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Comparing Offshore Outsourcing and the Internal Offshoring of Software Development: A Qualitative Study

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ABSTRACT

Distributed Software Development involves a number of different business models. Most of the companies, when searching for external solutions in other countries (offshoring), usually have two main options: offshore outsourcing (contracting services with an external organization) and internal offshoring (contracting with a wholly owned subsidiary). Both models have been studied for a long time, and indicate the need for a great collaboration among the stakeholders to succeed in distributed development. For this reason, in this paper we compare offshore outsourcing and internal offshoring from the viewpoint of three management levels: strategic, tactical and operational. We present findings from a case study conducted in five multinational companies. The findings are presented in terms of aspects identified to improve the performance in offshore software development, and were analyzed based on two dimensions – challenges and patterns of evolution.

Keywords

Offshore Outsourcing, Internal Offshoring, Distributed Software Development, Cross-border Collaboration

INTRODUCTION

Distributed software development (DSD) has been changing the way organizations are developing software around the world. Many companies are distributing their software projects both locally and globally, aiming at cost reduction, access to skill resources, flexibility, and competitive advantages. For these reasons, DSD has attracted a large research effort in software engineering (Boehm, 2006; Damian, & Moitra, 2006; Carmel, & Tjia, 2005; Prikładnicki, Audy, & Evaristo, 2003; Herbsleb, & Moitra, 2001; Carmel, 1999; Karolak, 1998). When organizations search for external solutions in other countries (cross-border), we have what the literature defines as the offshoring of software development (Carmel, & Tjia, 2005; Robinson, & Kalakota, 2004). The two main business models in such scenario include offshore outsourcing (contracting services with an external organization located in another country) and internal offshoring (contracting with a wholly owned subsidiary also located in another country). The first has become fairly common, but difficulties abound in trying to develop a relationship with an unknown foreign partner that is time and geographically distant. Such issues have led select organizations to create their own software development centers in countries like Brazil, China, India, Ireland, Russia, and Vietnam for example.

Both offshore outsourcing and internal offshoring involve a great collaboration effort among all stakeholders, including project team members, project managers, customers, senior managers, and directors. Because each model has particular characteristics, its challenges can also be different. And those differences are not well documented in the literature. The few existent studies are usually concentrated on strategic issues, and have the view of organizations that send projects offshore (Huen, 2006; Borland, 2004).

We run a qualitative case study in order to better understand the differences of each model. We present data from the viewpoint of three management levels: strategic, tactical and operational, based on the perspective of organizations that supply the offshore service. Our findings are based on evidences collected in five multinational companies, and are presented in terms of aspects analyzed based on two dimensions – challenges and patterns of evolution. In the next section we present the concepts involved in distributed software development. Then we present details of our research methodology, followed by the findings from our qualitative study.

DISTRIBUTED SOFTWARE DEVELOPMENT

As part of the globalization efforts currently pervading society, software project teams have become geographically distributed. This characterizes the Distributed Software Development (DSD). According to Carmel & Tjia (2005), when the distance becomes global, this characterizes the Global Software Development (GSD). The factors that contributed to DSD or GSD have been well documented in literature in the last years. Engineers, managers, and executives are facing many challenges on many levels, from the technical to the social, political and cultural. And this change is impacting the whole

software development lifecycle (Meyer, 2006). Thus, the organizational structure and development processes needed to support this kind of development are different from the one used in collocated environments.

When organizations explore distributed software development, it is very important to characterize what type of DSD business model are in place. Robinson & Kalakota (2004) proposed the first and second generations of DSD business models, based on relationship structure, and geographic location of the work. In Prikladnicki, Audy, Damian & Oliveira (2007), an adapted matrix was generated, with the most common models from practice. This matrix is also presented by Ågerfalk & Fitzgerald (2008). In this paper we present an updated matrix (Figure 1), with inputs from the OECD report (OECD, 2004).

