

IT-OFFSHORING – A COMPARISON OF EXPECTATIONS AND EXPERIENCES

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1. INTRODUCTION

The BITKOM (German Association for Information Technology, Telecommunications and New Media) forecasts a serious lack of IT experts on the German labour market in the upcoming years. Despite the recession caused through the financial crisis, they predict around 11,000 vacancies, especially in the field of software development (Scheer, 2008). One instrument to overcome the expected shortage is the deployment of experts from abroad through IT-offshoring. Before the turn of the century, the shortage of IT experts on the German labour market was already a main reason for German companies to offshore software development (Moczadlo, 2003). Therefore, it is necessary that companies have a clear understanding about the chances and risks of IT offshoring. In this article, the expectations of companies with no experience in IT offshoring with the evaluations of experienced companies are compared.

International organizations like UNCTAD (2004), OECD (2004) and EU (2003) as well as the press reported intensively on offshoring. The public interest in this topic increased exceedingly during the last couple of years (Maskell et al., 2006, p.1).

The UNCTAD (2004, p. 147) evaluated offshoring of services as a global shift which offers large benefits for the involved countries because the receiving countries gain jobs, know-how and access to foreign markets, the sending countries improve their competitiveness and are enabled to move into higher value activities. On the other hand, within the sending countries the dangers of job losses and lower wages are discussed vehemently in nearly all parts of the society (Mankiw, 2006, pp. 4; Trefler, 2005, pp. 9; Bhagwati, Panagariya, Srinivasan 2004, pp.97).

Despite this popularity, the definition of offshoring varies. This study follows the WTO (2005, p. 267) which define offshoring by using the criteria location and control. Non-captive offshoring or contracting out refers to the case when the supplier is a non-affiliated firm and located abroad. Captive offshoring describes sourcing from an affiliated company abroad.

The main motivation for companies to offshore services is to increase the competitiveness through cost savings and getting access to specialized skills. Through production and sourcing abroad companies can profit from the low labour costs for highly skilled personnel - especially in emerging markets. Internet and the worldwide availability of telecommunication networks for competitive prices facilitate the relocation of IT services. Also in Germany, one can observe this trend for several years now. The numbers of IT offshoring projects in Germany are rising (Broß, 2005, p.8).

The BITKOM together with the BDI (Federation of German Industries) state for companies the decision is often not whether but how to do it (Kirchhof, 2006, p.8).

On the other hand, IT-Offshoring, which crosses national and cultural borders, is a very complex arrangement regarding the planning, steering and controlling of processes as well as the intense communication and cooperation with vendors or employees abroad. Therefore, it is not astonishing that many companies made negative experiences with it. Aron and Singh (2005, p. 136) states referring to empirical studies “half the organizations that shift processes offshore fail to generate the expected financial benefits.”

2. THEORETICAL BACKGROUND

For IT offshoring, one can consider several theoretical approaches. The traditional trade theory shows that the factor price differences are decisive for the international division of labour. Companies therefore will produce through captive offshoring or source in those countries where they find relative factor price advantages for a comparable output.

2.1 Core competencies

The core competencies approach is one of the theoretical approaches that assist by the decision what kind of activities one can cut out of the value chain and hand them over to a foreign vendor. All activities belonging to the core competencies of a company should be performed in-house; non-core activities should be outsourced to the best supplier, if they are not necessary to protect competitive advantages (Quinn, 1992, pp. 3). For Lacity and Willcocks (2003, p. 117) this distinction alone is not very useful because one needs assessment tools to identify exactly what is core and non-core. For the determination of core competences, a combination of the resource-based theory with Porters' Strategic Positioning Framework (SPF) can be used (Porter, 1981; Gewald, Lamers, 2005; p. 2; Mahoney, Pandian, 1992, pp. 363). In the resource-based theory competitive core competences results from superior capabilities and resources. These resources consist of tangible and intangible assets (Halawi, Aronson, McCarthy, 2005, p. 78) which increase efficiency and effectiveness. Superior competences might also be developed or strengthened through the integration of unique skills (Prahalad, Hamel, 1990; Hamel, 1994).

2.2 Transaction costs

The transaction cost approach is recommended mostly to decide about make-or-buy, at home or abroad for activities which on principle could be offshored as well as for the controlling of the offshoring process and of the supplier's performance (e.g. Trefler, 2005, p. 21; Roztocki and Fjermestad, 2005).

