

Social Media and User Performance in Knowledge Sharing

Setiawan Assegaff 1st
Dept. Of Information System
STIKOM Dinamika Bangsa
Jambi, Indonesia
setiawanassegaff@stikom-db.ac.id

Akwan Sunoto 2nd
Dept. Of Information System
STIKOM Dinamika Bangsa
Jambi, Indonesia
akwan@stikom-db.ac.id

Hendrawan 3rd
Dept. Of Information System
STIKOM Dinamika Bangsa
Jambi, Indonesia
hendrawan@stikom-db.ac.id

Xaverius Sika 4th
Dept. Of Information System
STIKOM Dinamika Bangsa
Jambi, Indonesia
xaveriussika@stikom-db.ac.id

Abstract—The aimed of this study is to investigate the impact of social media utilization on student's performances for knowledge sharing in teaching and learning progress. A research model using the Task-Technology Fit Theory as a basis and three hypotheses developed for this study. Model and hypotheses then tested and validated using data obtained from a survey of respondents. The survey was conducted for students at a university in Indonesia. About 103 questionnaires filled out by members of the university, 75 questionnaires declared valid and used for further analysis. Data were analyzed using Smart Partial Least Square (Smart PLS). This study reveals that student performance and Knowledge Sharing impact by technology characteristic and social media utilization

Keywords— Knowledge Sharing, Social Media, User Performance, Task-Technology Fit Theory

I. INTRODUCTION

Today's, social media has undergone tremendous development; more and more social media applications are created and developed. Some of the quite popular social media applications are Facebook, Twitter, and Instagram. In 2014, the estimated the number of active users of social media applications in the world is about 1.9 billion people and was estimated in 2018 to be 2.67 billion people. In Indonesia, the number of active users in social media is estimated to be on the number 96.01 million people in the year 2016 (statista.com, 2016). This amount is expected to increase in subsequent years.

Social media is growing rapidly due to the features offered felt quite potentially provide benefits to users [1]. In addition, the application's ability to collect millions of people in one large virtual community makes this application a powerful weapon for those who have an interest in a great community. In its later development, social media has been utilized by the user in many aspects of human life. Social media was used in commerce, social, political and education. In education, it is quite a lot of educational institutions whether formal or non-formal use social media application to support their academic activities [2].

One of the social media features that potential to be used in teaching and learning activities is a virtual community (virtual group) [2]. The virtual community enables the gathering of a group of people who has the same interest [3]. Where the member of the group is facilitated to be able to interact, collaborate and communicate through a variety of

features provided by the social media application [4, 5]. In Educational context, the academic community is believed as one of the most important elements in helping student and lecturer to create intensive interaction. The intensive interaction among students and professors in the community allow them more intense on the process of transfer the formation and knowledge. The exchange of knowledge is one of the keys to creating new skills and competencies.

Nonaka (expert in the field of Knowledge Management) state that the exchange of knowledge can only come through interaction and collaboration activities [6]. Through interaction and collaboration activities the exchange of knowledge between experts and talent would occur. Further, Nonaka argues that new knowledge is only created through interaction and collaboration [6].

Many organizations in the world have proved that the transfer of knowledge is one of the most effective activities in creating new high skill [7]. We can see how organizations increasingly realize the importance of knowledge sharing interaction in an effort to bring a huge benefit to the improvement and creation of new knowledge [8, 9]. Thus we can conclude that the interaction and collaboration is key to the creation of powerful beings are competent [10]. In this study, we would like to investigate whether the use of social media for knowledge sharing activities can improve the performance of students and what factors impact the utilization of social media?

II. RESEARCH METHOD

A. Model and Hypotheses Development Social Media

Kaplan and Heinlein define social media as a collection of internet-based applications that provides web 2.0 interactive services among individuals and communities to interact, discuss, create and modify contains. Social media is now believed to be a tool that provides tremendous potential for the organization to improve the performance of the company [11]. To get the maximum benefit from the potential of the social media, the companies develop strategies to use social media in their business activities. Hanna et al (2011) proposed a concept to develop a strategy for the utilization of social media within an organization that they are familiar with the term "social media ecosystem". In the concept in the organization need to understand that the

use of social media in supporting the activities organized needs to be aligned, by appropriately combining social media how traditional and virtually in achieving organizational goals.

