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## Abstract

*Many large enterprises develop their software nowadays in globally distributed settings. By using the option to outsource, the respective enterprises can realize decisive competitive advantages. In order to remain competitive, small and medium-sized enterprises (SMEs) are also forced to follow this trend and to outsource parts of their software development. However, most of the existing studies analyze the outsourcing situation in large enterprises, whereas the position of SMEs is being neglected and remains unclear. Main drivers for software development outsourcing decisions, suitable vendor locations, and problems occurring while realizing such projects may differ between large enterprises and SMEs. Therefore, in this explorative research paper we examine the outsourcing activities of eight SMEs in the German state of Baden-Württemberg. Besides the question why SMEs are choosing the outsourcing option we seek to find out, which countries are best suited for outsourcing activities of SMEs as well as which obstacles in particular hinder these enterprises in successfully conducting software development outsourcing.*

*Keywords: Multiple-Case Study, Offshore Software Development, Outsourcing, Collaboration,*

# 1 Introduction

The discussion about global information systems (IS) outsourcing is not new and has been widely studied by the research community and affected industries (Bode and Mertens 2006; Sahay et al. 2007; Heeks et al. 2001; Lacity and Willcocks 2000 etc.). The majority of existing work addresses general issues of IS outsourcing such as the identification of problems and risks, the analysis of success factors, the discussion of cross-cultural challenges, the choice of offshore partners, etc. Additionally, researchers propose different models and approaches for managing software development in international teams and give best practices for overcoming existing offshore challenges (Carmel and Agarwal 2001; Rottman and Lacity 2004; Gregory 2010). Large enterprises already take advantage of this knowledge; outsourcing of their software development belongs nowadays to their daily business. But also for small and medium-sized enterprises (SMEs) IS outsourcing is getting more and more important (OECD 2005). In order to sustain competitive advantages, SMEs are increasingly forced to concentrate on their core activities within the enterprises' boundaries and to source parts of their tasks to low-cost countries. However, SMEs are facing numerous challenges. They often do not have the knowledge and resources at hand for setting up a globally distributed software development environment. Most existing tools and methods (comprising collaboration suites such as Microsoft Team Foundation Server[1] or Rational Team Concert[2] with adequate collaboration methods) are unsuitable for SMEs, because they are too complex and require extensive and expensive trainings for employees. Distance presents a further challenge for software development outsourcing of SMEs: Geographical, cultural, temporal, and linguistic distance increase complexity and establish additional barriers in global software development outsourcing (Carmel and Agarwal 2001; Damian and Zowghi 2003; Casey and Richardson 2006; Noll et al. 2010).

In general, there are basic differences between large and small enterprises that may cause different requirements for SMEs to overcome the challenges in software development outsourcing. For example, the hierarchies of SMEs are often flat and most of their internal communication is on an informal level (Richardson et al. 2008). Additionally, reliance on flexibility in reaction to changing customer and market demands (Ferneley and Bell 2005) as well as lower financial possibilities (OECD 2000) cause pressure on SMEs to choose the right partners and contractual arrangements to prevent from negative consequences (Boden et al. 2007). Despite these points, Richardson et al. (2008) stated that the involvement of SMEs in global software development seemed to be quite often opportunistic instead of carefully planned.

There is sparse available research on the specific requirements of SMEs and the obstacles they face in global software development outsourcing. For instance, Dibbern and Heinzl (2009) examine to which extent IS functions are outsourced by German SMEs and which determinants are responsible for explaining the variation in the extent. Boden et al. (2007) are focusing on coordination practices in global IS sourcing while Ehresmann et al. (2007) are focusing on agile practices for SMEs. Additionally, Richardson et al. (2008) are showing ways of bringing the strategies of a reference model into practice in the case of two small Irish enterprises. Consequently, previously conducted research mainly focuses on issues that affect SMEs while having already established an outsourcing scenario and having decided on a specific outsourcing environment.

