

The Role of Blockchain Technology as a Mediator between Knowledge Management and Sustainable Competitive Advantage

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Abstract. The advance of Information and Communication Technology (ICT) at Higher Education Institution (HEI) has moved beyond decision support system as it has now become an important intellectual capital asset that will determine the sustainable competitive advantage. The collection of information from internal resources through knowledge management (KM) has been regarded as one of the prominent sources to achieve sustainable competitive advantage. The implementation of KM was not substantial enough as it was expected, while precious information still scattered around the organization and yet organized and collected as it was supposed to be. Therefore, we surveyed HEI's students and faculty members to obtain their perception on the role of Blockchain technology as well as for them to voluntarily share their knowledge freely but still regarded as rightful owner of the intellectual capital. Through the current study, we found that KM positively influences Sustainable Competitive Advantage and Blockchain is aptly proposed to become an intervening variable for sustainable competitive advantage.

Keywords: Blockchain, Knowledge Management, Sustainable Competitive Advantage, Higher Education Institution.

1. Introduction

The advance of information and communication technology (ICT) impacts our daily life and affects how information (e.g. voice, data, and video) is distributed and exchanged between parties regardless of geographical location and time. The Higher Education Institution (HEI), nevertheless, is one of the entities that can be affected by the advance of ICT. As a source of knowledge, HEI is seen as a warehouse of knowledge where valuable information from research is derived from. Thesis writing and teaching activities are grown along with the HEI's age. HEI

management is consisted of three main pillars, i.e. Process, Content, and Resources[1]. Process can be seen as the core of learning activities where teaching, research and community services takes place. Content can be seen as methodology, teaching material, and results researches are stored. Resources is seen as sources of human capital, funding, teaching infrastructure and information system.

[2] noticed that Indonesia HEI's goal sets by the Indonesian government to implement the Tri Dharma, a consensus of Indonesia's HEI to prioritize teaching, research, and community development as main pillars. The Tri Dharma of higher education is the obligations that must be carried out and developed continuously by the entire academic community, including lecturers and students. With such high obligations given by the government, HEI must think of a way to comply with the government's obligation as well as to sustain and to survive in a tight competition among other HEI. [3] argued that HEI must move forward from exploring its resource-based superiority to knowledge-based superiority as a source of competitive advantage. This knowledge-based superiority is known as competitiveness in managing its knowledge management within the organization itself[4].

Managing knowledge as source of competitive advantage is a relevant issue in HEI knowledge management and sustainable competitive advantage relationship. Knowledge borne from tacit and explicit activities like teaching and scientific research disciplines will surely enrich HEI's competitive advantage. Hence, scattered and unmanaged knowledge will become knowledge waste and will never become source of HEI competitive advantage. Therefore, this study aims to investigate if HEI able to achieve sustainable competitive advantage with the use of ICT and its blockchain technology through their knowledge management efforts.

2. Method

The research was conducted at Indonesian higher education institutions in Jakarta in August 2018. Jakarta has more HEI's compared to other provinces in Indonesia. There are 318 HEI's spread throughout Jakarta and Greater Jakarta region [3]. The samples taken were from active faculty members and students. We distributed a questionnaire to active 45 HEI faculty members and students. The number of samples is justified using Partial Least Square - Sequential Equation Model (PLS-SEM). The use of this model and its bootstrapping method does not require normality in distribution since it follows a non-parametric rule. Fig. 1 represents the proposed conceptual model for this study.

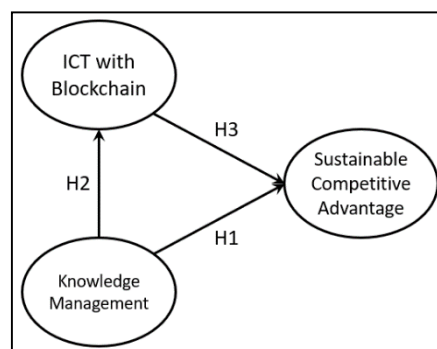


Fig. 1. Framework model.

3. Result

The number of female respondents is 72.7% male and 27.3% female, while 61% are active students and 38.6% faculty members of HEI. By using Smart PLS, two steps of test were conducted. One test is Confirmatory Factor Analysis (CFA) which tested the reliability and validity of the variable indicators.

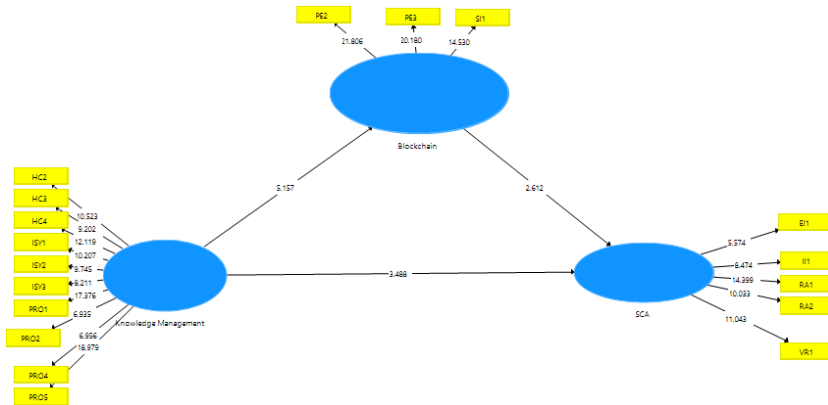


Fig. 2. Inner model method to test the indicator validity for its individual latent variable

