

The Impact of Source, Recipient, and Tacit Knowledge Characteristics on Tacit Knowledge Transfer Effectiveness

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Abstract. The nature of tacit knowledge which embodied in individuals, makes organization lose tacit knowledge through turnover. In order to preserve tacit knowledge in organization, effective tacit knowledge transfer between individuals is needed. Tacit knowledge transfer is a way to preserve and utilize tacit knowledge in organization. This research develops a model that shows the impact of source characteristics, recipient characteristics, and tacit knowledge characteristics on tacit knowledge transfer effectiveness. Source characteristics is represented by motivation of the source, reliability of the source, and teaching capacity. Recipient characteristics is represented by motivation of the recipient, absorptive capacity, and retentive capacity. Tacit knowledge characteristics is represented by causal ambiguity, prove, distributed, ownership right, and common knowledge. Tacit knowledge transfer effectiveness is represented by changes in knowledge, change in performance, providing knowledge, and obtaining knowledge. This model is validated in laboratories in a university. The respondents are assistants of the laboratories. Model validation is done by using partial least square. The results shows that key factors in tacit knowledge transfer effectiveness are teaching capacity and absorptive capacity.

Keywords: tacit knowledge transfer, source characteristics, recipient characteristics, tacit knowledge characteristics

1. INTRODUCTION

To gain benefit from knowledge, organizations must explicitly manage their knowledge, the problem occur when managing the knoweldge because knowledge is difficult to

imitate, intangible and also embedded in organization members and from past experience of the organization member (Zack, 1999) , (Wiig, de Hoog, & van der Spek, 1997). An organization can obtained great profit if investing in

knowledge asset, this can be done because knowledge is one of the undepreciated asset, on the contrary knowledge can be increased as long the knowledge is being used by another. Knowledge had major effect in the success of innovation process in an organization, because with continuous innovation the organization can sustained and develop the competitive advantages (Alwis, Hartmann, & Gemunden, 2004). In general knowledge can be divided into explicit and tacit knowledge (Nonaka & Takeuchi, 1995). Explicit knowledge is the knowledge that can be codified and transmitted into formal and systematic language. Tacit knowledge is the knowledge that consist of mental model, belief and hard to articulated.in an organization, the tacit knowledge must be converted into explicit knowledge in case the individual in an organization is leaving the organization.

Managing tacit knowledge in organization is considered harder than managing explicit knowledge, but the tacit knowledge is critical for the competitive advantage of organization (Ambrosini & Billsberry, 2007). Tacit knowledge can't be transferred completely into formal language, so it is hard to save the tacit knowldge electronically (Alwis, Hartmann, & Gemunden, 2004), these finding is support by the data given by Faust (2007) which stated that only 20% of organization knowledge that can be found, the rest 80% of knowledge are in the indiviudals. Knowledge can be lost form organization because the organizational knowledge only concentrate on the individuals, if one or more key person in organization left or retired, the vacancy will cause a knowledge gap which is hard to fill in later (Probst, Raub, & Romhardt, 2000). The other problem that occurred in transferring the tacit knowledge is that the process can be done in a quick way because it is depend on the specific relationship and can't be communicated well through words and symbol (Badaracco, 1991). The tacit knowledge sharing is important to enhance performance because it is perceived as an important asset for individuals and organizations (Panahi, Watson, & Partridge, 2012). To preserve the tacit knowledge within organization, it is needed a way to transfer the knowledge by utilize and conserve the knowledge (Koskinen, 2001).

This research purpose is to create the model for knowledge sharing in laboratory. The object of the research is industrial engineering department laboratories in Telkom University, Indonesia. Laboratory is one of organization in Telkom University. The function of the laboratory are to give a lab work to student and conduct a research regarding the laboratory expertise. To do this function the laboratory need an assistant that is competence in current laboratories expertise, but the problem is the average contract of assistant in laboratory is 2 semester, this implicated that there is a lot of individual turnover in laboratory. Frequent turnover can cause the tacit knowledge in the organization lost (Kang, 2007). The role of tacit knowledge is to make a guidance to do specific task (Zhou, 2004), in laboratory the role of tacit knowledge are

to manage the knowledge of how to do all laboratory activity by assistant such as tutoring, creating guidance, participating in competition, doing research, social works and also knowledge regarding the administration process of the faculty.

Form the explanation above, it can be conclude that the knowledge sharing is important to transfer all the previous assistant knowledge to the new assistant so that the laboratory can maintain the continuous improvement and can give the best service to the student.

2. METHODOLOGY

Model is designed by considering the factors of transfer tacit knowledge process. Model consists of the characteristics of the source and recipient and the tacit knowledge transfer effectiveness. Source characteristic is defined as all factors that related with the attribute from the source as the provider of tacit knowledge in transferring the knowledge.