Thus, in this explorative, qualitative research paper, the software development outsourcing activities of eight SMEs in the German state of Baden-Württemberg are examined. Besides the question *why* SMEs opt for outsourcing we seek to find out, *which countries and organizational structure* are considered to be best suited for outsourcing activities of German SMEs as well as *which obstacles* hinder these enterprises in successfully conducting software development outsourcing. By knowing specific

[1] http://www.microsoft.com/visualstudio/en-us (visited on 03-29-2011)
[2] http://jazz.net/projects/rational-team-concert (visited on 03-29-2011)

requirements of SMEs it will be possible to provide suitable solutions and recommendations for further acting.

The remainder of the paper is structured as follows: In Section 2 we discuss in detail the selected research approach and give an overview of the interviewed enterprises. Section 3 describes the findings of our study and summarizes reasons and locations for outsourcing as well as the most common problems with globally distributed software development in SMEs. In Section 4, the findings are discussed in the light of existing literature. Finally, the conclusion and implications for further work are presented in Section 5.

## 2 Research Design

The aim of our research endeavor was to answer the following research questions: (1) What are the reasons for small and medium-sized enterprises in Germany to outsource software development? (2) Which outsourcing locations and convenient organizational structures are chosen by SMEs? (3) Which obstacles occur in outsourcing scenarios from an SME's point of view? To answer these questions, we conducted a multiple-case study with eight interviewees working for different SMEs in the German state of Baden-Württemberg.

The case study method was chosen as it allows a more detailed in-depth inspection of a phenomenon in its real-life settings than other approaches (Benbasat 1987; Eisenhardt 1989; Yin 2009). Semi-structured interviews were used as principal data collection method in order to gain a rich understanding of the drivers and obstacles in software development outsourcing.

Our multiple-case study reasons on the situation of enterprises while the data collection is based on interviews with individuals. In order to avoid problems with the unit of analysis, we have focused on a selection criterion which requires our interviewees to be experts in outsourcing whilst being on management level as well. Consequently, these persons have gained experience in one or more outsourcing projects for multiple years and are representative for the enterprise owing to their position. Prior to our interviews we conducted a pilot study with four other enterprises. The goal of this approach was to familiarize with the topic, gain preliminary insights, and to develop relevant lines of questions for the final interview guideline (Benbasat 1987, Yin 2009).

Each of the eight interviews included 30 open questions and took between 45 and 90 minutes. The interviews were tape-recorded and transcribed literally. The transcripts have been sent to the interviewees for approval and corrected if necessary to make sure the essence of each interview was captured correctly.

We coded and analyzed the resulting transcripts using the qualitative research software QSR NVivo. Following the coding by the first author, the second author assigned the statements to the respective categories. The comparison of the coding sets resulted in an inter-coder reliability of 94 percent according to Holsti (1969). The reasons for mismatches were always very obvious (e.g., in that one coder had simply overlooked an issue within a statement). Finally, we analyzed the single cases for statements related to our research questions, followed by a cross-case analysis for pattern matching. As a last step, we reiterated the single cases for deeper insights into the identified patterns and excluded rival interpretations to maximize internal validity (Yin 2009).

Table 1 provides an overview about the single cases. The table contains information about the eight enterprises except for the second column which provides information about the interviewee's position. For instance, the third column indicates the total number of employees per enterprise. To ensure the confidentiality of information, the names of the enterprises are masked using the letters A-H. All enterprises stem from the software development sector except enterprise A which defines itself as multimedia agency and develops multimedia solutions for large customers. According to the European Commission (2010) an enterprise qualifies for an SME if it fulfills the following criteria: the staff headcount is below 250 and the turnover is at most € 50 million or the balance sheet total is at most € 43 million. Each enterprise is subject to this definition with staff headcounts between 10 and 190. Re-

garding the software products, enterprise B develops a standard software solution whereas enterprises D, E, and F are specialists in creating individual software. Company C develops a standard software solution as well as individual solutions for its customers. The other enterprises usually customize standard software to customer specific needs. Each enterprise has some experience concerning global software development outsourcing, reaching from one to seventeen years. The major findings of the case study are presented in the following section.