Two cost components, production costs and extra costs for the transaction itself (e.g. information, coordination and control) are decisive. Through economies of scale market solutions can reduce production costs (Vining, Globberman, 1999, p. 645).

The transaction cost theory as well as the principal agent theory are based on the theory of the firm developed by Coase (1937, 1960). Both focus on the

uncertainty of the future in the sense of unforeseeable developments like technique, market progress, or the behavioural uncertainty due to information asymmetry between the involved partners. Opportunism can occur; this means that contractual partners, who may have divergent goals, try to reach their own aims at the expense of their counterparts. They follow their self-interests. The vendor for instance can provide insufficient or manipulated information (Williamson, 1975, pp. 31–33).

Asset specificity is the degree of alternative uses of an asset without losing productivity. Idiosyncratic transactions have a high specificity (Williamson, 1979, p. 148). It is a common view that transactions with high asset specificity, high uncertainty or high frequency one should carry out inhouse while other activities should be outsourced (Willcocks, Lacity, Cullen, 2006, p. 14).

The hazard of opportunistic behaviour rises if only a few suppliers are able or willing to contract. High asset specificity also increases the switching costs. For Hancox and Hackney (1999, p.4) these reasons may explain the fact that extreme vertical integration and spot market transactions are rare in IT outsourcing, but a range of sourcing options can be found.

All the mentioned aspects of transaction cost economies one can find in offshoring software development. The activities are normally complex and the requirements are not complete in all aspects. Uncertainty increases in comparison to local outsourcing with the cultural and geographical distance of the partners involved.

The transaction costs for the offshoring of software development include the costs of negotiating the contract, the negotiating costs for change requests, the monitoring costs during the carrying out of the development and the cost disputes if the partners do not agree on escalation rules or if they do not follow them. Transaction costs can also occur from the partnership itself. In the future, parts of the contract may not cover the changed expectations and needs concerning costs, performance and metrics (Ross, Westerman, 2003, p. 3 f.).

Also in the case of captive offshoring, opportunism can occur by bargaining within organizations for example over wages, bonuses or internal transfer prices (Vining, Globerman, 1999, p. 649).

To be able to apply the transaction cost approach it is crucial to calculate all costs thereby incurred. Roztocki and Fjermestad (2005, pp. 2-3) point out that several companies calculate and control their offshore activities just with overhead based on direct labor costs. Executives are forced to guess the costs of their value chain and may overestimate the true cost of in-house operations while offshoring add substantially coordination and legal costs. For Kern, Willcocks and van Heck (2002, p. 51) the difficulties in calculating IT projects occur because of the wide variety of activities, skills, and technologies IT projects include. The inherent intangibles make it difficult to assess or account the costs and impacts particularly in IT development projects. Furthermore, they argue that in-house IT evaluation has an indifferent track record and this might make comparisons of in-house against supplier bids difficult. At least the ex post evaluation of the suppliers performance should be calculated on an appropriate basis. In the empirical analysis, therefore the question was asked how the calculation to compare offshoring and inhouse development is carried through.

2.3 Principal agency theory

The principle agent theory applied on offshoring focus on the relation between customers and vendors or between headquarters and affiliates. It is based on similar argumentations as the transaction cost theory: uncertainty, self-interest and bounded rationality (Hancox, Hackney.1999, pp. 5).

One can find several increments of the principal agent theory in literature. Their objectives are structured in two main topics: how can contracts be built to improve the hidden actions of the agent and relationship focussed approaches. The latter discuss how the kind of relationship may influence the results of offshoring. This is discussed contrarily.

Because of the uncertainty of the future and because of bounded rationality contracts for complex activities are always incomplete. For this reason, contracts are not self-enforcing and opportunistic behaviour can have a negative impact on the achievement of the goals of the customer. In case of conflicts, a court ordering is limited because of the nonverifiability of complex activities. Transaction-specific investments (asset specificity) establish a bilateral dependency (Williamson, 2002, p. 188).

The focus lies on the delegation of activities from the principal to an agent; irrespective whether both partners are in different or in the same organisation. Both, employees and vendors in principle have two different businesses: output production and asset value enhancement. Normally, only the output can be assessed through the principal. The difficult-to-describe projects are typically the innovative projects that generate the highest value added (Trefler, 2005, p.6).

