GLOBAL DISTRIBUTION OF COLLABORATIVE ACTIVITIES THROUGH MICRO ANALYSIS OF COLLABORATION

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Global distribution of work in its simplest form can be done through replication of function across geographies or by transitioning the entire function to another geography. When multiple time zones are involved with little overlap between them, it becomes difficult for the functions across these time zones to collaborate (this is not true when employees across the geographies work on the same time zone and not local time zones). This paper details a situation in which a traditionally accepted collaborative and co-located function of requirements gathering in a software development project was globally distributed across time zones by structuring the interaction to reduce the need for collaboration and also by micro analysis to ensure that non collaborative tasks could be executed in different geographies. This has implications on the onsite-offshore ratio of resources in IT projects and in sharing resources between different IT projects.

Keywords:

Global Delivery Model, Global Distribution of Work, Requirements Gathering, Requirements collaboration, Collaborative activities

1. INTRODUCTION

Enterprises have taken up development across different geographic locations due to business needs arising out of mergers and acquisitions, alliances, global markets, and market demands. To remain competitive in the global economy, companies are choosing global distribution of work (GDW) to attain benefits like faster time to market, access to diverse skills and expertise, handle large complex projects and cost advantages (Carmel 1999),(McDonough et al. 2001). Organizations use different models for distributing work based on the business need and strategy, across their value chains, products, manufacturing, knowledge process and services.

Organizations distribute work across four dimensions, namely; geographic or physical, organizational or unit based, temporal and functional or among stakeholders (Gumm 2006). While developing their GDW model based on the above dimensions, it is critical for organizations to consider work parameters like collaboration required (Carmel et al 2001), coupling between tasks and activities (Grinter et al 1999), knowledge transition and communication mechanisms for the work process under consideration (Herbsleb and Grinter 1999). At times the distribution dimensions may become inhibitors for the work parameters in the GDW model. For example, when work needs to be globally distributed across time zones, one of the key inhibitors is collaboration, given the fact that many activities require a certain amount of collaboration (Espinosa and Pickering 2006). Hence based on the objective of the GDW model a combination of distribution dimensions and work parameters need to be considered.

The models used for distribution of work have essentially been of two types (Allen and Hauptman 1987), (Grinter et al 1999). The first model, the ***project based***, where the entire job/function has been moved or replicated in a different geography is especially true for manufacturing, BPO, etc. The second model – ***process based***, is where sections of a function or process are executed across locations. This model is typically followed in software development and IT services. While the first model eliminates the need for collaboration between the geographies, the collaboration and knowledge transition needs among activities within geography may still exist. There is also a need for knowledge and best practice sharing across the geographic units, but this can be done in a structured manner with limited collaboration and asynchronously. The second, process based model addresses collaboration requirements across distributed locations by structured transitions at predefined points of the process, which are typically the end of a process stage. Allen and Hauptman have provided several criteria for selecting one model over the other while discussing the organization of R&D work. Their analysis is applicable even in the case of global distribution of work. In practice organizations develop certain hybrid models by a combination and sequence of the basic two models across the process.

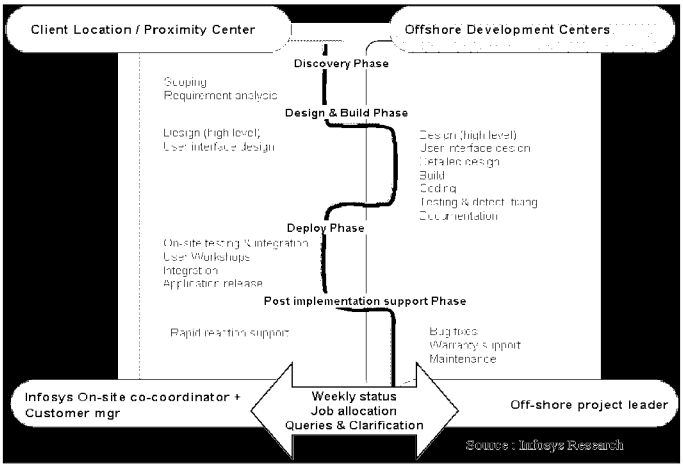

Fig 1: GDM model for software development

While the usual practice is to co-locate a process step, we examined the tasks within the process step and analyzed each task for location-dependency and the collaboration requirements. What we are proposing is an example of the second approach where the requirements function which was traditionally considered collaborative and co-located with the users is analyzed in more detail to identify aspects which can be globally distributed.

