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Measurement of Innovation Capability of Small Enterprises in the Wholesale Fabric Sector

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Abstract

The purpose of this paper is to measure the innovation capability of small enterprises in the wholesale fabric sector. This article uses a quantitative approach by applying Rasch analysis to measure the level of capability of small industry innovation through 48 statements addressed to 303 small businesses. Primary data was collected through distributing questionnaires directly to 325 respondents and 303 were returned. The instrument used in this study showed excellent reliability and validity, demonstrating that the construct capability of innovation could be fulfilled according to the Rasch model analysis. The results showed that small businesses that had the highest innovation capability were respondent number 037: female, age of the company: 0 – 2 years, number of employee: 0 – 10 people, and qualification: bachelor degree, marked by a tendency to answer agreed on various statements related to innovation capabilities; while respondent number 146, male, age of the company: 0 – 2 years, number of employees 0 – 10 people, and qualification: bachelor degree shows that answered towards disagreeing from the instrument of innovation capability so that it was concluded that the respondent had the lowest innovation capability among other respondents.

Keywords: Rasch model analysis, small enterprises, innovation capability

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1. Introduction

With the development of the globalization of the world economy and the upsurge of knowledge economy, a new technological revolution will set off across the world [1]. When the environment is dynamic and uncertain, with changing competitive and technological standards, companies must alter their resources and routines to innovate and survive [2]. In developed and developing countries, small businesses constitute a substantial component of the workplace-learning context, because they are major providers of employment [3]. Given the substantial stock of skills and knowledge in

small businesses, how skills and knowledge are acquired, maintained, and transformed through informal learning processes in these organizations are matters of significant interest to researchers, policy makers, and small business owners [4]. Small and medium-sized enterprises (SMEs) are increasingly looking for ways to enhance their ability to innovate effectively. Small businesses have a strong preference for and are heavily reliant upon informal learning processes, as opposed to employee participation in formal training [5].

To examine the roles of organizational culture and empowerment in enhancing innovation capability, empowerment is considered as an antecedent of innovation capability and also as a consequence of organizational culture [6]. Innovation is commonly acknowledged as a key factor in the development of both businesses and economies [7]. Innovation is also known to have propelled the process of industrialization in the past centuries and continues to underlie industrial development [8]. The ability to develop and launch innovative new products by using the latest technology quickly before global competitors, or soon thereafter, is a key factor in gaining first-mover advantages, achieving product success, capturing market share, increasing return on investment, and long-term viability [9]. Within small and medium sized enterprises (SMEs), innovation is essential to the ability to compete against larger, less resource-constrained firms [10]. Process innovation is indeed the particular way in which material firms organized their innovation process [11]. In this context, it is critical to develop the innovation capacity of small enterprises in the country for industrialization to compete favorably with other industrialized countries in international markets. In view of this, factors that influence innovation (such as resources, networking, risk taking, and involvement) must be investigated.

This study is based on a capability-based view of competitive strategy that states that an organization's source of competitiveness lies in its ability to leverage or arrange its assets properly. Instead of having stock of resources like knowledge, physical and human as assets, the theory of capability posits that better organizational performance arises from an ability to utilize these resources effectively. IC of an organization is one of the important capabilities that deliver value to the organization and its customer [12].

Processing industry includes various production activities that change the form of raw/raw materials into semi-finished goods or finished goods that are ready to be used or consumed. For example, the fabric industry that turns cotton into fabric; or the convection industry that changes the shape of fabric into various types of clothing; or the bottled beverage industry that converts various types of fruit into juice drinks in bottles ready for consumption. As for this category of Manufacturing Industry (manufacturing),

there are around 3.4 million MSMEs [13], the majority of which are engaged in 5 Industries, namely Food and Beverage (44.9%); Wood and woven crafts (19.9%); Textiles and apparel (14.4%); Non-metal minerals such as flour, mica, etc. (6.9%); and furniture (3.5%).