Conflicts of interest result from asymmetric information and uncertainty of the future. Traditionally it is assumed that the agent is risk averse because of his difficulty to diversify his risks and the limitation of actions he can undertake at the same time. As the principal has incomplete information about the agent and his actions, the agent can behave in self-interest at the expense of the principal (Padilla, 2003, p.7). The design of the contract that regulates the expected outcome and the expected performance of the agent as well as the relationship between principal and agent are core elements of the approach. Contracts can either be behaviour- or outcome-based. In terms of pricing models, the principal can use either fixed price or time and material for offshoring.

Self-interested behaviour of the agent can also occur because of hidden actions. These are actions, which influence the outcome and performance of the agent, but the principal hardly can monitor them. These situations can arise due to high monitoring costs for the principal or due to the lack of the principal's expertise to evaluate the behaviour and the total outcome of the agent's actions. As a solution of the imperfect monitoring, it is proposed to design outcome-based contracts. The hidden actions are measured indirectly through the results. The complication with this approach is that not all result-influencing factors lie in the responsibility of the agent (Padilla, 2003, pp. 4).

The other topic discussed in literature focuses on the consequences of partnerships. Lacity and Willcocks (2001, p. 85) argue, that suppliers have to keep earning the business. Already in 1993, Lacity and Hirschheim question the existence of strategic partnerships in a vendor customer relationship. They argue that vendor account managers are rewarded according to contract profitability. Account managers can

increase the earnings when charging the client extra for anything that is not part of the contract. Kern, Willcocks and van Heck (2002) analyse for the field of outsourcing the so called “winners curse”, which arises when suppliers make unrealistic biddings. A supplier already knowing that the bid will not cover his costs takes this risk in hoping to be able to identify and sell services that are needed operationally but which are excluded from the contract. The concerns of the supplier to cover the costs can lead to inflexibility in the interpretation of the contract, what can also implicate an adversarial relationship. (Kern, Willcocks, van Heck, 2002, p. 48).

Contrariwise Jurison (1995, pp. 240) argues that partnership can reduce the risk of a non-appropriate contractual provision. For Talluri and Narasimhan (2004) strategic relationships with suppliers are key ingredients to the success of a supply chain. Plambeck and Taylor (2006, p. 1509) focus on the dynamic aspect of a partnership. The partners should evaluate the potential for future collaboration. A prospect of a future interaction strengthens the development of trust and cooperation whereas an opportunistic behaviour would damage this perspective. Moreover, conditions and the relationship develop dynamically so that actions today influence the costliness and effectiveness of future actions. For Maskell et al. (2006, pp. 5) offshoring is a learning by doing process in which companies go through several stages from cost saving to sourcing for innovation. Also Gupta et al. (2006, p. 11) see a need to develop a long-term partnership between customer and vendor instead of an arm length project oriented relationship. They developed a model with which they show that offshoring of more complex and strategic projects are favourable in the course of time and with longer experience. Their simulations predict that the offshoring of more strategic tasks leads to higher profitability and sustainability (Gupta et. al., 2006, p. 20).

3. EMPIRICAL RESULTS

This chapter presents and compares the results of the empirical data from German companies with and without experiences in offshore software development.

3.1 Methodology

An online questionnaire was conducted in 2004/05 at Pforzheim University to analyse the German experiences with offshore software development. The response quota was 8%. A total of 423 German companies answered. 136 of them have experiences with offshore development, 69 are planning to offshore software development within the next three years, 218 have no experiences. Mostly CIOs, CEOs or heads of software development departments filled in the questionnaire. It is a non-representative sample.

