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Knowledge Transfer Model for Balinese Handicraft SMEs in Information Technology Era

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Abstract

Balinese Handicraft industry is one of the very unique art industry in Bali. The existence has supported tourism and also provide jobs for the majority of people in Bali. Most of these Handicraft produced by Small and Medium Enterprises (SMEs). Since its produce works of art and is unique, then the sustainability of SMEs is highly dependent on the transfer of knowledge possessed by those who are in SMEs from one generation to the next. Previous research indicates that IT plays a role in the knowledge transfer process in SMEs that produce the handicraft. The study has also produced a model of knowledge transfer that is composed of several constructs, namely Information Technology, Knowledge Transfer and success of SMEs. Correlation formed is technology affecting the process of knowledge transfer and knowledge transfer effect on the success of SMEs. This study aims to perform testing of the knowledge transfer model that utilizing IT in SMEs. Testing is done by using Sequential Equation Modeling (SEM), where the instrument used to collect the data is in the form of a questionnaire. The test results showed that Information Technology significantly affect the process of Knowledge Transfer and knowledge transfer significantly affect the success of the organization. However, sub-constructs Data Repository found not significantly affect the transfer of knowledge. Therefore, in the re-specification models, the sub-constructs is abolished.

Keywords: Knowledge Transfer Model; Balinesse Handicraft; Sequential Equation Modelling.

1. Introduction

Knowledge is one of the sources of wealth and success of an organization. Knowledge of individuals within the organization needed to improve enterprise performance and competition. Individual knowledge can be managed so that it can become the organization's knowledge. One of the ways used to make individual knowledge can be a knowledge organization is through the transfer of knowledge [10]. Transfer of knowledge is also known as a process that shift or move the source of knowledge to another person or department [2].

One of organization that has a lot of hidden knowledge is Balinese Handicraft SMEs. Most of those knowledge are in the form of tacit which is personal nature and stored in the human mind. This kind of knowledge is difficult to be formulated, communicated and disseminated. Usually the tacit knowledge to creating certain product is only have by few people within the SMEs. Hence, knowledge transfer is

needed to sustain the business. Knowledge that transferred in SMEs are knowledge related to products, products manufacture, sales and marketing.

Information technology (IT) is evolving to carry out the transfer of knowledge through channels such as email, chat, etc. IT can be used in organizations to achieve excellence, improve productivity and competition [7]. Hence, previous research develop a model of IT application for knowledge transfer in Balinese Handicraft SMEs. The model consists of three main constructs, namely information technology, knowledge transfer and the success of SMEs [8]. Good Knowledge transfer model is expected to increase the knowledge of personnel within SMEs, improving SME productivity, enhance competitiveness and customer satisfaction. The model need to be tested to determine its compatibility with the actual condition in the environment of Balinese Handicraft SMEs.

Based on those conditions, the study aims to conduct tests on models that utilize IT to improve the knowledge transfer process in Balinese Handicraft SMEs using Structural Equation Modeling (SEM). Model testing aims to produce a model that corresponds to the real conditions of Balinese Handicraft SMEs.

2. Literature Review and Related Research

2.1. Knowledge Transfer

Transfer of knowledge is the movement of knowledge within the organization, from person to person and influenced the characteristics of the people involved in the process. At the individual level, knowledge transfer has a meaning as a duplication process knowledge from the source to the receiver of knowledge. The success of knowledge transfer depends on the receiver's decision to reject or accept new knowledge from the source [1].

Communicates professional knowledge is a key activity for special labor or expert. Transfer of experience, insight, and knowledge efficiently and effectively by the experts is one of the activities in the dissemination of knowledge. Knowledge transfer occurs through interpersonal communication or group conversation [3]. Knowledge transfer processes that contributed to the creation of competitive advantage is the process of converting tacit knowledge into explicit knowledge sharing between individuals through socialization. Results from the transfer of knowledge cannot be observed directly and cannot be linked to certain workers. However, to be able to observe the vote results from the transfer of knowledge [5].

