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A Case Study of Job Satisfaction in an Offshore Office: Is Software Engineers' Motivation at Risk?

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Abstract. Nowadays many software development companies have become global and employ people in different sites around the world. It is common that long-term maintenance software development projects at their later stages migrate to the cheaper sites, while product management and control is performed at a distance. This, however, has one important implication - offshoring of old projects might significantly influence job satisfaction and lead to high turnover of the employees in offshore sites. In this case study we investigate job satisfaction through surveying software engineers in a Russian offshore site of a Swedish company and interviewing an employee who decided to quit. Our study shows that the nature of maintenance projects and cross-site collaboration may negatively impact software engineers' motivation, which is believed to be a key factor for project success in terms of productivity and conformance quality. The aim of this case study is to acknowledge motivational risks in order to mitigate them, and thus prevent attrition of experienced employees in the future.

Keywords: global software development, offshore software development, software engineer, job satisfaction, motivation, offshore maintenance, empirical study

1 Introduction and related work

Software development similar to other production disciplines today has become truly global as many individuals and teams from several geographically distant places collaborate to create software. Many companies employ such model of work organization striving for the most effective software development in terms of speed, price and quality. Globally distributed software development approach claims to enable benefits of access to larger skilled resource pool, reduced development costs, proximity to markets and other (Šmite et al., 2009). In result, there are hardly any large software companies that would not have one or several development centres offshore. However, we still hear frequent complaints about poor efficiency, which most often is explained by different Communication, Coordination and Control problems caused by distance,

temporal separation and socio-cultural problems inherent in global software development (GSD) (Conchuir et al., 2006). While it is very important to solve the so called 3Cs problems, we argue that possibly even more attention should be paid to software engineer job satisfaction and motivation as they are reported to be the key determinants for retention and have large impact on productivity and software quality (Beecham et al., 2008; Mak & Sockel, 2001). Besides, motivated people in globally distributed development are more likely to collaborate (Casey & Richardson, 2008).

Motivation and job satisfaction are commonly referred to as soft factors, which are difficult to address and even more difficult to measure. Nonetheless, the importance of these factors is crucial. If motivation impacts productivity, as stated earlier, and costs in software development are mainly related to human resources, then the effect of even minimal improvements shall be evident. Empirical evidence suggests that improved project success directly relates to good project management, which is underpinned by human factors (Hall et al., 2007), including job satisfaction and motivation. The nature of offshore development and global software development projects puts new demands on managers, as such projects are significantly more complicated than even the most complex project managed entirely in-house (Karolak, 1998). The challenges in achieving job satisfaction may be introduced by the role of motivation in different cultural backgrounds, complexity of organizational forms, contractual dependencies and power distribution, as well as widely discussed geographic and temporal distances. Furthermore, experience shows that what works in one context might not apply in a different context, because GSD is enabled through a wide variety of organizational forms (Šmite et al., 2009). This means that contemporary managers working in global projects shall be equipped with sufficient knowledge about motivation in different GSD settings. To the best of our knowledge no empirical research focusing on addressing motivation in global software development projects exists.

Motivated by the identified challenges, in this case study we investigate offshore software engineers' job satisfaction and motivation in collaboration between a Swedish software organization and its offshore site in Russia. The objective is to identify motivational risks in order to suggest the management the possible ways of how to enhance motivation and job satisfaction and prevent attrition of experienced employees.

The rest of the paper is organized as follows. In Section 2, the design of the case study is presented. The results are described in Section 3, and Section 4 provides the discussion. Conclusions based on the findings are presented in Section 5.

2 Design of the study

2.1 Objectives and research questions

The aim of the study is to explore software engineers' job satisfaction and motivation in an offshore site of the case company and suggest ways to enhance it. Our work is driven by the following research questions:

RQ1: What motivates employees of the offshore site?

RQ2: Are there any threats to job satisfaction and motivation of the employees from the offshore site?