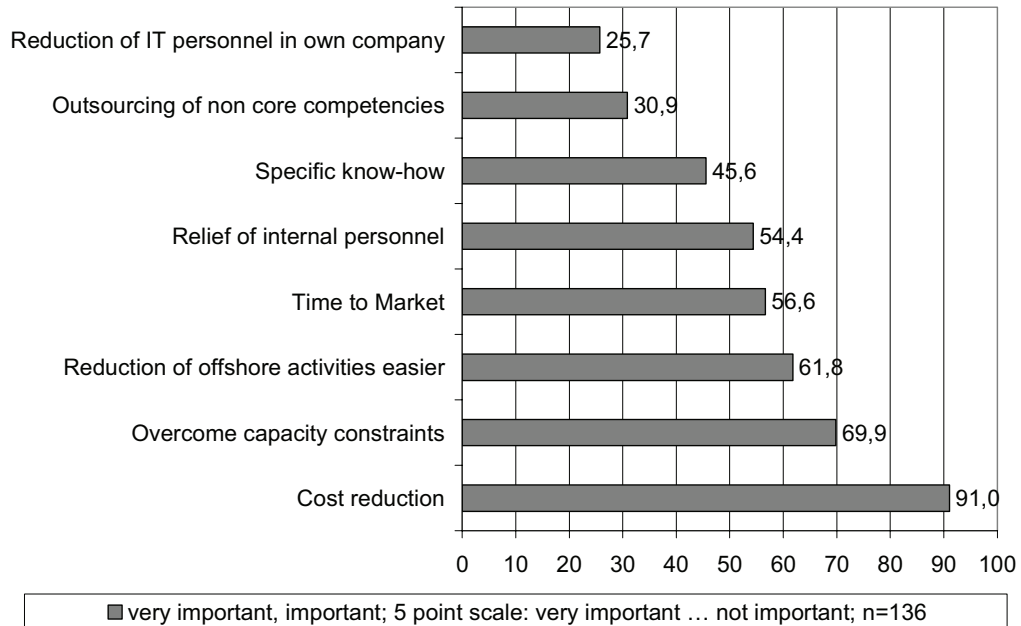
The data are analysed with descriptive statistics. Comparisons between variables are measured through Kruskal-Wallis-H tests on the level of $p \leq 0.05$.

3.2 Aims of offshoring companies

It is not astonishing that the first and most important reason for IT-offshoring for nearly all companies is cost saving. These results were also found for other countries like e.g. the United States or the Netherlands (Kraemer, Dedrick, 2004, p. 3, van Gorp, 2006).

Other important reasons for the offshoring of software development are to overcome capacity constraints, the fact, that reducing offshoring tasks with vendors or the reduction of offshoring personnel is easier than reducing IT-personnel in Germany as well as the aspect of acceleration the time to market and the relief of internal personnel at home for overtaking more challenging activities (see figure 1)

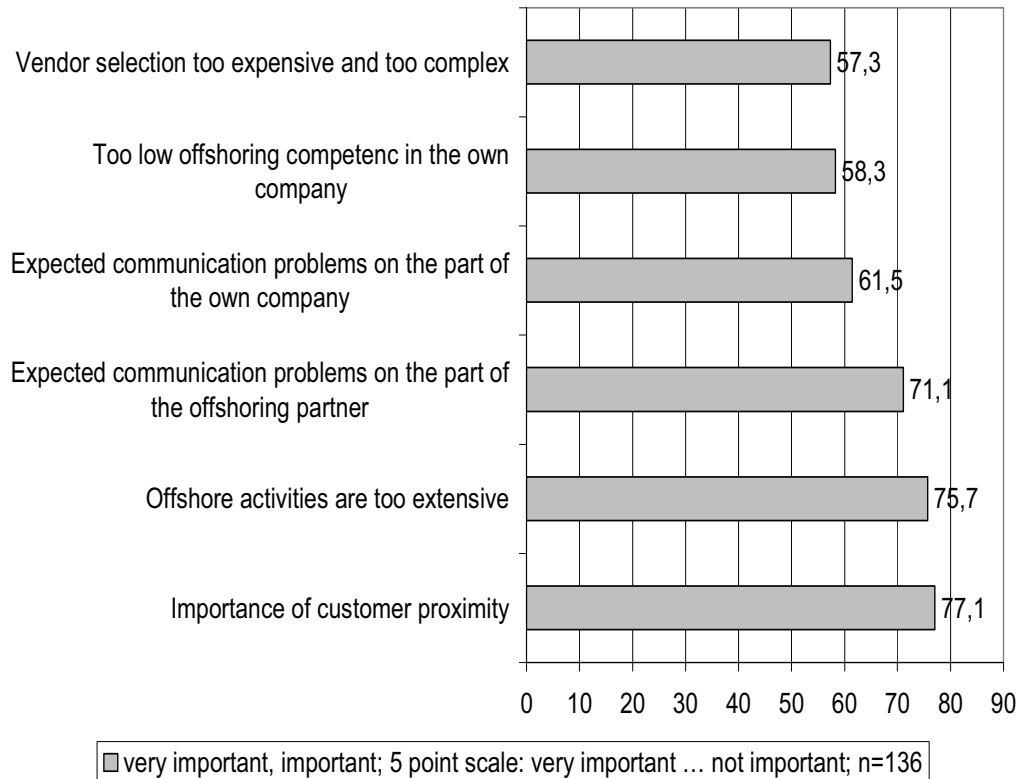
Figure 1: Aims of offshoring software development



