

Exploring Social Structures in Extended Team Model

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Abstract—Extended Team Model (ETM) as a type of offshore outsourcing is increasingly becoming popular mode of Global Software Development (GSD). However, there is little empirical knowledge about the social structures in ETM and their impact on collaboration. This paper reports a study aimed at exploring the role of social structures to support collaboration in an ETM. This study provide useful information and insights about the mechanisms introduced at different hierarchical levels to support social structures and how the existing social structures nurture collaborative behavior among cross-organizational GSD team.

Index Terms—GSD, social structures, case study.

I. INTRODUCTION

Global Software Development (GSD) can be adopted through various models such as outsourcing, offshore development centers, global sourcing and virtual teams [1]. These models differ from each other in terms of needed coordination and collaboration across distributed team members. The trend of adopting more collaborative approach between IT companies, particularly Small-Medium-sized Enterprises (SMEs), has resulted in slight change from typical offshore outsourcing towards long-term partnership beyond client-vendor concepts. Extended Team Model (ETM) [2],[3] is an example of such cross-organizational partnership that can be justified by the need of having access to a pool of technical experts while having limited resources for outsourcing governance and fluctuating demand for developing software needs.

Like other arrangements of GSD which are known to have significant collaboration challenges as summarized in [4], ETM is also expected to have its own share of collaboration and coordination challenges as this model advocate tighter integration of cross-organizational teams than those who present loosely-coupling of tasks and team members as one of the solutions to coordination and collaboration problems. ETM is certainly expected to benefit from some of the solutions proposed for addressing the GSD collaboration challenges. Such solutions include support for synchronous and asynchronous communication media [5], collaborative tools [6-7], knowledge management [8], having cultural ambassadors [5],[9], clearly defined roles and responsibilities [10], and minimizing tasks interdependencies and cross-site communication [5], [9]. Apart from relying on these solutions to collaboration challenges, we assert that ETM can benefit from building and leveraging social structures as it has been shown that social structures can help

to ease coordination and collaboration challenges [11-12]. While ETM is more commonly used terminology among practitioners, there is relatively little empirically built knowledge about this model and the kind of structures (e.g., work, communication, and social) it may have in the GSD literature. As the social networking and social structures are gaining significant attention in GSD, our study intended to explore the role of social structures in encouraging collaborative behaviors in an ETM-based GSD engagement.

II. BACKGROUND AND MOTIVATION

Extended Team Model (ETM) can be defined as a customized offshore outsourcing model aimed at building an extended arm of a client by having access to software development resources of a vendor, usually located offshore, by forming a partnership [3], [2]. Unlike virtual teams[1], an team based on ETM is not dissolved after a single project and the staff from vendor side is completely integrated in the client's team with access to technical training and mentoring from the client's staff.

Social Structure represents the formal or informal social networks (i.e., ties and interactions) that may exist within a project or an organization. It is asserted that the existence of strong social networks can help people to better collaborate on their work activities and share knowledge. When people know each other they are more likely to emotionally feel close to each other and can be more comfortable to share relevant information [11]. Hence, it is important for managers to identify and understand the mechanisms that are suitable for building and leveraging social capitals when forming GSD teams.

III. STUDY DETAILS

This research asserts that understanding the role of formal and informal social networks and the provision of supportive mechanisms to strengthen these structures can facilitate collaboration in a GSD team. This paper is focused on the following main research question:

What kind of mechanisms can support social structures in order to improve collaboration?

We used case study that is known as a suitable research method to uncover a phenomenon within its real-life context [13]. We studied an extended team within the independent organizations of client and vendor that have been business partners for more than 3 years. The client is based in Denmark and the vendor has a business development office in Denmark and a software development centre in Pakistan.

TABLE I. SUPPORTING SOCIAL STRUCTURES AT DIFFERENT LEVELS OF ETM

Company-Level	Team-Level	Individual-Level
<ul style="list-style-type: none"> • Introducing Equality Model • Nurturing Collegial Behavior • Encouraging Information seeking and sharing • Minimizing hierarchical hurdles • Defining Facilitator Role 	<ul style="list-style-type: none"> • Dynamic role selection • Fair task allocation • Ad-hoc P2P communication but keeping managers informed • Scheduled team updates (e.g. daily progress report, customized scrum meetings) • Communication with end-user over Bug tracking system • Frequent iteration and delivery 	<ul style="list-style-type: none"> • Socialization and sharing cultural trainings • Informal knowledge sharing

Our findings are based on 13 in depth semi-structured interviews that we conducted with both onshore (6 out of 13) and offshore (7 out of 13) team members. We covered diverse roles in our interviews including developers, project managers, architects, process, operational and IT managers with the average work experience of 9.5 years (minimum 5 years and maximum 13 years).