Control / Ownership	Outsource “Buy”	Domestic Outsourcing (External domestic supply)	Offshore Outsourcing (External cross-border supply)
	Insource “Build”	Shared Services (Internal Domestic Supply)	Internal Offshoring (Internal cross-border supply)
		Onshore / National	Offshore / International
		Location	

Figure 1. Business models for DSD (adapted from Prikladnicki et al, 2007; Robinson & Kalakota, 2004; OECD, 2004)

Domestic outsourcing: external domestic supply, where an external company (subcontract) is responsible for providing software development services or products for the client company (outsourcing). To characterize the onshore scenario, the subcontracting company is located in the client’s country (onshore).

Shared services: internal domestic supply, where there is a department in the company premises or a subsidiary in the same country (onshore) that provides software development services throughout internal projects (insourcing);

Offshore outsourcing or offshoring (international outsourcing): external cross-border supply, with business support services supplied by an external supplier (outsourcing), or suppliers, located in other countries (offshore).

Internal offshoring or offshore insourcing (international insourcing): internal cross-border supply, with internal business support services activities (insourcing) located in another country (offshore). In this model, a company creates its own offshore software development center (subsidiary) to supply the internal demand.

This paper focuses on the comparison between the two cross-border models, offshore outsourcing and the internal offshoring.

Offshore Outsourcing and the Internal Offshoring

Carmel & Tjia (2005) define offshoring as the movement of a business process done at a local company (onshore) to a foreign country (to take advantage of lower-cost labor), regardless of whether the work done in the foreign country is still performed by the local company or a third-party. In the offshoring scenario, companies can select between the offshore outsourcing and the internal offshoring business models. There are some organizations that want not only to distribute their processes, but also want to keep it under control (internal offshoring). Huen (2006) presents an enterprise perspective (enterprise is defined by the author as an organization that sends projects offshore) of the offshoring of software development, identifying benefits and risks of each model (Table 1).

This table presents some of the criteria used by the author to compare the models and helps organizations in deciding the model that best fits its environment. Another comparison from a business perspective was published by Gartner research, cited by Borland (2004). The advantages and limitations of each model are presented in Table 2.

	Offshore Outsourcing	Internal Offshoring
Revenue benefit/risk		
Benefit: Market entry/presence	No	Yes
Benefit: Leverage/incentives	No	Yes
Cost benefit/risk		
Benefit: Cost reduction	Yes	Yes
Risk: initial investment	No	Yes
Risk: hidden cost	Yes	Not applicable
Risk: other offshore costs	Yes	Yes
Productivity benefit/risk		
Risk: institutional knowledge loss	High	Low
Risk: security	High	Low
Quality benefit/risk		
Motivation to improve process	High	Low
Requirements flexibility	Low	Yes

Table 1. Benefit-Risk comparison, adapted from Huen (2006)

	Offshore Outsourcing	Internal Offshoring
Advantages	Better economies of scale and therefore lower costs	Global companies can get significant cost benefits from centralizing processes in a geographic location
	Access to better and continually enhanced technology	Process control remains in-house
	Inherent incentives to improve process	Process knowledge remains with the organization
	Ability to benchmark to industry and global standards	Better security
Limitations	Less control over process delivery	Higher cost compared to outsourcing
	Presently limited to specific functions within a business process	Slower response to change
	Still nascent and unproven service offerings	Lack of motivation to improve processes
	Limited industry and process knowledge (although it is growing)	Initial overtime cost savings become the new "legacy", and the next level of costs savings can be achieved only through the introduction of improved technology/processes
	Relationship management over the long term is crucial to successful outsourcing	Risk of transferring inherent inefficiencies to the insourced center

Table 2. Offshore Outsourcing x Internal Offshoring (Borland, 2004)

In our study, we analyzed the two cross-border models (offshore outsourcing and internal offshoring) in the context of software development. We present qualitative data comparing the two models, in order to improve our understanding of offshoring and fill a gap in the literature: while Madlberger & Roztocki (2008) found few papers investigating cross-border IS/IT collaboration, Prikladnicki et al (2008) found few papers investigating internal cross-border software development.

RESEARCH METHODOLOGY

We conducted a qualitative case study (Yin, 2003) in five multinational companies. Our data collection methods included onsite interviews with people from three management levels (Table 3).

