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The Effect of Management Capability on Product Innovation for SMEs in Indonesia

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Abstract.

Small, and Medium Enterprises (SMEs) are the backbone of the national economy. The increase in the number of SMEs in Indonesia must be accompanied by an increase in product innovation performance. Innovating products means contributing to the creation of competitive advantage, increased efficiency, and increased competitiveness, thus helping to ensure future performance. Bringing innovation to MSME products requires an effort to present creative visualization activities of concepts, plans, and ideas, represented in sketches and provide instructions on making something that does not yet exist, or so-called design management capability. This research investigated the extent to which the influence of the design management capability of MSME activists in Indonesia could contribute to presenting innovative products. This research provided a novelty to the construction of design management capability that combined the dimensions of previous research. The data collection method employed a questionnaire, with 360 respondents selected through the purposive sampling technique. Using Structural Equation Modeling (SEM) with AMOS 24 tool, the results of this study indicated that design management capability had a significant effect on product innovation.

Keywords: Design Management Capability;Product Innovation; SMEs.

1. Introduction

In recent decades, entrepreneurship has become one of the popular topics that can attract the attention and interest of various parties. Many start-up businesses have also sprung up. However, those start-ups face existential challenges, where the failure rate is very high, with a percentage reaching 67% ("Venture Capital Funnel," 2019). Design Management Capability is an important keyword for innovation activities and takes a leading role in running a business (Shih, 2012; Field, 2017). The existing innovation is expected to be the basis for a business entity.

The design allows a newly initiated business entity such as a start-up to be guided in carrying out business activities, controlling risk, and opening up existing opportunities to implement and manage an efficient design construct. Start-ups continue to be required to face fierce competition, grow rapidly, and accommodate a dynamic business environment. It has implications for design management which is a must in supporting business growth and contributing significantly to sustainable competitive advantage and strategic flexibility (Bruce et al., 1999; Chiva & Alegre, 2009; Acklin, 2010).

Design management capability refers to the capacity to deploy design resources adequately and dynamically (Mesa et al., 2013; Acklin, 2013), which impacts the organization's dynamic capabilities (Teece et al., 1997; Acklin, 2013). Design management capability is believed to contribute to a business entity reacting to the current opportunities at the right time, in the right way, and creating a new value (Teece, 1998; Jevnaker, 2000). It becomes a strength for start-ups to respond to the market faster by providing new, innovative products, following the customer needs, and dynamic business competition.

In Indonesia, Small, and Medium Enterprises (SMEs) are the backbone of the national economy. SMEs have been able to be one of the solutions to overcome the problem of equalization in the distribution of regional income and

reduce the unemployment rate. Data from the Ministry of Cooperatives and SMEs of the Republic of Indonesia (2018) stated that the number of SMEs continued to increase. In 2016, there were 61.7 million business units. And then, the number was increased by 2.06% to 62.9 million business units in 2017. In 2018, the increase was also evident from the data composition, where the number of Micro Enterprises reached 63.5 million units, Small Enterprises reached 783,132 units, and Medium Enterprises reached 60,702 units. The MSME sector contributed 59.84% to GDP in 2016 and increased to 60.34% in 2017. In addition, it has also been able to absorb the labor of up to 116.6 million people or 97.22% in 2017 (Ministry of Cooperatives and SMEs, 2018). It proves that the MSME sector is indeed one of the most effective solutions in reducing the unemployment rate and overcoming economic inequality (Rahayu, 2017).

The increasing number of SMEs in Indonesia must be accompanied by the increased performance of the resulting product innovations. Bringing product innovation means presenting creative ideas in an organization (Amabile et al., 1996). Innovation will adopt an idea or behavior concerning a new product, service, instrument, system, policy, or program for the existing business (Damanpour & Evan, 1984). The ability to innovate products contributes to creating competitive advantage and increased efficiency that help support current and future performance improvements (Vidal et al., 2012). Bringing innovation to MSME products needs an effort to present a series of creative visualization activities of concepts, plans, and ideas, represented in sketches and provide instructions on creating something that does not yet exist. It is closely related to design management capability (Walsh, 1996; Bruce & Cooper, 1997).

Design management capability is believed to contribute to new product innovation (Ho et al., 2011; Mesa et al., 2013; Gerlitz, 2016). The presence of new product innovation cannot be separated from the skills of business actors in presenting effective design. Basic skills, specialized skills, involving others, organizational change, and innovation skills have an essential role in carrying out design activities that contribute to product innovation (Dickson et al., 1995). This research investigated the extent to which the design management capability from MSME activists in Indonesia contributed to presenting innovative products. Indonesian SMEs, which are expected to grow to increase the export market, must undoubtedly be supported by capable product innovations. The innovation results are believed to strengthen the export potential (Zou & Ozsomer, 1999; Vidal et al., 2012). Innovation allows companies to update their products to be more attractive to adapt to the demands of international markets (OECD, 2005; Golovko & Valentini, 2011). This research also provided an overview of the test results of the design management capability construct as an independent variable on product innovation by combining previous research indicators so that the test results might describe the expected broader testing construct.

