Determinants of Intellectual Capital: A Study of SME's Batik in Central Java

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Abstract. The objective of this study is to explore the intellectual capital establishing factors especially for SME's. Intellectual capital constitutes intangible asset that will add the value of the company to achieve competitive excellence. Quantitative data analysis derives from the survey towards 87 middle range manages using jugdment sampling technique. The data was analysed using cronbach's alpha test to measure the reliability; exploratory factor analysis and confirmatory factor analysis with VARIMAX rotation were applied to measure factor analysis. Research location took place at two largest clusters of Batik Industry in Central Java that are Pekalongan and Laweyan-Surakarta city. The result shows that SME's batik in Central Java has an intangible asset. The factors of intellectual capital on batik SME's consists of the human capital, structural and relational capital.

Keywords: Intellectual Capital, Human Capital, Structural Capital and Relational Capital

1 Introduction

Central Java become third most populated province in Indonesia. It population until now around 33 million people. With that condition Central Java Industries increase by year include their batik industries. Intellectual capital can reach if the environment treated well so the government should managed it properly.

The development of knowledge-based economy causes tangible asset is no longer considered as distinguishing factor in competitive advantage[1]. The created value is no longer depending on the tangible asset but more on the intangible asset[2]. One of the intangible assets is Intellectual Capital. Intellectual Capital is a concept that has a wide concern within the last two decades. It is because intellectual capital is able to appear the competitive advantage that will lead to the performance organization because such resource is one that is hard to imitate that it could be considered as a strategic resource (Durst[3] ; Lo[4]). The purpose of this study is to explore the factors that establish intellectual capital especially for SME's. It is because in developing countries, intellectual capital especially for SME's has less concern[5].

2 Methodology

This research was carried out in two biggest clusters of batik industry in Central Java: Pekalongan and Laweyan-Solo as many as 87 from 275 SME's. Hence, the respond rate of this research was 32%. The respondents were selected by judment sampling. Human capital on this research was measured using indicator of competence, attitude and intellectual capability (Bontis[6]; Tovstiga & Tulugurova[7]; Khalique et al[8[) Structure capital was measured using indicator of procedure and policy (Cabrita & Bontis[9] ; St-Pierre & Audet[10]). Relational capital was measured using network (Castro et al[11] ; Srivihok & Intrapairote[12]). Data was analysed using cronbach's alpha test to measure the level of reliability; *exploratory factor analysis (*EFA) and *Confirmatory factor analysis* (CFA) with *VARIMAX rotation* were carried out to measure the factors that establish intellectual capital.

Analysis result that cronbach's α was between 0.75 and 0.80 for each construct, the value was reliable since it was on the expected threshold of 0.7. On the corrected item total correlation, the value $r_{count} > r_{table}$ of 0.2084, so it can be said that the constructs valid. The result of correlation test among the independent variables showed that there was no multi-co-linearity among the independent variables. It was seen from the absence of the correlation value between the independent variable which was more than 0.85, so it can be concluded that multi-co-linearity issues did not occur.

Exploratory factor analysis was used if the established factors were not determined priorly[13]. According to[14] factor of loading thresholds that was based on the size of the sample were 0.55; 0.6; 0.65; 0.7; 0.75 for the size of sample 100; 85; 70; 60 and 50. In this study, the level of accepted loading based on the size of the sample was 0.58[14]. Exploratory factor analysis for this research was carried out on 11 item of human capital variable, 9

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item of structural capital and 4 item of relational capital. The result shows that all those items were above the value of factor loading thresholds. This finding showed that such exploratory factor analysis proposed three indicators of human capital, with KMO 0.7482, χ^2 341,668 (*p=0,01*). Two indicator of structur capital were evident with KMO 0,7793, χ^2 236,495 (*p=0,01*). Customer capital is built by one indicator with KMO 0,5980, χ^2 273,562 (*p=0,01*). These findings shows that these constructs has fulfilled the criteria to be utilized as the factors to established intellectual capital.

To validate the construct of the exploratory factor analysis, the confirmatory factor analysis needed to carry out[15]. *Confirmatory factor analysis* (CFA) was used if the established factor had been determined first theoretically, or empirical research or both[15]. In CFA, there was goodness of fit that must be acquired, so the factors that established the construct could be accepted.