In this paper we address these research questions by discussing the results of an empirical investigation in one global software development organization. The company is selected based on availability of the multiple data sources. In particular, we have

measured job satisfaction and motivation in an offshore site through a survey tool, which was further supplemented by observations from a site visit and formal and informal interviews with offshore site personnel, onshore managers and one former offshore employee who has changed his job one year prior to our investigation.

2.2 Case background

Empirical findings discussed in this paper are obtained from the company that we for confidentiality reasons refer to as Alpha. It is a medium-sized subsidiary owned by a major multinational corporation producing software intensive products with the main development centre located in Sweden. Alpha develops complex products for process automation and control, in which software is being only an embedded part of the system. Systems development undergoes a rigorous set of processes that involve coordination of work among multiple departments. Although software development is not the company's primary business, the amount of software embedded in its products grows every day. Like many other companies in the late 90s Alpha engaged in offshore development. In the beginning for pure cost reasons and due to inability to employ people in the high-cost countries some work was sent to an outsourcing service provider in India. After three years of struggling with high attrition the company decided to establish their own site in Russia. This was expected to provide the control over recruitment and attrition, lacking in their previous experience.

Establishment of the offshore insourcing collaboration started small from employing just two developers working from home and scaled into a dedicated office with around 20 developers within four years. During this time the responsibility for maintaining most of the software applications that support the core products developed by the company was transferred to the new site. The company pays deserved attention to improving the collaboration with the offshore site, which was the main motivation for engaging in our research.

2.3 Empirical data collection and analysis

A survey instrument was implemented to investigate the trends towards motivation in the studied offshore collaboration. The survey was based on rigorous literature analysis (see Section 2.4) and comprised two types of closed questions inquiring about project settings and software engineer motivation. It was self-administrated and was conducted in the beginning of December 2011, when one of the researchers was visiting an offshore site of the case company. 16 responses were collected from 15 men and 1 woman in age between 20 and 59, who represented 8 projects in total. All the respondents had higher education, and their nationality was Russian. The response rate was 80%. The results of the survey were analysed statistically. We calculated the average responses and the standard deviation to check the variability.

After the analysis of survey results, both researchers performed the one and half-hour long semi-structured face-to-face **interview** with a former employee who after 15 years of work at the Russian site decided to leave Alpha due to inter alia motivational issues. The Swedish development unit manager and also few employees from the Russian site suggested him for an interview. One researcher was leading the conversation and both interviewers took notes.

Several face-to-face **meetings** were conducted to discuss the research progress with the managers from the onshore site. In particular, one group meeting was organized to

discuss results from the survey, and another to discuss the results from the interview and the proposed recommendations. As only one researcher was able to participate in these meetings, valuable feedback was gathered and documented in meeting minutes, which were shared among the researchers.

A dedicated **offshore visit** was organized, also undertaken by only one researcher. Observations and notes from informal discussions were documented, shared and discussed during the data analysis.

Qualitative analysis techniques of open and axial coding were applied for analysing the gathered empirical data. The results discussed in this paper are supported by evidence obtained from multiple data sources. In our analysis we selected emerging findings from the survey and supported them with qualitative insights that shed the light on events and opinions important for our investigation. By doing so we have conducted data triangulation, which increases the reliability of our findings.

2.4 Job satisfaction and motivation survey

In order to get a deeper understanding of the concepts of job satisfaction and motivation we performed a **literature analysis** focusing on what has been explored regarding job satisfaction and work motivation in general and specifically in the context of software engineering, and distributed development. Particular attention has been devoted to the tools used for measuring these concepts. As software engineer motivation and job satisfaction are not widely studied and empirical research is scarce, the research literature for analysis was gathered according to snowball-sampling method (Atkinson & Flint, 2001), using Beecham's et al. systematic literature review on software engineer motivation (Beecham et al., 2008) as the starting source of references. Due to the limitations of this research paper we do not discuss the literature analysis in detail. In summary, the literature analysis helped to obtain the knowledge about previously widely tested tools for diagnosis of job satisfaction and motivation. In particular, we highlight the work conducted by Hackman & Oldham (1974) and Morgeson & Humphrey (2006). Based on the knowledge obtained we developed a comprehensive **survey** for software engineers working in globally distributed projects.

