

Social Network Perspective: Model of Student's Knowledge Sharing On Social Network Media

Bentar Priyopradono¹, Danny Manongga², Wiranto H. Utomo³

¹ Information System Department, Faculty of Information Technology,
Satya Wacana Christian University, Salatiga, Central Java 50711, Indonesia

² Faculty of Information Technology, Satya Wacana Christian University,
Salatiga, Central Java 50711, Indonesia

³ Faculty of Information Technology, Satya Wacana Christian University,
Salatiga, Central Java 50711, Indonesia

Abstract

Recently, the role and development of information technology especially the internet, gives impact and influence in social relationship especially for social network site services users. The impact and influence the use of Internet which is related to exchange information and knowledge sharing still become one of the interesting topics to be researched. Now, the use of social media network by students are the best way to them to increase their knowledge as communication media such as, exchange the information or sharing about something. This research describes about knowledge sharing model of students by using social network perspective analysis in social network media. Based on this model, it can be seen if the students can be participated in social network media.

Keywords: *Knowledge Sharing, Social Network Media, Information Technology, Social Network.*

1. Introduction

The main reason people use the internet is aim to can communicate with others by using email or social network site. Internet has brought people to be able to use social network media so that they can interact and communicate well with friends or others by using social network such as twitter, facebook, and blog which are broader. There is a question appear whether social network media has social interaction relationship between students to exchange the information or knowledge sharing in supporting students' learning.

2. Social Network Analysis

Social Network Analysis (SNA) was developed to understand the relationship (ties/edge) between the actors (nodes/points) that exist in a system with two focuses, is that actors and relationship between actors in a particular social context. Those focuses help the understanding of how the position of the existing actors can affect access to the existing resources such as goods, capital, and information. It is shows that economic activity is associated with social structure that eventually led the concept of social capital.

Information is the most important resource that flows in SNA network which is often implemented to identify the flow of information and 'bottleneck'. In theory, by identifying the information flow and bottleneck, it can help to increase the strategies that could spur the actors to share the information instead of creating new strategy [8].

When the actors access the existing resources, they will form a cluster where the actor with the best position will get more information than the others. Usually an actor who has access to various resources is in corporate in the various clusters, and this will usually give strength / power because they act as intermediaries for them that their contacts and access are little. It needs to note is that the information flow that occurs is not necessarily commensurate, in the sense that the hierarchy is formed based on the position of actors in the network.

Network gives access not only to the resources but also to other actors who can help give value to those resources. This shows that actors can manage social network to maximize their benefits by getting closer to the resources and opportunities that exist. Investment in social

relationships to access or mobilize resources to generate economic income is referred as social capital development. The concept of social capital is often discussed in an abstract way. SNA is a tool which can be used to understand the social relationships that could affect local development. The aim of the use of the SNA is to visualize the relationships of different actors, who interact in one place / particular context. Furthermore, from the result of the visualization, the SNA can be used to:

1. Identify individual, groups, and units that play a major role.
2. Distinguish the break down information, bottleneck, structural holes, and also individual, group, and insolated units.
3. Exploit the opportunity to accelerate the flow of existing knowledge, either functionally or organizationally.
4. Increase patience and reflection on the importance of informal networks and the ways to improve organizational performance.
5. Strengthen the efficiency and effectiveness of existing formal communication channels.
6. Increase peer support / peer relationships and a network.
7. Enhance innovation and learning for all members of the organization.
8. Find new strategies to be implemented in the achievement of organizational goals [8].

2.1 Network

Network is a collection of relations. Formally, the network has some of the object (in mathematical terms is called a node) and the mapping or description of the relationships between the objects (nodes) [6]. One simple example of a network which can be found and seen is the existence of a society. The existence of the community can be viewed as a network of social relations between individuals from one another and are very complex [2].

2.2 Social Network

In society can be found if there are web and social network. The social network itself can be defined as the small world phenomenon that comes from the observation that each individual is often associated with a short introductory chain. Chains accumulate to form a relationship of complex social networks. In simple terms, refers to Agusyanto [3], social network can be described based on the components that make it up:

1. "A set of people, object or events; minimal amount to 3 units – which acts as a terminal. Usually represented by dots, which in the terminology referred to the actor of node."