| Enterprise | Interviewee's position | Staff headcount | Type of software | Sector | Outsourcing experience since |
|---|---|---|---|---|---|
| A | Technical consultant | 70 | Adapted standard software | Multimedia agency | 2001 |
| B | Director consulting | 120 | Standard software | Software development | 2000 |
| C | Head of software development | 190 | Standard and individual software | Software development | 2009 |
| D | General manager | 23 | Individual software | Software development | 2008 |
| E | Project lead | 130 | Individual software | Software development | 1993 |
| F | General manager | 10 | Individual software | Software development | 2008 |
| G | Head of software development | 160 | Customized standard software | Software development | 2008 |
| H | Division manager | 80 | Customized standard software | Software development | 2004 |

*Table 1. Overview of the Single Cases.*

# 3 Findings

The following subsections summarize our findings from the eight expert interviews concerning the questions *why* and *where* SMEs outsource parts of their software development and *what problems* they have been facing.

## 3.1 Reasons for Outsourcing

Outsourcing of software development activities gains attraction for small and medium-sized enterprises in Germany (OECD 2005). Often, enthusiasts refer to lower costs in developing countries when the outsourcing debate arises despite the fact that such endeavors often lead to unexpected additional costs (Dibbern et al. 2008). But outsourcing is not a uni-dimensional construct, even less for SMEs. Therefore, our first goal was to evaluate the key drivers that lead to software development outsourcing (SDO) decisions of SMEs.

First of all, we asked the interviewees about the strategic role that SDO plays in their enterprises. Enterprise A views SDO as a strategic option, the vendor's developers are used more or less as a kind of "extended workbench". An "extended workbench" in this regard relates to "a type of model where components are developed remotely and then brought together at the central site for integration and verification" (Sangwan 2007, p. 143). Enterprise B outsources all development projects; no single project is being developed in the home country. Therefore, for B it is not the question, what to outsource but rather how to outsource. Enterprise C uses SDO as strategic option in case projects demand more resources. In contrast, enterprise D currently uses its vendor as an "extended workbench", just like A. Developers in Germany work together with their colleagues on common projects at the vendor's site. However, enterprise D is planning to relocate the entire development activities to partners in low-wage countries. Enterprise E nowadays has the strategic option to outsource parts of the software

development if necessary. Similar to enterprise D, enterprise E is planning to intensify their SDO activities. For enterprise H, in contrast, SDO doesn't play a major role in their development activities.

Overall, our interview partners name six different reasons for software development outsourcing. Table 2 relates the interviewee's positions to the stated reasons. The table (as well as the following tables) has to be read as follows: y indicates that the interviewee perceives the factor *to be relevant* for the outsourcing decision. N indicates that the interviewee perceives this factor *not to be relevant* for the decision. Empty cells indicate that the interviewee didn't mention this point.

| | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **Sum** |
|---|---|---|---|---|---|---|---|---|---|
| Flexibility | y | y | y | y | y | y | | | 6 |
| Cost savings | n | y | y | n | y | y | n | y | 5 |
| Client pressure | | | y | | y | | | | 2 |
| Developers' quality / skill shortages | | | | y | | | y | | 2 |
| Round-the-clock development | | | | | | | | y | 1 |