The items of the survey were assessed on a 7-point Likert type scale, where higher values indicate more agreement with a given item. In one survey section respondents had to choose 5 out of 12 items. The results were processed according to Job Diagnostic Survey guidelines (Hackman & Oldham, 1974) thus ensuring that the results can be compared with results of the former research results.

3 Results

3.1 RQ1: What motivates employees of the offshore site?

In order to find out what motivates the employees from our case company Alpha we included a question in a survey enquiring to choose 5 factors from the list of 12 that are most likely to encourage the respondent to produce at his or her highest potential. The results are shown in Figure 1.

Fig. 1. Potentially most motivating factors

Among the top three most valued motivational factors in Alpha we have found challenging and meaningful work, which motivates us to explore the nature of work being offshored in more details. The remaining factor in the top three list is supportive relationships, which is often classified as a hygiene factor according to Herzberg's Motivation-hygiene theory (Herzberg, 1968). This means, that people in the offshore office pay much attention to the personal relationships at work, and will likely be dissatisfied, if there are no opportunities to create good relationships with their colleagues and management. Interestingly, our results confirm the latest research that emphasizes the necessity of supporting relationships in software engineers' job (Franca & Silva, 2009; Sach et al., 2010), which have been previously neglected (Hackman & Oldham, 1974).

Additionally, many other classic motivators that demonstrate social links among colleagues and with management have scored high. These are appreciation, authority, respect, and feedback. In response to our next question we validate which of these and related factors are at risk.

It is worth noting that in response to the first question respondents could select motivators that are not present in their current job, rather indicating the characteristics of the job, task or working environment that are most sought after. In the next step we analysed whether there are any threats to their motivation in the current job.

3.2 RQ2: Are there any threats to job satisfaction and motivation of the employees from the offshore site?

In order to answer RQ2 we surveyed employees' satisfaction with several motivational factors. The results are shown in Table 1. From the table we can see that the major areas of concern are factors that were evaluated as dissatisfactory. These were the following:

- Opportunity to get promotion (dissatisfactory)
- Personal growth and development (slightly dissatisfactory)
- Above the average pay and fringe benefits (slightly dissatisfactory).

At the same time careful attention shall be also paid to the factors that were selected as neutral, since it is fair to assume that over time these factors, if not addressed, are likely to turn into risks. These factors were the following:

- Stimulating and challenging work
- Opportunities to learn new things
- Opportunities to apply state-of-the-art tools and processes
- Opportunities to be creative and imaginative in job
- Opportunity for participation in the determination of methods, tools and procedures
- Performance feedback from local colleagues.

From the obtained results we see several trends.

Challenging work

A combination of dissatisfactory personal growth and development, and potential threats in relation to stimulating and challenging work tends to be one of the main areas of concern. From the observations and interviews we learned that work in the offshore site is mainly related with maintenance tasks. As the projects, in which the offshore site is involved, are very old, they have a lot of legacy code and old technologies are used to maintain them. Russian software engineers do not have opportunities to learn much new. Bug fixes dominate in the daily work in some of the projects, because the company has not invested in major refactoring efforts for a long time. At the moment, the trends from the survey indicate that the work at the offshore site is perceived neither challenging nor unchallenging, which in a long period may raise dissatisfaction. The former senior engineer interviewed quit his job in the offshore site after 15 years of work. He confirmed that such type of work for him has been de-motivating: "I don't want to just fix bugs indefinitely, but also participate in new development." Interestingly, he admitted that such type of work appears to be common for offshore development. At his new job in a different company he works for maintaining external systems, and the nature of the work is similar.

Mastery

For many engineers it is important to show their mastery. They strive for the best possible solutions and professional excellence. This, however, may often be an obstacle for meeting project budgets, when improvements require too large investments. Freedom in such cases is crucial, as the mastery provides the meaning for the job, and leads to new achievements ensuring personal growth. The former employee who we interviewed confessed, that having no refactoring has one implication – the products get unmaintainable. Thus when engineers are restricted to implement the most cost-effective and not the best possible solutions, they might feel dissatisfied.