2. "A set of bonds that connect one point to another point in the network. The line usually represents these bonds, which is a channel or path. Bond includes a bond or bond that does not seem apparent. Usually the bonding that occurs is known as a network connection or ties ".
3. "Flow, in the diagram depicted by arrows. Describe something that flows from one point to another, through a channel or path that connects each node in the network ".

Principles, which are underlying each of the components, affiliated with other components, such as:

1. Ties which link one point to another should be relatively permanent (there is an element of time / duration).
2. With a series of these bonds led to a set of points that there could be categorized or classified as single-unit different from the other entity.
3. There is a certain pattern or something that flows from one point to another. Channel that should be through is not occurring as randomly (random).

There is a "law" or rules that arrange the interconnectedness of each node in the network and also there is a set of authority and obligations that arrange from each point (members), the relationship of one point to another point or the connection of all points with the center points and so on [3].

3. Terminology Measurement SNA

3.1 Density and Eigenvector

Density is the proportion all of the relationships that exist in a network. By using density measurements can be obtained the information about amount of the relationship that has been created or received by each actor in a network. By knowing the value of the average (mean) and number of relationships (Sum) from the connection of actors in the network, it can be seen the power of relationships that may occur in the whole network.

Furthermore, the eigenvector approach is an effort to find the most central actors in the whole network. Eigenvlaue, explain that the location of each actor in each dimension or pattern of the relationship global distance. Eigenvector itself is the collection of the eigenvalue. Here, eigenvector is aim to see the aspects of the range (distance) as globally among the actors [5].

3.2 Centrality and Power

One of the measurements in SNA terminology which is often used to see and measure the role / influence (power) from the actors in a social network is centrality. Centrality is a measure to show how important the actor in

a network. Implications from the node / actor who became the center of a network is the actor who has a stronger capability in connecting members of other networks [5].

In general, to measure the role and influence of actors in a network can be done by looking at the 3 (three) centrality measures terminology, there are: Degree centrality, Closeness centrality, and Betweenness centrality [5].

1. Degree centrality is the degree of presence and actors position in a social network. Degree of actors presence can be seen in two kinds, there are:

In Degree: an actor with high In Degree is shows the role of an actor is very important (prominent actor). This is because many actors are trying to get relationship with them.

Out Degree: an actor who has high an Out degree to imply the actor in a social network as Influential actor (actor's effect). This will be shown if the ability of the actor who is able to exchange information with another also recognize and accept their views.

2. Closeness centrality is a measure of how far the information can be spread from one actor to another. Moreover, Closeness centrality show the distance between one actor to another in a network. It will be easier for the actor to disseminate information in the network if the value of the proximity is higher. On the contrary, if the value of proximity is low, then the distance of the actor with another are far enough, so that the dissemination of information from the informants is quite difficult to another actor.
3. Betweenness centrality is a measure that includes how far a node / actor are able to control / handle the flow of information between actors in the network. High betweenness centrality from the actor shows that the actor has a great capacity to facilitate the interaction among of them that are connected. Moreover, Betweenness centrality can also be used to measure how well the actor able to facilitate their communication with other actors in a network. As a result, an actor with a high betweenness value is the actors who are able to convey the information to other actors who are not directly connected with them, but the other actors can be connected to each other.

4. Knowledge Management

Knowledge management is a process that help the organizations to identify, select, organize, disseminate and transfer the important information and skills that are part of the organization in a good way, then it is expected to organize the knowledge so that can easily be used in effectively and efficiently. Knowledge management is focus on the identification of knowledge. It is also can provide the explanation so that, it can be divided in a

formal way and hope the knowledge management will increase the reuse of knowledge. Literature which is related to knowledge management has a different point of view. In modern times, the organization has realized the importance of knowledge management strategy so that the creation of management and knowledge sharing is very important to become an agenda [11]. Knowledge management and knowledge sharing is the creation and transfer of knowledge [10].

