

MOSCITO1 – SöCAP-GX

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Midterm report

“Up in the Air”

Moscito

Introduction

MOSCITO is an abbreviation for "Mobilizing Social Capital in Global ICT-based Organizations", and is a collaborative work between Telenor, The University of Oslo, NTNU and StatoilHydro, as well as various partners from universities abroad. The project is partly funded by the Norwegian Research Council. Their purpose is described as such:

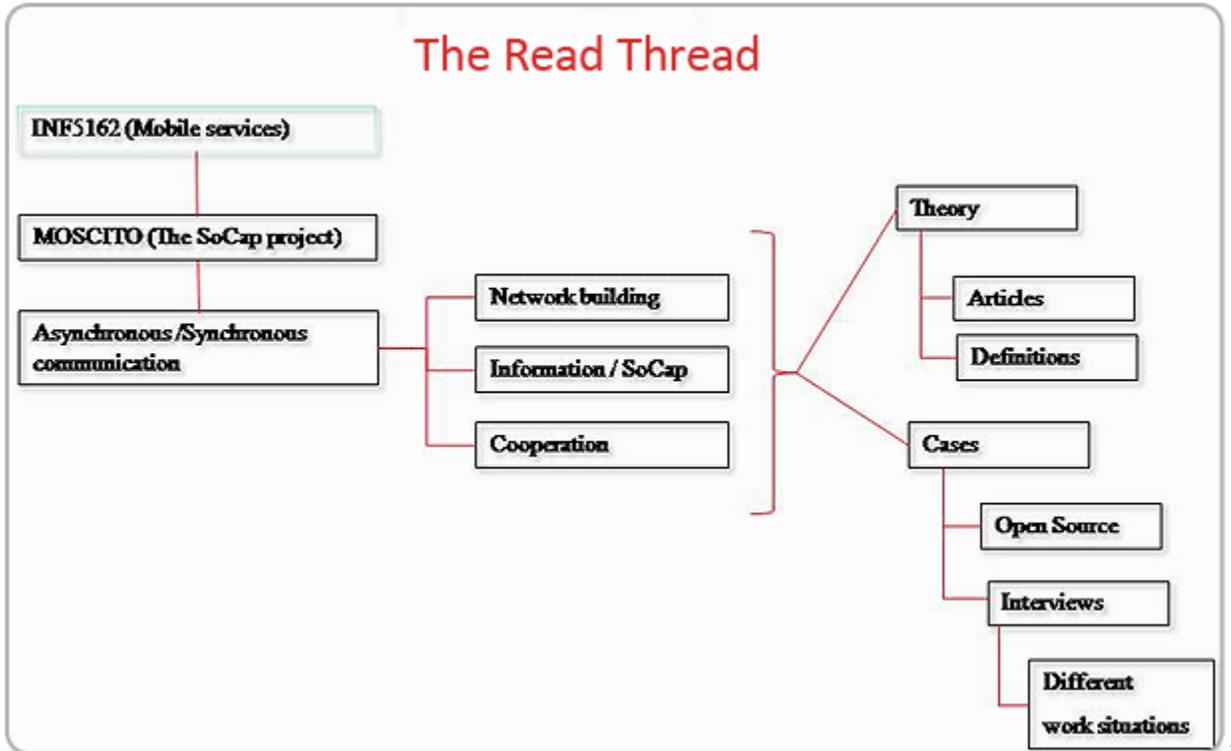
"The MOSCITO project will generate new empirical insights and accumulate evidence in the form of practical organizational knowledge as to how organizations operating on an international scene can use specific communication technologies to develop, maintain, combine and exploit social capital. The project will focus on three central types of technological clusters: mobile applications, web-based applications and e-mails & messaging, and investigate how each of these clusters affects the deployment of social capital in organizations."

Focus

Since the dimensions of the MOSCITO project are vast, we will limit our focus down to how people and organizations deal with social capital in the development of Open-Source Software. The reason we have chosen this approach is because people developing OSS often have a completely different way of communicating than people in many other work-situations due to the fact that they are often geographically spread rendering physical collaboration impossible. Whereas people working in the same building/office use more direct communication, people developing OSS have to rely on e-mails, faxes, forums, digital knowledge bases etc. - This is also where our point of interest lies; does the asynchronous communication used in OSS development work just as well as synchronous communication – what are the advantages and disadvantages of using the different types of communication? Will valuable social capital be lost in cases where inadequate technological applications are used to communicate?