2. Literature Review

2.1 Design Management Capability

Design is the result of a series of processes that transform ideas and opportunities (Bruce & Bessant, 2002). Design is viewed as the primary antecedent of the company's performance (Hertenstein et al., 2005; Abecassis-Moedas & Mahmoud-Jouini, 2008). Design management is considered an organizational and managerial practice and skills that enable companies to achieve good and practical design (Gorb & Dumas, 1987; Dickson et al., 1995; Mesa et al., 2013). Considering a series of design activities exerts a combination of logical and intuitive thinking (Mesa et al., 2013), as well as a creative visualization of various attributes such as concepts, plans, and ideas, which are poured into a sketch along with instructions to create something that does not yet exist (Walsh, 1996; Bruce & Cooper, 1997).

In conducting a business design, the design management capabilities are needed to achieve an effective design (Mesa et al., 2013). There are five skills in managing design management for the MSME activists to achieve high growth: basic skills, specialized skills, involving others, organizational change, and innovation skills (Dickson et al. 1995; Mesa et al., 2013). Basic skills involve managing basic activities regarding the design process to design high-quality products, manufacturability, cost efficiency, and accelerating the launch of new products; Specialized skills refer to the ability to manage certain specialized activities that are useful for the product design process; Involving others is the ability to engage customers and suppliers in the design process to produce new product ideas; Organizational change discusses the ability to make changes in response to existing circumstances, both in general and in terms of moving towards contemporary design and cross-functional team management; Innovation skills are concerned with the ability to manage innovation through awareness and knowledge of innovation competition and imitation as a source of radical new design ideas.

2.2 Design Management Capability dan Product Innovation

Innovation involves generating and implementing new ideas, processes, and products (Mesa et al., 2013). The design has an essential meaning in innovation to represent the creative aspect of implementing ideas into material form. It is based on meeting technical capability and consumer demand (Walsh, 1996). For SMEs, the design improves communication and innovation power in product development (Brazier, 2004; Acklin, 2010).

Management is challenged to perform various activities or managerial skills to optimize the design process (Mesa et al., 2013).

Innovation requires two conditions to be met: novelty and utility (Vidal et al., 2012). Novelty means the innovation process resulting from scientific discoveries, production, or new management techniques. Meanwhile, utility talks about commercialization capabilities over the executed ideas. Product innovation will give birth to new features that are believed to significantly improve customer service performance (Mesa et al., 2013).

SMEs have experienced several obstacles, especially in accessing resources to support innovation. SMEs have not realized that design is a strategic resource in solving various types of obstacles and problems (Acklin, 2011), such as limited human and financial resources and less formal or non-existent product development and innovation processes (Fueglistaller, 2004). Inability in terms of access to design resources or poor design understanding will impact the weak development and integration of design management functions in SMEs (Cox, 2005; Moultrie et al., 2007). In contrast, strong design capabilities lead to successful technology commercialization, including the frequency and speed of commercialization of new products, the rate of innovation, and an even number of patents (Ho et al., 2011). The hypothesis of this research was: Design management capability has an influence on product innovation.

Design management capability has an influence on product innovation.

3. Methodology

3.1 Measurements

This study used a causal research design. The determination of data in this research was assisted by using questionnaires. The questionnaires used a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Design Management Capability was measured based on five dimensions developed by Mesa et al. (2013). As for measuring Product Innovation, the design was developed by Mesa et al. (2013) and Afriyie et al. (2019) with 10 indicators. Information about the demographic characteristics of respondents being collected was the gender of respondents, the business sector being carried out, the length of business operation, and monthly income.

3.2 Sampling and Data Collection

The number of samples employed and examined in this study was 360 respondents. The samples employed were the MSME activists living in Indonesia, have a business operated for at least 1 year, and involve technological elements in running their business. The sampling locations were distributed in various cities in Indonesia, such as Jakarta, Bandung, Medan, Surabaya, Semarang, Samarinda, Banjarmasin, Makassar, Pontianak, and various other Indonesian regions through online questionnaires.