Learning

Software engineering is faced to constant change of technology. For developers it is very important to follow the new tendencies, in order to avoid a natural fear of obsolescence (Mak & Sockel, 2001). For people with high growth needs it is very important to constantly learn, and an employer should provide developers with learning opportunities, so that they stay competitive in the job market. It might and should be in employer's interests, because research results show that engineers are committed to their field of expertise and not necessarily to the company for whom they work (Tanner, 2003). Thus if a company does not address developers' needs, there remains a great risk to loose valuable employees.

Learning addresses not only new tools, but also new systems and domains, in our case employees complained that they do not have much variability at work as they are supporting the same software for many years.

Career development and promotion

Career development and promotion prospects have been often reported to be important motivational factors for software engineers (Burn et al., 1995; Mak & Sockel, 2001; Franca & Silva, 2009). The results of our survey demonstrated that these factors were the least satisfactory.

Alpha's policy determines that every employee has to participate in a yearly individual goals setting process, which can be regarded as a tool addressing motivational

needs. We have however found that this event is viewed as a formality. Our research identified an improvement opportunity – necessity for the onshore managers to implement follow-up activities, and feedback on the progress toward goal accomplishment. This is needed to demonstrate the employees' abilities to pursue cherished goals, as this promotes the meaningfulness of work (Humphrey et al., 2007). Onshore management later confirmed that this corporative activity could be improved.

Promotion opportunities are crucial to maintain employee motivation and job satisfaction because promotion is a very explicit recognition for achievement and conformation of growth. In our case we learned from the former colleague that promotion opportunities for senior developers in Alpha were insufficient. He told us that after 5 years a senior engineer is still a senior engineer. The onsite managers explained that career paths and available positions are dictated by the corporate policy, which is not a subject to easy change even for the Swedish site.

Recognition and rewards

The importance of monetary rewards as a motivational tool increases (Hall et al., 2007); although earlier it was regarded as only a hygiene factor (Herzberg, 1968). However, it has always been thought that the complexity of software engineering demands a pay to be higher than average (Beecham et al., 2008). From the survey results we learned that Russian employees are slightly dissatisfied with their pay and fringe benefits they receive. More importantly, we learned that the reward system in the offshore site is not always based on merit or on seniority. We therefore attribute dissatisfaction to the fact that engineers are not compensated relatively to the other individuals making similar contribution to the company. All these findings confirm existing research (Tanner, 2003). We thus believe that these findings can be generalizable for the contemporary software development organizations.

Additional observations were made in relation to the lack of feedback from remote management. From the interviews we found that Russian employees sometimes felt insufficiently recognized by the Swedish management. One of the proposed explanations for that was cultural peculiarity, as Swedes tend to remain silent when everything is fine and provide feedback only in case of problems. Swedish Institute has declared the concept of equality to be a cornerstone in Swedish society (Swedish Institute, 2012), which possibly explains why high achievements at work are not highlighted between the others. Nonetheless, verbal recognition for well-done work is very important as it promotes a feeling of worthwhile accomplishment and it has also a nature of feedback providing an opportunity for employees to learn about their performance level and proximity to their goal (Mak & Sockel, 2001).

Social needs and ties

Nowadays organizational psychologists declare that social factors are very important in a work life and they can significantly affect work motivation and job satisfaction (Humphrey, 2007). For long it has been thought that software developers have exceptionally low need to socialize compared to other professionals (Beecham et al., 2008), but recent research results argues otherwise (Franca & Silva, 2009; Sach et al., 2010). Our case study confirms the latter views, as we have found that supportive relationships with colleagues, management and other stakeholders, and working with other people in general have scored high in the list of motivators.