In the strategic level, we searched for people such as subsidiaries directors, global managers, and people with knowledge to answer questions about the organization strategy on distributed software development, integration among subsidiaries, and long-term vision (Organizational Management, also referenced in this paper as strategic level). In the tactical level, we searched for people responsible for a group of project teams in many portfolios, such as portfolio managers, with knowledge to answer questions about many projects inside the subsidiary or organization as a whole (IT or Portfolio Management, also referenced in this paper as tactical level). In the operational level, we interviewed people responsible for the management of projects and teams, such as project manager, product manager, or technical leaders (Project Management, also referenced in this paper as operational level). Table 3 shows the number of interviewees and their organizational role in each company.

Role	Qty	Dimension	Company
Site Director	6	Organizational Management	C1, C2, C3 (2), C4, C5
IT Manager	5	IT Management	C1, C2, C3, C4, C5
Project Manager	7	Project Management	C1, C2 (2), C3, C4, C5 (2)
Technical Leader	2	Project Management	C1, C2

Table 3. Interviewee profile in each company

The data collection instrument was a semi-structured interview guide, with open-ended questions. The interviews were conducted in Canada and Brazil, both in English and in Portuguese. We asked questions related to software engineering

techniques and tools adopted by the companies in order to improve the performance with distributed projects, existence and utilization of software processes in the distributed units, the existence of software process improvement programs, configuration management and knowledge management practices. Moreover, we asked about the adoption of software quality models such as CMMI and strategies applied in order to successfully manage distributed projects, including team integration, and non-technical factors for people management, such as culture, trust, among others, besides project management activities itself. We also asked questions related to the organizational structure, project allocation and type of projects.

Data Analysis

Our data analysis applied methods of content analysis as proposed by Krippendorff (2004). Before the analysis, we run a data preparation step. All recordings were transcribed and a careful reading on the data was performed, to familiarize the researcher with the data collected before starting the coding. After that, we started the coding in all interviews. Categories and sub-categories were generated (in English) by an examination of a subset of data in each text. The analysis was then executed, with different views of the data, including the viewpoint of the three management levels interviewed. For data analysis, we used Microsoft Excel, and Atlas TI (Atlas, 2007).

Companies' Characterization

The study was conducted at five multinational companies, detailed in Table 4.

Company	Headquarters location	Location of business units	Location of data collection	DSD business model	Experience with the business model
C1	U.S.	Brazil, India	U.S., Brazil	<i>Internal Offshoring</i>	5 years
C2	Brazil	Brazil, U.S.	Brazil	<i>Offshore Outsourcing</i>	3 years
C3	Canada	Canada, India	Canada	<i>Offshore Outsourcing</i>	3 years
C4	Canada	Canada, India, France, England	Canada	<i>Internal Offshoring</i>	1 year
C5	Portugal	Brazil	Brazil	<i>Internal Offshoring</i>	3 years

Table 4. Companies

Company 1 (C1) is a multinational computer company with headquarters in the U.S and centers in Brazil and India. Our research contacted stakeholders in both the Brazil and U.S. locations. There were 400 people working with software development in Brazil, and 1000 in India. Both the Brazilian and Indian centers develop internal projects for the headquarters' client located in U.S. The Brazilian subsidiary is officially recognized as a level 2 organization in the SW-CMM model since 2002.

Company 2 (C2) is a multinational information technology service provider with headquarters in Brazil. We collected data at the main Brazilian software development center, which had 200 people working in software development projects. All clients are external to the organization (offshore outsourcing). The company has a center in the US, which subcontracts projects to companies in other countries. The center studied has been certified as ISO 9001 and recognized as a level 3 organization in the SW-CMM model.

Company 3 (C3) is an IT service provider with headquarters in Canada. The company had 260 people, out of which 150 working in the software group. The company subcontracts part of the development to an external company in India, which had around 20 people working with 15 people in Canada. We collected data in Canada from stakeholders in the software development center, and also interviewed stakeholders from the Indian company. The company informally follows some practices of the CMMI model.

