# Analysis Factors Affecting an Application to Knowledge of SMEs

Wasun Khan-Am[1]
Information Systems Department, Faculty of Business Administration, RMUTT
Wasun_k@rmutt.ac.th

Christian Pappenheim
30/16 Lad Phrao Road, Khlongjaokhunsing, Wangthonglang, Bangkok, Thailand
c.pappenheim@gmx.de

**Abstract**

The purpose of this article is to analyze factor which affects toward application of small and medium enterprise (SME) knowledge in Pathum Thani province, Thailand. The research question is focusing on what factors affecting using knowledge of SMEs. Seventy SMEs data were collected as a sample of this research. The quota sampling was used as a mean to define sample size for each district in Pathum Thani province. The snowball method was used as a tool to select samples. The result of factor analysis reduces twelve observe variables to three components of using knowledge management. The regression model indicated that factors affecting toward application of SMEs are: usefulness of knowledge, transfer knowledge to an individual, exchange of knowledge within group, and codify knowledge activities.

**Keywords:** Knowledge Usage, SMEs, Path Analysis

## 1. Introduction

### 1.1 Statement of Problem

Today the knowledge is one of valuable assets in organization. If the organization has a lot of knowledge, this organization will obtain more advantage than their competitor. Even though knowledge management has been dispersed to several organizations and the big firms have a good facility and methodology to manage knowledge in their firms. However, for Small and Medium Enterprises (SMEs) are unclear in terms of SMEs' knowledge management, either does it exist or not? This paper tries to use quantity analysis to figure out an existing of knowledge management on SME. What kind of knowledge management activity they do? What are factors affecting knowledge management in SME?

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[1] **Corresponding author**

This research employs Theory of reason action, together with technology acceptance model; and by using Path Analysis. The data were collected from SMEs in Pathum Thani, Thailand. The results indicated the factors affecting knowledge management in SMEs.

### 1.2. Research Objectives

1. To determine knowledge management activities in SMEs in Pathum Thani, Thailand.
2. To identify and examine factors affecting knowledge management in SMEs in Pathum Thani, Thailand.

## 2. Literature Review

### 2.1 Knowledge

Knowledge (Brooking, 1999) is defined as information in context with understanding to applying that knowledge. Knowledge is classified to two types as tacit and explicit knowledge (Uriarate, 2008).

- Explicit knowledge (Fiewstone, 2001; Rémy & Caroline, 2011) is an objective that is easily captured, codified and communicated.
- Tacit knowledge (Sunassee, & Sewry, 2002; Rémy & Caroline, 2011) is subjective that is connected to intuition, emotions, beliefs, know-how, experiences and values.

### 2.2 Knowledge Management

The very simply meaning of knowledge Management (Uriarate, 2008) is the conversion of tacit into explicit knowledge and sharing it within the organization. It contains four elements which are:

- Knowledge creation and capture
- Knowledge sharing and enrichment
- Information storage and retrieval, and
- Knowledge dissemination.

### 2.3 Knowledge Activity

Uriarate (2008) presents that knowledge can be exchanged during discussion and meeting between colleague. Knowledge can be transfer into individual from external and internal activities including training, seminar, on-the-job training, and workshop. Knowledge can be created from create knowledge workshop.

### 2.4 SMEs in Thailand

SME stands for Small and Medium Enterprise. Characteristics of SME in Thailand (Thai Ministry of Industry, 2002) are defined by ministerial regulations with the number of employed and the value of fixed assets of SME in 2002. The SME definition is defined by two type of business, small and medium enterprise.

The small enterprise is a business which does not have an employee more than 50 people, and does not have an investment more than 50 Million Baht. The medium enterprise is a business which does not have an employee more than 200 people and does not have an investment more than 200 million Baht.

Although there are a lot of SMEs in Pathum Thani website, Researcher found some of them are disappeared by their product themselves or economic crisis or both. Some of them can be survived and be strong now. It is too hard to identify number of SME in Pathum Thani.

