

A Systems Thinking Model for Open Source Software Development in Social Media

Moyen Mohammad Mustaqim
Uppsala University
Department of Informatics and Media
Box 513, 751 20 Uppsala, Sweden
Moyen.Mustaqim@im.uu.se

ABSTRACT

In this paper a social media model, based on systems thinking methodology is proposed to understand the behavior of the open source software development community working in social media.

The proposed model is focused on relational influences of two different systems- social media and the open source community. This model can be useful for taking decisions which are complicated and where solutions are not apparent. Based on the proposed model, an efficient way of working in open source development community within social media can be found.

Categories and Subject Descriptors

H.3.4 [Social networking]: Model construction and analysis, analyzing a particular community's character stand on a model, model based decision making in social networking.

General Terms

Design

Keywords

Social media modeling, social networking, systems thinking, opens source development.

1. INTRODUCTION

By the existing social media boom on Internet, sharing acquaintance has become further collective and easy accessible.

In the field of system science, the systems thinking methodology is practiced before the traditional approach, in order to get a better understandings of a problem or for creating a model of a specific system. The proposed model in this paper uses a systems thinking approach to understand the combined character of two systems. One system is the social network itself and the other system is the open source development community. A model of this type is needed, as it is useful to envisage and find out optimal ways of solving problem by the open source development community. This model can be used to identify, and counteract, possible negative effects of the two systems working in parallel.

2. OPEN SOURCE DEVELOPMENT

While the phenomenon of open source software development has recently been given a lot of media attention, the basic concept is actually much older in its origins. From the very beginning of computer science, it has

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, to republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

MSM'10, June 13, 2010. Toronto, Canada

Copyright © 2010 ACM 978-1-4503-0229-6/10/06... \$10.00"

been a common practice among researchers, students, and engineers to share source code [3] [5].

As the open source software development community is expanding, there is a prominent possibility of using social media tools for them to share their knowledge. The model proposed here is intended to be helpful for decision making in such situations if any sensitive issues within systems arise.

3. SYSTEMS THINKING

3.1 Why Systems Thinking

Systems thinking is needed to bridge the borders between different disciplines, as a common language for knowledge exchange. In system science there can be issues that affects or are affected by the surrounding environment. Such issues, where the environment can be stable or dynamic [1], systems thinking are very handy while dealing with such issues. However the target of the systems thinking remains somehow the same regardless of what kind of system it is while trying to predict an issue influenced by another system [3].

3.2 Emerging Properties and Synergy

Emerging properties are considered to be the unexpected behaviors that stem from interaction between the components of a system and between the components and its environment [6]. Although the role is often unappreciated, synergy can be considered as one of the core concepts of systems sciences. It can be defined as a combined action of different entities of the system where the output or final outcome is favored over the difference of individual action of any entity.

3.3 Hard and Soft Systems Thinking

Hard systems thinking (HST) is an approach to real-world problems in which an objective or end-to-be-achieved can be taken as given [2]. Soft systems thinking (SST), or interpretive systems approach [4], first looks at "what", and secondly considers "how" [1]. Checkland [2] suggests that while HST belongs to the paradigm of optimization, SST belongs to the paradigm of learning. SST is not a replacement of HST, but rather a complement [6]. Once the objective is known, HST could be the suitable approach.

4. PROPOSED MODEL

The proposed model has two different configurations. The first structure provides a viable model view of accomplishing a development task within the open source community. The second structure shows how to find imperfections while two systems are working together with each other.

4.1 Open Source Development Structure on Systems Thinking Model

This structure of the model consists of three main components- the principal user's task, involvements of other users and finishing the task.

Hard systems thinking and soft systems thinking methodology are used to construct this model. The model is shown in Figure 1 and is described in the following sub sections.

4.1.1 User's Task

The principal user in the community is the one who starts a particular blueprint or development of a piece of software. To do so, the user involves in learning new things as long as no difficulties are faced. Once the user finds complexity, he then tries to brush up his own skills to solve the problem himself. Once user feels complicatedness, it is then time according to the model (Figure 1) to hand over the problem to other users.