y: relevant for the decision; n: not relevant for the decision

*Table 2. Reasons for Outsourcing.*

Six out of the interviewed eight enterprises regard flexibility as an important aspect in SDO. We follow the definition of a labor-based flexibility (Gertler 1988) and define flexibility as the ability to respond to market demands in a short period of time and thereby to supplement lacking in-house manpower. For instance, A states: "Sometimes there are many projects, sometimes there are only few projects. In 2001, when the Internet bubble burst, we had few projects, so we had to fire people. This is not a nice thing, especially since we had to hire people with the same skills a few months later again. To buffer these peaks, we came to the conclusion to use a nearshoring[3] team." B reports similar problems: "If we have too many or too few projects on short notice, then we can buffer that with developers that are otherwise not on our payroll. If we need more resources, then we ask our vendor if we can get more developers." D emphasizes the "hire and fire" mentality of some vendors: "If I need many developers very fast, I am more flexible with my vendor. Just as well I can get rid of them, that's the charm of it. It is like a scalable workbench." E mentions similar advantages when needing more people: "From time to time our capacity is the bottleneck. Our clients decide late to start a project. We then have to react very fast. We are happy that we have a partner who can take much faster people on board compared to us."

When it comes to cost savings of SDO, our interviewees are not as clear as with the first driver. On the one hand, interviewee A states, that "cost considerations play a minor role". Additionally, interviewee D explains that SDO is even more expensive than developing in-house in the home country. This is strongly related to higher communication and administrative costs. Interviewee C expects cost savings only in the long run: "From my personal perspective, I expect this to be profitable in the long run, but it is rather the very long term. It is natural to ask whether the wages raise there as well in the long term." Likewise, interviewee G states that "we do not only look at the cost. This is not the primary topic". On the other hand, the rest of the interviewees consider the potential cost savings as a major driver. For example, interviewee E explains: "It is mainly for cost reasons."

Moreover, two of our interviewees reported pressure from their own clients as a driver for their own SDO decisions. C, for instance, states: "Our large clients wanted us to outsource. Therefore, we went to India. The client wanted the development to be accomplished in India. In Germany, only process analysis, specification, and supervising should take place." Additionally, E adds cost pressure of the

[3] Nearshoring refers to "global outsourcing from countries that are 'closer' to the client's home country in terms of geographic, temporal, historical, political, cultural, and other types of client-vendor distance" (Gregory 2010, p. 2). Less specific, Abbott and Jones (2002) define: "Nearshore software outsourcing refers specifically to situations in which software development centers are located outside of the outsourcers host country, but in the same, or a similar, time zone, and which can be reached by a short-haul flight from the outsourcers site."

clients: “The clients ask actively for cheaper prices. We tell them that it is possible if we outsource parts of the project. If the client has no objections, we can offer this option.”

Other aspects that are mentioned by two of the interview partners are the developers’ quality and skill shortages in regard of the needed technologies. Interviewee G, for instance, explains: “In the middle and long term, we will not get enough employees with the desired skills. We have to be prepared for this situation.” A reason for this is the expected scarcity of specialist workers in Germany.

Round-the-clock development doesn’t seem to be important for SMEs. Enterprise H is the only one to consider this as a major driver for SDO: “SDO is especially important in the hot phase when a project must be completed and change requests and errors emerge. We have a team working abroad that identifies and documents errors as well as change requests. Another team can realize the change requests and fix the errors overnight in their regular working time. That is quite a nice side effect.”

In a nutshell, it seems that a shift in the mindset of the deciders in SMEs takes place: Outsourcing decisions are not only driven by cost savings but even more by a gain in flexibility. Almost all interviewed enterprises confirm that lack of specialists in the IT sector is becoming a critical factor in the future and could only be balanced by outsourcing of software development. Cost savings are still relevant as well, but they will become less important in the long term.