Company 4 (C4) is a multinational organization providing energy management solutions, with headquarters in Canada (45 people in software projects). The company develops off-the-shelf products, but the clients are business departments inside the company around the world (internal offshoring). These units identify business opportunities and generate demand to the software development center in Canada. We contacted stakeholders in the software development center in Canada, in projects where they interacted with internal clients from France and England.

Company 5 (C5) is a multinational organization with business in different areas, such as food and non-food retail. The headquarters and clients are both located in Portugal, and the clients are internal to the organization. The company has a software development center in Brazil developing projects for these internal clients. The Brazilian center has 200 employees and it is where we conducted our data collection. The Brazilian center is officially recognized as a level 3 organization in the CMMI model since 2008.

To identify differences between the two models, we compared them in general and from the perspective of the three management levels. The comparisons are presented next.

COMPARING OFFSHORE OUTSOURCING AND INTERNAL OFFSHORING

We were inspired by the classification proposed by Madlberger & Roztocki (2008) and discussed the differences in terms of non-technical, technical, and organizational aspects, following the terminology proposed by Chrissis et al (2006). Technical aspects are related to the use of tools, methods, data, and processes required by a project or a process. Organizational aspects are related to organization structure, responsibilities and role, and general operating principles and methods of an organization. Non-technical (or contextual) aspects are related to the self-management, coordination, communication, and interpersonal abilities needed to successfully perform in the organizational and social context of a project. Our general findings were analyzed based on two dimensions: challenges and patterns of evolution. In our study, challenges mean critical aspects found in the DSD operation. Patterns of evolution mean a set of standard steps (or stages) that were successfully followed in the past.

Challenges

In general, for the offshore outsourcing organization studied (external cross-border), challenges related to organizational and non technical aspects were more critical. In internal offshoring (internal cross-border), technical aspects were more critical. One possible explanation for this behavior could be related to what Carmel & Tjia (2005) define as “Buy versus Build”. “Buy” encompasses offshore outsourcing, and implies faster ramp-up because the provider already has operations in place. It is a less risky short-term strategy, but from a software development perspective, most of the problems faced are related to difficulties on team building, the necessity of a fast synchronization among team member in a short period of time, and project allocation strategies that sometimes are not the best configuration (contextual and organizational issues). The authors also say that “Build” is related to internal offshoring, and represents a larger investment, and longer time-to-benefits. It is riskier in short term, with difficulties to recruit and hire people, but superior in knowledge transfer. In this case, contextual and organizational issues are easier to deal with if compared to “Buy”.

According to a manager from the tactical level in the offshore outsourcing organization, non technical aspects are critical because “...the problem with outsourcing is that you don’t know who you are going to get. And the problem might allude too early and once the project is finished, that team, with all that knowledge is spread again. Because they are working trying to find work and unless you have projects back-to-back, they go away and then you can’t assemble the same team, so you lose them, that knowledge...” A subsidiary director justifies that technical aspects are the most relevant challenges in internal offshoring because “... I think we always knew the difficulties regarding trust, and culture for example. But we never realized how important those issues are for a distributed projects. The fact is that we have many challenges to deal with. And our first initiative was to develop a process to guarantee a standard way for the development of projects. The process itself is not enough, but was the most important aspect for us in the beginning. After that, we could start thinking about other very important challenges, such as the trust acquisition or communication for example.”

Patterns of evolution

An interesting finding regarding the evolution of companies in both models is that in the offshore outsourcing organization the evolution followed a pattern like “technical aspects first, non technical aspects next”, while in internal offshoring the evolution was in the opposite way. A possible explanation for this difference is illustrated by two quotes extracted from the interviews. In the offshore outsourcing organization, a manager from the strategic level said that “...there are a lot of things we’ve learned from various engagements in terms of trying to reduce the cost associated with this operation. Our experience indicates that in your first offshore project, even though the development resources may be half of the cost, it may cost more than to deliver it onshore. On the other hand, in internal offshoring there’s no difference between one individual sitting in this building or in another country. There’s just an issue with the communication to overcome.” From the internal offshoring organizations, another manager from the strategic level said that “... we had a first phase where the problem was not the lack of trust, but to foster trust acquisition among people that didn’t know each other, showing that we have the necessary skills to develop the projects. In the second phase, our goal was to show that we had knowledge in diverse technologies. And finally, in the third phase we showed that we were able to developed distributed projects, with different technologies, working together with many business areas within the organization.”