Innovation can be understood as an idea, method, technique or instrument that is more effective or efficient than the previous one. It can also be seen as the implementation of better and improved solutions that fulfill new needs or meet existing needs better [14]. Innovation capability is one of the most important dynamics that enables SMEs to achieve a high level of competitiveness both in the national and international market. Thus, how to promote and sustain an improved innovation capability should be the key focus area of the top managers of SMEs [15]. The innovation capability as a result of the set of capabilities, driven by technology and business. In the technological context, it is possible to find the capacity to apply knowledge to transform resources into products through routines, that is, technological development and operational capabilities. In the business context, in turn, it is possible to find the capacity of the firms to launch developed solutions in the market with a low transaction cost, that is, managerial and commercial capabilities [16]. Innovation capability is one of the most important dynamics that enables SMEs to achieve a high level of competitiveness both in the national and international market. Thus, how to promote and sustain an improved innovation capability should be the key focus area of the top managers of SMEs [17]. By organizational innovation we mean “the implementation of a new organizational method in a firm’s business practices, workplace organization or external relations”. Innovation capabilities involve a firm’s ability to recognize an opportunity for innovation, and then combine firm resources and capabilities to successfully exploit the opportunity through innovation [18].

2. Methodology

This type of research is quantitative using primary data collected from 303 textile SMEs in Tangerang by distributing questionnaires for 2 weeks in June 2019 assisted by several students as members of the research team. The questionnaire contained a description of the respondents’ profile, such as: gender, age of the company, number of employee, and qualification. Innovation capability consists of resources, networking, risk taking, and involvement which developed in 48 research. The next step is to process the data by entering the answers of respondents who have been given a Likert rating score into Microsoft Excel and then analyzed using Winsteps version 3.73 of Rasch Analysis [19].

The output tables of Rasch Analysis are variable maps, summary statistics, rating scales, person fit orders, item statistics, person statistics, scalograms, and unidimensionality [20].

3. Results

Based on data processing using Winstep Software, a quantitative output can be generated that can be analyzed using Rash Model Analysis as described below:

SUMMARY OF 303 MEASURED Person

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
MEAN	170.5	48.0	.64	.18	1.02	-.2	1.00	-.3
S.D.	19.3	.1	.64	.02	.56	2.5	.54	2.4
MAX.	214.0	48.0	2.46	.25	4.18	8.6	4.05	8.5
MIN.	79.0	47.0	-2.02	.16	.21	-6.2	.21	-5.7

REAL RMSE	.21	TRUE SD	.60	SEPARATION 2.94	Person RELIABILITY	.90
MODEL RMSE	.19	TRUE SD	.61	SEPARATION 3.29	Person RELIABILITY	.92
S.E. OF Person MEAN = .04						

Person RAW SCORE-TO-MEASURE CORRELATION = .99
CRONBACH ALPHA (KR-20) Person RAW SCORE "TEST" RELIABILITY = .92

SUMMARY OF 48 MEASURED Item

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
MEAN	1076.4	302.9	.00	.07	.99	-.3	1.00	-.2
S.D.	108.4	.2	.54	.01	.27	3.0	.28	3.0
MAX.	1237.0	303.0	1.49	.08	2.09	9.9	2.21	9.9
MIN.	748.0	302.0	-.92	.06	.68	-4.2	.67	-4.4

REAL RMSE	.08	TRUE SD	.53	SEPARATION 6.97	Item RELIABILITY	.98
MODEL RMSE	.07	TRUE SD	.53	SEPARATION 7.27	Item RELIABILITY	.98
S.E. OF Item MEAN = .08						

UMEAN=.0000 USCALE=1.0000
Item RAW SCORE-TO-MEASURE CORRELATION = -1.00
14541 DATA POINTS. LOG-LIKELIHOOD CHI-SQUARE: 33336.19 with 14188 d.f. p=.0000
Global Root-Mean-Square Residual (excluding extreme scores): .7934

Figure 1: Summary Statistics

Description:

1. Person measure =.64 logit shows the average value of respondents in the IC instrument. The average value is more than logit 0.0 indicates the tendency of respondents who more answered agree on statements in various items.

2. Cronbach's alpha value (measuring reliability, i.e. interaction between person and item as a whole) =.92 is in the excellent category (> 0.8)

3. Person reliability =.90 is included in the good category

Item value reliability =.98 in the special category

4. The grouping of people and items can be determined by the value of separation. The greater the value of separation the quality of the instrument in terms of the overall respondent and the item is better because it can identify the group of respondents and groups of items. Another equation that can be used that looks at groupings more closely is called strata separation:

H = (4xseparation) +1 / 3

H = (4x2.94) +1 / 3

= 4.25

This means that there are four groups of respondents

From the picture it can be explained that the most difficult item to approve is N20 and the easiest item to approve is N41

4. Discussion

From the results of the measurement of innovation capability measurement shows that: Person measure = +0.64 logit shows the tendency of respondents to answer more agree on statements in various items means that the respondent understands the purpose of the statement in the questionnaire as a whole and the simple and straightforward language structure is right on target as SMEs. The selection of respondents is in accordance with the objectives of the study because they master the statements given to them, meaning that the respondents are indeed business operators who go about their daily lives as reflected in each item of statements related to the capability of innovation.

