

Chapter 16

New Forms of Work in the Light of Globalization in Software Development

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ABSTRACT

Globalization in software development introduced significant changes in the way organizations operate today. Software is now produced by team members from geographically, temporally and culturally remote sites. Organizations seek benefits that global markets offer and face new challenges. Naturally resistant to change, these organizations often do not realize the necessity for tailoring existing methods for distributed collaboration. Our empirical investigation shows a great variety in the ways organizations distribute responsibilities across remote sites and conclude that these can be divided into two main categories: joint collaboration that requires investments in team building and independent collaboration that requires investments in knowledge management and transfer. Finally, we discuss practices that are applied in industry to overcome these challenges and emphasize necessity to fully understand the pros and cons of different ways to organize distributed software projects before starting a project in this new environment.

INTRODUCTION

Recognized as the phenomenon of the 21st century (Friedman, 2005), globalization of the world economies brought significant changes to nearly all industries, including information technology (IT) and, in particular, software development. Global

software work originates from IT outsourcing that is recognized as a natural evolution of how the global market operates today (Minevich et al, 2005).

Tight budgets, shortage in resources and time has motivated many companies to start looking for partners outside. Accordingly, outsourcing and especially offshoring (relocation of business processes to a lower cost country) have become components of a new global paradigm that is based on the selection

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of appropriate and strategic technologies, skills and resources with the strongest potential and the lowest cost within the global marketplace.

The decision to source software development to an overseas firm is looked at frequently in simple economic terms - it's cheaper, and skilled labor is easier to find (Carmel et al, 2005). The list of assumed benefits of global software engineering (GSE) also includes the necessity of reaching mobility in resources, obtaining extra knowledge through deploying the most talented people around the world, speeding time-to-market, increasing operational efficiency, improving quality, expanding through acquisitions, reaching proximity to market and many more. However, a recent empirical investigation shows that these benefits are neither clear-cut nor can their realization be taken for-granted as the GSE literature may lead one to believe (Conchúir et al, 2006). After a decade of experimentations companies come to realize that blind cost reduction strategies tend to fail. And the reason for this is distinction between manufacturing of goods and intellectual work.

It is not a secret that manufacturing has spread globally, and even branded products are nowadays developed by emerging nations. Software industry follows this trend and leads towards mass-production of software components following standardized product-line approaches. India and China became well known phenomenally growing software development centers. Smaller nations are also competing with each other for their best deals from the world leading contractors.

However, in contradiction to manufacturing, distribution of intellectual work is not as easy as it may seem. No matter how much companies try to industrialize software development processes by developing small pieces that would be integrated into a product at the end, the process of software development significantly depend on human interaction. In contrast to other engineering disciplines, where actual development is based on stable plans and technical designs, software engineering is suffering from rapid changes in

requirements throughout the development life cycle. And if a co-located team can cope with uncertainty and changes more effectively, distribution of software life cycle activities among team members separated by contextual, organizational, cultural, temporal, and geographical boundaries introduces significant difficulties in managing interdependencies. Virtual and often asynchronous environment that characterize globally distributed projects affect the way team members interact and communicate and form an iceberg of problems that are often hidden to an unfamiliar eye.

BACKGROUND

The main challenges of global software engineering are caused by the uniqueness of working environment and are not related to technical challenges that project managers are used to overcome. These challenges are brought by geographic, temporal and cultural distance between the global software team members. Related studies recognize that the key areas of concern and major sources of overhead caused by these barriers are concentrated around communication, coordination and control activities (Ågerfalk et al, 2005).

Communication in globally distributed projects is troubled by temporal and geographic distance. A lack of working hour overlap leads to asynchronous interaction and sequential delays in information turnaround. Geographic distance affects the ways of interaction. Computer-mediated communication is much poorer than personal contact or even a phone conversation. However the later are costly and thus often not considered in global projects. Distance between the remote sites affects the amount of interaction too. Frequency of communication decreases with the distance among the team members (Carmel, 1999). Issues that are easily discussed and resolved at a cup of coffee in the corporate kitchen often hang in inbox for several days. Poor socialization, lack of frequent feedback, and unpredictability in communica-

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