Good team infrastructure has been mentioned as to be one of the most important factors affecting motivation (Hall et al., 2007). Survey results show that most of the

employees were in agreement and noted that they are almost satisfied with opportunities to develop friendships, existing relationships and received support and guidance from onshore and offshore colleagues. Our further investigation revealed that a potential area of improvement with this respect is promotion of teamwork. We learned that most of the employees are not working in teams or do not have to collaborate intensively with other colleagues to complete their work. In the interview the former employee mentioned that for him it has been very hard to mainly work on his own. Communication with users and clients might also enhance motivation (Grant et al., 2007), but offshore employees in Alpha seldom have access to any beneficiaries.

	Motivational factors	1: Extremely dissatisfied	2: Dissatisfied	3: Slightly dissatisfied	4: Neutral	5: Slightly satisfied	6: Satisfied	7: Extremely satisfied	STDEV
Growth factors	Stimulating and challenging work				4.20				*1.22*
	Opportunities to learn new things				3.93				*1.42*
	Opportunities to apply state-of-the-art tools and processes				3.60				*1.29*
	Opportunities to be creative in job				4.47				*1.05*
	Opportunity for participation in the determination of methods, tools and procedures				4.33				*1.04*
	Personal growth and development			3.47					*1.27*
	Feeling of worthwhile accomplishment					5.20			*0.85*
	Opportunity to get promotion		2.47						*1.28*
	Opportunity for participation in the setting of goals					4.60			*1.21*
	Above the average pay and fringe benefits			3.27					*1.16*
	Great job security					4.60			*1.33*
	Chances to exercise independent thought and action					5.33			*0.47*
Social factors	Friendly relationships with local colleagues						5.80		*0.43*
	Friendly relationships with remote colleagues					5.33			*0.73*
	Support and guidance from local colleagues					5.40			*0.97*
	Support and guidance from remote colleagues					5.47			*0.66*
	Chance to help other people at work					5.40			*0.70*
	Respect and fair treatment						5.60		*0.55*
	The overall quality of supervision					4.73			*1.14*
	Performance feedback from local colleagues				4.14				*1.56*
	Performance feedback from remote colleagues					4.86			*1.92*
Environmental factors	Appropriate working conditions						5.60		*0.39*
	Flexibility in work times						5.87		*0.83*
	Involvement of multiple distributed teams					5.00			*0.93*
	Temporal, geographical and socio-cultural distances between distributed teams					5.20			*0.94*

Table 1. Satisfaction with motivational factors

3.3 Recommendations and follow-up activities

In order to improve the motivational potential of jobs in the offshore site, based on our findings we have proposed several recommendations to the Swedish site management, which we organize in the order corresponding to the ranking of the factors with the potential for motivating the offshore employees:

- Due to the current gaps in the variability and lack of challenge in the current tasks given to the offshore office, the company shall either accept the threat of a growing turnover of the offshore employees, or provide new, more challenging tasks. In the studied case these would be related to new development instead of pure maintenance, and/or or major refactoring with the usage of state-of-the art technologies, tools and processes;
- We also recommend assigning employees at offshore site greater responsibility and power. Although the developers have received responsibility for the work artefacts (the software systems that they maintain), several observations indicate that there is no power over deciding on the ways of working, tools and technologies being used, as well as the investments into software improvements. We learned that the offshore team perceives that all power is owned by the onshore management, and thus doubts the feedback and initiatives received from the local administration. To improve the motivation, we recommend that the offshore management apart of administrative functions fulfil technical leadership functions, too.
- As supportive relations scored high on the motivational factors, and the offshore office currently does not work in teams, we recommend to further promote teamwork;
- Since the managers are often unaware of what motivates software engineers (Peters, 2003), it is important to encourage active communication between the offshore developers and the onshore management. In the studied case we recommend to take an advantage of the existing goal setting process, which currently is seen as a necessary but not useful formality, and establish appropriate career development and promotion mechanisms;
- We recommend improving the reward strategy in order to demonstrate transparency (Doherty, 2009). It is very important to reward employees for particularly high achievements or good ideas not only by compensations and benefits, but also even more importantly by recognition and appreciation (Hall et al., 2007). We found that this was important to emphasize, since the Swedish culture was associated primarily with constructive negative feedback and a lack of positive feedback by the offshore developers. Consequently we also recommend bridging the cultural understanding between the sites.

