

Intercultural Challenges in Offshore Software Development Outsourcing Relationships: A Systematic Literature Review Protocol with Preliminary Results

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Abstract

CONTEXT- Offshore software development outsourcing (OSDO) is an emerging business approach adopted by many software development organisations in developed countries. There are many motivations for developing software at offshore locations including access to large labor pool, low development cost, high quality and round-the-clock development. However, in spite of these motivations OSDO presents a variety of challenges to the software development organisations including temporal, geographical and intercultural differences. Intercultural differences cause many relationship problems between vendors and client organisations in OSDO.

OBJECTIVES- This research seeks to identify the potential intercultural challenges faced by vendor organisations in OSDO relationships by reviewing the literature in a systematic way.

METHODOLOGY- We have developed a systematic literature review (SLR) protocol, and are in the process of implementing the protocol. SLR is based on a structured protocol, and is therefore, different from ordinary literature review. SLR provides in-depth and more thorough results than ordinary literature review. SLR finding will be validated using case study method in different outsourcing industries.

EXPECTED OUTCOMES- The expected outcomes of this review will be the identification of intercultural challenges or barriers faced by vendor organisations in the establishment and maintenance of OSDO relationships. The final outcome of this research is to develop an Intercultural Challenges Mitigation Model (ICMM).

Keywords: Intercultural challenges, systematic literature review, outsourcing relationships

1. Introduction

Global software development (GSD) is increasing in popularity in today's Information Technology (IT) industry [1, 2]. GSD has become a key trend in the field of software engineering [3]. Software outsourcing is a modern paradigm in software engineering in the

context of GSD [4]. Due to the high adoption of offshore outsourcing (international outsourcing) we are interested in highlighting the intercultural challenges faced by vendors in offshore software development outsourcing relationships. Offshore software development outsourcing (OSDO) is a form of GSD which is established on contract-based relationship between client and vendor organisations and primarily used by client organisations for reducing software development cost [5, 6].

Over the last decade, many firms have started global software development (GSD) in order to reduce software development cost. The primary rationale behind the high adaptation of offshore software development outsourcing is low development cost [7-9]. Other motivations for OSDO include access to large labor pool, better use of scarce resources, reduction in time-to-market, and business advantages from nearness to customers [10-13]. The main reasons of switching to OSDO are reduction in development costs and development time especially via the use of follow-the-sun strategy [14, 15].

However, in spite of these benefits OSDO faces many challenges like complex communication and coordination problems in conditions of telecommunication requirements, cultural distance, geographical distance and temporal distance [16-20]. Earlier work suggests that half of the organisations that have tried GSD have failed to realize the expected results which have resulted in poor global relationships, misunderstanding of the projects' requirements, high costs and poor services [21, 22]. Different studies show culture as a critical success factor in software development outsourcing relationships [18, 19]. Understanding different factors in software development outsourcing relationships can help to ensure the successful outcomes of outsourcing projects and long lasting relationships between clients and vendors [23, 24].

The objective of this research is to identify the intercultural challenges/problems faced by vendors in OSDO relationships via Systematic Literature Review (SLR). The paper reports our study plan in the form of SLR protocol. This paper is an extended version of our published paper [25]. To understand intercultural challenges in OSDO relationships from vendor's perspective, the following two questions were formulated.

RQ1: What intercultural challenges or problems, as identified in the literature, are faced by vendors in offshore software development outsourcing relationships?

RQ2: What intercultural challenges or problems, as identified in the real practice, are faced by vendors in offshore software development outsourcing relationships?

2. Background

It is normally observed that people of one society strangely perceive the acts of the people of another society. Such act may have different significances in different societies. Generally, from their life experiences people develop a set of rules and procedures for meeting their needs. Such set of rules and procedures along with a supportive set of ideas and values is called a culture. Culture is a very vast topic, you can find more than 164 definitions for culture alone [10, 26]. A well-known Sociologist and Anthropologist Sir Edward Tylor (1871) defines culture as "*Culture is that complex whole which includes knowledge, beliefs, art, morals, law, customs and any other capabilities and habits acquired by man as a member of society*". From the cited definition it is clear that culture has a great impact on almost all aspects of our life. Similarly culture affects activities involve in software development outsourcing. In the field of software outsourcing, the vendors need to understand the culture of their target clients and its impact on software development lifecycle and their relationships [27-29]. Developers must focus on the culture and linguistic requirements of the target countries and local groups including developers, customers, clients, and end-users [30]. There

are many social and cultural differences between workers in the US and Asians in attitudes towards authority, work ethic, sense of time, and the styles of communication. For example, U.S. client companies usually prefer to use informal telephone and email contact and specify every single detail items on the document. In contrast, Japanese clients prefer verbal communication rather than written documents and also tend to prefer to use electronic media more formally and less frequently [31].