Cronbach's alpha value that measures reliability, that is, the interaction between respondents and statements as a whole is 0.92, including the excellent category. This means that the statements compiled are appropriate to measure the capability of SMEs innovation because these statements are the result of the development of innovation capability variables which are reduced to four dimensions, namely resources, networking, risk taking, and involvement. Based on the reliability value obtained, it can be concluded that the statements developed from the innovation capability variable will remain consistent if it is used again to measure the capability of innovation to SMEs

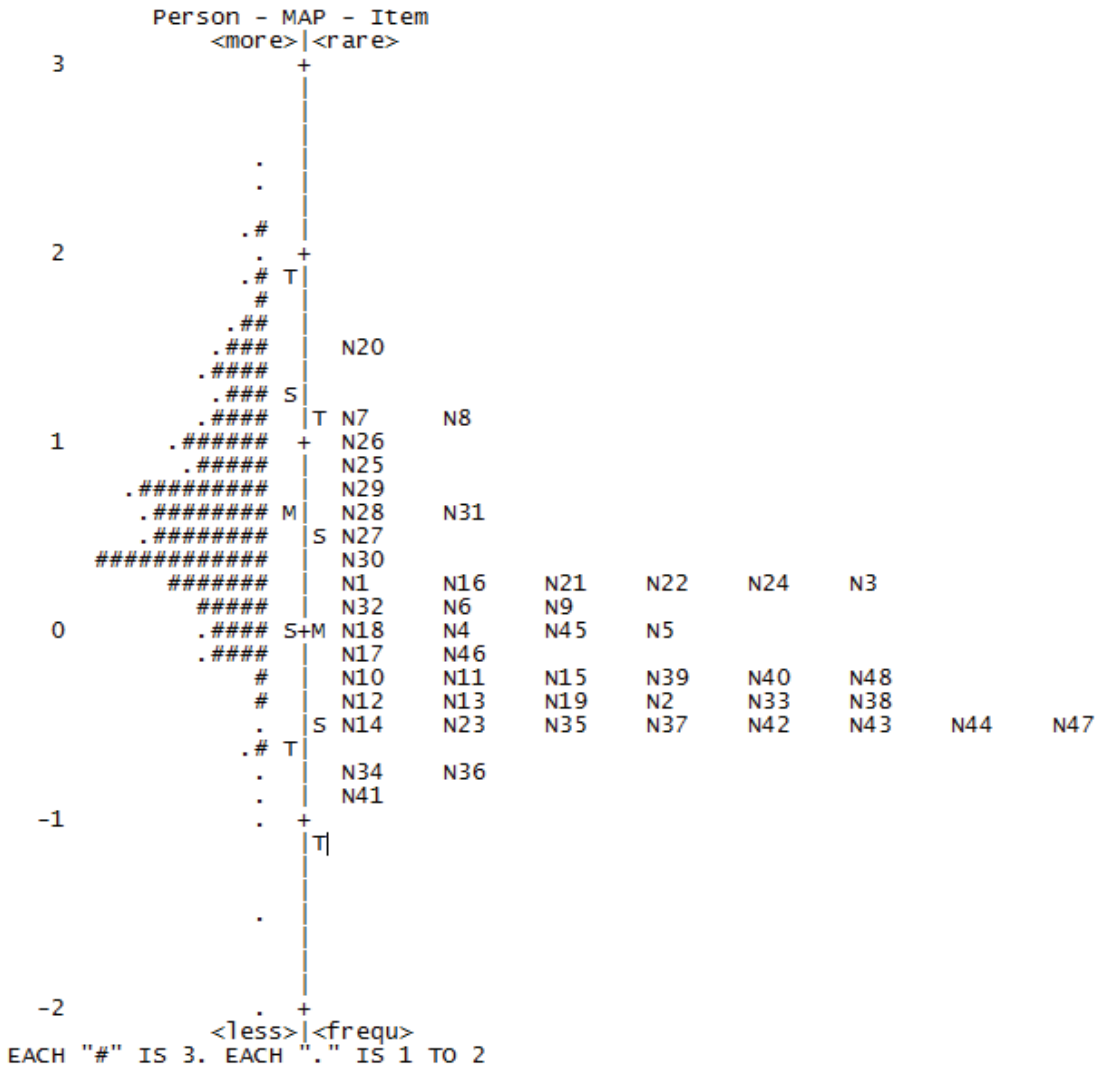

Figure 2: Variable Maps

with the same results meaning that these statements precisely represent the elements of innovation capability in SMEs.

Respondents number 037: female, age of the company: 0 – 2 years, number of employees: 0 – 10 people, and qualification: bachelor degree have a tendency to have the highest innovation capability compared to other respondents marked by the tendency to answer agree on various statements related to innovation capabilities; while respondents number 146: male, age of the company: 0 – 2 years, number of employees 0 – 10 people, and qualification: bachelor degree shows that answered towards disagreeing from the instrument of innovation capability so that it can be seen that the respondent has the lowest innovation capability among other respondents.

The respondent number 037: female, age of the company: 0 – 2 years, number of employees: 0 – 10 people, and qualification: bachelor degree is the respondent

who have the highest innovation capability, it can be seen that this respondent has and applies the dimensions of innovation capability, namely resources, networking, risk taking, and involvement in running the textile business. Resources in the scope of innovation capabilities such as technology, finance, knowledge, and skills. Therefore it can be seen that respondents who have the highest innovation capability also have access and support in terms of technology, finance, knowledge, and skills in running a business. SME Networking includes good relations with government, educational institutions, and customers. This is indicated by the support and assistance obtained from the three parties in running the business. From the government obtained clear regulations on business activities, educational institutions provide support in the form of business management training

The most difficult statement of items agreed by respondents was N20 (We only focus on a limited number of customers) and the items that were most easily agreed by respondents were N41 (Our company has workers who are responsible). This means that SMEs are not only focused on limited customers or existing customers but are still trying to find new customers by expanding customer segments. If so far most customers are individual buyers, retail agents around