We analyzed the data using the qualitative data analysis approach called thematic analysis following the six phase steps proposed by Braun and Clarke [14].

IV. FINDINGS

We explored the gathered data for different types of interactions and dynamics among formal and informal social networks and the effect of these interactions on teamwork. We also looked for the social supportive mechanisms that can be provided to improve collaboration across the sites. Following are our findings.

A. Supporting Social Structures at Different Levels of ETM

We describe our findings on how the social structures are being supported through different mechanisms and the practices in order to achieve team collaboration. We categorize our findings into company-, team- and individual-level as can be seen in Table I.

1) *Company-Level*: The onshore management fully understands the importance of cooperative and collaborative behavior for building and maintaining extended teams. One manager stated:

“I expect everybody on the team to act as a true team member... in that way the offshore and the local IT department are melding together because now we are one IT department. So everybody participate in describing solution and everybody needs to sort of dig into their knowledge domains and ensures that they are a kind of putting in the knowledge they have whenever it’s needed”

Our analysis revealed a set of company-level practices to support social structures. These practices have been trickled down through the levels of ETM and influenced the practices and activities at the team and individual levels.’

a) Introducing Equality Model: Equality Model refers to the perspective of treating everybody equally that is based on the egalitarianism commonly found in Scandinavian societies. Introducing this mindset within the distributed teams not only motivates informal communication by relaxing the environment to talk openly about religion, hobbies and weekend activities but also provides better opportunity to share ideas and concerns by decreasing the fear of being questioned and giving everybody equal opportunity to dig into the problem.

b) Nurturing Collegial Behavior: Reflects the mindset of shared responsibility rather than pointing the finger at individuals that represents the attempts of management in creating the feeling of teamness by considering all the team responsible for the things that can go wrong. We observed that this mindset could help the developers to overcome the emotional stress of the shortcomings in providing clear requirements, tight deadlines and frequent changes in requirements and keep them collaborative and adaptive to these types of challenges.

c) Encouraging Information Seeking and Sharing: Refers to the strategy of making each individual responsible to seek for the missing information that gives the right to everybody approaching each other for asking clarification questions. This practice, which is also aligned with the aim of building team spirit, has been enabled with the flat communication pattern.

d) Minimizing Hierarchical Hurdles: Despite the hierarchical social culture that may exist at both sites, the organizational culture tries to define a unified vision towards hierarchies by enabling individuals to talk to everybody. The flat communication pattern, facilitate information sharing and conveying a message between two ends as well as promoting the level of awareness across distributed teams through dense interactions.

e) Defining Facilitator Role: The facilitator refers to the role that keeps track of different communication channels and takes action to accelerate the process. This role is assigned to a senior person who has a broad knowledge of

the projects and familiarity with the team members over long period of time. This person is able to take quick actions for smooth coordination in a team.

f) *Other Mechanisms*: We also observed that the extended offshore team was allowed to take a day off or go together for entertainment activities within working hours after a successful completion of a release. The management at the offshore development center treated everybody equally and provided a relax atmosphere with flexible working hours despite the hierarchical culture of their society.

2) *Team-Level*: Our analysis shows that the introduction of the social support mechanisms at the company level has influenced the work related processes and practices at the team level. We have identified a set of process elements and practices that are described in following:

a) *Dynamic Role Allocation*: The studied ETM has the practice of dynamic role allocation and selection of leaders based on their skill sets and experiences irrespective of their locations explicitly show implementation of equality model by management, which broadcasts the mindset across the team members. An example of this action is having the main leader of the whole development team located at offshore site.

b) *Fair Task Allocation*: We observed that allocation of a resource to a work-item is based on required skill-sets and expertise as well as availability. There is no assumption or perception of competency gap between offshore and onshore developers; and everybody is fairly involved in a project's lifecycle

c) *Ad-hoc One-to-one Communication*: We observed a high amount of on-the-spot point-to-point communication between offshore and onshore site to discuss the issues. It is very easy to contact remote colleagues irrespective of hierarchies. However, the developers are supposed to keep their direct leaders and project managers updated about their discussions with the team members at the other end. This activity can maintain awareness of the ongoing tasks for leaders and developers.