## 3.2 Outsourcing Locations and Organizational Structure

As stated earlier, the second goal of our study was to examine which countries are considered to be best suited for outsourcing activities of German SMEs and to explore the organizational structures of applied engagement models (e.g. third-party, joint venture, or captive). This part of our research supports the confirmation or refutation of existing literature stating that domestic outsourcing is less challenging than sourcing into offshore countries observed through the lens of German SMEs (Carmel 2006, Oshri et al. 2007). As Table 3 shows, most of our interview partners prefer Eastern European sites for their outsourcing activities. Enterprise G sources parts of the development to the USA to access required expert knowledge. Enterprise H is the only one to develop in a – from a German perspective – “classical” outsourcing country such as India. Additionally, Table 3 shows the countries in which our interviewed enterprises developed software and failed. Enterprises D and F report significant project failures in Asian countries (D: “We once had a project with a software development company in India. That project failed terrifically”), enterprise E once developed in Tunisia. Tunisia can be seen as nearshoring location from a Central European point of view. But the existence of various cultural differences compared to Central Europe caused many project failures. Enterprises A, C, and G failed in Eastern European countries. However, enterprises A and C still run nearshoring projects. A very exceptional constellation of current and failing outsourcing country is provided by enterprise A. Even though a previous project failed in Ukraine, A still relies on its outsourcing partner in Eastern Europe and does not consider the selection of the location as main aspect of the project failure.

| | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** |
|---|---|---|---|---|---|---|---|---|
| Current outsourcing location | Ukraine | Bulgaria, Belarus, Russia | Hungary | Ukraine | Russia | - | USA | India |
| Negative experience in | Ukraine | | Bulgaria | India | Tunisia | Indonesia | Romania | |

*Table 3. Today’s Outsourcing Locations and Negative Examples.*

Complementary to the countries where the enterprises currently develop software, we asked which regions seem to be eligible for SDO projects. Table 4 provides an overview of the according results. Supplementary to the findings of Table 3, it can be seen that Eastern European countries seem to be most attractive for SDO of SMEs, followed by countries that are located within the European Union (EU). South and North American countries play only a minor role in outsourcing decisions of German SMEs. However, only two of our eight interview partners consider vendors from the Asian region to

be able to develop their software. Four of the enterprises exclude Asian vendors explicitly from their options. This is also the case for South America. Finally, enterprise E has no preference for a particular region.

| | A | B | C | D | E | F | G | H | Sum |
|---|---|---|---|---|---|---|---|---|---|
| Eastern Europe | y | y | | y | | y | y | y | 6 |
| European Union | | | y | | | y | y | y | 4 |
| Asia | n | n | | n | | y | n | y | 2 |
| North America | | | | | | | y | | 1 |
| South America | n | | | n | | | n | n | 0 |
| No preference | | | | | y | | | | 1 |

y: eligible region; n: not an eligible region

*Table 4. Eligible Regions for Software Development Outsourcing.*

The final part of this subarea of our interviews deals with the appropriate organizational setup of SDO scenarios. As Table 5 shows, six of the enterprises regard the assistance of third party vendors as a feasible solution. Half of the enterprises also regard own subsidiaries in low-cost countries as feasible solution (captive outsourcing) whereas enterprises A, D, and F don't consider this to be suitable. For instance, A states: "We never thought of establishing a subsidiary abroad". C on the contrary side adds: "It is important to have own employees and thus control". Enterprise G is the only one that thinks about joint ventures in low-cost countries.

| | A | B | C | D | E | F | G | H | Sum |
|---|---|---|---|---|---|---|---|---|---|
| Third party vendor | y | n | | y | y | y | y | y | 6 |
| Own subsidiaries | n | y | y | n | y | n | | y | 4 |
| Joint venture | | | | | | | y | | 1 |

y: viable organizational structure; n: not a viable organizational structure

*Table 5. Organizational Structure.*

Apparently, SMEs consider sourcing to third party vendors in nearshoring countries as good solution for their problems regarding flexibility. SMEs even use the option to establish own subsidiaries in low-wage countries in order to maintain management and control. Thus gaining flexibility and at the same time maintaining control seem to be the main drivers for the applied engagement models.

