

Industrial Validation of Software Outsourcing Partnership Model (SOPM): A Case Study Protocol

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Abstract: Software outsourcing partnership (SOP) is a type of client-vendor cooperative relationship for achieving mutually beneficial goals and is totally based on mutual trust and commitment. Usually, a fruitful outsourcing association may possibly convert to outsourcing partnership. The development of SOP depends on the employment of various factors like 'mutual inter-dependence and shared values', 'organizational proximity', 'reciprocal trust', 'effective communication', 'joint management', and 'high-quality production'. We have identified a list of 142 'practices' for 14 critical factors using Systematic Literature Review (SLR) methods. For the validation of the findings of SLR, an industrial survey was conducted. We have then distributed these factors and practices in five levels of the SOP model. The objective of this paper is the development of a protocol for evaluation of SOP model in the industrial environment. This evaluation will check the suitability of the newly developed model in real world settings and will inform about areas where model needs improvements according to the requirement of the software industry.

Key words: Systematic literature review protocol, software outsourcing partnership, case study.

1. Introduction

Collaborative relations such as outsourcing partnership over passing the traditional organizational limits and are an essential measure of today's trade success. Organization that struggles for competitive advantages via mutual aid creates new inter-organizational as well as intra-organizational arrangements and nets. Organizational relations in these nets go yonder the old-style order and supply sequence trades. In this type of relation, everything like investments, risks, profits and loss of joint struggles are distributed amongst allies. Long lasting corporate relationships are made based on reciprocal trust. Collaboration generally helps in reducing the expenditures of attaining and applying appropriate expertise and competencies required for effective professional developments. Collaborative associations are typically called associations, alliances, coalitions, joint ventures or partnerships [1]-[3].

In the course of the earlier two decades, partnerships have emerged is one of the key stratagems for growing organization in order to stay in the market competition [4]. A partnership is a cooperative association among autonomous organization(s). Partnerships might benefit organization to persist in competition by increasing efficiencies [4], joining new markets [5], giving new products and gain access to new resources pool [6].

Due to big economic changes, globalization, antagonism from low remuneration unindustrialized countries, and improvements in information technology (IT). From 1980 onwards various types of business

networks have been shaped such as strategic networks, multi-vendor contracts, different kinds of association, alliances, coalition, joint ventures, and partnership etc [7, 8]. Obviously different kinds of companies having not the same kind of needs, consequently considerably many kinds of associations are obligatory [9]. Software development outsourcing (SDO) companies now use a wide diversity of methods to source SD work; they outsource, develop in-house, broaden in-house competence through acquisitions, and shape joint ventures or partnerships with overseas organizations [9].

Software Outsourcing partnership (SOP) is a relation for a long time based on the renegotiations of mutual adjusted task and commitment that supersede the stated contractual terms and conditions as specified in the opening stage of the alliance [10]. It is flexible, long term and based on sharing of risks, benefits, future goals and visions. In practice, only a fruitful outsourcing relationship is a candidate for promotion to outsourcing partnership [11]. It cannot be instantly developed, but rather, it shapes with the passage of time [12]. A key difference in SOP and ordinary outsourcing is in their level of depth; SOP is a deeper relationship [8]. A relationship is said to be SOP, where the parties share confidential information about future plans, work together, combine resources, share risks and benefits, and make joint decisions to achieve mutual advantageous results [13]. Outsourcing partnership is a good tool to overcome technological uncertainty, because it can effectively deal with uncertainty, by sharing information of unexpected events in developments [14].

According to Kedia and Lahiri [15], the organizational business related work is currently endorsing extensive outsourcing of production work from developed nations such as the United State to numerous overseas outsourcee such as China, India, Ireland, Malaysia, Ukraine, Philippines, Russia, Pakistan and Latin America etc. This increase occurs because to stay alive in the current highly competitive industrial setting, a lot of new organizations involved in global outsourcing of product and services. Regardless the growths of international collaboration, the studies of partnerships between client and their foreign vendor have not attained sufficient consideration in the academic literature.

In order to identify SOP solution/practices for the execution of various Success Factors (SFs) from the perspective of a vendor, we have verbalized the following research question (RQ).

RQ1. What are the solution/practices, as reported in the literature for the employment of various factors in SOP from vendor's perspective?