### 2.5 Pathum Thani Province

Pathum Thani (Pathum Thani province, n.p) is the one of provinces in Thailand and is a metropolitan city. Its boundary is connected to Bangkok. There a several types of population in Pathum Thani. It consists of urban and rural society and called University City. There are seven districts in Pathum Thani as follow:

1. Mueang Pathum Thani,
2. Khlong Luang,
3. Thanyaburi,
4. Nong Suea,
5. Lat Lum Kaeo,
6. Lam Luk ka, and
7. Sam Khok.

### 2.6 SME Knowledge Application

Normally, SME in Pathum Thani province, Thailand is a small or medium business in Thailand. The business type of SME usually is production business. The core business process is made to stock process model (Valacich & Joseph, 2012). The model of made to stock are presented in figure 1.

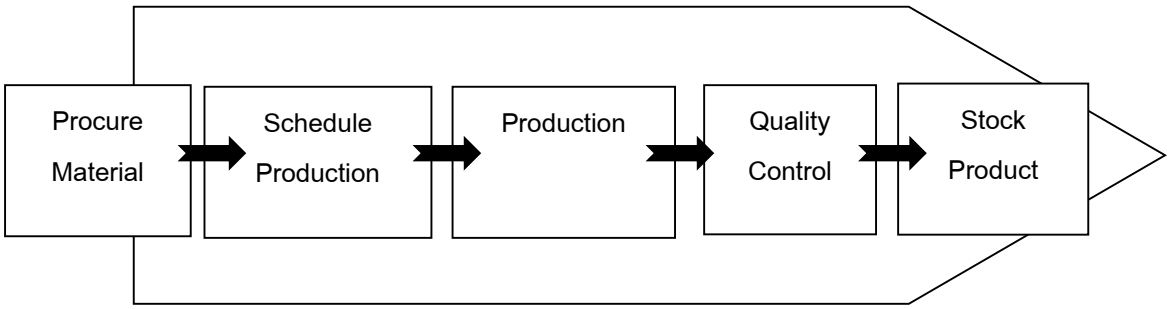


Figure 1: Made to stock Business

According to the figure 1, made to stock model consists of 5 process starting from purchase material for product, plan to produce goods, execute plan, test a quality of goods, and final store goods in stock or inventory. If SMEs apply this model to their business, the required knowledge of SME composes of selecting material, operation or production include planning, and execution; quality control of product and service; and marketing knowledge.

### 2.7 Theory of Reason Action (TRA.)

TRA (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) stands for Theory of Reasoned Action. TRA is drawn from social psychology and is one of the most fundamental and influential theories of human behavior. The core constructs consist of attitude toward behavior and subjective norm**.** The theory reason action model show in the next figure