Based on the interviews, we also realized that it is important to understand the role of the different stakeholders involved in each model and what they think it is important from their points of view. In the next section we present a discussion from the viewpoint of the three management levels.

Analyzing the importance of each aspect: the Perspective of Different Management Levels

Organizational level – DSD strategy vs. Project allocation

From an organizational perspective, a manager in one of the internal offshoring organizations justified why the project allocation strategy is one of the most critical and important aspects for them. He said that "...in wholly-owned subsidiaries, we know that when we finish a project, another project will come. When we started five years ago, for example, most of our projects were related to small bug fixes. In the past, our projects were distributed based on how trustful would be a distributed team. Currently, we have a completely different scenario, where the project allocation is a critical activity in our process, and it is mostly based on the skill that each distributed team has."

To illustrate why DSD strategy is one of the most important aspects in in an offshore outsourcing organization, a manager said that "...I cannot think we are going to engage in a lot of outsourced, pure outsourced activities anymore. The reason is that the risk associated with outsourcing requires you to be precise in terms of your requirements as to permanently increase the cost associated with the onshore interface. And the use of this kind of things only works when you know what you are buying, in a very precise. Our strategy plays a very important role in this case".

Tactical level – Software development process vs. Training and learning

From a tactical perspective, we found that the existence of a well defined software development process is one of the most important aspects in the offshore outsourcing model. The reason, according to a manager interviewed, is that "...the biggest difference would be the processes that we follow at the different companies. So, for instance, my company in India and the company in Canada, follow slightly different processes. The company in Canada has their own set of processes that they follow and my company has their own too. To actually merge those processes when we work as a team, that's difficult to do initially or immediately. We try to make it the whole thing one team, as opposed to actually thinking of it as an outsourced or contracted organization. For this reason we tailor our processes to meet a DSD structure". On the other hand, even though the main challenges in the internal offshoring model were concentrated in the technical dimension, a quote from a manager illustrates why training and learning are so important in the tactical level. He said that "...we invested a huge effort to deal with non-technical issues in the beginning. Our turnover rate in Brazil is relatively low. Our team was prepared, and I can say that our core team not only has the experience to support a DSD operation like this, but also can share this experience with new employees". One possible reason for that is the fact that internal offshoring organizations usually spend a considerable effort defining processes and work environment in the beginning, being also able to invest in the development of contextual skills within the organization. Both quotes also corroborated to the general findings related to patterns of evolution.

In this level, we found that technical aspects are more relevant for offshore outsourcing organizations, while contextual aspects are more important in internal offshoring. In practical terms, this means that while people from the tactical level in offshore outsourcing wants the project done first; in internal offshoring it seems that investment in people is more important.

Operational level – Requirements engineering vs. Project management

From a project management perspective – or operational level, requirements engineering appears to be one of the most relevant aspects for the offshore outsourcing model, due to the contractual nature of this type of outsourcing. This is illustrated by what a project manager said: "...we run into problems with communication more quickly at least with our experience in India. Although English is used, it's not always the strongest. Sometimes it's not strong enough to communicate and consequently understand requirements appropriately". On the other hand, for internal offshoring organizations, the most relevant aspect is the management of projects itself, mainly related to the definition of roles and responsibilities. A quote from a project manager in this model also illustrates our findings: "...Sometimes it is very difficult to tell what the responsibilities of a project manager in our scenario are. We used to have a global and a local project manager. Currently we have only a global project manager, but I don't know if this is the most efficient solution. In my opinion this is very sensitive for us."