Razmerita et al., 2009, proposed several technologies in social media that can be used in optimizing knowledge sharing, namely:

- *A personal webpage* is a tool that can improve the organization and presentation of information and share with the community.
- *Personalized search tools* provide the facility to search for and share information.
- *A social bookmarking* tool that makes it easy for community members to share bookmarks of interest among the members.
- *The personalized live discussion forum* is a tool that can guide in analyzing, evaluating, displaying and sharing of information among member of communities.
- *the virtual world* is a tool that encourages community members to share their knowledge.
- *Blogs and wikis* is a supportive tool for editing, viewing, organizing information or knowledge by individuals or collaborate with others.

The tools above are part of social media technologies and services that could be an option for us in optimizing individual knowledge sharing activities with community members. Unlike the traditional tools for knowledge sharing, social media-based technology services supporting the process of interaction, collaboration more interactive and intensive, thus enabling the sharing of knowledge that is richer in content and more intensive [5]

Research in the field of social media and knowledge management that has to produce some advantage knowledge this time includes conceptual models, case studies, empirical studies. One of the studies related to the social media and knowledge management conducted by Razmerita et al. (2009). In their study, they found that there is the same principle between social media and knowledge management in sharing the information. Social media has shown a positive role in knowledge management. In others research conducted in social media and knowledge management, some researchers have managed to identify the benefits obtained through the use of social media in knowledge management. However, although in principle social media are believed to synergize with knowledge management the researchers also found the constraints faced in the implementation of social media in knowledge management. Knowledge management in social media can be supported through a variety of tools that allow creating, code, organize, and share knowledge, but also to socialize and improve personal network and collaborate in order to organize and create new knowledge.

Knowledge Sharing

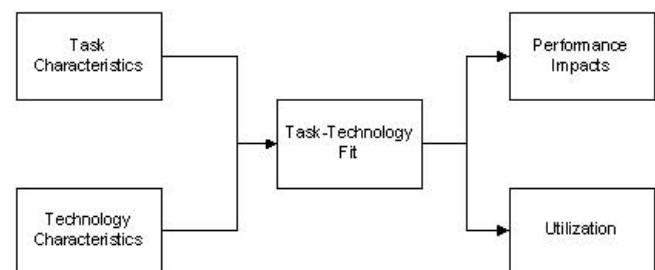
Knowledge sharing is a major activity in the knowledge management area. Knowledge sharing allows individuals in an organization to work together to exchange information, ideas, suggestions, ideas, and experiences that ultimately creating the formation of a new knowledge [1, 3-5].

Knowledge sharing is a mechanism of the spread of knowledge held by the organization to all members of an organization. One of the leading theories relating to knowledge creation comes from Nonaka (2008). Another expert in Knowledge Management Srivastava et al. (2006), defines knowledge sharing as sharing expertise, information, advice, and ideas among individual to another's individual within an organization [7]. In his theory, Nonaka argues that knowledge is created only from the interaction between people or between organizations.

Task-Technology Fit Theory

This study using the Theory of Task-Technology Fit (TTF) as a basic reference in resolving the issues raised. Task-Technology Fit (TTF) is one of the theories that was built to evaluate the positive impact of the utilization of computer technology which was first introduced by Goodhue and Thomson in 1995. The TTF provides a theoretical basis to determine whether a technology can provide a good impact on user performance through evaluation of conformity between task characteristic and the technology used to complete the task [12].

Task technology fit is a theory that was developed to evaluate the suitability of the duties of a person in an organization with the technology used in these duties. This theory was originally developed by Goodhue and Thomson in 1995. In TTF there are four main pieces of theoretical constructs proposed such as; Task characteristic, Technology characteristic, utilization and performance impact. Goodhue and Thomson in TTF theory suggested that the performance of someone will affect by the characteristic of technology and the utilization of technology for his work.