5. Knowledge Sharing

Knowledge Sharing arise because of the individuals' effort to transfer knowledge to others in the organization. Successfulness of the sharing is depend on the ability of the receiver and the ability to learn [4], knowledge sharing is based on three factors such as characteristics of the recipient (such as capacity to absorb, language and technical knowledge), type of task (routine or non-routine) and the type of knowledge (continuum Between tacit and explicit). Absorption may the recipient to understand and use the knowledge that has been received, where the capacity is depend on the adequacy of the knowledge is receiver to understand the context and background of the problem [4]. Knowledge sharing is an activity that is common to discuss in knowledge management. Knowledge sharing is also an important part in knowledge management. Knowledge innovation is the goal from the knowledge management but the knowledge innovation unable to work without the knowledge. Here, sharing and using the information will speed up the innovation process and improve the quality of innovation. Knowledge sharing is also means the knowledge innovation because everyone has to add his own understanding when sharing knowledge [1]. Knowledge sharing can involve the individual, team and organization. The purpose of knowledge sharing is to transfer knowledge from the individual to the team or the organization [1], picture of the process of knowledge sharing can be a part of the contribution from the knowledge that one of the parts gets the knowledge. It can be increase their own understanding and they can process it into knowledge. Knowledge creation can be done by converting the knowledge which based on the concept of tacit and explicit knowledge. The implications of knowledge are able to achieve. It is because not only by the conversion of knowledge but also through the knowledge transfer from the individual level to group and the organization level to another [7].

6. Related Work

6.1 Liao and Xiong

According to Liao and Xiong paper, they developed a model based on perspective social networking about knowledge sharing in community (CoPs), they analyze knowledge sharing CoPs by looking a network density, network centrality, network structure is found that there is a strong relationship contributes to the implicit knowledge transfer and Weak bonding describe explicit knowledge based on index above [8]. Fig 1 is a portrait model of knowledge sharing in communities based on social network analysis.

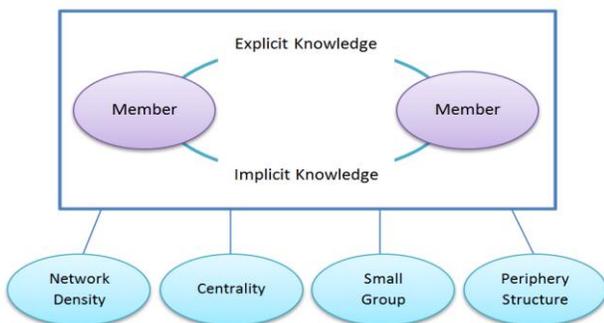


Fig. 1 A Model of the Knowledge-Sharing Communities of Practice Based on Social Network Analysis Perspective.

6.2 Weiqin Chen

Based on Weiqin Chen paper, the collaboration data analysis can help to uncover the important aspects from the teachers' and students' cooperation, this paper presents the method of social network analysis to support collaborative learning by using knowledge-building system [9]. The process model of knowledge building has shown on Fig 2 below.



Fig. 2 A Model Knowledge Building.

7. Result

Model of knowledge sharing using social network perspective analysis for the students on social network media can be seen in Fig 3.

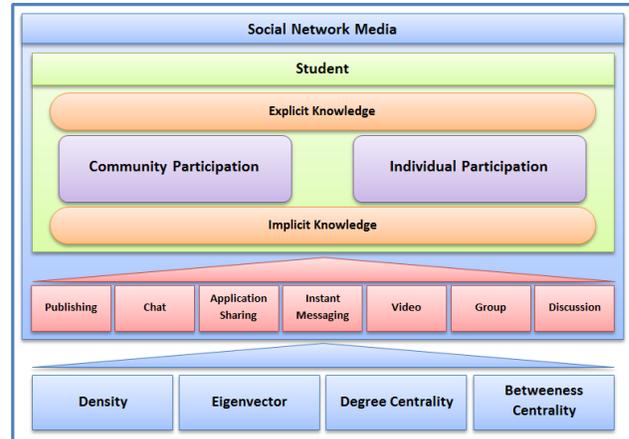


Fig. 3 A Model Knowledge Sharing Student in Social Network Media on Social Network Analysis Perspective.