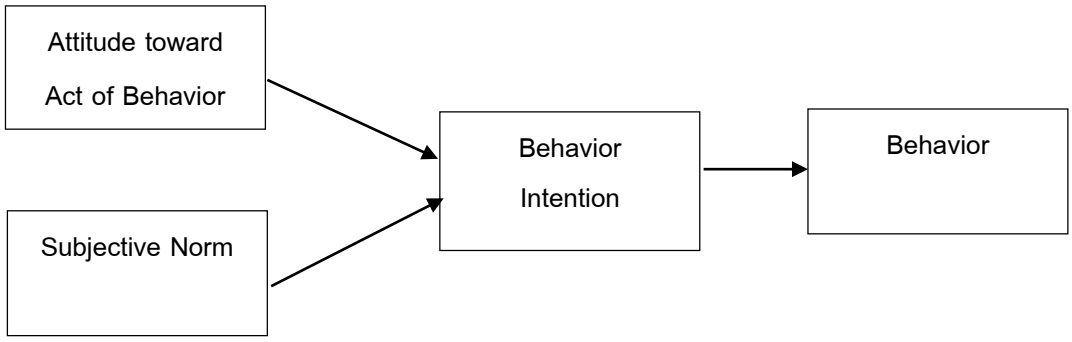


Figure 2 Theory reason action model I

### 2.8 Technology Acceptance Model (TAM.)

TAM (Venkatesh, Davis & Davis, 2003) stands for Technology Acceptance Model. TAM is adapted from TRA in information system context. An independent variables of TAM consist of perceived usefulness, perceived ease of use, and subject norm with are inherited from TRA. The TAM model shows an effect of perceived usefulness and perceived ease of use on behavior intention through behavior in action. The model of TAM shows in figure 3.

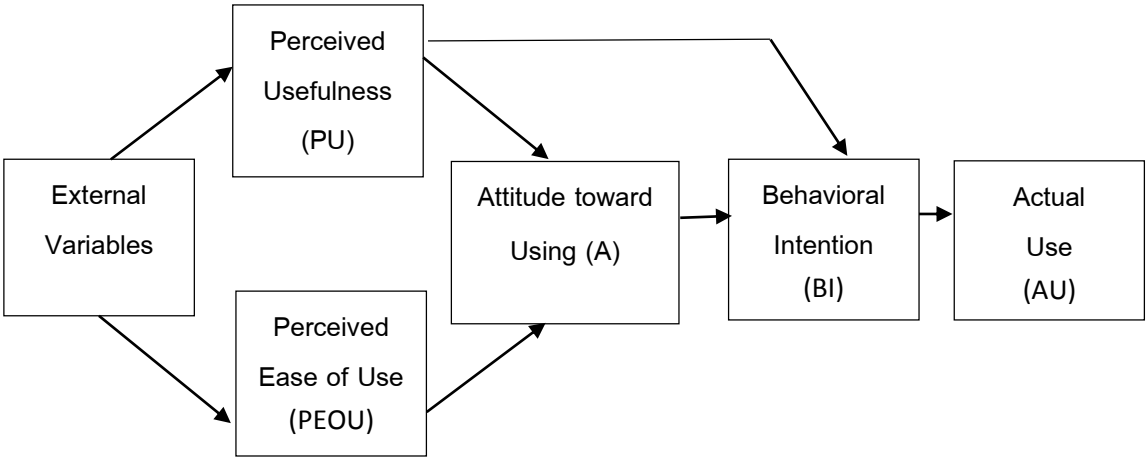


Figure 3 Technology acceptance model

In figure 3, there are six parts of TAM including external variables, perceived usefulness, perceived ease of use, attitude toward using, behavioral intention, and actual use. In this research, there are only two parts is model applied to research model are: perceived usefulness and perceived ease of use.

## 3. Data and Methodology

### 3.1 Population and Samples

The population of this research is SMEs which are located in seven districts of Pathum Thani province, Thailand. The respondent is representative of SMEs who are willing to give information about their business and their activities.

### 3.2 Sampling

A quota sampling was employed to this research. There were 7 districts in Pathum Thani province and 10 samples were randomly chosen from each district. The total of sample size was 70 samples. The snowball method was used as a sample selection method.

### 3.2 Hypothesis

The hypothesized causal ordering for how a level of obtaining knowledge and usefulness of knowledge cause application of knowledge.

### 3.3 Analysis Method

Firstly, data analysis was described and reported by descriptive statistic of knowledge application in SME, and then a factor analysis was used to grouping and reducing observe variable to component of knowledge application. After factor analysis, correlation test was used to

classify a relation among component of knowledge application and two independent variables as usefulness of knowledge variable, and use of knowledge. Finally, the multiple regression model was used for analyzing causal model with collected data.

## 4. Research Results

### 4.1 Descriptive

The mean and standard deviation of obtaining knowledge are presented in Table 1.