2.2. Small and Medium Enterprises (SMEs) in Indonesia

According to the Law of the Republic of Indonesia No. 20 of 2008, called the small business is an entity that has the following criteria;[6] (1) Net worth more than Rp 50 million up to a maximum of Rp 500 million, excluding land and buildings. (2) It has annual sales of more than Rp 300 million up to a maximum of Rp 2.5 billion. Meanwhile, the so-called medium-sized enterprises are business entities that have the following criteria; [6] (1) The net worth of more than Rp 500 million up to a maximum of Rp 10 billion, excluding land and buildings; (2) It has annual sales of more than Rp 2.500.000.000 up to a maximum of Rp 50,000,000,000.

2.3. Structural Equation Modelling (SEM)

SEM is described as an analytical approach that combines factor analysis, structural model and path analysis. Another term for SEM include covariance structure analysis, latent variables analysis, confirmatory factor analysis and analysis of Linear Structural Relations (LISREL) [4]. SEM has two models, namely the structural model and the measurement model.

2.4. Related Research

This research is enhancement of previous model proposed by [8].

Fig. 1Knowledge Transfer Model utilizing IT [8]

The model consists of three constructs, namely, Information Technology (IT) Infrastructure, Knowledge Transfer (TP), and Business Success (KU). Construct Information Technology has sub construct Hardware, Software, Network and Repository. Knowledge transfer consist of knowledge, process, tools, people, strategy and method sub-construct. SMEs Success consist of individual and organization knowledge improvement, productivity improvement, competitiveness improvement, and customer satisfaction. This model also have two hypothesis which are H1: Information Technology influenced knowledge transfer and H2: Knowledge Transfer influenced SMEs Success. Overview of the previous proposed model can be seen in Fig 1.

3. Research Methodology

This section is used to discuss the measures and instruments used in this study. The steps of this study started from a model of knowledge transfer proposed by Sentana in [8]. While the research instrument used in the collection of data is questioner.

3.1. Research Steps

Development steps in previous model started from literature review, environment study, which is Handicraft SMEs, type of knowledge analysis, knowledge transfer analysis and IT utilization analysis, identification of construct and the correlation within model, and development of the model.

After identifying the model proposed from previous research, then performed the process of designing the questionnaire, pre-test, data collection, and Model Evaluation. Pre-test conducted by distributing questionnaires to 30 respondents, who were asked to assess on whether the items is easy to understand and relevant to the construct. Validity and reliability test of pre-test questioner showing well result. After performing the pretest, data collection is carry out by distributing questionnaires to the respondents which is SME Handicraft Bali. Data collection was conducted in five districts in Bali, which are Denpasar, Badung, Tabanan, Gianyar and Klungkung.

Model evaluation carried out by using SEM. The purpose of evaluation is to determine the validity and reliability of construct-forming models and also to test the model fit to the data. Stages in testing the model can be described as follows; Descriptive statistical analysis, Inferential Statistics Analysis (data transformation is using Method of Successive Interval and Data Normality testing), Measurement Model Analysis and Structural Model Analysis. The final result of this research is a re-specified model for knowledge transfer that utilizing IT for Balinese Handicraft SMEs.

3.2. Research Instrument

The research instrument used was a questionnaire. Indicators in the questionnaire was created based on the construct of elements and relationships between elements. In this case the construct is mapped into latent variables and elements constructs become variables observed. Constructs that would be latent variables namely information technology, knowledge transfer, and the success of SMEs. Questionnaires consist of 25 indicators or question. Questions were grouped by the variables of the model study, which has 12 variable indicators of information technology, 8 variable indicators of knowledge transfer and 5 variable indicator of the success of SMEs.