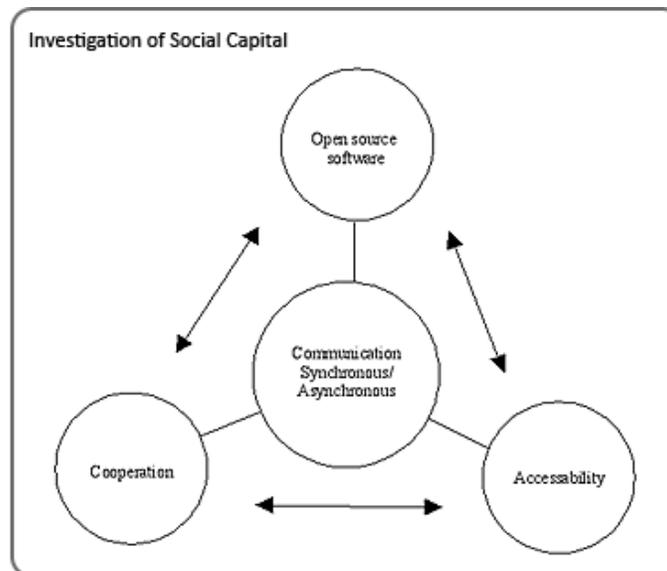
The asynchronous communication of OSS development has proven to work very well - we will therefore use this as a case to investigate the exact channels of communication used, and the prevention of losing valuable social capital even if the developers in some cases never meet physically.

We will first look at how social capital is defined within the boundaries of this project, and also take a closer look at the different aspects of communication and its impact when used in the setting of a larger organization. We will include different areas of mobility and mobile technologies and in what way, they facilitate workflow and efficiency. The figure below shows how our group will investigate the issues mentioned above and how we visualize the connection and natural flow of our areas of studies:



1: Model of approach

We have also developed a model that illustrates the different areas; communication, OSS, cooperation and accessibility, how they are linked together and mutually affect each other.



1.2: Model for investigation of Social Capital

As we can see from this model, we will use communication as the core concept linking the other areas together when using the case of OSS development.

Social Capital

Social capital has in sociological theory been referred to as: "The advantages of having access to a rich and differentiated network of relations." Further explanation from the Project Proposal on Mosquito's website is read as follows "The goodwill that is engendered by the fabric of social relations and that can be mobilized to facilitate action". Capital is by most researchers used in the sense that it demands some sort of investment to give a return. Social capital can also be regarded as a quality or resource residing in the relation between actors. It is believed that social interaction has side effects related to increased motivation and a higher level of productivity which is closely linked to social capital. The concept of social capital, or the value that can be derived from social ties created by goodwill, mutual support, shared language, common beliefs, and a sense of mutual obligation, has been applied to a number of fields, from sociology to management. It is only lately, however, that researchers in information technology and knowledge management have begun to explore the idea of social capital in relation to their field. Particularly on a micro level as resources available to actors through participation in social network, and on a system level as relation based resources which are of importance for a system's qualities and performance (http://en.wikipedia.org/wiki/Social_capital).

Issues related to social capital

In their studies of social capital Edwards and Foley (American Behavioral Scientist on Social Capital) raised two key issues related to the concept. The first argument was that social capital is not equally available to all, in the same way as other forms of capital are also differently available. Geographical and social isolation are factors that can play a part in the limitation of access to this type of resource. Another argument is that not all social capital is created under

equal conditions. The benefits descended from a particular source of social capital often depend on the socio-economic position of the source with society (http://en.wikipedia.org/wiki/Social_capital).

Another study conducted by Portes argued that social capital has four negative consequences: exclusion of outsiders; excess claims on group members; restrictions on individual freedom; and downward leveling norms. (http://en.wikipedia.org/wiki/Social_capital)

An important factor that scientists have pointed out is that social capital involves a complex interaction of space and time and therefore emphasizes the importance of an event as a major determinant.

“Social capital is highly context specific and involves a dynamic relationship between its structural elements that fluctuate widely on spatial and temporal scales. The importance of specific context is further highlighted by the fact that the structure and consequences of social capital are not highly correlated; similar structures can have very different manifestations” (<http://www.gnudung.com/>).

Within the literature concerned social capital among others Dolfma and Dannreuther has introduced the concepts of bonding and bridging, where bonding is horizontal among equals within a community and bridging is vertical between communities (Dolfma and Dannreuther 2003; Narayan 2002; Narayan and Pritchett 1999). Bridging social capital is closely related to thin trust, as opposed to the bonding (splitting) social capital of thick trust (Anheier and Kendall 2002).

Communication

Achieving productive collaboration depends heavily on methods that provide effective communication. It is not uncommon for leaders of an organization to spend 80% of their time dealing with communicating between the members of the organization and themselves.

