

# Ontology of Encourage Knowledge Sharing Factors Align with Theory of Planned Behavior in Virtual Learning Communities

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**Abstract** - Today, in the world of education, study in the classroom alone is not sufficient and does not respond to the learning of the students. Online Social Networks today have a development of an educational Virtual Learning Communities, VLCs. This paper presents a study of factors that encourage the sharing of knowledge of students on Social Network using the Theory of Planned Behavior, TPB and encourage the transfer of skills, their knowledge and their experiences to others in the VLCs. The results showed that the factors that contributed to the sharing of knowledge and behavior habits, norm and perceived behavioral control. And in this paper has offered a framework and guidelines for the sharing of knowledge in VLCs aligned with the TPB that mentioned above by the use of information technology ontologies and open source learning platform.

**Keywords** - Ontology, Theory of Planned Behavior, Knowledge Sharing, Virtual Learning Communities

## I. INTRODUCTION

In education with online Social Network today has conducted and found that community is a role even and resulting in the development of VLCs. [2] VLCs allow each student or group of students at each location to meet the goal of learning. The exchange

e-learning addition has defined the purpose of the VLCs can increase the capacity of learning by encouraging students to learn and share the knowledge gained from the Social Network. [14] Students can share their knowledge with others in a variety of ways. Such as creating a series of questions, lesson introduction, helping each other, including the group of students. This will lead to increased performance of the class.

In addition, the TPB describing human behavior to be represented by a man with the intention to perform the behavior depends on his beliefs. Three reasons include the belief that is behavior beliefs, normative beliefs and control beliefs. [15] In past studies of the theory of planned behavior, no research has led to the concept of a knowledge-based used to create ontologies under this theory and there is no research that brings ontologies used to assess the nature of learning, VLCs based on the TPB. Therefore, in this study the researchers have used the concept of VLCs to align with the TPB and ontologies lead to assess the nature of learning. To assess this virtual learning community of e-learning systems are being developed. And the developing system using questionnaires targets two groups of students attending and not attending classes in subjects BCS118, "Information Technology and Professional Work" of the Sripatum University.

## II. CONCEPTS AND THEORIES

In this introduction to Social Network and TPB explains the concept of ontologies as encourage knowledge sharing factors align with TPB into the VLCs by the following ordering:

### 1. Virtual Learning Communities

VLCs Today online Social Networks are used in education. Cause the development of VLCs studied up.

- Yang, S.J.H., Chen, I.Y.L., Kinshuk., and Chen. [2] has conducted research and found that virtual learning is an Internet technology that allows each student or group of students at each location to meet the goal of learning, e-learning.

- Burnett, G. and Dickey, M.H. [14] defines the purpose of the VLCs means to increase the capacity of learning by encouraging students to take their knowledge and share the knowledge gained from the Social Network. This will lead to increased performance of the class.

- Daniel, B., Schwier, R.A., and McCalla, G. [11] proposes that research shows the importance of the social costs that will improve the performance of students in VLCs beyond it.

- Heiyanthuduwege and Karunaratna [9] found that the center of the VLCs is associated with learning performance.

- Piccoli, G., Ahmad, R., and Ives, B. [3] has proposed a research found that students in VLCs has the ability to use a computer was higher than students who did not do.

- Wellman, B. and Salaff, et. Al. [8] found that the network can support community engagement in the pore network is characterized by the accumulation of binding the virtual learning as any.

- Koh, J. and Kim, Y.G. [16] research has found that the relationship between knowledge

sharing community with devotion leads to the appearance of a virtual community. The research suggests that the level of knowledge in the community to represent that represents the strength of the Social Network.

### 2. Online Social Network

Social networking sites established from the beginning by website Classmates.com [13] and website SixDegrees.com [5] that restricts the use of specific students studying in the same school for history recording, Data communication, messaging and data exchange. These common interested data between friends in name only. The site Epinions.com [12] which is caused by the formation of Jonathan Bishop [11] added on the part of the user to control the content and connect with each other, not only friends in name only. Since that is the beginning of a Social Network. For today Online Social Networking is a channel of communication has been very popular. Because the users of Social Network, which will take part on the Internet without limitations.

With the current Online Social Network is into education. Resulting in the development of education, VLCs by Yang, SJH, Chen, IYL, Kinshuk & Chen, NS [2] conducted a study and found that virtual learning as Internet technology that allows each student or group of students at each location to meet the goal of learning, e-learning and the data mining.

### 3. Theory of Planned Behavior (TPB)

TPB is one in Social Psychology Theory which developed from Theory of Reasoned Action, TRA [16]. And TPB was developed to predict the behavior of individual intentions. By assumption that normal humans will make decision based on reasonable mechanical. Later year 1985 Ajzen defined TPB by describe behavior that is not in the control of the individual, person having difficulty controlling behavior. A person cannot decide exactly what to do or not do. Rely on chance or other resources such as time, skill, cooperation from others and so on. The difference of the TPB and TRA is the factors perceived behavioral control. The perceived

behavioral control is in recognition of an individual of easy or hard to do.