3.3 Data Analysis

The present study used Structural Equation Modeling (SEM) with AMOS 24 statistical tool to analyze and evaluate the built research constructs' measurement model and structural model. The fit test model was assessed based on goodness-of-fit index parameters such as chi-square ($\chi 2$), CMIN/DF, Root Mean Square Error of Approximation (RMSEA), Root Mean Squared Residual (RMR), Goodness of Fit Index (GFI), Tucker Lewis Index (TLI), Incremental Fit Index (IFI), Comparative Fit Index (CFI), and Normed Fit Index (NFI). The validity evaluation relied on the Standardized Loading Factor (SLF) value, which must be ≥ 0.50 (Hair et al., 2014:618). In contrast, the construct reliability relied on the tabulation results of Construct Reliability (CR) and Average Variance Extracted (AVE) values. Furthermore, the SEM analysis carried out was a structural model analysis to assess whether the research hypothesis was accepted or rejected. SEM analysis displayed the t-score on each coefficient. Hypotheses can be said to have a causal relationship if the value of t-score $\geq$ t-table (1.96) with a significance level of α (usually $\alpha = 0.05$).

4. Result and Discussions

4.1 Respondent Characteristics

The analysis of the respondents' profiles in this research was based on the following demographic characteristics:

Table 1. Characteristics of Respondents

Category	Item	f	%
Gender	Male	149	41
	Female	211	59
	Total	360	100
Business sector being carried out	Culinary	112	31
	Fashion	98	27
	Craft	107	30
	Publishing and Printing	43	12
	Total	360	100
Length of business operation	1 Year to < 3 Years	101	28
	3 Years to < 5 Years	193	54
	> 5 Years	66	18
	Total	360	100
Monthly income (in IDR)	1 million to < 10 million	40	11
	10 million to < 25 million	67	19
	25 million to < 50 million	104	29
	50 million to 100 million	113	31
	> 100 million	36	10
	Total	360	100

4.2 Measurement and Structural Models

The results of validity and reliability tests and goodness-of-fit were as follow:

Table 2. Measurement Model Results

Items		SLF	CR	VE
Basic Skills	Designing quality into products	0,871	0,914	0,689
	Designing manufacturability into products	0,817		
	Designing low cost into products	0,821		
	Designing and launching new products faster	0,811		
Specialized Skills	Using the latest computer aided design tools effectively	0,877	0,914	0,739
	Estimating the true cost of new products during the design process	0,871		
	Finding people with excellent design skills	0,846		
	Testing manufacturability of new products during the design process	0,844		
Involving others	Involving customers in the design process	0,878	0,875	0,697
	Involving suppliers in the design process	0,805		
	Getting new product ideas from customers	0,819		
Organizational change	Changing traditional ways of doing things	0,835	0,903	0,758
	Getting different functions in the firm to work together	0,867		
	Replacing sequential with concurrent design	0,909		
Innovation skills	Finding new design ideas - not just me-too imitations	0,933	0,840	0,788
	Quickly becoming aware of competitors' innovations and imitations	0,840		
Product Innovation	expressly introduction of new products	0,93	0,975	0,830
	Replacement of products being phased out	0,935		
	Extension of product range within main product field through new products	0,928		
	Extension of product range outside main product field	0,917		
	Development of environment-friendly products	0,885		
	Market share evolution	0,872		
	Opening of new markets abroad	0,926		
	Opening of new domestic target groups	0,921		
	developing new product features	0,922		
	reposition of existing products	0,873		

Table 2 illustrates the results of the overall model validity and reliability tests. Standardized Loading Factor (SLF) values of all indicator variables on a full model were above 0.50. It indicated that all indicators were declared valid and could measure the construct of the built full model. The reliability test obtained the relevant results. All instruments were declared reliable

and could consistently measure the construct of the built full model, indicated by the Average Variance Extracted (AVE) values of the entire indicator instruments that were ≥ 0.50, and the Construct Reliability (CR) values that were ≥ 0.70.

Table 3. Goodness of Fit Index

Goodness of Fit Index	Cut off Value	Results
CMIN/DF	≤ 3.00	2,563
RMSEA	≤0,08	0,066
TLI	≥ 0.90	0,949
IFI	≥0,90	0,954
CFI	≥0,90	0,954
NFI	≥0,90	0,926

Table 3 portrays the results of the model fit test. Based on the model fit test results, it can be seen that the model suitability requirements could be accepted and declared fit. Six measurements showed a degree of good fit. Hair et al. (2014:583) states that a research model construct can be declared fit and accepted if at least three to four measurements obtain a degree of good fit or above the cut-off value.