3. HOW COLLABORATIVE IS REQUIREMENTS GATHERING?

Let us examine "requirements gathering" for a business software, as a function or activity within a software development life cycle. The iterative model for requirements gathering based on the process followed within Infosys Technologies Limited (NASDAQ: INFY) is depicted in figure 2. Irrespective of the methodology (waterfall or iterative) used it has always been perceived and accepted that "Requirements Gathering" is a collaboration between the respective business users and requirements team. Therefore it has also been accepted that the requirements team and the system users should be co-located in the same location or in the least that they meet regularly. The methods used to elicit requirements are interviews and requirements workshops which gather rich information about the task and the domain but require face-to-face communication. Collaboration technologies like conferencing, document sharing, chat (Handel and Herbsleb 2002), case tools (Leonard et al 1997) etc. have reduced the need for the two groups to be in the same physical location, but they still need to be in overlapping time zones. Questionnaires and other paper-based methods may be used to support the collaboration discussions, but can not capture implicit and unstated needs which a face-to-face discussion elicits.

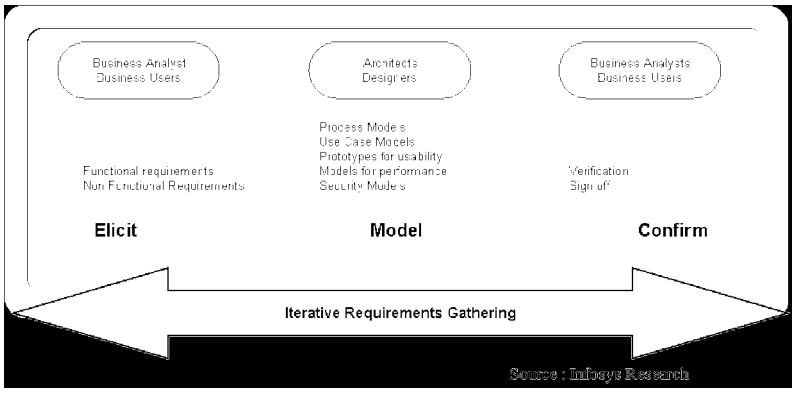

Fig 2: Iterative model for requirements gathering

leverage the benefits of offshore locations. But in certain situations where co-location is not critical but time zone difference or geography becomes a barrier, locating team members within the same geographical region can be advantageous.

a. When local laws do not allow data access or data transfer outside the country, team members need to be located within the same geographical region.

- ***Time zone distribution*:** With the objective to leverage the GDM model and leverage offshore locations, all tasks which could be conducted from locations with a time zone difference were explored. We examined tasks which did not need a 24-hour turn around and could be conducted independently by team members with clearly defined inputs. The turn around time was taken as one of the parameters so that any lacunae in the output or execution of the preceding task did not affect the productivity or quality of the succeeding task.

a. The methods like interviews and workshops, used to elicit the functional requirements, capture rich unstructured information. This unstructured information is what creates the dependency to the next set of tasks like requirements modeling and prototypes. By introducing a structured output at the end of the elicitation sessions, the dependency can be reduced to a large extent. Guidelines and templates were developed for structured notes-taking, representation methods for different types of information. This ensured that the output of a collaboration discussion with the business users was a structured document which could be sent offshore for further processing. The offshore requirements analyst modeled the requirements as per the inputs and identified any gaps and issues. This was sent back to the co-located team, who would then address the issues themselves or in collaboration with the users. Since these set of tasks do not need a 24-hour turn around time, it provides for any communication delays and issues which come up within the two teams.

b. The user interface (UI) prototypes development is another task which depends on the elicitation discussion. Since the information required to design the prototype is quite structured, UI designer can develop from an offshore location if the necessary inputs and standards are provided. The inputs required are the UI standards and the details of the fields on the screens. The requirements capture template was modified to capture the user interface requirements explicitly. Typically UI designers are not software engineers and hence UI section of requirements capture template was structured such that the UI design team did not have to refer to sections of the requirements document or other documents. The UI designers developed the prototypes and sent it across to the requirements team for review with the users.

- ***Dependency on a particular individual:*** Theoretically any task can be executed by any individual if he has the required skills and inputs. In practice, certain tasks have dependency on the specific individual who executed a prior task because of the implicit knowledge gained while executing the task (Orlikowski 2002). In the requirements gathering activity the requirements integration and verification have this type of dependency on the members who were involved in the collaboration discussions. We did not explore reducing this dependency as it would not reduce the need for collaboration during requirements verification.

a. The ownership of the requirements document was always with the co-located team

- ***Usage of collaboration technology:*** The four criteria outlined by Geiseler and Rogers (Geisler and Rogers 2000) for technological mediation in design collaboration can be applied to any collaboration activity. We ruled out the usage of synchronous collaboration technology due to the time zone difference. Some of the asynchronous collaboration technology like virtual rooms and workspaces did not address the needs of requirements gathering activity. The option of using Dictaphones, video recordings to capture the collaboration interactions was used in certain cases, but in most cases it works against the elicitation objective as users become very conscious of what they say and clamp up.

- ***Methodology and tools:*** The method developed involved breaking the requirements gathering activity into tasks and dispersing its execution to different actors and locations.

a. Elicitation planning was introduced as a critical step of the process. The plan covered the detailed

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