2. Background

In literature, outsourcing partnership is divided into three diverse perspectives, (1) economic, (2) social and (3) strategic management [16]. The first one is based on two theories i.e agency theory and transaction cost theory. It looks at governance, coordination, productivity and financial connections between firms [17]. But it does not focus on reasons for outsourcing besides cost efficiency [16]. Social perspective is also based on two theories i.e relational exchange and social exchange, it emphasizes on the existence of trustful client-vendor relationship [16]. It is distinguished from the others by the fact that its focus on the issues such as mutual trust, equity, and cooperation. Further, there are communal goals and a written bond of mutual sureties between the parties [18]. Here the formal contract exists but it is not enough alone for the success of outsourcing arrangements [19]. In this perspective dissolution or extension of relationship is grounded on the bi-directional agreement [17]. The third and last one is based on the theory of resource dependency, it explains how firms achieve desired goals by implementing outsourcing paradigm [16]. However, it does not consider the issue of relationship management [16]. Previous research [20] classified the organizational relationship into two types:

A. Transactional style: This type of relationship is built through a proper agreement, here the procedures are well stated and in the case of disappointment to deliver the said services by any party is set on through

a court case or forfeit as defined in the bond.

B. Partnership style: It is based on sharing of risk and benefit. This type of relationship is view as a sequence of connections without a fixed endpoint, it requires to establish a way for monitoring and executing its processes [21]. From partnership view point, there are dual outsourcing types.

A) Service outsourcing: here a system management and integration service is provided without asset transfer. B) Asset outsourcing: it involves shifting of people hardware, and software to partner site [22].

Recently published studies by Lai [23] on the factors affecting partnership quality between service receiver and providers in outsourcing ventures. It also shed light on the connection flanked by the quality of partnership in outsourcing and the ultimate attainment of outsourcing benefits. The results show that factors such as shared knowledge positive effect shared benefits, organizational linkage positive effect commitment and predisposition, bi-directional dependency positive affect mutual benefits; commitment and predisposition, and commitment have a positive effect on outsourcing success.

Garousi et al [24] conduct a study, to find a list of practices for arrangement and steering collaborative projects. Through thematic exploration, they acknowledged ten risk factors and seventeen solution groups. Notable findings of the study was the indication of best solution i.e the most common ones ensure management meeting, the requisite for a supporter, be agile throughout the partnership, and shifting of the investigator to the industrial environment.

Developing a fruitful long lasting cooperative correlation among two diverse organizations appears to be more complicated and demanding as generally expected. According to Dwyer [25], development of partnership is a multifold practice in which psychosocial, economic and legitimate procedures are concurrently proceeding. Common objectives and directions, communication, reciprocal trust and assurance and partner compatibility are the constituent elements of a fruitful partnership [26]. The main motives for outsourcing partnership are cost savings, increased flexibility bi-directional decision making, acquiring to professional expertise, better-quality of service, free management time when there is lack of resources and improved financial control [27].

3. Research Method

Case study method is proven to be the most powerful instrument for validation in empirical software engineering [27]. In order to assess our recently developed model SOPM [30], we have planned to execute two case studies in SDO organizations. Upon the completion of every single case study, a focus group session will be arranged with the aim to obtain feedback from the participants. We will revise the model according to the suggestion of the participants.

3.1. Why Case Study Approach?

The case study procedure was incorporated because case study is a powerful tool for assessment [27]. It can generate adequate evidence in the real world industrial environs [28]. The method also offers subterranean acumens for problem resolving and assessment [28]. As the SOPM is developed to be used in the real world industrial setting, the case study investigation is a suitable technique for this situation. Real world case studies are in-dispensable because they:

1. Will inform about the usability and practicality of the SOPM in software development organization.
2. Will illustrate that the SOPM is well fit or suitable in the real world development environment.
3. Will point out regions where the SOPM cravings enhancement.

3.2. Aims and Objectives

We aim to narrow the gap between academia and industry, in the context of SOP in such a way that is

accessible to both researchers and practitioners. The objective of the case studies is to test our recently industrialized model.

3.3. Research Question

In order to achieve the settled objective the following research question is administered:

RQ1: Is the SOPM practically robust in reports of assessing organizations capability for SOP?

RQ2: Is the SOPM is easy to use and up to what extent the user is satisfied from the result of SOPM?

RQ3: Does there any area which needs improvements and how it will be improved?

3.4. Case Study Protocol Development

To increase thoroughness, repeatability and to reduce the researcher biasedness in a case study, proceeding to the actual process, we have settled a plan called protocol. The protocol proposes the case study procedures and plans by cataloging the particulars of several approaches for executing case study [30]. A first version was submitted for evaluation to an expert, as result of the review, he suggested some minor changes. The protocol was updated in light of the suggestion and then presented to the SERG (Software Engineering Research Group) at University for final comments and approval. Finally, it will be published as a research article.

3.4.1. Task distribution in case study

The following are the roles of the case study:

Implementation: Employment of SOPM in the case organizations.