4.2.1 Hypotheses Testing

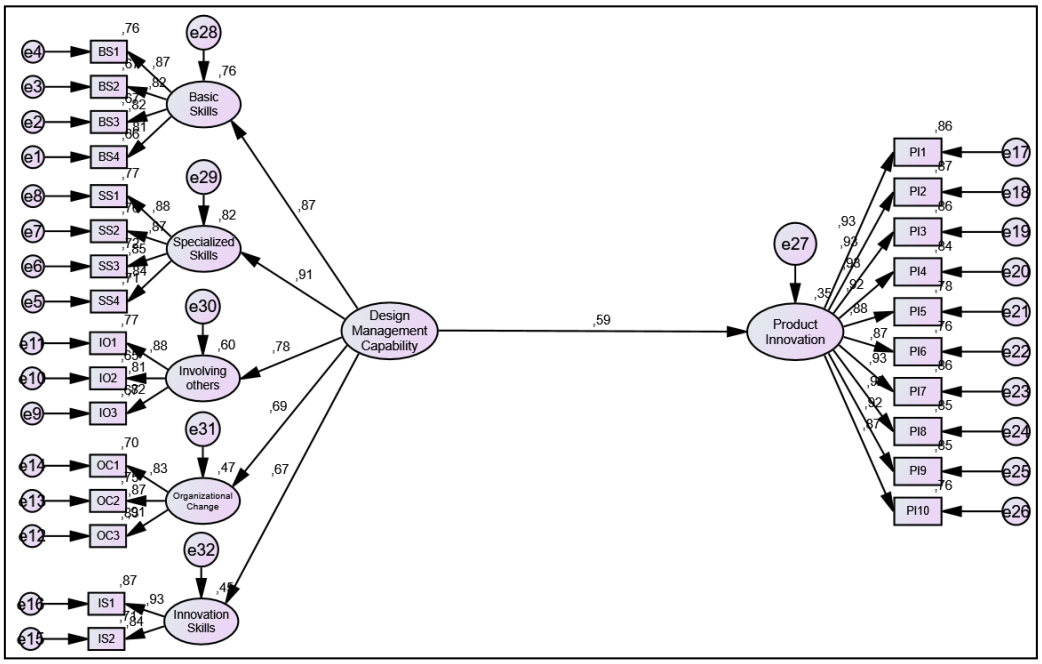

Fig 1: Full Model Structural Test

Based on the results of AMOS processing shown in Table 4, the t-score value is 11.277, and the p-value is 0.001, which is marked with a three-star symbol. These results indicated that the t-score value for the variable of design management capability toward product innovation was higher than the t-table value of 1.96. In addition, the obtained p-value was smaller than 0.05 ($\alpha = 0.05$). Based on these results, it can be stated that design management capability significantly influenced product innovation.

Table 4. Hypothesis Testing

	Estimate	S.E.	C.R.	P	Label
Product_Innovation <--- Design_Management_Capability	0,645	0,057	11,277	***	

The results of this study were in line with previous research showing that design management capability could encourage product innovation (Ho et al., 2011; Mesa et al., 2013; Gerlitz, 2016; Liu & Rieple, 2019). Product innovation is believed to be presented if SMEs activists have five skills elements, such as basic skills, specialized skills, involving others, organizational change, and innovation skills.

5. Discussion

Product innovation is one of the challenges faced by SMEs. One of the requirements for a business to achieve sustainable competitive advantages is innovation. Product innovation will exist if an organization continues to strive to present a series of processes such as developing plans and ideas, represented in sketches, and providing instructions on how to make something that does not yet exist, or so-called design management capability (Walsh, 1996; Bruce & Cooper, 1997).

Building a design management capability means building five elements of skills, such as basic skills, specialized skills, involving others, organizational change, and innovation skills (Dickson et al., 1995; Mesa et al., 2013). The ability to build strong design management will affect the ability to innovate products. In addition, the ability to access technology, communication skills, and product development capabilities will also be encouraged if an organization seeks to present design management capabilities (Brazier, 2004; Acklin, 2010; Ho et al., 2011).

The results of this study emphasized that SMEs need to consider design management capability and product innovation if their businesses want to continue to exist. Design management capability implies the development of product innovation. It indicates that SMEs and stakeholders need to seriously strengthen design management capability so that SMEs can continue to survive amidst intense competition with industrialization through sustainable product innovation capabilities.

6. Recommendations

Business people, especially SMEs, need to improve their design management capability continuously. A strong design management capability will affect the ability to innovate products. Based on previous research, an organization's design management capability could encourage the ability to access technology, communication skills, and product development capabilities. Additionally, they need to strive to continue carrying out a series of product innovation processes if their businesses want to continue and have sustainable competitiveness.

For stakeholders, the issue of design management capability and product innovation needs to be seriously followed up to strengthen the existence of SMEs, considering the existence of SMEs has a strategic position and is very important to sustain the nation's economy.

For researchers, the results of this study are expected to be literacy materials and references to develop a deeper and more comprehensive study to contribute to advancing SMEs.

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