3.4 Reasons for the non-application of IT-offshoring

For three fourth of the companies the most important reason not to apply offshoring is the importance of customer proximity (see figure 2). They see themselves not to be able to keep this proximity on a level, which is decisive for the intended quality of the customer relations.. Nearly the same number of companies estimates offshoring to be too extensive in supervision and controlling or expects communication and language problems on the part of the offshoring partner. The internal reasons which are crucial to keep the software development in the Germany are the expected communication and language competence of the own personnel as well as the lack of offshoring knowledge in the company itself. Moreover, companies see the selection process to choose an offshore destination and there an offshoring collaborate as too complicated and too expensive

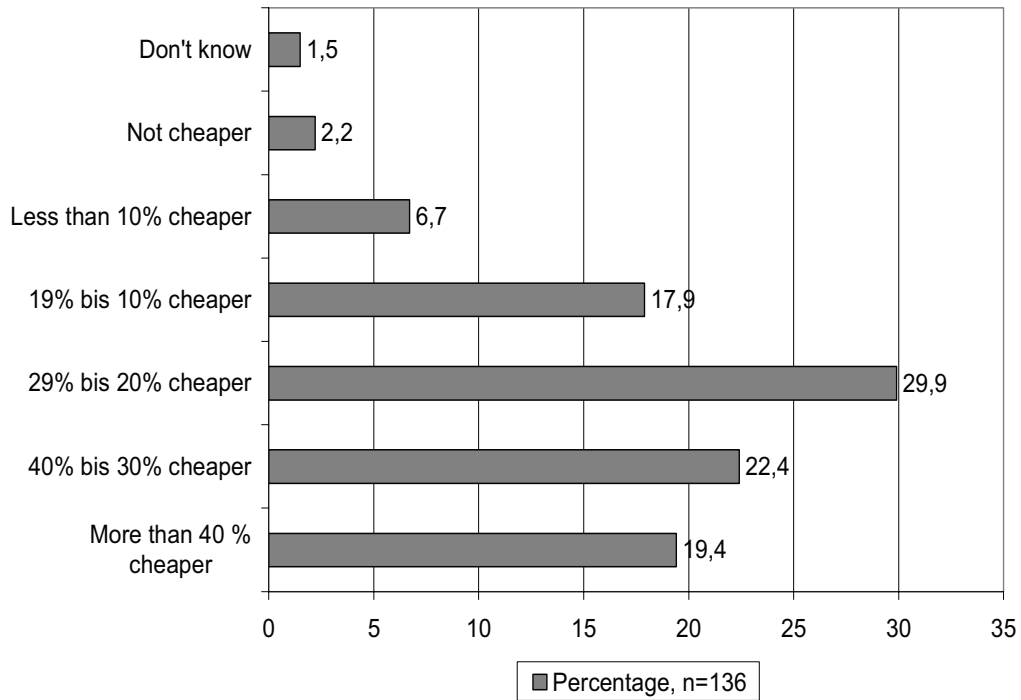
Figure 2: Most important reasons for abstain offshoring



3.5 Cost advantage, quality and co-operation in offshoring

The majority of the companies calculate a cost advantage of offshoring the software development of 20% and more compared with in house development (see figure 3). Besides that they are more than 80% of them are content with the quality of the deliverables and the competencies of their offshore vendor or their affiliate abroad.