Assessment/Analysis of results: Dr. Siffat Ullah Khan and Prof.Dr. Li hongqi.

Data collection: Sikandar Ali and Yang Zhongguo

3.4.2. Case selection for participation

We will identify an outsourcing organization from Pakistan Information Technology Board (PITB). We will invite different organizations to participate in the evaluation of SOPM through a letter of invitation. We have a plan to conduct two case studies in an outsourcing organization with in Pakistan. If more than one organization agrees to participate then we will select one organization on the basis of their experience in the SDO and their level of CMMI.

3.5. Execution of Case Study

To provide more confidence in the evaluation of SOPM [30], a case study will be conducted at vendor organization in Pakistan. That organization will be selected for a case study, which provided rich descriptions of their SDO projects and granted permission to release the case study results.

Firstly, we will send an invitation to various vendors' organizations for participation in the case study for the evaluation of SOPM. Finally, we will receive those organizations which agreed to participate in the study. If more than two organizations agreed to participate, then we will select organization based on their experience in software outsourcing. The management of organization will nominate their key members of SDO projects for participation in the case study to be conducted. A correspondence will be made both over emails and head-on negotiations for the period from one to two months, in order to develop their thorough understanding of the SOPM.

Prior to actual execution of the case study, we will send all the relevant documents including summary document, consent document, evaluation document and feedback recording document to the participant. We will also explain to them their roles in these case studies. During the case studies, we will give a few hours of training to participants so that they know all the processes of SOPM. In the training session, different components of the SOPM will be illuminated and participants will be stimulated to use the SOPM

self-reliant.

During the case study, the nominated participants will use the SOPM [30] and will assess the level of vendor's capability for SDO partnership activities of their respective company independently without any help or suggestion from the researcher.

3.6. Criteria for Case Studies

For the evaluation of our newly developed model SOPM, we have planned to use similar criteria as used by other researchers [31]-[33]. The motivation for setting these criteria comes from literature [31-33] and by a consideration of our previous work [34], [35]. The subsequent criteria will be incorporated.

Level of user satisfaction: This criterion highlighting on the gratification of the end user from SOPM. It states that whether end users are able to accomplish the listed goals and objectives according to their expectations and requirements while using the SOPM self-reliant without any ambiguity or confusion.

Level of ease of use: This criterion states that whether or not the SOPM is flexible and self-understandable. Those models and standards which require resources, training, and effort are usually not adopted by organizations.

Level of structure simplicity: This criterion stress to pinpoint any defects related to the structure of SOPM and how to improve those defects. During the case study we aim to obtain the perception of the participants in the following areas:

- Suitability of the assessment tool used for SOPM.
- Distribution of SFs and CRs across different levels.
- Distribution of practices/solution across the identified CSFs.
- Time complexity of SOPM i.e how much time users takes to measure vendor's partnership level.

3.7. SOP Model Development Stages

The model is built in five phase as pictorialize in Fig. 1. The first phase in the development of SOPM is to established success criteria. The inspiration for establishing these criteria motivated from literature [31]-[33] and by the thoughtfulness of our work [34-36]. Data gathering and analysis is phase 2. Streamlining and organizing of outcomes will be done in phase 3. Development of SOPM grounded on the survey outcomes is stage 4. Assessment of the SOPM through industrial case studies will be completed at the last phase i.e phase 5.

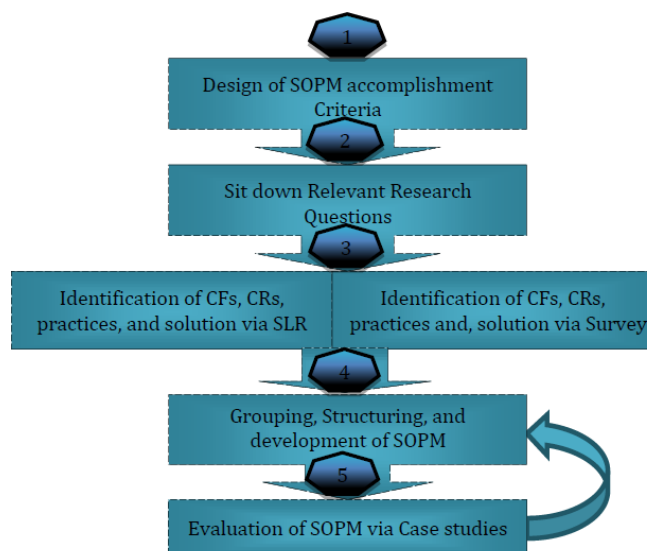


Fig 1. SOP Model development stages.