4. Result and Discussion

4.1. Descriptive and inferential Statistic Analysis

Descriptive statistical analysis is more related to the collection, processing and presentation of the summary data. The data used in this research was obtained from questionnaires distributed to the craftsmen, workers and handicraft business owners in Bali. There are 208 questionnaire data that can be used. Table 1 contains an explanation or description of the respondent based on Sex and Age.

While the inferential Statistics related to data modeling and decision-making based on analysis of data, which in this case is used to test the hypothesis, to estimate future observations, and make correlation models. In this research, hypothesis testing is using a data processing method with SEM. Computer applications used include Microsoft Excel and Lisrel 8.8.

Table 1. Respondent demographic data based on Sex and Age

Category	Frequency	Percentage (%)	Category	Frequency	Percentage (%)
Sex			Age		
Male	126	60.6	< 25 years	50	24
Female	82	39.4	25-35 years	90	43.3
			>35 years	68	32.7
Total	208	100	Total	208	100

4.2. Measurement Model Analysis

Measurement model is a model that only consist relationship between variables observed with latent variables. The data obtained from the questionnaire is processed so it can be used as input in Lisrel 8.8 software. The first stage of the calculation is to identify whether an item questionnaire can be used as a good indicator for measuring the latent variables in the model. To achieve a variable with a fairly good validity, the indicator variable of the model chosen by the standardized loading factor values $\geqslant$ 0.5 and the value of t load factor (factor loading) $\geqslant$ 2 [9].

As shown in Table 2, there are some variable that has standardized loading factor value <0.5. Those indicator are part of repository sub-construct. This is because most of SMEs did not have any repository to keep their knowledge. Then, these variables should be eliminated from the calculation to achieve a model with good validity. Once the variables are omitted from the calculation, the identification process than repeated.

The next process is the re-calculation of the measurement model which has been modified to determine whether these constructs have good validity and reliability. Results Standardized Solution after a process of elimination led to six indicators in information technology eliminated. Elimination of some indicators may be due to several factors such as item questions in the questionnaire have not been validated in previous studies. Another error that may occur is the number of respondents who are less representative for measuring the model. This research obtains 208 data obtained through a questionnaire and distributed

to several areas in Bali. This data measurement using the estimation method Maximum Likelihood Estimator. Best practice data size in this study was five times the number of questions in the questionnaire. Since there are 25 questions on the questionnaire, respondents were required minimum is 125. However, the determination of the number of respondents must also take into account the number of the population studied. Repairs to the findings in this study are expected to be improved in future studies.

After carrying out the re-calculation, all the indicators in the model has good validity. This can be seen from the value of the standardized loading factors for all the question items have a value of $\geqslant 0.5$. In addition, the t value produced, has a value of $\geqslant 2$, it indicates a high level of confidence. After identifying and determining that the measurement model is valid, then the next step is to test the compatibility of the model with the available data. Compatibility testing is done by measuring the value of Goodness of Fit Indices (GOFI), measuring the validity and reliability of the model. GOFI good value indicates that the proposed model is representative of the data. There are 8 standard GOF which indicates a good fit (good fit or marginal fit) and 6 sizes GOF shows poor compatibility, so it can be concluded that the model of this study overall had a good match.

4.3. Structural Model Analysis

The combination of structural models with measurement model is a model of the complete SEM (full SEM). Structural model analysis was performed to evaluate the coefficient which indicates a causal relationship or the influence of a latent variable to the other latent variables. These causal relationships expressed in the form of a hypothesis. The significance of a hypothesis in SEM determined by reference to the estimated value and the t-value resulting from the Lisrel application. A hypothesis is said to significantly if the t-value $\geqslant 1.96$.

Table4. Summary of structural model estimation results

Hypothesis	Path	Estimation	T-value	Conclusion
H1	TI→ TP	0.29	3.57	Significant
H2	TP→KU	0.66	7.19	Significant

Table 4 shows that both hypothesis is proven correct. In accordance with the analysis carried out in the constructs of knowledge transfer based on the literature and previous studies, the results obtained show that the constructs of knowledge transfer (TP) is a construct that has an influence on the success of SMEs (KU) with the estimated value of 0.66. Similarly, the construct of Information Technology (TI) have an influence on the transfer of knowledge to the estimated value of 0.29. It can be concluded that the Transfer of knowledge is a factor that determines the success of SMEs and Information Technology is a determining factor of knowledge Transfer.