Figure 3: Cost advantage of offshoring software development



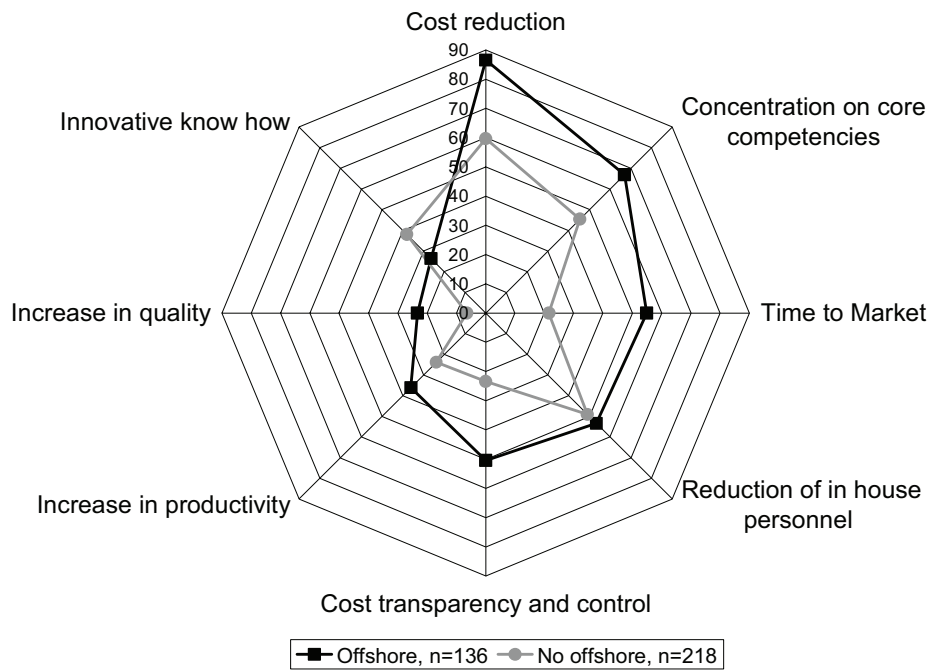
3.6 Comparison of advantages

A comparison of the advantages companies see in offshoring software development shows that the opportunities to cut costs are not only the most important aim of offshoring but also realized the most (see figure 4).

On the second rank of the advantages is the concentration on core competencies, followed by the acceleration of time to market. In addition, the majority of the companies evaluate the chance to reduce in house personnel as a main advantage of offshoring software development. The accesses to innovative know how and to increase quality is not a major advantage in the experience of the companies doing software development offshore.

The access to innovative know how is the only advantage, which is evaluated higher by the companies without own experience in offshoring, whereas they underestimate the chances of all other criteria.

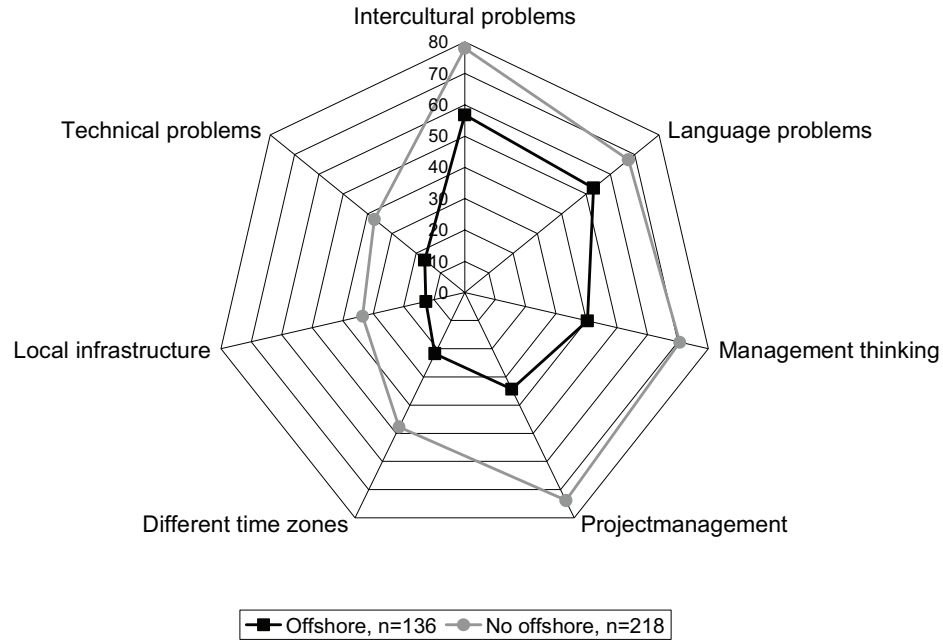
Figure 4: Advantage of offshoring software development in comparison



3.7 Comparison of problems

The most important problems that occur with offshoring are intercultural misunderstandings, followed by language problems. Nearly half of the respondents see management thinking and around one-third project management as problematic fields. Working in different time zones, the local infrastructure and the technique are of no consequence. Here, one can see clearly that companies without own experience overestimate systematically the problems combined with offshoring.