The result showed that intellectual capital on batik SME's was established out of three components namely human capital, structural capital and relational capital. Human capital was the "spirit" for intellectual capital, since it played the important role within the strategical planning in creating competitive advantage[16]. Human capital led to the "knowledge, ability and employee's experience"[17]. In batik SME's, human capital is one of important components that encouraged the improvement of performance. The essence was in the depth of the intelligence of the members of the organization and if such intelligence was combined, it could motivate the employees to achieve the objectives of the organization which eventually will affect the performance[18]. From the factor analysis, it showed that experience was one of the most important factors from human capital. Experience was made as the base in making the policy or strategy and supported by the professional skills, made SME's survived from the invasion from the competitor even it could have more superior than competitors.

Structural capital is supporting infrastructure for human capital, in other words, the existence of structural capital made human capital developed. The company that had strong structural capital would have supportive organizational culture, where the individuals within the company always tried to do anything, including the failure and training, in order to contribute to the company (Bontis[6] ; Cinca, Molinero & Queiroz[19]). Organizational culture established in batik SME's was supportive culture that put forward the attitude of being helpful and supportive among the members of organization. Supportive organization culture will strengthen the structural capital, where the individuals within the organization put some effort to try anything, including failure and learning, in order to contribute to the company[20]. Relational capital according to[21] is a function of longevity: this capital will provide more value to the company when it created the "long term" relation with the parties outside the company. For batik SME's, customers was an important factor from the creation of longevity. The ability to maintain the existing customers and to attract new customers was the main keys to the successful company[12].

3 Discussion

Intellectual capital definition has been revealed by many researchers. Steward[22] stated that intellectual capital as an intellectual material that consists of knowledge, information, intellectual property, an experience that can be used to create prosperity. Bontis[6] explained that the pursuit of the effective use of knowledge (the finished product) as opposed to information (the raw material). Khalique et al[8] represents a combination of intangible assets or resources, such as knowledge, know-how, professional skills and expertise, customer relationships, information, databases, organizational structures, inovasis, social values, faith and honesty. Even though there are many differences in formulating intellectual capital, but it is agreed that the intellectual capital components consists of human capital, structural capital and relational capital. Human capital leads to "knowledge, ability and the experience of the employees"[17]. Structural Capital constitutes supporting infrastructure for human capital, in other words the existence of structural capital develops human capital (Bontis[6] ; Cinca et al[19]) . Relational capital is generally defined as a relationship that is able to be established by company's external parties, such as customers, suppliers, partners, and regulator[23]. For SME's, intellectual capital provides competitive advantage[24],because the tangible resource of SME's is smaller than big company. Organization will succeed if they are able to optimize their intellectual capital[25]. Therefore, SME's will have better performance and competitive advantage if they could explore and utilize their intellectual capital[26].

4 Conclusion

The finding of this research supports the previous researches stated that intellectual capital was established out of three components; human capital, structural capital and relational capital. Human capital is the main base of intellectual capital, since the knowledge is within human. In batik SME's, human capital is the main function of intellectual capital, the knowledge embedded was investment to achieve the competitive advantage of SME's. Suggestion that could be given to this research was on the factor of human capital, manager had to improve more creativity and innovation related to the continuity of product cycle. It was because batik

was very easy to imitate, therefore, innovation in the design, colouring, and motives had become important factors. On structural capital, manager had to be able to code the knowledge of the owner/manager or employees (tacit knowledge) so that it could be distributed to the entire members of organization (explicit knowledge). Such coding could be through procedure, routine and the culture of organization.

However, there indeed some limitations to this study. First, the concept of intellectual capital especially for batik SME's was a relatively new concept that the subjectivity of the respondent's perception significantly affect the result. Second, this research was not carried out longitudinal instead it used cross sectional study where the data collection was carried out in a certain time so that it could not describe the true intellectual capital of the batik SME's. For future research, other capitals need to be explored on the intellectual capital of batik SME's. Such as spiritual, social, and technology capital so that the more comprehensive intellectual capital model could be obtained especially in order to create the competitive advantage for SME's. Besides, it is necessary to test the influence of the intellectual capital towards other variable such as performance or competitive advantage especially for SME's.