Communication is the process where a person, group or organization (Sender) transmits an information type (message) to another person, group or organization (Receiver), and where the receiver gets a certain understanding of the message.[KAUFMANN]

Examples of different aspects of communication:

- Verbal/Non-verbal communication
- Synchronous/Asynchronous communication
- Formal/Informal communication
- One-way/two-way communication

Examples of well-known communication channels:

- Formal documents
- Email
- SMS
- Online discussion groups
- Chat
- Phone calls
- Tele and Video conference
- Face-to-face meetings

Effective communication models and having access to different customized channels enabling the transfer of it, is a crucial factor for successful collaboration across organization and country borders.

Arguments supporting this may include:

- Geographic barriers exclude «face to face» communication, which is regarded to be the most efficient form of communications in a great number of situations
- Language and cultural barriers result in different interpretations and perceptions of messages
- Different time zones between communication actors reduce significantly the time available for carrying out synchronous communication

The selected communication channel depends on the nature of the message to be transmitted. Routine information exchange may well use low bandwidth asynchronous channels: Formal documents, emails, SMS. Whereas demanding communication like in negotiation, brainstorming sessions etc. are often conducted over richer synchronous channels: Face-to-face meetings, Video conference i.e.

Joel Haefner points out in his paper ["Opinion: The Importance of Being Synchronous"](#) that despite of the existence of technology that enables distance learning, distance students do not have the possibility to give immediate feedback. This lack of interaction makes synchronous communication the preferable option when conducting teaching classes.

Mobility/Accessibility

In a globalizing context, employees are required to work in different time zones, spending more time traveling and dealing with international customers. This is required in order to strengthen the firm's competitive advantage and keep up with the expansion into new markets and countries. It would not be possible for workers to respond to customers' requests, nor for

project-orientated teams scattered around the world, to cooperate effectively and efficiently without the assistance of mobile technology.

From the definition by the dictionary, mobility means the quality or state of moving freely. It has many different dimensions: physical movements, control or ability of moving, by means of mobile facilities and un-stationary terminals etc. If we look at how communication is constituted, we might crudely divide the structure into three layers from a technical perspective. The top layer is the service, realized by the mid-layer of the application and the lowest is the physical infrastructure where mobility is implemented. We are in a state and process of creating such an environment where people are given the tools to access all manner of electronic communications, media, entertainment, commercial services, information resources, personal files and academic content, in both mobile, desktop or laptop settings. Mobility facilitates thus somehow different services, and is closely connected with communication, accessibility, cooperation, networks and information systems and therefore also related to social capital.

With some objective restraints from i.e. different time-zones or restriction on available facilities and aspects like subjective intentions, communication can be formed asynchronously. On the other hand, synchronous communication often meets the demand for a faster respond, shortening the receiver's time of waiting. Whether we obtain a more or less effective communication depends on the situations. It is unlikely that people have the same preference for choosing a favorable way of communicating. For instance, some people prefer to formulate themselves through asynchronous communication forms, like email rather than a face-to-face meeting; while others prefer privacy while they respond to a "message" and makes themselves inaccessible. Nevertheless, mobility facilitates the communication and accessibility giving people more choices and flexibility, though dominant technologies like cell phones, desktops and stationary terminals. Work hours are not what they used to be and people's place of work is not what it once was. These days your office can be everywhere, at home, at the airport or even in the back seat of a taxi. Mobile tools ensure people the capability of increased flexibility and faster correspondence in order to accommodate the current situation.

The development of internet and cellular network reinforces partially the network building which facilitates allocating information and social capital. In the explosive information society, the way a person has access to critical information and the immediate response is becoming more and more crucial. For example, the software developers in open source projects get access to the existing software's codes which were not available in earlier days without people paying a high fee. Because of the increasing mobility of today's workforce, mobile facilities provide these developers with more competitive capabilities of faster accessibility to information and the sharing of developers knowledge and social capital.

The way in which cooperation can be achieved effectively and efficiently is of practical importance for theoretical research regarding exploitation of social capital. Deployment of project allocation and well-planned teamwork is the result of specialized industrialization and therefore tight cooperation is a necessity. Early research regarding concepts of mobility (Bellotti, 1996) discussed the use of shared resources and communication. It focused on the employees physical movements in the office and their access to utilities such as printers, and getting information from colleagues located away from their own desks. It might be discussed in a different way, for example how the remote printing configuration and instant messenger effectuate cooperation in an office scenario, facilitated by present technology. Mobility, in different dimensions from the physical movements to the mobile facilities, gives cooperators more control and flexibility in terms of communication and information accessibility.

