggest that ICT application has a significant positive impact on online innovation. Some experts (e.g., Meenakshi, 2013; Ladokun et al., 2013) explain the role of ICT in innovation.

Learning organization is defined as an organization that has the ability to always improve its performance in a sustainable and cyclical manner because its members are committed and competent to learn and share knowledge at the superficial and substantial levels. Learning organization is a figurative word that describes an organization as an integrated system that continuously transforms itself because its members experience a learning process based on its work culture. The individual learning process occurs when members of the organization experience the process of understanding new concepts (know why), followed by the increased ability and experience to realize the concepts (know how), resulting in the improvement of organizational added value (Slater, 1995).

Learning organization is the process of detecting and correcting errors. Learning organization refers to the opportunities provided to employees so that the organization becomes more efficient (Caroline et al., 2015). Learning organization means the process of improving action through better knowledge and understanding. Hence, learning organization actually supports knowledge management (King, 2009). Slater (1995) defines learning organization as an ability of an organization to create, aquire, interpret, transfer, and share knowledge, aiming at modifying its behavior to develop new konwledge. Thus, learning organization takes place through the sharing of insights, knowledge and mental models built on past knowledge and experience.

The indicators for learning organization, according to Senge (1990), are: (1) personal mastery, (2) mental models, (3) building shared vision, (4) team learning, and (5) systems thinking. Kiziloglu's (2015) study has revealed that learning organization had an impact on innovation. This study used the famework of Senge's five disciplines. Along the same line, Chuan Peng Yu (2017) also discusses the impact of learning organization on product innovation.

A company that adopts learning organization culture is able to create, acquire, interpret, transfer, and share knowledge, aiming at modifying its behavior to reflect on its new knowledge and experience. Learning organization refuses stability by continuously conducting self-evaluation and experimentation (Rrustemi, 2011).

Tornatzky and Klein (1982) suggest that innovation is characterized by product superiority, product cost, and product credibility. An innovative product may fail simply because its failure to display a unique design or misconception about what customers want and need. Product innovation is supposed to provide an added value that makes it better than other similar existing products. This innovation is required to outline a market-driven strategy (Day, 1994). Furthermore, Lukas (2000) puts forward the following indicators for product innovation:

1. Line extension: the product is not actually new to a company, but relatively new to a certain market.
2. Me-too product: the product is new to a company, but is not new to a certain market.
3. New-to-the-world product: the product is new to both company and market.

Reguia (2014) suggests that a product can be a competitive advantage. Product innovation can also have a positive impact on company financial ability. Companies that are able to design their products in accordance with the what the customers wants will be able to survive the competition because their products will always be in demand (Muangkhot, 2015). Bozkurt and Kalkan's (2014) study also reveals that the company's ability to continuously innovate its products will keep its products continue to meet what the market wants and needs. Thus, product innovation can serve as the source of the company's competitive advantage to achieve a good business performance (Swaminathan, 2014).

3 Methodology/Materials

This quantitative study was carried out using a descriptive survey and an explanatory survey method. Descriptive survey is a research method that aims to obtain a description of the object by conducting an object research. And explanatory survey is a research method that aims to determine the characteristics of variables by examining a number of samples in small leather industries in Garut regency. The indicators for the information technology variable are human resources, hardware, information systems, and organization; the indicators for the learning organization variable are personal mastery, mental models, building shared vision, team learning, and systems thinking; the indicators for the innovation variable are product line expansion, me-too product and new-to-the-world product; and the indicators for the business performance are internal and external business performance. The research population were 738 leather industries in Sukaregang, Garut, from which 70 samples were selected purposively. These industries were eligible to be the samples provided that they had business permit from the Industry and Trade Office of Garut. Data were analyzed using partial least square-structural equation model (PLS-SEM) by means SmartPLS

4 Results and Findings

Based on the research paradigm previously described, the design of analysis of the application of information systems technology and learning organization to product innovation capability and its impact on business performance of leather tanning industry can be illustrated in the following figure:

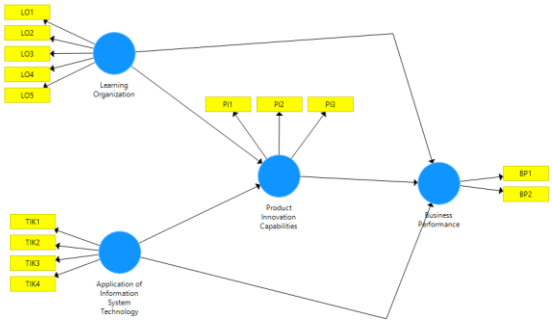

Fig. 1: of Analysis Design using SmartPLS

Referring to this model, it was then formulated the following research problems:

1. Does learning organization have a significant impact on business performance?
2. Does the application of information system technology have a significant impact on business performance?
3. Does learning organization have a significant impact on product innovation capabilities?
4. Does the application of information system technology have a significant impact on product innovation capabilities?
5. Do product innovation capabilities mediate the impact of learning organization and application of information system technology on business performance?