Table 1: Mean and Standard deviation of Obtaining Knowledge

| No. | Variable | Activities | Mean | Standard Deviation |
|---|---|---|---|---|
| **1** | VTK1 | Internal Training | 3.91 | .800 |
| **2** | VTK2 | Internal Workshop | 3.99 | .807 |
| **3** | VTK3 | External Training | 3.60 | .875 |
| **4** | VTK4 | Study Document | 3.37 | .837 |
| **5** | VTK5 | Discussion | 3.93 | .754 |
| **6** | VTK6 | Study Procedure Manual | 3.62 | .811 |
| **7** | VTK7 | On-the-job Training | 3.93 | .709 |
| **8** | VTK8 | Talking During Coffee Break | 3.99 | .789 |
| **9** | VTK9 | Meeting | 3.90 | .801 |
| **10** | VTK10 | Knowledge Codified | 3.53 | .696 |
| **11** | VTK11 | Knowledge Storing | 3.51 | .756 |
| **12** | VTK12 | Knowledge Developing | 3.75 | .715 |

In Table 1, most of knowledge management activities for obtaining knowledge are on much level, internal training, internal workshop, external training, discussion, study procedure manual, on-the-job training, talking during coffee break, meeting, knowledge codified, knowledge storing, and knowledge developing; except study document is on fair level.

### 4.2 Factor Analysis

A factor analysis was conducted to reduce a number of variables and create a component. Next table presents loading-factor score of activities for obtaining knowledge.

Table 2: Loading Factor of activities for obtaining knowledge

| Variable Name | Component | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| **VTK1** | **.731** | -.075 | .293 |
| **VTK2** | **.661** | -.102 | .480 |
| **VTK3** | **.730** | .122 | .070 |
| **VTK4** | .486 | .535 | .067 |
| **VTK5** | **.633** | .104 | .200 |
| **VTK6** | **.712** | .551 | -.106 |
| **VTK7** | **.694** | .197 | .266 |
| **VTK8** | .270 | -.024 | **.798** |
| **VTK9** | .354 | .113 | **.747** |
| **VTK10** | -.003 | **.897** | .143 |
| **VTK11** | .110 | **.896** | .119 |
| **VTK12** | -.002 | .395 | **.733** |

In Table 2, the factor loadings enable eleven variables to three components and deletes VTK4 variable by its value. Its loading score is under 0.6. The first component is called TIDV, *Transfer knowledge into an individual*, which consists of VTK1, VTK2, VTK3, VTK5, VTK6, and VTK7. The second component is called TGRP, *transfer knowledge within group*, which consists of VTK8, VTK9, and VTK12. The last component is called STORK, *store knowledge,* which consists of VTK10, and VTK11

**4.3 Correlation Test**

After factor analysis done, all produced variable are tested by correlation testing. The objective of this test is to find relation among three activities for obtaining knowledge components (TIDV, TGRP, and STORK), usefulness of knowledge variable (UFOK), and use of knowledge (UOK). The findings of correlation test are presented as table below:

Table 3: Correlation Test Output

| | **UOK** | **UFOK** | **TIDV** | **TGRP** | **STORK** |
|---|---|---|---|---|---|
| **UOK** | 1 | .439* | .444* | .473* | -.036 |
| **UFOK** | | 1 | .522* | .628* | .036 |
| **TIDV** | | | 1 | .534* | .256* |
| **TGRP** | | | | 1 | .238* |
| **STORK** | | | | | 1 |

* Correlation test is significant at the .05 level. (2-tail)

Table 3 indicated:

1. UOK correlates with UFOK, TIDV, and TGRP
2. UFOK correlates with UOK, TIDV and TGRP,
3. TIDV correlates with UOK, UFOK, TGRP, and STORK
4. TGRP correlates with UOK, UFOK, TIDV, and STORK
5. STOR correlates with TIDV, and TGRP

### 4.4 Full Model

According to correlation test table together with TRA and TAM, the full model is generated and presented in the Figure 4.