4.1.2 Other User's Engagement

The model describes three principal tasks while other users get involved into the problem sent by the primary user. It is important that they understand the problem first. And once they want to integrate with other users for sharing their knowledge, they need to know the optimal way of communication with others. As seen on figure 1, soft systems thinking methodology is used to find the answers of these questions. Once SST is successfully applied HST is applied in next step (Figure 1). SST was first used to narrow the goals of a specific user so that the goal can be achieved in a fewer steps using HST methodology in the model

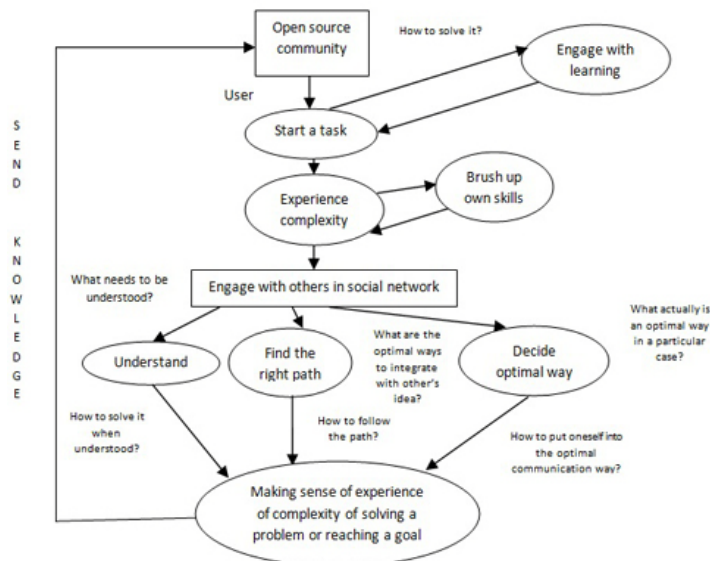


Figure 1. Systems thinking model for open source development in social network.

4.1.3 Finishing a Task

While multiple users are reaching their own specific goals their ideas are combined and the knowledge is sent back to the primary user who then can use this knowledge to finish the task (Figure 1). It is important to notice that the social media being an independent system acts differently without the use of such model.

4.2 Manipulation of Open Source Community with Social Media by the Model

The systems thinking model for finding out how two systems behave while working together, which can be tuned to overcome problems arises in development phase, is shown in Figure 2.

4.2.1 Unexpected Behaviors of System

SST approach helps in finding emerging properties while HST attempts to solve it (Figure 2). Subsystems' combinatorial outcome and final outcome has huge influence on the type of two systems. SST methodology is therefore helpful to find emergent properties of these systems according to the model (Figure 2). Good synergies lead to faster development in this case.

4.2.2 Overcoming the Error

Once there are errors detected such as the possibility of emergent properties or bad synergies, hard systems thinking can be used to overcome such situation. HST is best to use the good synergies in a system, found using soft methodology (Figure2).

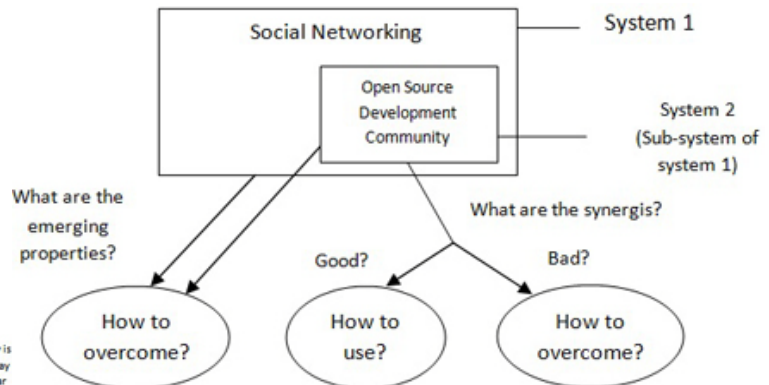


Figure 2. Error handling in social networking.

5. CONCLUSION

While social media opens a door of enormous opportunity in terms of sharing interest of specified knowledge, it is important that the sub systems working under social media follow a specific model to make the most out of social media's power. The proposed systems thinking model can create best possible output against the effort and time implied and based on such model, social networking structure can be altered for any enhancement.

6. REFERENCES

- [1] Aronson D. Overview of Systems Thinking. Communications. 1996.
- [2] Checkland, P. (1981). *Systems thinking, systems practice*. Chichester, Wiley.
- [3] D. Caminer, J.Aris, P. Hermon, F. Land, 1996. *User driven innovation: The World's First Business Computer*, New York, McGraw-Hill.
- [4] Emmeche, C., S. KØPpe and F. Stjernfelt (1997). "EXPLAINING EMERGENCE: TOWARDS AN ONTOLOGY OF LEVELS." *Journal for General Philosophy of Science* 28(1): 83-117
- [5] K.Kuwabara, 2000, "Linux: a bazaar the edge of chaos" *First Monday*, volume 5, number 3 (March), http://www.firstmonday.org/issues/issue5_3/kuwabara/
- [6] Marchal, J. H. (1975). "On the Concept of a System." *Philosophy of Science* 42(4): 448-468.