Source: Goodhue and Thompson, (1995)

Fig. 1 Task-Technology Fit Theory (TTF)

Goodhue and Thomson in 1995 develop a concept for measuring the TTF by using eight factors: quality, locatability, authorization, compatibility, eases of use/training, production timeliness, reliability systems, and relationship with users. Base on the previous research that applies this theory, this theory has been proven able to explain and predict the impact of information technology on the performance of the user. In the beginning, this theory is used to evaluate the performance at the individual level but on the advanced development, this theory was also applied to evaluate the level group of the user which use of information technology. Since the beginning of development, this theory has been applied to various types of information technology, including electronic commerce systems. In the Previous study, researchers generally collaborate theory with other relevant theories or enrich the understanding of technology

utilization. Some researchers explore the theory with new relevant factors to investigate the impact of factors with TTF to getting better understanding impact the use of information technology [13-16]. In developing research instruments researchers using Linkert scale. Where each factor was measured by using 2 to 10 pieces of the question, and with a response using 7 Linkert the scale of strongly agrees to strongly disagree.

Model and Hypotheses Development

The following figures (fig.2) shows the relationship between variables that developed for this study. In our research model, we would like to investigate the impact of task-technology fit and social media utilization in student performance for knowledge sharing. The research model contains one independent variable "perceived task-technology fit" and has two dependent variables is the "Social Media Use", and "Student Performance Impact"

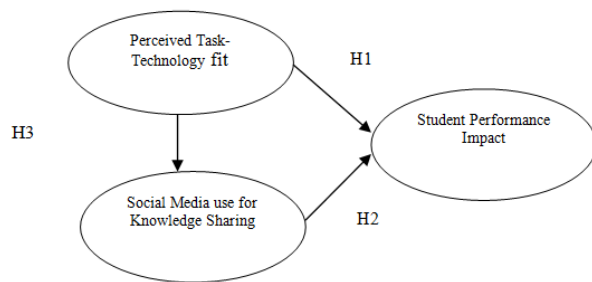


Fig. 2 Research Model

Hypotheses developed for this study are:

H1: *Perceived task-technology fit positively influence student performance impact*

H2: *Social media use influences positively impact student performance.*

H3: *Perceived task-technology fit positively influences the use of social media*

Research method

A. Participant

Data collection was conducted by direct questionnaire distribution to the respondents. Data collection was using the instrument that contains 10 of the questions. Questionnaires were distributed to students in a university. A total of 75 respondents from 103 respondents who answered the questionnaire. The respondents who participated in the survey consisted of 72% male and 28% female.

B. Research Instrument

The instrument applied in this study was developed base on the Task-Technology Fit Theory. Modifications to construct and indicators did to make sure the instrument in meeting the need within the research context. The propose of this study is to examine the relationship between the three constructs are "fit technology task", "social media utilization" and "student performance impact" in the sharing of knowledge. The definition of constructs and their referral sources are described in Table 1.

TABLE I Variable in Research Model

Variable name	Definition	Source
Perceived Task-Technology Fit	User perception related to social media for knowledge sharing	Larsen et al, 2009; Goodhue and Thomson, 1995
Utilization	The use of social media by student	Larsen et al, 2009; Goodhue and Thomson, 1995
Student Performance Impact	Student Performance impact by using social media for knowledge sharing	Larsen et al, 2009; Goodhue and Thomson, 1995

Each construct is measured with indicators using a Likert scale. A scale developed in five levels of ratings, with the following explanation, starting from 1 = strongly disagree to 5 = strongly agree on points. The indicators used in this study are described in the Appendix.

C. Data Analysis

Smart PLS used to evaluate the developed research model. Structural Equation Model (SEM) approach applies to validate the research model. SEM was used because of its ability to test a causal relationship between the constructs that contain a number of indicators [17]. There are two major steps undertaken in analyzed data, first conduct model of measurement assessment, the aims of this activity is to ensure that each construct and indicators on the research instrument have met the criteria [18]. The next activity has conducted an evaluation of structural models. In this stage, the hypothesis will be testing along with the model fit assessment.

