A Readiness Model for Software Development Outsourcing Vendors

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Abstract

CONTEXT - Software development outsourcing has been growing steadily. However significant outsourcing failure rates have also been reported. One of the major issues in outsourcing business is that many organisations undertake software outsourcing initiatives without knowing whether or not they are ready to undertake them.

OBJECTIVE – The objective of this project is to develop a readiness model in order to measure the organisation’s (vendor) readiness for software development outsourcing.

METHOD – Two types of data will be collected in this research project: firstly, factors that can have a positive or negative impact on software outsourcing clients in the selection of software development outsourcing vendors; and secondly, how one can implement these factors.

EXPECTED OUTCOME – The anticipated outcome of this project will be a software outsourcing readiness model to assist software practitioners in the design of effective software outsourcing strategies. This model should assist outsourcing vendors in measuring the strength or weakness of software outsourcing activities.

1. Introduction

Due to offshore software development a software outsourcing has become an important process of global software development. Software development outsourcing is defined as a situation where a company (a client) contracts out all or part of its software development activities to another company (a vendor), who provides agreed services for remuneration [15; 27]. Over the last decade, many firms in the U.S. and UK have outsourced software development projects to offshore countries. More than 50% of the American Fortune 500 firms and an increasing proportion of European and Japanese firms are users of offshore software outsourcing [29]. The trend towards software development outsourcing has been growing steadily and the United Nations World Investment Report 2004 predicted the 18-fold increase in outsourcing of IT-enabled business processes between 2002 and 2007 [34].

There are many reasons for software development outsourcing [6]. Small and medium sized companies with limited resources and technical expertise are best served by outside contractors. Large companies may use an outsourcing strategy in order to experiment with new information technologies without making an upfront investment. Large companies may also use software development outsourcing due to limited availability of software development expertise at the host companies and to reduce processing costs [2]. However the scope of software development outsourcing is expanding from focusing only on reducing cost to improving organisations’ overall business performance. Research shows that software quality plays a vital role in achieving business benefits [7; 13; 35]. Indian software companies have been reported to provide high quality software [3; 30]. This is the reason that in the software export market, India is a dominant software outsourcing provider [33]. In addition, more than half of all CMM level 5 companies in the world are located in India [17; 30]. These trends show that a software quality standards and models certification is used as one of the criteria in the selection of software development outsourcing vendors. In addition, software outsourcing clients use other criteria for the selection of outsourcing vendors, i.e. vendors’ technical expertise, vendors’ prior experience and vendors’ organisational structure. This trend has led to a realisation that the organisations (vendor) readiness for software development outsourcing plays a vital role in the selection of software development outsourcing vendors.

This research is premised on the need to gain an in-depth understanding of different criteria used by the
software development outsourcing clients for the selection of software development outsourcing vendors. Understanding different selection criteria will lead software development outsourcing vendors in addressing those criteria in order to be fully ready for software development outsourcing initiatives. This may also help to ensure the successful outcome of outsourcing projects and long lasting relationships between clients and vendors [1; 5; 10-12; 19; 26; 28].

2. Aims and Objectives

The objective of this project is to develop a readiness model in order to measure the organisation’s (vendor) readiness for software development outsourcing. The model will assist outsourcing organisations (vendors) in evaluating their strength and weaknesses in terms of designing, implementing, and measuring suitable strategies to support their software development outsourcing activities.

In order to achieve this objective an empirical study will be conducted to explore what criteria do software outsourcing clients use for the selection of software outsourcing vendors. We aim to narrow the gap between software development outsourcing research and practice in such a way that is accessible to both practitioners and researchers.

3. Research Questions

There are two research questions that have motivated the work reported in this thesis:
1. What factors do software outsourcing vendors develop in order to have a positive impact on software outsourcing clients?
2. What barriers can undermine outsourcing organisations in the selection of software outsourcing vendors?

The software outsourcing readiness model will be developed based on an empirical analysis of practitioners’ experiences and perceptions of factors that can have a positive or negative impact on software outsourcing clients during the selection of software outsourcing vendors.

We will automate the readiness model in the form of a software tool in order to facilitate software outsourcing vendors in assessing their readiness for software outsourcing. This tool will perform different activities and will generate different assessment reports for the software outsourcing vendors.

4. Research Methodology

4.1 Data Collection and Analysis

Two types of data will be collected in this research project: firstly, factors that can have a positive (critical success factors – CSFs) or negative (critical barriers – CBs) impact on software outsourcing clients in the selection of software development outsourcing vendors; and secondly, how one can implement these factors.

For the identification of factors, a systematic literature reviews process will be used [16; 31]. A systematic review is a defined and methodical way of identifying, assessing, and analysing primary studies in order to investigate a specific research question [16; 32]. Systematic reviews differ from ordinary literature surveys being formally planned and methodically executed. They are intended to be independently replicable, and so have a different type of scientific value than ordinary literature surveys. In finding, evaluating, and summarising all available evidence on software development outsourcing, a systematic review may provide a greater level of validity in its findings than might be possible in any one of the studies surveyed in the systematic review. A systematic review protocol will be designed first in order to perform the systematic literature review.