According to Figure 4, the full model used a correlation testing as a base of model. The next analysis is to identify an identity model of factor affecting knowledge management application with path analysis.

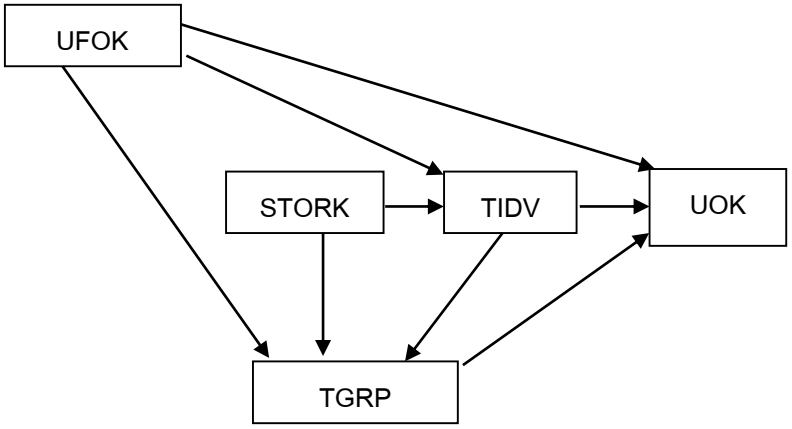


Figure 4: Full model

### 4.4 Regression

According to the full model, the regression output of UOK with predictor UFOK, TIDV, and TGRP is presented in Table 4

Table 4: Regression output for significant path UOK on TGRP and TIDV

| **R** | **R square** | **Adjusted R Square** | **Std. Error of the estimate** |
|---|---|---|---|
| **.524** | .275 | .253 | .597 |
| | Standardized Coefficients | T | Sig. |
| **TGRP** | .330 | 2.678 | .009* |
| **TIDV** | .268 | 2.177 | .033* |

*Coefficient is significant at the .05 level

In Table 4, there are only TGRP and TIDV to UOK. The path coefficient for UOK on UFOK is not significant and has to be removed from the model.

The regression model output of TGRP with predictor UFOK, TGRP, STORK is presented in the Table 5.

Table 5: Regression Output for Significant Path: TGRP on UFOK, and TIDV

| **R** | **R square** | **Adjusted R Square** | **Std. Error of the estimate** |
|---|---|---|---|
| **.673** | .453 | .436 | .488 |
| | Standardized Coefficients | T | Sig. |
| **UFOK** | .480 | 4.527 | .000* |
| **TIDV** | .284 | 2.678 | .009* |

*Coefficient is significant at the .05 level

In Table 5, there are only UFOK and TIDV to TGRP. The path coefficient for TGRP on STORK is not significant and has to be removed from the model.

The regression output of TIDV with predictor UFOK, STORK is presented in Table 6.

Table 6: Regression Output for Significant Path: TIDV on UFOK, and STORK

| **R** | **R square** | **Adjusted R Square** | **Std. Error of the estimate** |
|---|---|---|---|
| **.574** | .329 | .309 | .493 |
| | Standardized Coefficients | T | Sig. |
| **UFOK** | .513 | 5.127 | .000* |
| **STORK** | .238 | 2.376 | .020* |

*Coefficient is significant at the .05 level

In Table 6, all path of TIDV have significant, no path need to delete.

### 4.4 Reduced Model

According to all regression models, the reduced model and coefficients are generated and are presented in the figure 5.