## 3.3 Obstacles

The final section of our study dealt with occurring obstacles that SMEs have to manage while outsourcing software development activities. Hence, we have taken strategic aspects of outsourcing as well as specific risks that can emerge on the client side into account when researching obstacles (Earl 1996). Furthermore, we assumed for successful outsourcing that "a company must be capable of managing the IT services first" (Earl 1996, p. 27). Table 6 provides an overview of major drawbacks that our interviewees were faced with. First of all, we can state that our interviewed SMEs mainly blame missing domain knowledge, different cultures and mentalities, as well as the additional communication effort to be responsible for less outsourcing success than expected. For instance, G states: "Since you always act within a common ecosystem where you don't have to talk about certain things then, out of a sudden, things go wrong" when an outsourcing partner participates in such a well-acting system. Interviewee B expressed missing domain knowledge with the following description: "When I talk about automatic teller machines everybody here [in Germany] knows what an automatic teller machine is. In China, the developer might not know, just because of his cultural background. The transfer of concepts is complex." While enterprise B was referring to a specific machine with appropriate processes, another example for the difficulty with domain knowledge was reported by E: "It is not

easy to explain the German school system or financial systems within the public sector to a partner. They live in a different manner; they have other systems over there."

| | A | B | C | D | E | F | G | H | Sum |
|---|---|---|---|---|---|---|---|---|---|
| Different culture/mentality | y | y | y | y | y | y | y | | 7 |
| Communication overhead | y | y | | y | y | y | y | y | 7 |
| Missing domain knowledge | | y | y | y | y | y | y | | 6 |
| Language | y | y | y | y | y | | n | | 5 |
| Additional work / extra costs | y | y | | y | | y | | y | 5 |
| Time difference | | | | y | | y | y | y | 4 |
| Spatial distance | y | y | | y | | y | | | 4 |
| Knowledge transfer | | | y | | | | y | y | 3 |
| Increasing wage level | | | y | | y | | | | 2 |
| Hidden costs | n | | | y | y | n | n | n | 2 |
| Lack of trust | n | | | | | n | y | n | 1 |

y: obstacle; n: not an obstacle

*Table 6. Obstacles in Global Software Development for SMEs.*

Furthermore, language also plays an essential role when SMEs get software developed from an external vendor. Five interviewees indicate that project goals have not been met due to language issues. While some SMEs have not established a translation policy yet, others report precisely defined strategies and well documented process descriptions. The interviewed enterprise and their partner either collaborate in the same language or translate requirements and necessary documents in a commonly accepted language. Nevertheless, the majority of our interviewees states that either strategy leads to information loss, especially when both commonly agree on English as mediator language. Company A states for instance: "We have to work longer on specific features and we have to discuss longer until both parties have the same understanding of one discussed task. That is caused by the language barrier. English is for neither of us the mother tongue. When I discuss something it can happen that this is comprehended in a wrong way." Interviewee D reports similar problems when he states: "The English language of our partner is partially very bad. You can understand them tolerably when they talk. However, we have the impression that not all discussed concerns were absorbed by them when we talk."

While large software enterprises advertise global sourcing with the follow-the-sun principle and faster time to markets (Carmel and Agarwal 2001), SMEs consider different time zones and spatial separation as obstacles in outsourcing partnerships. For instance, B reports: "The general problem is always that when I develop [software] here, I go to the room next door and discuss the problem together with my developer right on the screen until he understands what I mean. This is much more difficult when your software is developed abroad."

Likewise, all enterprises that indicated drawbacks by spatial distance and time difference preferred lean problem solving by closeness and the ability to see each other face-to-face. "That was very difficult due to the time difference, since we only had three or four hours when our office times overlapped," stated interviewee F. This evidence is also emphasized by the fact that only one interviewee stated that round-the-clock development is an advantage for SDO while none of the others did so (cf. section 3.1).

Additional work and knowledge transfer were mentioned from several enterprises. Own technological shortcomings are reported by A: "We once had a project to be developed in Flash. I did the coordination on my own even though I was not well skilled in Flash. So I was able to see changes in the source code but I was not able to judge their optimality. When we had to work on change requests it was obvious that this procedure was not good. Then we found out about suboptimal parts of the code that I was not able to be aware of before." Additionally, H mentions financial aspects: "It is risky to have

additional expenses and extra costs. Then I come to the point where I have a project that isn't valuable anymore."