In discussions with the onshore managers we found that they were not aware of some existing motivational threats at the offshore site, for instance, unchallenging nature of maintenance work mainly because of the use of old technologies and methods. Several major changes regarding work at the Russian site have been already planned and a few are considered based on our findings. Firstly, it is planed to move existing software to a

new platform. This would involve consolidation of several projects and reengineering of the old systems, thus addressing motivational needs of software engineers by ensuring challenging work and opportunities to learn new technologies. These changes would also provide an opportunity to employ teams and thus promote the social ties among the developers. Secondly, it is planned to implement some new roles at the offshore site to ensure more promotion opportunities, and what is the most important, creation of a new technical leadership group at the Russian site is considered, thus flattening out the amount of managerial power and responsibility between the sites, and ensuring the craved for promotion opportunities.

The feedback received from the onshore management demonstrated that the offshore employees were unaware of several planned initiatives that were sought after. The management decided to improve the information exchange, as the research results indicated the potential positive effect of transparency on software engineer motivation.

4 Discussion

4.1 Offshored work

Notably, many of the mentioned potential threats and current risks identified in Alpha are strongly related to growth needs, which are believed to be exceptionally high for software engineers and thus differentiate them from the other professionals (Beecham et al., 2008). People with high need for personal growth and development are more appropriate for a job high in motivating potential than people with low needs for growth. A job low in motivational potential can frustrate a person with high growth need strength (Couger & Zawacki, 1980). Based on current empirical research and our own observations we conjure that offshore projects often involve routine maintenance work and bug fixing. While we have found that maintenance projects are associated with boring work, lack of growth and mastery, this may be an inherent problem in offshore projects that requires deserved attention. In addition, too small pieces of work allocated to offshore developers mean that people often work alone, and thus the social needs for teamwork are not properly addressed.

4.2 Organizational structure and power distribution

Several symptoms indicate that power distribution in global collaborations is unbalanced. In our case we learned about three different power sources – corporate top management, Swedish onshore management and Russian offshore management. The latter was found to have the least power. Isolation of offshore sites and restrictions in application of leadership means ultimately lead to inability of addressing the motivational risks that surface in the offshore site. At the same time there is a threat that remote onshore management learns about these needs with a delay that is a common problem in remote collaborations. In fact, previous research indicates that offshore sites might hide their problems due to the fear of termination of collaboration in case of complaints (Šmite et al., 2008)

5 Conclusions

In software engineering a job high in motivational potential is believed to lead to greater job satisfaction, which ensures low retention mainly important because of cost perspective, while motivation provides quality and productivity. In this case study we investigated what motivates employees of the offshore site and if there are any threats to their job satisfaction and motivation.

In response to RQ1, the survey results show that employees regard challenging and meaningful work and supportive relationships to be the major factors encouraging them to produce at their highest potential and stay at work. The latest confirms recent research suggesting that there is a shift in motivational profile of software engineers regarding the importance of supporting relationship and work with people in general, which has increased dramatically if compared with motivational needs of software engineers in 1980s (Hall et al., 2007).

To respond RQ2, we analysed data obtained from multiple sources and found several trends that are related to motivational risks in the offshore site. The most alarming are the factors referring to the limited growth needs, as offshore employees are dissatisfied with their personal growth and development. There are motivational threats in relation to stimulating and challenging work, opportunities to learn something new and apply modern technologies and processes. The inherent nature of maintenance work does not support these needs, and, in fact, leads to the opposite. Offshore employees are also dissatisfied with promotion opportunities, which according to the current research results is one of the most important motivators. They are slightly dissatisfied with their salaries and fringe benefits, too. Different social needs are almost satisfied, but promotion of teamwork could enhance satisfaction.

Based on our study results and given recommendations the case company's management has decided to perform several follow-up activities, which address software engineer motivational needs, suggesting that such surveys could be useful for process improvement planning.

For the future work we would like to focus on learning whether the case studied is representative for other offshore collaborations by surveying more companies.

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