Tangerang, but SMEs are expanding their customer networks to convection entrepreneurs and retail traders outside Java. This can be seen from the growth of logistics delivery businesses that send textile materials. As for the statement of having responsible workers, it can be reviewed because these SMEs are generally family businesses that are driven by their own relatives so that the sense of belonging is stronger for conducting business responsibly. Family and cultural ties further foster a strong sense of belonging and try to maintain business continuity by employing close relatives or relatives. This can be seen from the emergence of several tribal backgrounds in Cipadu Market, such as the Minang, Sundanese, Batak, and so on. With the existence of associations or associations with a background of tribal similarity, it shows that trust is an important thing in running a business.

For the statement “access to technological assistance needed” and “sure that the government knows the problems faced by small businesses and are able to solve them” are responded to in contrast with male and female respondents. Male respondents think more positively which means that they are optimistic and believe in the use of technology and the role of government can support and help the progress of their businesses but female respondents argue otherwise. Female respondents believe that the business is run alone without government assistance and minimal use of technology.

5. Conclusion

Small and Medium Enterprises (SMEs) related to the creative economy and entrepreneurship. Therefore innovation is needed to be able to run a business by utilizing available resources, expanding networks, courage to take risks, and the involvement of all parties related to business operations. From the innovation capability variable that is the focus of this research, it is developed into 48 statements that represent innovation capabilities in SMEs.

The subjects in this study were 303 textile SMEs in Tangerang who provided their opinions related to the research object, namely the capability of innovation in doing business. The interaction between SMEs and the statements in the questionnaire is very good so it can be explained that the statements compiled have used the right language, i.e. SMEs with varying levels of understanding but in accordance with the daily lives faced by these SMEs.

From the measurement of innovation capability on 303 textile SMEs, the results obtained were that the respondents with the highest innovation capability was number 037: female, age of the company: 0 – 2 years, number of employees: 0 – 10 people, and qualification: bachelor degree; meanwhile, male respondent, 0 – 2 years, number of employees: 0 – 10 people, and qualification: bachelor degree has the lowest innovation capability among other respondents.

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Conflict of Interest

The authors have no conflict to declare.

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