The qualitative data collected also allowed us to observe that in offshore outsourcing project managers need more investment in the human side prior to technical, which is the opposite to what managers in the tactical level see. In internal offshoring is the opposite: managers in the tactical level understand the need to invest in non technical aspects prior to technical due to the characteristics of this type of business relationship (usually long-term, and within the same organization). This can lead to important conflicts of interests and lack of synchronization. Table 5 presents a summary of the comparison.

Offshore Outsourcing	Internal Offshoring
<i>Main challenges</i> related to organizational and non technical aspects	<i>Main challenges</i> related to technical aspects
<i>Patterns of evolution:</i> technical aspects prior to non technical	<i>Patterns of evolution:</i> non technical aspects prior to technical
<i>Organizational level:</i> strategic aspects are the most relevant	<i>Organizational level:</i> strategic aspects are the most relevant
<i>Tactical level:</i> technical aspects are the most relevant	<i>Tactical level:</i> non technical aspects are the most relevant
<i>Operational level:</i> technical aspects are the most relevant, but investment and training on non technical aspects are necessary	<i>Operational level:</i> technical aspects are the most relevant, although training on non technical aspects are planned in a regular basis

Table 5. Summary of the comparison

Limitations, Threats to Validity, and Validation of Findings

In this study we aimed to present the main results of a detailed study carried out at five multinational companies. As any qualitative study, we have important limitations. The first limitation is related to the number of companies studied and generalization of findings (Oates, 2006). Moreover, there are some limitations regarding the bias of the researchers, which can influence the results. Another limitation is based on the research challenge itself, where the results sometimes can be generated by an organization specific characteristic, and not for a general practice in software engineering or computer science as a whole. The lack of experience of some people interviewed is also a limitation, because some answers can lead us to certain false conclusions.

We also identified some threats to construct and external validity (Wohlin, Höst, & Henningsson, 2003). Construct validity is an assessment of how well you translated your ideas or theories using words that represent concepts, assuming that all data collection methods were planned based on a theory (Carver, Van Voorhis, & Basili, 2004). Some threats to construct validity could be the fact that the researcher didn't have enough knowledge and didn't do a good enough job on defining its constructs. In our study, experienced researchers were involved in the construct definition and validation through many interactions including face and content validity.

External validity is related to generalizing the results. It is the degree to which the conclusions in a certain study would hold for other persons or companies in other places and at other times (Wohlin et al, 2003). Threats to external validity are issues that call into question the applicability of the conclusions to other environments (Carver et al, 2004). In our study, some results we found might be based on the company culture, and not based on a software development practice. Since we interviewed people in two countries, this can also be a threat to external validity, because the answers can have some bias based on the countries culture. Further studies are needed in order to confirm our findings.

Finally, considering the validity of findings, Seaman (1999) says that validity in qualitative research can be reached through triangulation, instrument validity and documentation. Triangulation is the use of multiple sources of data, with multiple data collection techniques and multiple analysis techniques. In our study, we used triangulation of data collection and analysis to draw conclusions based on multiple types of evidence. Many interactions and pilots were planned until the interview guide was fully approved by the research team and external reviewers. In addition, the documentation was reviewed and audited by the research team and selected respondents.

CONCLUSIONS

This paper brings empirical evidence of a comparison between two of the most common business models in the offshoring of software development (cross-border), from the perspective of the organizations that supply the offshore service. While DSD dramatically impacts the way products are conceptualized, developed, tested and delivered, the move of an onshore process offshore is not a simple step, neither a simple project.

We identified important aspects based on the analysis of three different management levels, and the data collected made it possible to learn more about the most critical issues found in each model. From a practical point of view, we believe that it is important to understand what practices are appropriated for offshore outsourcing where there are legal and organizational boundaries, as opposed to projects distributed within the same company. For this reason, we are planning follow-up studies that will continue to analyze difficulties faced by companies in different DSD models, and in particular the patterns of evolution in the internal offshoring model.