III. RESULT AND ANALYSIS

Table 2 below illustrates the profile of the respondents who participated in this study. Respondents came from a college in Indonesia. Data collected by distributed the questionnaire to students. A total of 103 respondents participated in filling out the questionnaire and 75 questionnaires declared valid can be used for further analysis.

TABLE II Demography Characteristic of Respondent

Characteristics of demography	Number of respondents	Percentage
Gender		
Man	54	72%
Woman	21	28%
Age		
20 years and under	14	18%
20-25 years	50	67%
25 years and older	11	25%

A. Evaluation of Measurement Model

Each construct in the research instrument should be evaluated to check their validity and reliability. It is intended that all constructs that exist meet the standards that have been agreed so it proved valid and reliable. Reliability can be ensured by checking the value of Composite Reliability and Average Variance Extracts (AVE) of each construct. Table 5 below shows that the value of CR and AVE for all constructs is above 0.8 and 0.6. It is indicated that all constructs are reliable. The next reliability test will be performed by internal reliability test of the constructs; this is conducted by evaluating the value of alpha Cronbach. The results of data analysis showed that the Cronbach alpha of each construct is above the 0.7, which indicates the level of reliability is good [19].

TABLE III Model Fit Indicator

	R-Square	Cronbach's Alpha	Commonality	Redundancy
SPI	0.446	0.8347	0.6666	0.2382
SMU	0.402	0.7635	0.6825	0.275
TTF	0	0.7807	0.687	0

The next process is to make sure that all constructs are valid. Two evaluations names convergent validity and discriminant validity will apply in this stage. The first step is to evaluate the value of the loading factor. Table 4 describes the resulting test that all the indicators have factor loading values above 0.6, this indicates that all the indicators met the standards. The indicators meet standard if the construct loading factor value of each indicator above 0.6 [19].

TABLE IV Loading and Cross Loading Factor

	Performance Impact	Social Media Use	Task-Technology Fit
PI1	0.9382	0.6326	0.4551
PI2	0.8715	0.5892	0.6946
PI3	0.6434	0.3012	0.2032
PI4	0.7828	0.4503	0.3496
SMU1	0.5368	0.7907	0.4646
SMU2	0.5216	0.9106	0.6013
SMU3	0.5107	0.7701	0.4997
TTF2	0.58	0.6167	0.825
TTF3	0.2717	0.3715	0.7573
TTF4	0.4792	0.5298	0.8982

The final test in measurement model evaluation is checking the feasibility of the discriminant validity. The test can take place by checking the value of AVE each on each construct exist [20]. The AVE value of a construct must be

greater than the AVE value of the existing construct variants. Table 6 shows that the AVE value of each construct has a higher than the value of the other existing constructs. It can be concluded that the AVE value of each construct has already met the criteria.

TABLE V AVE and CR Value of Variables

	AVE	CR	PF	SMU	TTF
PI	0.666	0.887	0.816		
SMU	0.682	0.865	0.826	0.826	
TTF	0.687	0.867	0.828	0.828	0.828

B. Evaluation of Structural Model

After conducting an evaluation of the measurement model, and get good results. The next agenda is to test the hypotheses. Before hypotheses test is done, it is necessary to implement several steps to validate that research model. The first step is to measure the explainer power level of models by checking the value of the R2. The result of the test that describes in Figure 2 the R2 value of the model is 0.446. It can be concluded that The model has the ability to predict the performance of students in knowledge sharing using social media amounted to 44.6%. It is proved that the model is fit.

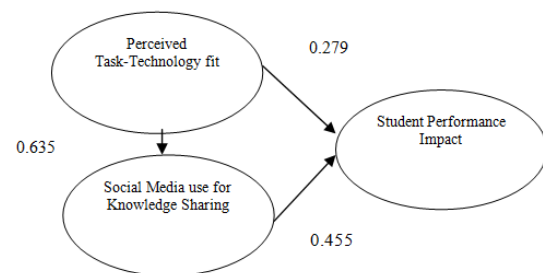


Fig. 3 Evaluation of Research Model

In conducting hypotheses testing, this study uses p-value as indicators. The result of testing is described in Table 6 below. P Value for each hypothesis is: H1 = 0.0001, H2= 0.0001 H3 = 0.0001. The result shows all of the hypotheses are supported.