The previous study that include the source characteristic in their research are from Argote and Ingram (2000), Emery (2002) and Gouza (2006).

Table 1: Source Characteristic Operational Definition

| Dimension | Operational Definition |
|-----------------------------------|---|
| Motivation to Share Knowledge | The desire and willingness of the source to share their tacit knowledge |
| Reliability of Knowledge Provider | Sources of tacit knowledge has tacit knowledge to be transferred, and the ownership can be accounted for. |
| Teaching Capacity | The quality and depth of the capabilities of the sources of tacit knowledge to share the tacit knowledge. |

Recipient characteristic is defined as all factors that related with the attribute from the recipient in transferring the knowledge. The previous study that include the source characteristic in their research are from Argote and Ingram (2000), Emery (2002) and Gouza (2006).

Table 2: Recipient Characteristic Operational Definition

| Dimension | Operational Definition |
|------------------------------|--|
| Motivation to Gain Knowledge | The desire and willingness of the recipient of tacit knowledge to gain the tacit knowledge from the other. |
| Absorptive Capacity | ability to recognize the value of the information, assimilate the information and understand and apply tacit knowledge that received |
| Retentive Capacity | Tacit knowledge receiver's ability to save new tacit knowledge. |

Tacit knowledge characteristic is defined as all factors that are related with the attribute form tacit knowledge as the object in knowledge transfer process. The previous study that include the tacit knowledge characteristic in their research are from Argote and Ingram (2000) and Gouza (2006).

Table 3: Tacit Knowledge Characteristic Operational Definition

| Dimension | Operational Definition |
|------------------|--|
| Causal Ambiguity | The possibility of more than one interpretation of the causal relationship of a tacit knowledge. |
| Proof | Evidence that the tacit knowledge to be transferred have benefits as well as linkages with other knowledge. |
| Distribution | Tacit knowledge in distributed organizations on its members (no member who has all knowledge as a whole). |
| Owner Rights | Tacit knowledge is the property of the individual as well as being a source of strength and individual excellence. |
| Common Knowledge | The similarity of the background of knowledge possessed by the source and the receiver in the transfer process. |

Tacit knowledge transfer effectiveness is defined as the success of tacit knowledge process. The previous study that include the tacit knowledge characteristic in their research are from Argote and Ingram (2000) and Wilkessman *et al.* (2007).

Table 4: Tacit Knowledge Transfer Effectiveness Operational Definition

| Dimension | Operational Definition |
|-----------------------------|---|
| Tacit Knowledge Change | Increased of breadth and the depth of tacit knowledge possessed by the recipient. |
| Performance Change | Improved performance of the receiver caused by the implementation of new tacit knowledge. |
| Tacit Knowledge Provision | Sources provide and teach new tacit knowledge to the recipient. |
| Tacit Knowledge acquisition | The recipient will absorb and learn new tacit knowledge from the source. |

After the data is gathered, the next step is to hypothesize all the dimension related to the tacit knowledge transfer.

Argote and Ingram stated that the source characteristic is related to the transfer knowledge process, the individual characteristic that involved in knowledge process transfer affect the knowledge transfer process, from the statement it can be conclude that source characteristic is positively related to tacit knowledge transfer effectiveness.

Argote and Ingram (2000) stated that the recipient characteristic is related to the knowledge transfer process, the individual characteristic that involved in knowledge process transfer affect the knowledge process transfer. The characteristic of recipient affect the knowledge process transfer (Emery, 2002). Gouza (2006) stated that all the factor that related with the characteristic of the recipient affect the effectivity of knowledge transfer. From the statement it can be conclude that recipient characteristic is positively related to tacit knowledge transfer effectiveness.

The characteristic of knowledge which is being transferred affect the knowledge transfer process (Argote and Ingram, 2002). The attribute of the knowledge which is being the transfer object affect the knowledge transfer process (Emery, 2002). Gouza (2006) stated that all the factor that related to the knowledge characteristic that being transferred affect the knowledge transfer effectiveness. From the statement it can be conclude that tacit knowledge characteristic is positively related to tacit knowledge transfer effectiveness. Table 5 shows the hypothesis of the research

The next step is to process the data by using Structural Equation Modeling (SEM) with the Partial Least Square approach (PLS). SEM with PLS are selected because it can solved all equation in the model simultaneously and can explained the relationship among the factors given with a few data. The PLS are chosen because the respondent of the research are few but represent near as the population of the current study.

Table 5: Hypothesis of the Research

| Dimension | Operational Definition |
|-----------|--|
| H1 | Source characteristic is positively related to tacit knowledge transfer effectiveness |
| H2 | Recipient characteristic is positively related to tacit knowledge transfer effectiveness |
| H3 | Tacit knowledge characteristic is positively related to tacit knowledge transfer effectiveness |

All the factors that influence the knowledge transfer are called second order construct. The second order construct have some indicator, this are called the first order construct. The second order construct are obtained by reviewing previous research about factors that affect knowledge sharing by

transferring the tacit knowledge in the organization. Figure 1 shows the research model.