To answer these questions, measurement model quality testing (PLS algorithm) and hypothesis testing (bootstrapping) were carried out using SmartPLS. What follows is the result of measurement model quality testing:

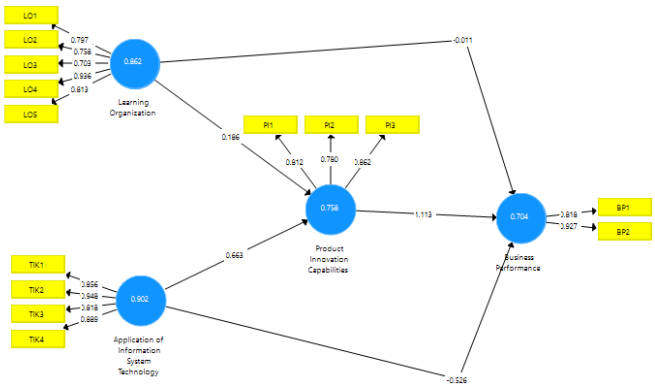

Fig. 2: of PLS Algorithm Calculation Result

Based on the result of PLS algorithm calculation, it was obtained the following outer loading of each variable and its respective indicators:

Table 1: Outer Loading

	Application of Information System Technology	Business Performance	Learning Organization	Product Innovation Capabilities
BP1		**0.818**		
BP2		**0.927**		
LO1			**0.797**	
LO2			**0.758**	
LO3			**0.703**	
LO4			**0.936**	
LO5			**0.813**	
PI1				**0.812**
PI2				**0.780**
PI3				**0.862**
TIK1	**0.856**			
TIK2	**0.948**			
TIK3	**0.818**			
TIK4	**0.889**			

Based on the result of outer loading, it was revealed that the scores of all variables and their respective indicators were higher than 0.70. This result indicates that all variables have good convergent validity, so these variables will be included in the hypothesis testing. This will ensure research results that have good and high validity.

The model was then tested to measure the reliability and validity. The results of these measurements can be seen in the Cronbach Alpha score and Composite Reliability of >0.60.

Table 2: Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Application of Information System Technology	**0.902**	**0.940**	**0.931**	**0.773**
Business Performance	**0.704**	**0.794**	**0.866**	**0.764**
Learning Organization	**0.862**	**0.896**	**0.901**	**0.648**
Product Innovation Capabilities	**0.758**	**0.782**	**0.859**	**0.670**

Therefore, it can be concluded that the measurement models of all variables have ideal reliability and good validity, and all these variables can represent all indicators in the block. The next step was hypothesis testing. It can be observed in the following bootstrapping result:

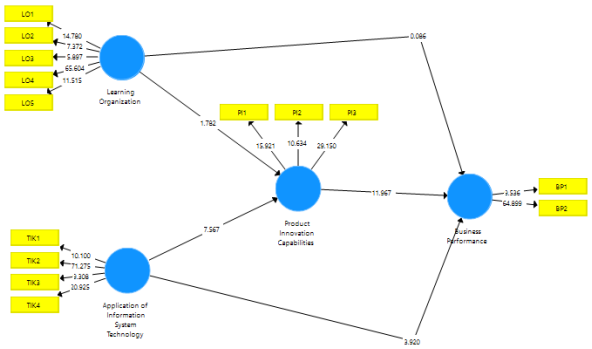

Fig 3: Bootstrapping Result

Referring to the results presented in path coefficient, the rule of thumbs of the supported hypothesis are: (1) if the coefficient or correlation direction between variables (indicated by the original sample value) is in line with what is hypothesized, and (2) if the statistical t value is higher than 1.96 and the probability value (p-value) is lower than 0.05 or 5%.

Table 3: Path Coefficient

Mean, STDEV, T-Values, P-Values					
	Original Sample (O)	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P Values**
Application of Information System Technology -> Business Performance	-0.526	-0.540	0.134	3.920	0.000
Application of Information System Technology -> Product Innovation Capabilities	0.663	0.663	0.088	7.567	0.000
Learning Organization -> Business Performance	-0.011	-0.005	0.123	0.086	0.931
Learning Organization -> Product Innovation Capabilities	0.186	0.191	0.104	1.782	0.075
Product Innovation Capabilities -> Business Performance	1.113	1.125	0.093	11.967	0.000

The testing result reveals that:

1. The impact of application of information system technology on business performance has a path coefficient of -0.526, so the impact could be said significant (t = 3.920 >1.96; p = 0.000 < 0.005).
2. The impact of application of information system technology on product innovation capabilities has a path coefficient of -0.663, so the impact could be said significant (t = 7.567 >1.96; p = 0.000 < 0.005).
3. The impact of learning organization on business performance has a path coefficient of -0.011, so the impact could be said significant (t = 0.086 >1.96; p = 0.000 < 0.931).
4. The impact of learning organization on product innovation capabilities has a path coefficient of 0.186, so the impact could be said significant (t = 0.782 >1.96; p = 0.000 < 0.0750).
5. The impact of product innovation capabilities on business performance has a path coefficient of 1.113, so the impact could be said significant (t = 11.967 >1.96; p = 0.000 < 0.005).

Table of Total Indirect Effects presents the hypothesis testing on mediation effect.

Table 4: Total Indirect Effects

Mean, STDEV, T-Values, P-Values					
	Original Sample (O)	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P Values**
Application of Information System Technology -> Business Performance	0,737	0,747	0,126	5,871	0,000
Application of Information System Technology -> Product Innovation Capabilities					
Learning Organization -> Business Performance	0,207	0,215	0,117	1,767	0,078
Learning Organization -> Product Innovation Capabilities		0,000	0,000		
Product Innovation Capabilities -> Business Performance					

Based on PLS analysis result, it was revealed that:

1. Application of information system technology has a significant positive impact on business performance through product innovation capabilities with a value of 0.000 or lower than 0.05.
2. The learning organization has no significant impact on the business performance through product innovation capabilities with a value of 0.078 or higher than 0.05.

5 Conclusion

From the results of research that has been done, it can be drawn some conclusions as follows::

1. The impact of application of information system technology on business could be said significant.

2. The impact of learning organization on business performance could be said not significant

3. The impact of product innovation capabilities on business performance could be said significant

4. Application of information system technology has a significant positive impact on business performance through product innovation capabilities

5. The learning organization has no significant impact on the business performance through product innovation capabilities

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