4.4. Re-specification Model

After passing validity test, it was found that the indicators that lead to sub construct a data repository, in the construct of information technology, are not have a significant role in the process of knowledge transfer. Overview of the knowledge transfer models that utilize information technology, after re-specification can be seen in Fig 3
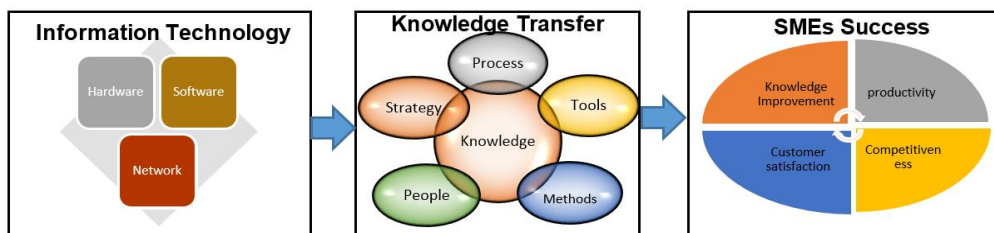

Fig. 2Knowledge transfer model utilizing IT after re-specification

5. Conclusion

This research has evaluated a model of knowledge transfer that utilizing IT for Balinese Handicraft SMEs. The result show that IT has a significant influence to knowledge transfer and knowledge transfer has a significant influence to SMEs Success. Hence, both of the hypothesis in this research are proven significantly. The result also eliminated sub-construct Repository since it is proven that sub-construct did not have significant role for the model. However the sub-construct Repository can be recommend as a part of model that utilized IT in Handicraft SMEs.

Acknowledgements

References

[1] Carr, LC, Bateman, JP, dan Navlakha JS. They Call For Help, But Don't Always Listen: The Development of the User-Help Desk Knowledge Application Model. Proceeding of the Fourteenth Americas Conference on Information Systems; 2008, p. 1-12.

[2] Chen C, dan Xin Z. Research on Architecture of Tacit Knowledge Transfer Based on Ontology, *IEEE Computer*; 2008,p. 624-625.

[3] Eppler MJ. *The Concept of Knowledge Communication and Its Relevance to Management*. Switzerland : University of Lugano; 2006

[4] Ghozali I, Fuad. *Structural Equation Modeling – Teori, Konsep dan Aplikasi dengan Program Lisrel 8.80*, Semarang: Badan Penerbit Universitas Diponogoro; 2008.

[5] Osterloh M, Frey B S. Motivation, Knowledge Transfer, and Organizational Forms, *Organization Science*, 2006, 11(5):538-550.

[6] Rahmana A. Peranan Teknologi Informasi Dalam Peningkatan Daya Saing Usaha Kecil Menengah. *Seminar Nasional Aplikasi Teknologi Informasi (SNATI)*; 2009: p. B11- B15.

[7] Sangkala. *Manajemen Pengetahuan*, Jakarta : PT RajaGrafindo Persada; 2007.

[8] Sentana IWB, Yuniastari NLA, Hermawan D. Analisis Pemanfaatan Teknologi Informasi Untuk Meningkatkan Transfer Pengetahuan, *Prosiding Konferensi Nasional Sistem dan Informatika 2014*; p. 851-854.

[9] Wijanto SH. *Structural Equation Modeling dengan LISREL 8.8*, Yogyakarta: Graha Ilmu; 2008

[10] Yuniastari NLA, Husni HS.Knowledge conversion conceptual model case study: Bali handicraft SMEs,*International Conference on Advanced Computer Science and Information Systems*; 2012: p 173-178.