TPB described above can be with the concept of Social Network. In particular, the three factors of such theories are:

1. Attitude toward the Behavior
2. Subjective Norms
3. Perceived Behavioral Control

To determine the behavior of sharing knowledge on VLCs, as depicted in the work of Irene Y.L. Chen et al [9] this study factors that affect the sharing of knowledge through the perspective of a student's behavior. The conclusion is important factors affecting knowledge sharing feature: Intention, Subjective Norm, Attitude toward Knowledge Sharing, Perceived Behavioral Control and Social Network Ties. (Irene Y.L. Chen et. Al.) [9].

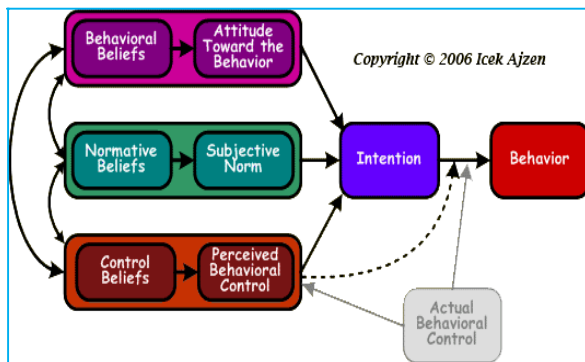


Fig. 1 Theory of Planned Behavior (TPB)

#### 4. Ontology

Berners-Lee [4] said ontologies means the structure that represents the ideas or concepts, relations and axioms, with a model for that domain. The main structure is the Semantic Web. Vladimir and Larissa [3] said, ontologies means the creation of knowledge-based understanding of the concepts. Ontology was made to substitute specialized knowledge, ability to share information. The data re-use, broadcast properties and extracting knowledge from database.

In summary, ontology means the concept that defines the meaning of a word. The announcement features expressly for use in

explaining a concept or model of community information sharing communities. The structure of such a relationship the computer can understand and interpret it using a class relationship. This includes a hierarchy of classes and properties of the class knowledge gained from ontology scope is limited, domain. This helps support the process of information retrieval. The language used to describe ontology semantic information. It can be either RDF (Resource Description Framework) or OWL (Web Ontology Language) or DAML (DARPA Agent Markup Language).

<code>class-def animal</code>	% animals are a class
<code>class-def plant</code>	% plants are a class
<code>subclass-of NOT animal</code>	% of things that are not animals
<code>class-def carnivore</code>	% carnivores are a class
<code>subclass-of animal</code>	% which is a subclass of animals
<code>slot-constraint eats</code>	
<code>value-type animal</code>	% that eat animals
<code>class-def herbivore</code>	% herbivores are a class
<code>subclass-of animal</code>	% which is a subclass of animals
<code>slot-constraint eats</code>	
<code>value-type plant</code>	% that eat plants
<code>class-def springbok</code>	% springboks are herbivores
<code>subclass-of herbivore</code>	
<code>class-def lion</code>	% lions are carnivores
<code>subclass-of carnivore</code>	
<code>slot-constraint eats</code>	
<code>value-type herbivore</code>	% that eat herbivores

Fig. 2 Example of Ontology Defined the Animal

### III. CONCEPT KNOWLEDGE SHARING IN VLCs USING ONTOLOGY FACTORS ON TPB

The concept of knowledge sharing in VLCs, based on the TPB using ontology and open source learning platform after had the literature reviewed above. The development of ontology to represent cognitive factors promoted the sharing of knowledge is in the below.

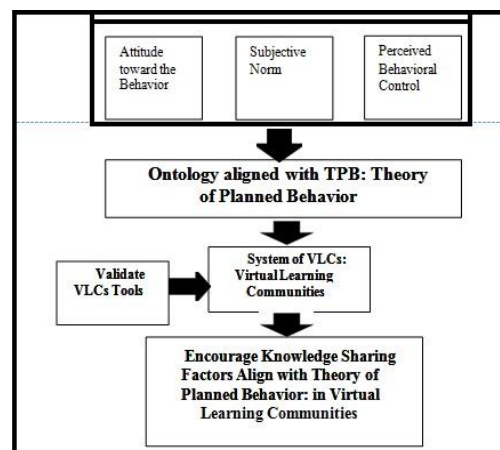


Fig. 3 Concept Frame Work

Fig. 3 shows, the application of the TPB with ontology to develop information technology systems to support VLCs. For the process of developing ontology in knowledge sharing, we can use to develop ontology Protégé Program, Developed by Stanford University, Ford (Stanford University) [6], or HOZO [10] developed by Osaka University (Osaka University) [10] or OntoEdit [1] and so on. These tools can communicate and keep knowledge in the form of ontology easier and more convenient. And the intelligence community learning virtual social network can use the learning platform for open source, Moodle [7] which is used extensively for the ability to share knowledge on VLCs. This software also allows teachers or those working in education to create online tutorials with ease quickly. One of the remarkable ability of the software Moodle is to encourage interaction between the learner and the content of the joint development of lesson content. This is one way that can help the learning community as a knowledge sharing on Social Network more effectively.

#### IV. CONCLUSIONS

This paper presents the alignment of Theory of Planned Behavior (TPB) with ontology factors in encouraging the sharing of knowledge in Virtual Learning Communities, VLCs. It is seen that e-learning system is on a virtual learning communities must include the factors that contribute to the sharing of knowledge, including behavior habits, norm and perceived behavioral control. These factors make the sharing e-learning by the development through technology ontologies, Protege and open source software, Moodle under the proposed framework.

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**(Arranged in the order of citation in the same fashion as the case of Footnotes.)**

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