Offshore software outsourcing engages people from different geographical locations and cultural backgrounds. This increases the need for research on the impact of national and cross cultural issues [32]. In our previous research work we identified culture as a critical factor for vendor organisations in OSDO [27, 29, 33]. The importance of culture in OSDO cannot be ignored. This is because cultural risks can “*make and break an offshore project*” [34]. A number of researchers have tried to address the impact of intercultural challenges in OSDO as mentioned below:

Ali Babar et. al., [23] study indicates that cultural understanding is a vital factor for gaining trust in the initial phase of outsourcing relationships. 100% interviewees considered cultural understanding as a critical factor for building initial trust. One of interviewees elaborated on the importance of cultural understanding: “*Ability to communicate in a client’s native language and familiarity with his/her culture can provide the biggest advantages or barriers to achieving initial trust.*”

Koh et. al., [35] study indicates that Conflict is inevitable in teams, and cultural misunderstandings often contribute to more disagreements and disputes, as members from different cultures handle conflict differently. Similarly language differences and differences in communication styles can lead to misunderstanding.

Teagarden et. al., [36] conducted a research on knowledge sharing among Chinese and Indian Multinational corporations (MNCs). They have argued that professional culture is a barrier in knowledge sharing among MNCs in China and India.

3. Systematic Literature Review Protocol for Intercultural Challenges in OSDO Relationships

Kitchenham defines three main steps in a systematic review process: planning the review, conducting the review, and reporting the review [37]. In this paper we describe the first step of a systematic review (i.e. planning the review). The output from this step is a systematic literature review protocol that defines the purpose and procedures for the review. Kitchenham notes that a pre-defined protocol is necessary to reduce the possibility of researcher bias [37]. This paper is an extended version of our previously published protocol in MySec 2011 [25].

3.1. Constructing Search Term

The following details will help in designing a search term relevant to our research questions.

Population: Offshore software outsourcing vendors and clients

Intervention: Intercultural challenges, or characteristics, or factors, or problems

Outcomes of relevance: Offshore software outsourcing Relationships

An example of the Research Question containing the above details is:

RQ1: [What intercultural challenges/problems] **INTERVENTION**

are faced by

[software outsourcing vendors]

POPULATION

in

[offshore software development outsourcing relationships] **OUTCOMES OF RELEVANCE**

The experimental design is not included in the research questions as we are open to the types of study and due to the fact that there do not appear to be standard study approaches in the area of software development outsourcing.

3.2. Search Strategy, and Search

The search strategy for the SLR is a plan to:

- a. Construct search terms by identifying population, intervention and outcome.
- b. Find the alternative spellings and synonyms.
- c. Verify the key words in any relevant paper.
- d. Use Boolean Operators.
- e. Integrate the search string into a summarized form, if required.

Results for a: RQ1: offshore software outsourcing, relationships, intercultural challenges or problems, outsourcing vendors

Result for b: Offshore software outsourcing: (“offshore software outsourcing” OR “information systems outsourcing” OR “information technology outsourcing” OR “IS outsourcing” OR “IT outsourcing” OR “CBIS outsourcing” OR “computer-based information systems outsourcing” OR “software contracting-out” OR “distributed software development” OR “multi-site software development” OR “global software development” OR “GSD” OR “offshore software development outsourcing” OR OSDO)

Relationships: (Relationships OR “teamwork” OR collaboration OR co-ordination OR alliance OR associations OR partnerships OR dealings OR contract OR interaction OR relations OR affairs)

Intercultural challenges: (“intercultural problems” OR “intercultural disputes” OR “culture problems” OR “Customs problems” OR “customs troubles” OR “intercultural harms” OR “cultural norms” OR “cultural barriers” OR “cultural risks”)

Negative impact: (“negative impact” OR “worse results” OR “bad effect” OR “terrible outcome” OR unpleasant OR “communication problems” OR failures)

Vendor(s): (vendor OR vendors OR service-provider OR dealer OR trader OR marketer OR seller OR developer OR salesperson OR retailer OR stakeholders)

Results for c: IS/IT outsourcing relationships, cultural barriers in software outsourcing relationship, cultural risks, outsourcing alliance, software outsourcing co-ordination.