Figure 5: Problems of offshoring software development in comparison

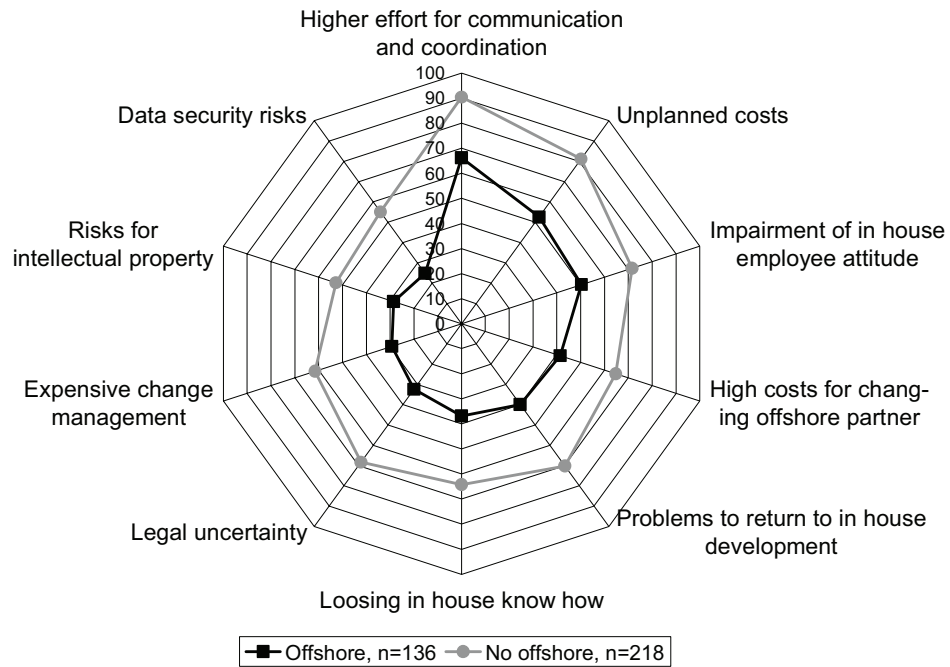


3.8 Comparison of risks

Companies without own experiences overestimate also the risks in offshoring systematically (see figure 6). Two third of the companies with own experiences in offshoring see the higher effort for communication and coordination as a high risk, more than 90% of the companies without own experience evaluate in the same way. The majority of the companies with experience also see in unplanned costs a high risk. They also evaluate the impairment of in house employee attitude as very risky because of the fear of employees to loose the job or have to accept wage cuts.

The other fields bearing risks are evaluated by less than have of the respondents with experiences as highly risky.

Figure 6: Risks of offshoring software development in comparison



4. CONCLUSIONS

Offshore development is an instrument for increasing the competitiveness mainly through cost cutting or overcoming capacity constraints. In the average companies save with offshoring 20% and more compared with in house development. Companies can access innovative know how also on the home market in Germany. There the advantages of offshoring nearly can be neglected.

Most companies are content with the quality of the deliverables and with the competences of the developers abroad. Difficulties occur from intercultural misunderstandings and language problems. Also the management approach and the project management have potentials for improvement.

Clearly one can see that companies without own experience in offshore development underestimate the advantages of this instrument and overestimate the problems and risks.

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Abstract

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Based on an empirical study conducted in 2004/05 at Pforzheim University this article analyses the expectations and experiences of German companies with offshore software development. The comparison shows that companies without direct experience with offshore software development underestimate the opportunities and overestimate the risks of this internationalization instrument.

Key words: *Offshoring, Internationalization, Transaction cost theory, Principal-Agent-Theory, International Software Development*