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REFERENCES

1. Ågerfalk, P., Fitzgerald, B. (2008). "Outsourcing to an Unknown Workforce: Exploring Opensourcing as A Global Sourcing Strategy," MIS Quarterly, Vol.32, Issue 2.
2. Atlas TI 5.0.66. (2007). Retrieved on May of 2007, from <http://www.atlasti.com>.
3. Boehm, B. (2006). A View of 20th and 21st Century Software Engineering. In Proceedings of the 28th International Conference on Software Engineering, Shanghai.
4. Borland. (2004). Putting your own house in order before Offshoring, retrieved on Jan of 2009, from http://www.borland.com/resources/en/pdf/white_papers/offshoring_exec_white_paper.pdf.
5. Carmel, E., & Tjia, P. (2005). Offshoring Information Technology: Sourcing and Outsourcing to a Global Workforce. UK: Cambridge.
6. Carmel, E. (1999). Global Software Teams – Collaborating Across Borders and Time-Zones. US: Prentice Hall.
7. Carver, J., Van Voorhis, J., & Basili, V. (2004). Understanding the Impact of Assumptions on Experimental Validity. In Proceedings of the ACM-IEEE International Symposium on Empirical Software Engineering, pp. 251-160.
8. Chrissis, M. B., Konrad, M., & Shrum, S. (2006). CMMI: Guidelines for Process Integration and Product Improvement, 2nd Edition, SEI Series on Software Engineering, US: Addison-Wesley.
9. Damian, D., & Moitra, D. (2006). Guest Editors' Introduction: Global Software Development: How far Have We Come?. IEEE Software, 23(5), pp.17-19.
10. Herbsleb, J. D., & Moitra, D. (2001). Guest Editors' Introduction: Global Software Development. IEEE Software. 18(2), pp. 16-20.
11. Huen, W. H. (2006). An Enterprise Perspective of Software Offshoring. In Proceedings of the 36th ASEE/IEEE Frontiers in Education Conference. pp. 17-22, San Diego, USA.
12. Karolak, D. W. (1998). Global Software Development – Managing Virtual Teams and Environments. Los Alamitos: IEEE Computer Society.
13. Krippendorff, K. (2004). Content analysis: an introduction to its methodology. US: Sage Publications.
14. Madlberger, M., Roztocki, N. (2008). "Cross-Organizational and Cross-Border IS/IT Collaboration: A Literature Review", In Proceedings of the Americas Conference on Information Systems, 2008.
15. Meyer, B. (2006). The Unspoken Revolution in Software Engineering. IEEE Computer, 39(1), pp. 124, pp. 121-123.
16. Oates, B. J. (2006). Researching Information Systems and Computing. US: Sage Publications.
17. OECD (2004). OECD Information Technology Outlook, Organization for Economic Co-operation and Development, retrieved on Jan of 2009 from <http://www.oecd.org/dataoecd/22/18/37620123.pdf>, 378 pages.
18. Prikladnicki, R., Damian, D., Audy, J. L. N. (2008). Patterns of Evolution in the Practice of Distributed Software Development: Quantitative Results from a Systematic Review. In Proceedings of Evaluation and Assessment in Software Engineering (EASE), Bari, Italy.
19. Prikladnicki, R., Audy, J. L. N., Damian, D., & Oliveira, T. C. (2007). Distributed Software Development: Practices and challenges in different business strategies of offshoring and onshoring. In Proceedings of the International Conference on Global Software Engineering. Munich, Germany.
20. Prikladnicki, R., Audy, J. L. N., & Evaristo, J. R. (2003). Global Software Development in Practice: Lessons Learned. Journal of Software Process: Improvement and Practice. Wiley, 8(4), 267-281.
21. Robinson, M., & Kalakota, R. (2004). "Offshore Outsourcing: Business Models, ROI and Best Practices. Mivar Press.
22. Seaman, C. B. (1999). Qualitative Methods in Empirical Studies of Software Engineering. IEEE Transactions on Software Engineering, 25(4), pp. 557-572.
23. Wohlin, C., Höst, & M. Henningsson, K. (2003). "Empirical Research Methods in Software Engineering", In: R. Conradi and A.I. Wang (Eds.): ESERNET 2001-2003, LNCS 2765, pp. 7-23, Springer.
24. Yin, R. (2003). Case Study Research, Design and Methods, 3rd edition, US: Sage Publications.