d) *Scheduled Team Updates*: Scheduled updates at team-level assure communication formal channels. The daily update of burn down charts helps to keep leaders aware of the progress of each work-item and being able to take quick actions to resolve the hurdles. Customized scrum meetings provide opportunities for discussing the issues in the team and getting overall updates.

e) *Communication over Bug Tracking System*: The bug tracking system is an important means of communication to support work and social interaction. The concerns of end-users regarding the product (e.g. bugs, need of changes) are communicated to the development team through the bug tracking system.

f) *Frequent Iteration and Delivery*: Despite not having a direct communication with customers, the offshore team keeps the customers updated on the work status through

iterative monthly releases that also provide opportunities for direct and indirect interactions.

3) *Individual-Level*: We have also identified a set of individual initiatives for social interactions with remote colleagues. We describe these informal initiatives for personal interactions below.

a) *Socialization and Sharing Cultural Trainings*: One-to-one interactions can be considered as informal solutions to deal with socio-cultural challenges. The onshore team believes that this approach can help them to make more relax environment to motivate their offshore colleagues talk aloud, ask questions and make constructive critical discussions both sides believe that sharing daily life and improving interpersonal relationship can help the remote team members feel like colleagues rather than employees and more comfortable to initiate contact and share their concerns.

b) *Informal Knowledge Sharing and Getting Updates*: Informal chats for knowledge sharing and getting updates mainly happens between the key roles (e.g. managers, leaders) of the two ends. The frequent informal chats between these nodes appear to be helpful in hearing about hidden information and addressing frustrations of their team members. These informal communication channels have helped increase the level of awareness at both ends. They have also strengthened the social ties in the team. This social structure can be considered as a backbone, which is informally contributing to share knowledge, build trust and increase awareness across the distributed team members.

B. Cooperative Behaviors

We refer the cooperative actions of individuals as cooperative behaviors. These actions are usually non-spoken rules that emerge as a result of collective learning through the mechanisms of social structures. We identified several instances of cooperative behavior of team members. The observed behaviors mainly reflect the feeling of teamness and shared responsibility among distributed GSD team members. While the organizational supportive mechanisms facilitate communication across the teams by removing hierarchical hurdles and allowing the use of diverse communication media (i.e. Emails, Skype chats, Audio/ Video calls, Screen sharing) over the time the team members have learnt how to benefit from these facilities but not disturbing each other. The initiation of contact is as simple as pinging on Skype or sending an email. These practices enabled the team members to bridge the geographical distance and simulating the quick chats that can simply happen in collocated teams about changes.

We observed that the feeling of seeing each other as equal and shared responsibility enabled team members to happily compromise certain things in their personal life style, for example, working late at evenings, or on Saturdays towards a deadline and sending work-related SMS to each other over the weekend that is not a very common practice in Scandinavian countries. We also observed that sharing business domain knowledge over frequent communication

with offshore developers is perceived as more efficient and effective way to communicate requirements compared with making extensive documentation.

V. CONCLUSIONS

Our study has revealed the social supportive mechanisms at different layers of an ETM that can enable a GSD team to act more collaboratively. The identified mechanisms stem from the company-level social structure supportive practices that appeared to have trickled down to the team and the individual levels in terms of organizational culture and individual behaviors of collaboration [10, 15]. The findings have shown that the company-level practices play a significant role in address well-known socio-cultural challenges in GSD such as building the feeling of teamness [16], [5], [17], [18] and trust [17], [16]. The management's slogan of "equality and shared-responsibility" reflects in work practices (i.e., role selection, task allocation, and no individual blamed) at team-level. These practices provide supportive mechanisms to help developers to tolerate the stress of the challenges they face such as working with unclear requirements, frequent changes, no direct access to the customer, delayed feedbacks, and tight deadlines.

An ETM based GSD team emphasizes a tight integration between onsite client staff and offshore vendor staff and supporting them through building and maintaining social structures. This approach contradicts with most of the traditional offshore outsourcing strategies that emphasize to minimize interdependencies [5, 9]. While our study shows that supporting and motivating social structures towards smooth and frequent interactions significantly help to improve cross-organizational collaboration, it can have its own drawbacks such as the difficulties of building and maintaining relations and cost of communication, that need to be critically considered. These findings are expected to provide us and other researchers with some interesting research questions to be explored in the future research.

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