Open-Source

A study to be

“Open source is a development method for software that harnesses the power of distributed peer review and transparency of process. The promise of open source is better quality, higher reliability, more flexibility, lower cost, and an end to predatory vendor lock-in.” [Open Source Initiative](#)

But how do the cooperation between developers work?

Developers in Open Source projects are often located in different parts of the world, which makes the challenges regarding communication relevant for our study. In these situations, communication is often asynchronous due to the fact that developers might be in different time-zones. In addition participants belong in different cultures and have different native languages.

With this in mind, we see that some sides of our questions regarding how social capital, knowledge, cooperation and network building with respect to asynchronous/synchronous communication might be answered by studying/interviewing participants in these kinds of projects.

There are also as we see it, several similarities with an open source project and the CONTEST project that Telenor R&I are currently studying. Both projects types are built on volunteerability, cooperation across countries and cultures and both relies heavily on modern communication technologies, especially the internet and its extended use.

The Open Source initiative way of running projects, has also become something to consider in other projects than software development projects, for example in science projects. Since the openness obviously has been a success in several ways, there must be some issues of cooperation here that works well over distance.

Our group is curious with regards to how communication is carried out within such projects, and how it affects the productivity and motivation within groups. And most importantly, what kind of communication is used, in which part of the project if differed.

After reading an interview with Karim R. Lakhani <http://hbswk.hbs.edu/item/5544.html>, an assistant professor at Harvard Business School, we also found that desired Social Capital sharing and gaining could be enhanced considerably by using the principles of the OPI within a large

organization, or by broadcasting problems to people within the same field of science outside the organization.

Karim R. Lakhani wrote the paper "The Value of Openness in Scientific Problem Solving," coauthored with Lars Bo Jeppesen, Peter A. Lohse, and Jill A. Panetta

Here they discover and confirms several interesting issues regarding openness in scientific problem solving. Some of them are;

- The outsiders, at the peripherals of the project that where likely to solve the problem.
- A problem for Open Source Initiatives has been that firms are afraid of sharing their IP, but as Lakhani says "I think it's a legitimate concern, although practice doesn't prove that out in the sense that even if other people know about the problems you're working on or have seen your solutions, it's very hard to implement those solutions in other settings. Knowledge is actually very sticky. Even if you reveal everything about what's going on, there's tacit knowledge behind a lot of scientific and technological activities."
- Another problem is that scientists often consider themselves to be at the top of their discipline, and do not see the point of inviting others. But as the study reveals "Innovations happen at the intersection of disciplines."
- And why did outsiders contribute "People talked about feeling part of a community and being intellectually challenged" and "The more creative they felt in those projects, the more likely they were to participate and spend time" and of course a potential reward.

To achieve answers and light to some of our questions, we will continue to read about experiences in articles found on the net, and we will try to interview people that have participated in Open Source projects.

A preliminary questionnaire;

Why did you participate in the project

How do/did you communicate with others in the group?

When did you use the different (if different) communication forms?

What do you think of the different forms of communication?

What do/did you think worked well

What did you think didn't work well, problems encountered?

What did you miss with respect to communication and cooperation?

How was knowledge about the project distributed among members?

What did you gain from participating?

References

- **Bellotti V and Bly S**, "*Walking Away from the Desktop Computer: Distributed Collaboration and Mobility in a Product Design Team*", 1996. ACM.
- <http://www.samforsk.no/sitepageview.aspx?sitePageID=1198>
- **Joel Haefner**, "*Opinion: The Importance of Being Synchronous*" URL: <http://wac.colostate.edu/aw/teaching/haefner2000.htm>
- **Geir Kaufmann and Astrid Kaufmann**, "Psykologi i organisasjon og ledelse" Fagbokforlaget 2006
- **Eric Raymond**, "*The Cathedral and the Bazaar*" URL: http://www.firstmonday.org/issues/issue3_3/ramond/index.html
- **Sandeep Krishnamurthy**, "*Cave or Community? An empirical examination of 100 mature open source projects*" URL: <http://opensource.mit.edu/papers/krishnamurthy.pdf>
- **Lakhani, Jeppesen, Lohse, Panetta**, "*The value of openness in scientific problem solving*", URL: <http://www.hbs.edu/research/pdf/07-050.pdf>
- **Open Source Initiative**, URL: <http://www.opensource.org/>
- **Lakhani, Karim**, "*Open Source Science: A New Model for Innovation*", URL: <http://hbswk.hbs.edu/item/5544.html>