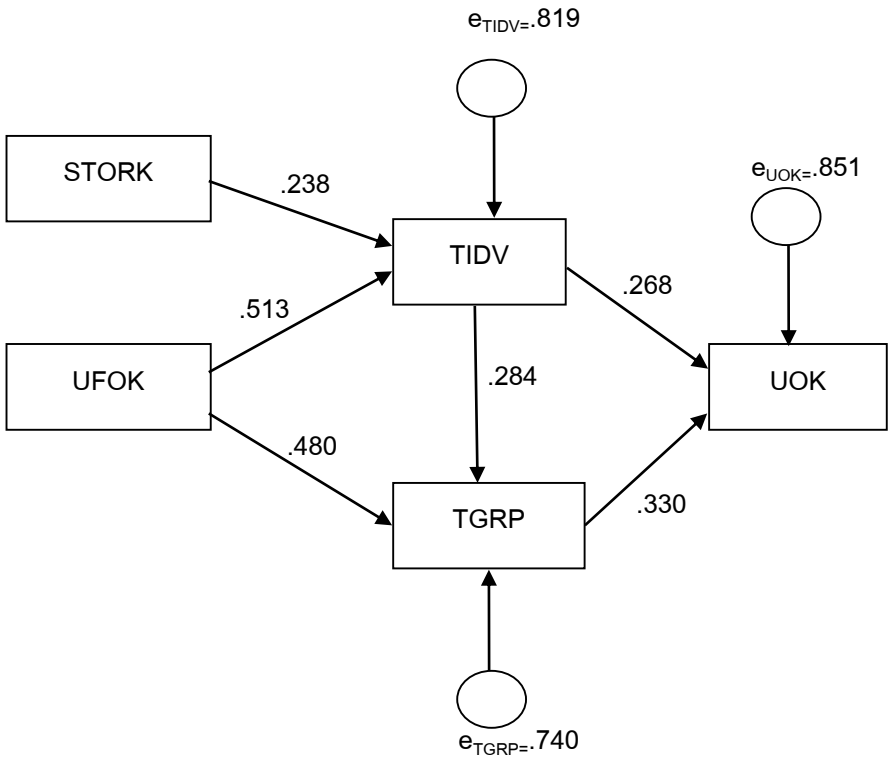


Figure 5: The Reduced Model

With reduced model, the direct, indirect, and total effects of causal model are computed and presented in the next table.

Table 7: Summary of Causal Effects for Reduced Model

| Outcome | Determinant | Casual Effects | | |
|---|---|---|---|---|
| | | Direct | Indirect | Total |
| **TIDV** | STORK | .238* | - | .238 |
| **R2 = .329** | UFOK | .513* | - | .513 |
| **TGRP** | UFOK | .480* | .146 | .626 |
| **R2 = .453** | TIDV | .284* | - | .284 |
| | STORK | - | .068 | .068 |
| **UOK** | TIDV | .268* | .094 | .362 |
| **R2 = .275** | TGRP | .330* | - | .330 |
| | UFOK | - | .344 | .344 |

* Direct effect is significant at the .05 level

### 4.5 Equation

From a regression table, the equation of model show in this section as:

$$TDIV = .513UFOK + .238STORK \quad (1)$$

$$TGRP = .480UFOK + .284TIDV \quad (2)$$

$$UOK = .268TIDV + .330TGRP \quad (3)$$

The first equation describe transfer knowledge into individual activities depends on useful of knowledge and store knowledge activities. The second equation describe transfer knowledge within group activities depend on useful of knowledge and transfer knowledge into an individual activities, the last equation describe use of knowledge depend on transfer knowledge into individual activities and transfer knowledge within group activity.

## 5. Conclusions

By using factor analysis methodology, the twelve applications of knowledge management are reduced to three main component as transfer knowledge into individual, transfer knowledge within group, and store knowledge,

A path analysis is conducted to determine the casual effects among the variables of UOK, TIDV, TGRP, STORK, and UFOK. The full model was not consistent with the empirical data. Test of missing paths in the full model indicated that two insignificant path of UOK on UFOK, and TGRP on STORK was removed from the model. Thus, a reduced model is generated. Computation of reproduced correlations for the reduced model indicates consistency with the empirical correlations. All path coefficients are significant at the .05 level.

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