References

1. S. Fathi, S. Farahmand, and M. Khorasani, "Impact of intellectual capital on financial performance in the pharmaceutical industry in Iran", International Journal of Accounting and Economics Studies, 1(1), 1–8 **(2013)**.
2. R. Cabrita and J. L. Vaz, "Intellectual Capital and Value Creation : Evidence from the Portuguese Banking Industry", In Electronic Journal of Knowledge Management (Vol. 4, pp. 11–20). https://doi.org/10.1111/j.1755-0998.2011.03037.x **(2006)**.
3. S. Durst, "Small And Medium- Sized Enterprises ' Succession Process : Do Intangible Assets Matter ? A Study Conducted In Germany", The European Chair on Intellectual Capital Management Working Paper Series No.2011-IB **(2011)**.
4. Y.-H Lo, "Managerial capabilities, organizational culture and organizational performance: The resource-based perspective in Chinese lodging industry", Journal of International Management Studies, 7(1), 151–157 **(2012)**.
5. J. Chen, Z. Zhu, and H. Yuan Xie, "Measuring intellectual capital: a new model and empirical study", Journal of Intellectual Capital, 5(1), 195–212 **(2004)**.
6. N. Bontis, "Intellectual capital : an exploratory study that develops measures and models", Management Decision, 36(2), 63–76 **(1998)**.
7. G. Tovstiga and E. Tulugurova, "Intellectual capital practices and perfomance in Russian enterprises", Journal of Intellectual Capital, 8(4), 695-707 **(2007)**.
8. M. Khalique, N. Bontis, J. A. N. bin Shaari and A. H. B. M. Isa, "Intellectual capital in small and medium enterprises in Pakistan", Journal of Intellectual Capital, 16(1), 224–238. https://doi.org/10.1108/JIC-01-2014-0014 **(2015)**.
9. M. D. R. Cabrita and N. Bontis, "Intellectual capital and business performance in the Portuguese banking industry", Int. J. Technology Management, 43(1), 212–237 **(2008)**.
10. J. St-Pierre and J. Audet, "Intangible assets and performance: Analysis on manufacturing SMEs", Journal of Intellectual Capital, 12(2), 202–223 **(2011)**.
11. G. M. Castro, J. E. N. de López and P. L. Sáez, "The role of corporate reputation in developing relational capital", Journal of Intellectual Capital, 5(4), 575–585 **(2004)**.
12. A. Srivihok and A. Intrapairote, "Measuring Intellectual Capital : Web Sites Analysis of Thai SMEs. In The Fifth European Conferencce on Organizational Knowledge, Learning and Capabilities", University of Innsbruck Austria **(2004)**.
13. G. S. Sureshchandar, "Determinants of quality : a confirmatory factor analysis approach", Journal of Service Marketing, 16(1), 9–34 **(2002)**.
14. J. F. Hair, W. C. Black, B. J. Babin, & R. E. Anderson, "Multivariate data analysis. Englewood Cliffs: Prentice Hall" **(1998)**.
15. G. M. Castro, and M. Delgado-verde, "Assessing Knowledge Assets in Technology-Intensive Firms : Proposing a Model of Intellectual Capital", Journal of Centru, 5(1), 43–59 **(2012)**.
16. L. Henry, "Intellectual capital in a recession : evidence from UK SMEs", Journal of Intellectual Capital, 14(1), 84–101 **(2013)**.
17. N. Bontis, and J. Fitz-enz, "Intellectual capital ROI: a causal map of human capital antecedents and consequents", Journal of Intellectual Capital, 3(3), 223–247 **(2002)**.
18. S. Hermawan, "Bisnis IKM Batik dan Memenangkan Persaingan di CAFTA", Jurnal Strategi Dan Bisnis, 1(2) **(2013)**.
19. C. S.Cinca, C. M. Molinero, and A. B. Queiroz, "An Approach to the Measurement of Intangible Assets In Public Sector Using Scaling Techniques", Journal of Intellectual Capital, 4(2), 249–275 **(2003)**.
20. M. Longo and M. A. Mura, "Multidimensional Measure of Employees Intangibles" Journal of Intellectual Capital, 30(8), 548–569 **(2007)**.
21. P. O. De. Pablos, "Measuring and reporting structural capital: Lessons from European learning firms", Journal of Intellectual Capital, 5(4), 629–647 **(2004)**.
22. T.A. Stewart, "Intellectual Capital: The New Wealth of Organizations", In New York: Doubleday (pp. 1–4) **(1997)**.
23. T. Sirivanh, S. Sukkabot and M. Sateeraroj, "The Effect of Entrepreneurial Orientation and Competitive Advantage on SMEs ' Growth : A Structural Equation Modeling Study", International Journal of Business and Social Science, 5(6), 189–194 **(2014)**.
24. C. M. Jardon and M. S. Martos, "Intellectual capital as competitive advantage in emerging clusters in Latin America", Journal of Intellectual Capital, 13(4), 462–481 **(2012)**.
25. P. Pablos, "Evidence of intellectual capital measurement from Asia, Europe and the Middle East", Journal of Intellectual Capital, 3(3), 287–302

(2002).

26. C. Sekhar, M. Patwardhan and V. Vyas, "A Delphi-AHP-TOPSIS based framework for the prioritization of intellectual capital indicators : A SMEs perspective", Procedia - Social and Behavioral Sciences, 189, 275–284 **(2015)**.