TABLE VI Hypotheses Result

Hypotheses	Path Coefficient	T-stat	P-Value	Result
H1	0.279	9.800	0.0001	Significant
H2	0.635	12.99	0.0001	Significant
H3	0.455	5.895	0.0001	Significant

$DF = 72$ ($DF=N-K$) ($75-3 = 72$), $N =$ number of samples $K =$ number of variables (constructs)

IV. DISCUSSION

The purpose of this research is to have a better understanding on how task-technology fit elements and the utilization of technology (social media) have an impact on user performance (in this context student as user and knowledge sharing is the main activities of performance).

In General, data analysis result shows that both of elements, task-technology fit element, as well as technology utilization element, impact the user performance. This study found that the task elements of task-technology fit significantly affect the performance of students in sharing knowledge using social media. This means students believe social media provide features that can help them to share the knowledge. Students also believe that their knowledge sharing activities is better by using social media. Future more the students also believe that social media have met their needs in knowledge sharing in learning activities in their college.

The study also reveals that students are assured to using a technology (in this case, social media). This is because they believe that social media has the features they need and these features are complete enough to achieve their goal. They feel social media is the right technology for their activity in knowledge sharing. Our study finding is consistent with previous studies that apply TFF [13, 14]. Aljukhadar et al. and Larsen et al. stated that the people will use technology if the technology fulfillment the needs of the users to performing their task.

Future more, our study indicated if the students also felt that using social media increased knowledge sharing performance. Students feel more productive and more effective due to the use of social media. Our findings are relevant to the study done by Larsen et al and Widagdo and Susanto. Where in the study they found that the use of the technology according to user needs will improve the performance of the work / meet the objectives of the work/activities [13, 14].

Based on the results, this study concluded students have performance increase in their sharing of knowledge activities due to the use of social media in teaching and learning environment. The students felt that social media met their needs and have useful features. The findings in this study reinforce the scientific basis that the performance of the individual as a result of the use of technology is significantly influenced by the characteristics of the technology used but it is also influenced by their desire to take advantage of these technologies.

This study has limitations in term of on the number of respondents for the sample. Future studies may consider obtaining a more proportional number of respondents. There are also two important agenda that should be done in future studies, first investigate whether there are any other elements that independently/ dependently affect the performance of users when using technology in addition to the two elements that have been investigated above. Factors that could potentially include "perceive ease of use", this element relates to whether to utilize a technology users find it easy or not much effort is needed. Another agenda is to conduct research in different universities both in terms of culture or kind. Colleges are investigated currently in the Indonesian island of Sumatra that has a relatively distinct culture with universities on the island of Java. Colleges are investigated at the moment is private college course that different with

public universities environment. These differences can affect the results of the study which has been carried out.

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Appendix
Variables and Indicators

Variable	Indicator	Source
Perceived Task-Technology Fit	Social Media application provides functions/features that help me to share information and knowledge with fellow students and professors	Larsen et al, 2009; Goodhue and Thomson, 1995
	Sharing information and knowledge are better by using social media.	Larsen et al, 2009; Goodhue and Thomson, 1995
	Features of social media fit my needs for sharing information	Larsen et al, 2009; Goodhue and Thomson, 1995
utilization	I use social media to share information	Larsen et al, 2009; Goodhue and Thomson, 1995
	I use social media to share knowledge	Larsen et al, 2009; Goodhue and Thomson, 1995
	I use social media to discuss the information and knowledge with others students and professors	Larsen et al, 2009; Goodhue and Thomson, 1995
Student Performance Impact	Sharing of information/knowledge through social media makes my information sharing activities more productive	Larsen et al, 2009; Goodhue and Thomson, 1995
	Sharing of information/knowledge through social media sharing makes me more effective	Larsen et al, 2009; Goodhue and Thomson, 1995
	Social media with information and knowledge sharing services tool improving the quality of my knowledge sharing	Larsen et al, 2009; Goodhue and Thomson, 1995
	I can easily and effectively share information and knowledge through social media	Larsen et al, 2009; Goodhue and Thomson, 1995