Interestingly, two interviewees stated increasing wages as current issue whereas the majority of our basic set considered low wages not as decisive criterion for their near and far shoring projects (cf. Section 3.1). Against recent behavioral studies within the outsourcing domain (Dibbern et al. 2008) hidden costs (in terms of unexpected costs) were not considered as problem by our interviewees: An example for this can be found in the statement of A: "We know that we will have an increasing communication effort and that project schedules extend by one third when we outsource. It is also a fact that a developer in Ukraine is not that much cheaper than a developer in Germany. When taking the whole price into account and not only the labor costs, then you come to the conclusion that the expenses are almost equal to an internally hired person within our branch. However, one has the advantage that there are no ancillary labor costs and developers can be exchanged easily in case of conflicts." G adds: "I don't consider [hidden costs] as risk. That is something one knows upfront." This is in accordance with our findings of Section 3.1 that flexibility and not financial aspects are the most important factors that lead to SDO decisions.

Trust was only mentioned once as a critical factor in software development outsourcing. Even three out of eight affirmed that trust had not been an obstacle when conducting such projects. By interviewee F, trust is seen more critical "within larger projects with more people involved". In most cases distrust was avoided by a smart selection of the outsourcing vendor and existing relationships between the partners as in the case of A: "My project coordinator [from the external side] and I have established a leveled environment; I will hold on that. He participated right from the beginning. I trust him that he takes care of the involvement and effort of the people from there and that they work and do a good job."

Obviously, by mentioning a multitude of challenging factors in SDO many aspects of already researched phenomena have been affirmed. Nevertheless, some issues such as cultural factors, communication overhead, and lacking domain knowledge have been shifting significantly to the center of consideration and will be discussed in the following section.

# 4 Discussion and Limitations

In this section, the findings of the research are discussed in the light of existing literature. Finally, recommendations for SDO vendors according to our observations are given.

For SMEs in Germany the gain in flexibility is the main driver for SDO. This result contrasts the statement from the ACM Globalization report (Aspray et al. 2006), that cost savings are the primary driver for outsourcing. Unlike for large enterprises, cost savings are not the main aspect: on the one hand, these aspects play a major role, but on the other hand a large part of our interviewees is realistic enough to know that costs are not uni-dimensional constructs and transaction costs may lead to even higher efforts in outsourcing scenarios (Dibbern et al. 2008). A reason for the emphasis on flexibility compared to cost issues as main driver for SDO in SMEs might be the *relative realized* gain in flexibility: SMEs with, for instance, 10 developers realize a relatively large gain in flexibility in regard of their developer headcount when collaborating with a third party vendor on software development projects. Adding 20% manpower in a short period of time may be more worth than realizing small-scale cost-savings. For large enterprises, the situation is different: enterprises with, for instance, 10.000 developers have to think big when outsourcing parts of their software development. When realizing similar gains in flexibility of 20% as the just mentioned SME, 2.000 additional developers in outsourcing locations would have to be hired. Here, cost issues play a much larger role, especially in the mindset of the deciders. Adding only a few developers from abroad would not lead to that much gain in flexibility that it would outperform against the cost issue. The other drivers mentioned in Section 3.1 do not play such an important role for most enterprises. Therefore, for outsourcing vendors that target the growing market of SDO for SMEs it seems to be recommendable to implement highly flexible processes and pricing models.

Apparently, most SMEs consider the nearshoring option to be the most promising. This result is in contrast to the findings of Wildemann (2005), where it was found that the majority of large German enterprises sources work packages to India and China and only 29% go to Eastern European countries. However, some of the interviewed SMEs started their outsourcing activities in offshore regions and came soon to the conclusion that the farshore option is not suitable for their organization. This corresponds to Lacity et al. (2009) stating that domestic outsourcing is the preferred option with regard to cultural differences, knowledge transfer, and control issues. Also, we report a difference in the mindset of deciders in SMEs here, compared to large enterprises. Deciders of SMEs know about the obstacles in outsourcing; going to a nearshoring location reduces some of these issues. In contrast to large enterprises, SMEs have to reduce complexity in globally distributed software development. Large enterprises, on the contrary, are often able to deal with complex scenarios and can thus decide for the lower-wage farshore destinations. Drawing on our findings of Section 3.2 we report a first learning curve by SMEs in this regard.