For “how to implement” factors that have a positive or negative impact on software development outsourcing clients, an expert panel review process will be conducted in order to seek opinions of software outsourcing experts about the guidelines or practices required to implement these factors in the vendor organisations. These experts will be selected on the basis of their experience in the software development outsourcing industry and/or list of publications in the area of software development outsourcing. We aim to find 5 experts (locally and/or internationally) in software development outsourcing research and practice. We have made preliminary discussions with these experts and we are in the process of explaining their role in this project.

4.2 Readiness Model Development

Five stages will be used to design this model as shown in Figure 1.

The first stage in the development of readiness model is to set criteria for its success.
The motivation for setting these criteria comes from literature [20; 21; 24] and by a consideration of the Technology Acceptance Model [8; 9]. The following criteria will be used:

- **User satisfaction**: end-users need to be satisfied with the results of the readiness model. End-users should be able to use the readiness model to achieve specified goals according to their needs and expectations without confusion or ambiguity.

- **Ease of use**: complex models and standards are unlikely to be adopted by the organisations as they require resources, training and effort. The structure of the readiness model should be flexible and easy to follow.

Stage 2 is the stage where data will be collected and analysed. Stage 3 is the stage where rationalization and structuring of results will be performed. Based on the empirical findings, in stage 3, the readiness model will be developed. In the final stage an evaluation of the readiness model will be performed.

Figure 2 shows a planned structure of the readiness model. It also shows the relationship between software outsourcing readiness levels, CSFs and CBs and different practices used to implement CSFs and CBs. It demonstrates how readiness levels indicate software development outsourcing capability and how empirical findings will be fed into these readiness levels, CSFs and CBs and different measurement practices.

The structure of the readiness framework will be built upon the following three dimensions:

- Readiness levels dimension
- CSFs and CBs dimension
- Implementation dimension

The primary motivation for building these dimensions for readiness model emanates from our previous work in the field of software process improvement in which we have designed and evaluated the readiness model for software process improvement [21-25]. The categorisation of CSFs and CBs will lead us to design different readiness levels for software development outsourcing organisations. These readiness levels will contain different CSFs and CBs. Under each factor different practices will be designed that will guide how to implement each factor. The readiness framework in Figure 2 shows that organisations should address each factor in order to achieve a certain readiness level.
4.3 Readiness Model Evaluation

We aim to find 3 outsourcing organisations (vendors) for the evaluation of the readiness model. The case study method will be used to evaluate the readiness model as it is considered a powerful evaluation tool and can provide useful real world information [36]. Three case studies will be conducted where readiness model will be used to evaluate its effectiveness in software development outsourcing. At the end of these case studies, focus group sessions [18] will be conducted with the participants in order to obtain feedback about the readiness model. In order to structure the focus group sessions the criteria described in section 4.1 will be used, i.e. ease of use and user satisfaction.

We have chosen focus group sessions for feedback because the data from focus groups is mainly from the interaction between the members in the group without any suggestion or help from the researchers. The other reason is that the existence of subjects in a group of peers allows them to be more open about issues discussed than they will be in individual interviews [18].

5. Timeliness and Novelty

Software development outsourcing companies are facing many problems due to the absence of reliable infrastructure for software outsourcing. One of the key challenges is to handle complex communication and coordination problems in conditions of time and cultural separation [29]. Other challenges are to develop software development outsourcing practices, creating confidence and trust among the outsourcing companies and to manage the expectations of what can and what cannot be done in a distributed setting [29]. Research also suggests that half of the companies that have tried outsourcing have failed to realise the anticipated results [4]. There are many reasons for outsourcing failures [14]. One of the major issues in outsourcing business is that many organisations undertake software outsourcing initiatives without knowing whether or not they are ready to undertake them [4]. For example, Dun & Bradstreet survey found 50% of outsourcing relationships worldwide failed within five years due to poor planning [4]. In another study conducted in the UK and India, Sahay et al [29] have discussed different problems related to transfer of UK culture to India. They have also examined the role of power and control during this outsourcing business.

However, despite the importance of the global software development, little empirical research has been carried out on software development outsourcing practices in general and different aspects of organisation’s (vendor) readiness for software development outsourcing in particular. An empirical study in this area is expected to provide quite useful insight about the factors that may play a positive or negative role in selecting outsourcing vendors.

The anticipated outcome of this project will be a software outsourcing readiness model to assist software practitioners in the design of effective software outsourcing strategies. This model should lead vendor organisations to business benefits and should assist them in measuring the strength or weakness of software outsourcing activities. This model should also help vendor organisations in improving their software development outsourcing capabilities. Software development outsourcing capabilities improvement provides marketing advantage to organisations and helps them to compete internationally.

6. Research carried out to-date

We have made the following progress so far:
- Identification of problem
- Identification of research questions
- Selection of research methodology
- Decision on planned structure of the readiness model.
- Selection of evaluation method

We have started the first phase of data collection (i.e. systematic literature review). We are in the process of designing and implementing a protocol for systematic literature review.

We have also identified two outsourcing experts and we are in the process of arranging interviews with them.

7. References


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