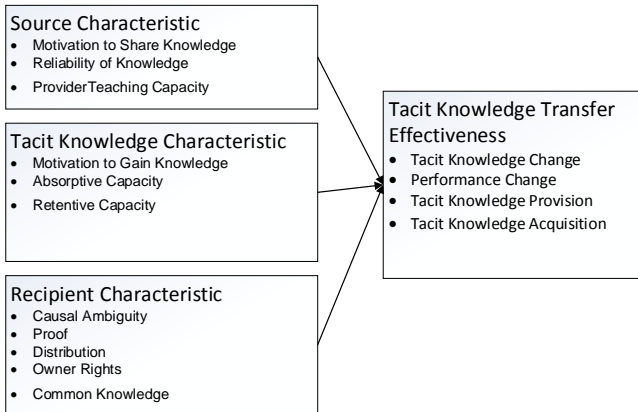


Figure 1. Research Model

This research intended to identify the factors that influence the transfer of tacit knowledge in organization and summarize all factors into model. Questionnaire is used as the assessment for the model. The questionnaire question is designed from the operational definition of each second order construct and the derived which is the first order construct. Total respondent of the research are 83 respondent, the respondents are the laboratory assistant of Industrial Engineering Department, because in every laboratory knowledge transfer process which are between assistant are done by giving training and personal interaction. Table 6 shows the questionnaire design of this research.

Table 6: Questionnaire Design

| Second Order | First Order | Number of Question |
|--------------------------------|-----------------------------------|--------------------|
| Source Characteristic | Motivation to Share Knowledge | 2 |
| | Reliability of Knowledge Provider | 2 |
| | Teaching Capacity | 2 |
| Recipient Characteristic | Motivation to Gain Knowledge | 2 |
| | Absorptive Capacity | 3 |
| | Retentive Capacity | 2 |
| Tacit Knowledge Characteristic | Causal Ambiguity | 1 |
| | Proof | 2 |
| | Distribution | 2 |
| | Owner Rights | 3 |
| | Common Knowledge | 1 |
| Tacit Knowledge Transfer | Tacit Knowledge Change | 2 |
| | Performance Change | 2 |
| | Tacit Knowledge Provision | 2 |
| | Tacit Knowledge acquisition | 2 |

From the data collection process, it is known that 83 respondent are from different laboratories but still in the same department. Table 7 shows the distribution of respondent.

Table 7: Distribution of Respondent

| Laboratories | Number of Respondent |
|------------------------------------|----------------------|
| Ergonomics Laboratories | 7 |
| Facilities Planning Laboratories | 7 |
| Product Development Laboratories | 7 |
| Manufacturing Process Laboratories | 20 |
| Business Simulation Laboratories | 17 |
| Statistic Laboratories | 7 |
| Production Planning Laboratories | 6 |
| Techno Economy Laboratories | 11 |

3. RESULT AND DISCUSSION

3.1 Model Evaluation

The overall result of outer model evaluation of the model is considered as good based on the rule of thumb (Ghozali, 2006) : AVE \geq 0.5 and composite reliability \geq 0.7, all the dimension is above the desired rule of thumb so it can be conclude that the outer model is valid and reliable.

Table 8: Outer Model Evaluation

| Dimension | CR | AVE |
|-----------------------------------|------|------|
| Motivation to Share Knowledge | 0.91 | 0.84 |
| Reliability of Knowledge Provider | 0.88 | 0.79 |
| Teaching Capacity | 0.89 | 0.80 |
| Motivation to Gain Knowledge | 0.92 | 0.85 |
| Absorptive Capacity | 0.83 | 0.62 |
| Retentive Capacity | 0.92 | 0.86 |
| Causal Ambiguity | 1 | 1 |
| Proof | 0.90 | 0.81 |
| Distribution | 0.82 | 0.69 |
| Owner Rights | 0.84 | 0.64 |
| Common Knowledge | 1 | 1 |
| Tacit Knowledge Change | 0.93 | 0.87 |
| Performance Change | 0.96 | 0.92 |
| Tacit Knowledge Provision | 0.92 | 0.84 |
| Tacit Knowledge acquisition | 0.91 | 0.84 |

The relationship between second order construct can be seen using R-square and correlation between construct. The second order construct that is dependent to the other construct is tacit knowledge transfer effectiveness (d). This construct are

dependent to source characteristic (a), recipient characteristic (b) and tacit knowledge characteristic (c). The average R-square value for second order construct is 99%, it means that R-square value from each second order construct can be explained by its first order construct. Table 6 shows the overall result of the R-Square Value form the model.