In most of the cases, software development projects are being outsourced to third party vendors, but even in half of the cases, own subsidiaries have been build. This is in accordance with the gain in flexibility mentioned above. Building own subsidiaries in low-wage countries is a time- and cost-intensive endeavor. For SMEs, this effort hardly pays off due to the relatively high set-up costs compared to the realized gain in resources. Again, the preferred organizational setup in outsourcing scenarios for SMEs seems to change over time from own subsidiaries to third party vendors.

Referring to the obstacles for SMEs, many of our interviewees point out missing specific knowledge as major drawback in SDO, which is congruent with the research of Levina and Vaast (2008). Furthermore, a very broad range of obstacles was already stated by Carmel and Nicholson (2005): “Communication may be impacted by technical issues such as telecommunications infrastructure, cultural differences, accents, and language ability” (Carmel and Nicholson 2005, p. 33). Even environmental aspects such as “time-zone differences may lead to coordination difficulties” (Carmel and Nicholson 2005, p. 34) have already been in the focus of SDO research. Additionally, the danger of hidden extra costs caused by knowledge transfer from the client to its vendor has been identified as a major issue (Dibbern et al. 2008). The identified obstacles differ between large enterprises and SME only to a marginal degree. However, solutions that assist enterprises in solving these issues might differ between the different types of enterprises. Consequently, further research in that area is well advised to set its focus on supporting SMEs in overcoming the identified drawbacks by offering new methods or approaches. As we have identified in our study, missing domain knowledge, cultural issues, language problems, as well as communication overhead should be addressed first.

Our work still contains some limitations that have to be taken into account. First, statistical generalization is hardly possible due to the limited number of cases. However, statistical generalization is not the goal of the case study method; analytical generalization is still possible (Yin 2009). Our results provide valuable insights into SDO of SMEs in Germany and question some of the existing research results especially of SDO in large enterprises in the context of SMEs. Second, due to our decision to use open questions in the interviews, slightly different answers were given compared to using closed questions. For example, as presented in Table 2 we asked the interviewees for their reasons to outsource. If somebody used the term flexibility (or synonyms), we marked the respective category. If the person has not mentioned the term, we did not ask whether this might be a reason, as we would have when using a closed questionnaire. However, this research layout can lead to less interviewer biases (Yin 2009). Third, our results base on single interviews per case which may have an impact on the rigor of our results. The same holds true for the fact that we were only able to include principals and no agents into our studies.

## 5 Conclusion and Further Research

Nowadays, for SMEs in Germany it is not the question if outsourcing is necessary but rather how to successfully manage the required outsourcing activities. Especially the need of flexibility and the

chance for lower development costs are the main drivers for SDO decisions. But instead of going to "classical" outsourcing destinations in Asia, SMEs nowadays often opt for the nearshoring option. Therefore, for the enterprises participating in our case study, Eastern European countries are the most attractive. We have seen that the realization of components in large development projects is to a large extent outsourced to third party vendors abroad. Despite a huge amount of research in the outsourcing domain, SMEs are still facing a lot of obstacles that hinder them to complete development projects in a satisfactory manner.

However, many of the problems resulting in failed projects are tackled by SMEs themselves by means of adapted types of organization and renewed decisions regarding the outsourcing locations. However, the issues "identify the right components to develop abroad", "improve communication and collaboration" as well as "knowledge transfer" in small-scale settings need further academic advice. Especially solutions (e.g., tool-based or best practices) customized for the needs of SMEs are strongly needed. Further research should also include enterprises from other sectors, as, for instance, financial institutions. Finally, the study could be complemented by additional research work illuminating the agents of SDO.

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