From the model above on Fig 3, it can be seen the flow of information in knowledge sharing at social network media. Social network media can give support to the knowledge sharing and also knowledge transfer from the implicit knowledge and explicit knowledge among the student. Here, from all over the structure model above, the students gets the knowledge and do the knowledge sharing through activities such as publishing, chatting, application sharing, instant messaging, video call, group discussing on the social network media. The power and relationships those model can be seen from the density, eigenvector, degree centrality and the betweenness centrality that may occur in the whole network (network).

4. Conclusions

In conclusion, this research describes the model of knowledge sharing by students using social network perspective analysis in social network media. The model can be applied if the student can participate in social network media. Here, students' activities to conduct the knowledge sharing by using social network media can collaborate with knowledge through publishing, chatting, application sharing, instant messaging, video call, and group discussing.

Acknowledgments

This paper has been finished because the support from my lectures Dr. Ir. Wiranto Herry Utomo, M.Kom. and Prof. Ir. Danny Manongga, MS.c., Ph.D. who give the motivation for trying to write international journal. Thank you very much.

References

- [1] An Fengjie, Qiao Fei, Chen Xin, 2004. Knowledge Sharing and Web-Based Knowledge-Sharing Platform. IEEE International Conference on E-Commerce Technology for Dynamic E-Business (CEC-East'04), 278-281.
- [2] Agusyanto, Ruddy, 2010. Fenomena Dunia Mengecil - Rahasia Jaringan Sosial. Institute Antropologi Indonesia.
- [3] Daly & Haahr., 2007. Social Network Analysis for Routing in Disconnected Delay-Tolerant, MANETs ACM 978-1-59593-684-/07/0009.
- [4] Dixon, N. D. 2000. Common Knowledge: How Companies Thrive by Sharing What They Know. Boston, MA: Harvard Business School Press.
- [5] Hanneman, Robert A. and Mark Riddle. 2005. Introduction to social network methods. Riverside, CA: University of California, Riverside (published in digital form at <http://faculty.ucr.edu/~hanneman/>)
- [6] Kadushin, Charles, 2004. Introduction to Social Network Theory.
- [7] Small, C. T., & Sage, A. P. 2005/2006. Knowledge management and knowledge sharing: a review. Information Knowledge Systems Management, 5, 153-169.
- [8] Liao, K., Xiong. H, 2011. Study on Knowledge Sharing of Community of Practice Based on Social Network Perspective. Scientific Research.
- [9] Chen, W. 2009. Social Network Analysis Supporting Collaborative Knowledge Building. International Workshop on Social Informatics.
- [10] McInerney, Clare. 2002. Knowledge management and the dynamic nature of knowledge. Journal of the American Society for Information.
- [11] Coakers, Amar, Granados. 2010. Knowledge Management, Strategy, and Technology: a Global Snapshot.

Bentar Priyopradono a senior student at Magister of Technology and Information System, Faculty of Information and Technology at Satya Wacana Christian University Salatiga, Indonesia. Besides studying for his Magister to achieve M.Cs degree. He got a bachelor's degree with a major in information system, Faculty of Information Systems Satya Wacana Christian University Salatiga in 2009.

Dhanny Manongga a lecture at Faculty of Information and Technology at Satya Wacana Christian University Salatiga, Indonesia. Completed his undergraduate education at the Faculty of Electrical Engineering Satya Wacana Christian University. Completed master and doctoral education in the UK. Research specialization of Prof. Ir. Danny Manongga, MS.c., Ph.D. is in the field of Artificial Intelligence, Knowledge Management and Social Network Analysis (SNA).

Wiranto. H Utomo, a lecture at Faculty of Information and Technology at Satya Wacana Christian University Salatiga, Indonesia. He got a Master Degree in Computer Engineering at Gajah Mada University Yogyakarta Computer Science in 2002 and his Ph.D at Gajah Mada University in 2011. Research specialization of Dr. Ir. Wiranto Herry Utomo, M.Kom. is in the field of SOA, java EE, web services, and software engineering.