3.8. Feedback Session at End of Case Study

In order to acquire feedback about the practicality of SOPM, feedback sessions will be conducted with the participants. In direction to configure the feedback sessions the following criteria were used:

- To check ease of use of SOPM.
- To check the structure of the SOPM.
- To check user satisfaction level from SOPM.
- To review the factors.
- To review the practices.

Document for feedback session (questionnaire like document) was designed and used as a means to structure the feedback session. Each feedback session will be an informal discussion and the questionnaire will be filled out by each participant at the spot. Each questionnaire will be qualitatively analyzed.

4. Analysis and Expected Results

We have performed the following analysis of the data collected during the case study:

- To measure the capability of vendor organizations in SDO relationships for SOP.
- To measure score points for each success factors and practices at each company. If the sum of the average score greater than or equal to seven, then the position of the success factors will be manifest as “Strong” (powerfully implemented) else “Weak” (dimly implemented).
- To analyze the feedback obtained at the focus group session with the participants at the company in order to check whether SOPM needs any enhancement.

The focus group session aims:

- To judge whether SOPM can be used effectively in the organization for the identification of strong and weak factors in the context of SOP.
- To judge whether SOPM is clear, easy to use and specifically helpful in measuring capability and implementing CSFs.
- To check the participant’s satisfaction with the assessment results and overall performance of the SOPM.
- To check whether the practices designed for each factor are easy to use and unambiguous.
- To check generalization and applicability of SOPM to SDO partnership organizations.
- To check the capability of SOPM of determining strong and weak area/factors in outsourcing organization for SOP formation.

5. Reporting

The target audience for the study is SDO organizations, researchers, and practitioners. The evidence discovered will help outsourcing vendor’s organizations in evaluating their strong suit and weaknesses in relation to designing, implementing, and measuring suitable strategies to support their SOP activities. The scholar will publish these findings in the form of a conference or journal articles and thesis subject to concealment issues of upholding the confidentiality of employee and organizations. Apart from this, the information gathered during feedback session will help the researcher to determine whether SOPM needs any improvement.

6. Schedule

Table 1 show, schedule for the case study. There are no hard deadlines if any of the phases got lengthier than expected will not create any problems.

Table 1. Schedule of Task

Step	Duration
Planning	One Week
Protocol Development	One month
Protocol Implementation/Evaluation	One month
Data Analysis	two weeks
Reporting	two weeks

7. Study Ethical Requirements

Prior to conduct case studies an ethics application was sanctioned by the respective university of the listed authors. The investigators planned the case studies' interviews to bump into the ethical requirements, i.e. protection of subjects from any deception, damage, and loss of privacy. The self-esteem and interest of contributors will be valued at all times. Approval from the host organizations will be gained before conducting the investigation. All contributors will be informed that all evidence gathered during the case study will be used for research purposes only. Such statistics will be kept in the AUTHORITARIAN CONFIDENCE. Any publication obtained from this case study will present facts in aggregate form such that individual respondents or organizations taking part in the research cannot be traced. Any willing participant can withdraw their participation at any time during this study. In addition, only the data collectors and the supervisory team will have access to the data. Additionally, participants will be educated about the nature of the research, through briefed documentation prior to the dissemination of the study results.

8. Potential Conflict of Interest

Not known

9. Divergences

We will record any divergence, which may occur during the study, from the protocol will be recorded in a new document and will append to this document.

10. Protocol Reviews/Validation

The protocol was initially looked over by my tutor and few amendments were suggested. Then, it was presented to Software Engineering Research Group (SERG) at the University for Post Review.

11. Conclusion and Future Direction

A good number individual's research works have been conducted in the field of outsourcing relationships for finding practices to implement success factors. But no SLR procedure has been carried out for the documentation of practices in SOP in general and to group the practices in model form in a systematic and collective way in particular. The paper at hand, present results of the one phase of a proposed study in form of case study. The study protocol is presently in the execution phase. We welcome empirical inquiries on this subject. This will sanction our results and also trajectory vicissitudes in approaches to SOP accomplishments over time.

In future, we plan to code SOPM in the form of the software application, in order to ease SDO vendors in implementing factors significant for developing SOP. This software application will be able to produce different valuation reports during the evaluation and will perform all activities related to SOP. Some of the functions of software tool are given below.

- Will assess each solution and practices to implement these CSFs.
- Finding the position of the CSFs implementation i.e. weak and strong.

- Providing the partnership level of the outsourcing organization.
- This tool will also guide the SDO practitioners in successfully assessing the organization's partnership level concerning CSFs.

Our upcoming work will focus, on the development of SOP framework. This paper contributed to only one milestone/deliverables of the proposed SOPM, the evaluation of SOPM through the case study.

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