Table 9: R-Square Value

| Dimension | R-Square | Correlation to D |
|--|----------|------------------|
| Source Characteristic (A) | 0.999970 | 0.679286 |
| Recipient Characteristic (B) | 0.981944 | 0.788513 |
| Tacit Knowledge Characteristic (C) | 0.999867 | 0.702086 |
| Tacit Knowledge Transfer Effectiveness (D) | 1 | 1 |

3.2 Source Characteristic

From the result, it is known that the R-square value of source characteristic is at 99%, it means that the second order construct can be explained by the first order construct. The correlation between source characteristic and tacit knowledge transfer effectiveness is 0.67, which mean that there is positive relation between these first order. From the result, it can be conclude that the source characteristic is positively related to tacit knowledge transfer effectiveness. The result of the research is consistent with Argote and Ingram (2000), Emery (2002) and Gouza (2006) which state that individual characteristic that play role as source is affects the transfer knowledge effectiveness. To make the tacit knowledge transfer more effective, it is needed to improve the teaching capacity of the source, for example by conduct a training to improve individual competency in communication. The knowledge source in the case are the laboratory assistant, their task is to share their knowledge regarding all aspect of laboratory activity to new assistant. The reliability of knowledge provider in the case are considered reliable, because the source which are the assistant are expert in their field. The motivation to share knowledge can be done by giving the mandatory by the upper level management or by including the activity in their line of duty, in example in job description. The source with the same characteristic are tend to more trustworthy by creating the mutual understanding to share a knowledge (Foos, Schum, & Rothenberg, 2006), because the source and recipient are the laboratory assistant, it can be conclude that the sharing process is more easier.

3.3 Recipient Characteristic

From the result, it is known that the R-square value of recipient characteristic is at 98%, it means that the second

order construct can be explained by the first order construct. The correlation between recipient characteristic and tacit knowledge transfer effectiveness is 0.78, which mean that there is positive relation between these first order. From the result, it can be conclude that the recipient characteristic is positively related to tacit knowledge transfer effectiveness. The result of the research is consistent with Argote and Ingram (2000), Emery (2002), Gouza (2006) and Salleh, et al. (2012) which state that individual characteristic that play role as recipient is affects the transfer knowledge effectiveness. To make the tacit knowledge transfer more effective, it is needed to improve the absorptive capacity of the recipient. Gouza (2006), stated that the factor that influencing the absorptive capacity is the knowledge within the person. According to Salleh, et al. (2012), to improve the absorptive capacity of the recipient, it is needed to conduct training and seminar to make the recipient knowledge more adequate, job rotation is considered as important to make the sharing process more effective, and the important thing is to evaluate the current performance by giving feedback. The knowledge recipient in the case are the new laboratory assistant, their role in the sharing process is to absorb and gain new knowledge regarding the laboratory activity. To reduce the retentive capacity, it is good to conduct periodically meeting with the supervisor of the laboratory, frequent communication between the recipient and the management can reduce the retention from the recipient. Another way to reduce the retentive capacity is by giving the incentive to the laboratory assistant.

3.4 Tacit Knowledge Characteristic

From the result, it is known that the R-square value of tacit knowledge characteristic is at 99%, it means that the second order construct can be explained by the first order construct. The correlation between source characteristic and tacit knowledge transfer effectiveness is 0.70, which mean that there is positive relation between these first order. From the result, it can be conclude that the tacit knowledge characteristic is positively related to tacit knowledge transfer effectiveness. The result of the research is consistent with Argote and Ingram (2000), Emery (2002) and Gouza (2006) which state that characteristics and properties in transfer knowledge process affects the transfer knowledge effectiveness. To make the tacit knowledge transfer more effective, it is needed to improve the owner right. Owner right affect the personnel intention to share knowledge (Stenmark, 2000). Organization need to improve the personnel motivation, one of example by giving incentives for personnel who involved in knowledge sharing process. The incentive form can be financial or non-financial incentive.

4. CONCLUSION

This research goal is to determine the factor that affect knowledge sharing in organization by looking into knowledge transfer of tacit knowledge, the tacit knowledge transfer model is tested in laboratories. To improve the tacit knowledge transfer in organization, there are several factor that needed to considered, which are motivation to share knowledge, reliability of knowledge provider, teaching capacity, motivation to gain knowledge, absorptive capacity, retentive capacity, causal ambiguity, proof, distribution, owner rights, common knowledge, tacit knowledge change, performance change, tacit knowledge provision, and tacit knowledge acquisition.

From the result, all the dimension can be explained by the tacit knowledge transfer effectiveness. The strongest correlation to the tacit knowledge effectiveness is tacit knowledge characteristic. To give better understanding and insight about the effectivity of knowledge transfer process, it is needed to compare the result of the model with another data from different organization, in example different department from university.

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