The CFA test can be seen in Figure 2. The indicator is considered as a valid variable when the rule of thumb all the indicator that construct the variable must be at least 0.7, and Average Variance Extracted (AVE) must be above 0.5. As for the indicator to be considered reliable, the indicator must meet the validity indicator of Cronbach alpha above 0.7 and composite reliability above 0.7 [5].

4. Discussion

From our finding, some indicators were not validity nor reliable. Hence, the removal of the indicators so that the construct can be said otherwise. The indicators that do not meet the validity criterion factors are PE1, SI2, EE1, EE2, PRO3, HC1.

Table 1. Validity & reliability test

Var.	Cronbach's Alpha	Rho A	CR	AVE
BC	0.826	0.830	0.896	0.741
KM	0.953	0.956	0.959	0.703
SCA	0.888	0.896	0.918	0.692

The next step was to do the CFA test one more time to make sure that all the Loading Factor indicators are above 0.7, Cronbach Alpha at least 0.7, and Average Variance Extracted (AVE) are above 0.5 (see Table 1). Next step was the inner model test which measured the influence level between latent variables. The inner model path analysis (Fig. 3), must satisfy the t-value score of 1.96 and significance level below 0.05 with the confidence level of 99.5% [5].

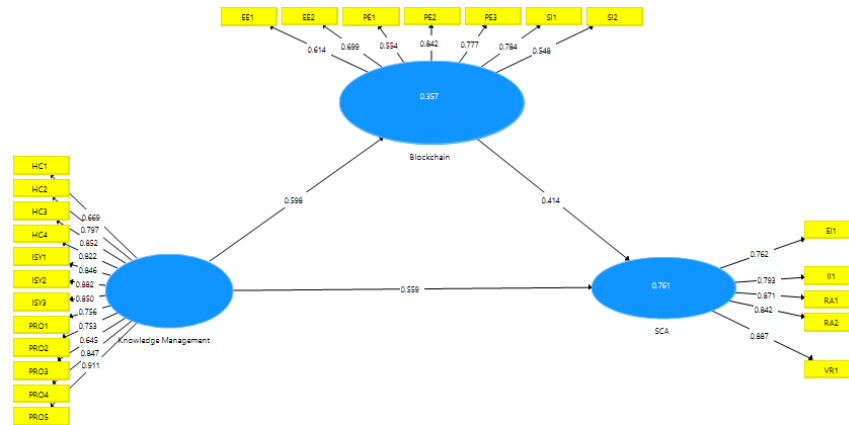


Fig. 3. Outer model method to test the relation between latent variables

From the inner model test, it was found that Knowledge Management positively influences Sustainable Competitive Advantage ($t = 3.003$, and $P < 0.005$). The result satisfies Hypothesis 1, where KM positively influences and is a significant factor. From the inner testing model, it was found that KM positively influences Technology Orientation where $t = 6.857$, and $P < 0.005$. This result, therefore, answers Hypothesis 2 where KM positively influences Technology Orientation. Then, the testing of the influence of Technology Orientation shows of SCA where $t = 2.612$ and $P < 0.005$). This result also shows that Blockchain influences and is significant to SCA. The R Square scores (Table 2) can be seen that Blockchain and KM Variables contribute to 72.9% of in construction of SCA. Whilst KM only contributes 34.7% to the Blockchain variable.

Table 2. R-square of KM

Var.	R ²	R ² adjusted
BC	0.729	0.715
SCA	0.347	0.332

5. Conclusion

Through our findings, it can be seen that KM positively influences and a significant factor to SCA. Therefore, it is known that to obtain a sustainable competitive advantage, HEI must apply KM in order to survive the competition, where knowledge must be collected, stored and disseminated over the students and faculty members for them to gain new knowledge as well as materializing all of the intangible asset, coming from a collection of knowledge to reshape or to invent new product/services, that would create innovation in teaching method.

Blockchain indeed can become a mediating variable to KM in achieving stronger sustainable competitive advantage. Although the works of KM may influence SCA, by using Blockchain, students and faculty members will have more confidence in sharing their knowledge as they believe that their shares of knowledge whose regarded as a precious source of personal Intellectual Capital (IC) can be regarded by anyone who use it. When this IC is materialized as new innovation in products/services, the IC owner will be honored for their contribution to the

organization. Only through this appreciation from HEI to the contributors will encourage them to work together hand in hand to contribute to sustainable competitive advantage of HEI.

From the R-square analysis, KM only contributes 34.7% of Blockchain variables, therefore, further study of this particular research would be to find other variables that may work as antecedents to Blockchain.

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