Results for d: (“offshore software outsourcing” OR “information systems outsourcing” OR “information technology outsourcing” OR “IS outsourcing” OR “IT outsourcing” OR “CBIS outsourcing” OR “computer-based information systems outsourcing” OR “software contracting-out” OR “distributed software development” OR “multi-site software development” OR “global software development” OR “GSD” OR “offshore software development outsourcing” OR OSDO)AND (Relationships OR “teamwork” OR collaboration OR co-ordination OR alliance OR associations OR partnerships OR dealings OR contract OR

interaction OR relations OR affairs) AND (“Intercultural problems” OR “intercultural disputes” OR “cultural problems” OR “Customs problems” OR “customs troubles” OR “intercultural harms” OR “cultural norms” OR “cultural barriers” OR “cultural risks”) AND (“negative impact” OR “worse results” OR “bad effect” OR “terrible outcome” OR unpleasant OR “communication problems” OR failures) AND (Vendor OR vendors OR service-provider OR dealer OR trader OR marketer OR seller OR developer OR salesperson OR retailer OR stakeholders)

Result for e: The above search strategy was used to search the relevant literature in IEEE Xplore and ACM digital libraries. However no results were displayed and that is the reason that we integrated the search string by excluding the minor terms from our search strategy. The integrated search strategy, we used which worked successfully on IEEE Xplore, ACM digital library and CitSeer digital library, is given below.

(“offshore software outsourcing” OR “information systems outsourcing” OR “information technology outsourcing” OR “IS outsourcing” OR “IT outsourcing” OR “CBIS outsourcing” OR “computer-based information systems outsourcing” OR “software contracting-out” OR “distributed software development” OR “multi-site software development” OR “global software development” OR “GSD” OR “offshore software development outsourcing” OR OSDO) AND (Relationships OR “teamwork” OR collaboration OR co-ordination OR alliance OR associations OR partnerships OR dealings OR contract OR interaction OR relations OR affairs) AND (“Intercultural problems” OR “intercultural disputes” OR “cultural problems” OR “Customs problems” OR “customs troubles” OR “intercultural harms” OR “cultural norms” OR “cultural barriers” OR “cultural risks”)

3.2.1. Search String Breakup: The above search string is used as our search term. However, there are some databases/libraries like Springerlink and Google scholar that do not allow lengthy search strings; therefore we will split the above search term into smaller substrings and will do separate search for each of these search strings. The substrings for the stated research question RQ1 is given below. Each search term in research question is divided into two sub search terms.

Search string 1: (“Offshore software outsourcing” OR “information systems outsourcing” OR “information technology outsourcing” OR “IS outsourcing” OR “IT outsourcing” OR “CBIS outsourcing”) AND (Relationships OR “teamwork” OR collaboration OR co-ordination OR alliance OR “team work”) AND (“Intercultural problems” OR “intercultural disputes” OR “culture problems”)

Search string 2: (“Computer-based information systems outsourcing” OR “software contracting-out” OR “distributed software development” OR “multi-site software development” OR “global software development” OR “GSD” OR “offshore software development outsourcing” OR OSDO) AND (Associations OR partnerships OR dealings OR contract OR interaction OR relations OR affairs) AND (“Customs problems” OR “customs troubles” OR “intercultural harms” OR “cultural norms” OR “cultural risks”)

We used the above substring for the libraries like Springerlink, ScienceDirect and Google scholar but no relevant papers were found. That is why the after negotiation with the supervisor we designed separate strings for each library to obtain relevant papers. Search strings for the aforementioned libraries are given below.

String for ScienceDirect and Sringerlink digital libraries: (“Offshore software outsourcing” OR “information systems outsourcing” OR “information technology

outsourcing” OR “IS outsourcing” OR “IT outsourcing” OR “CBIS outsourcing”) AND (culture OR “Intercultural problems” OR “intercultural disputes” OR “culture problems”))

String for Google scholar library: (“Offshore software outsourcing” OR “information systems outsourcing” OR “information technology outsourcing” OR “IS outsourcing” OR “IT outsourcing”) AND (culture OR “Intercultural problems” OR “intercultural disputes” OR “culture problems”))

An initial scoping study was conducted to determine the resources to be searched, and the search terms to use for each resource. In this scoping study a trial search was conducted using the following search string on CiteSeer and IEEE Xplore digital library (“Offshore software outsourcing” OR “IT outsourcing” OR “IS/IT outsourcing”) AND (“intercultural challenges” OR “cultural risks”) AND (relationships OR contract OR co-ordination OR partnerships). The information retrieved through this search string was used as a guide for the development and validation of the major search terms. In the scoping study, some papers that were already known to be relevant were used to check the validity of the search terms. The resources searched in the scoping study included databases, specific journals, and conference proceedings.

3.2.2. Resources to be Searched: IEEE Xplore, ACM Portal, ScienceDirect, SpringerLink, CiteSeer and Google scholar

3.3. Publication Selection

3.3.1. Inclusion Criteria: The inclusion criteria we used to determine which piece of literature (papers, technical reports, or grey literature etc.) found by the search term will be used for the data extraction. We will only consider papers related to offshore software outsourcing and written in English language. The criteria are listed below:

- Studies that describe intercultural challenges/issues in offshore software development outsourcing relationships
- Studies that describe intercultural factors causing problems in offshore software outsourcing relationships
- Studies that describe intercultural factors affecting the continuation/termination of the outsourcing relationships

3.3.2. Exclusion Criteria: This section describes the exclusion criteria in order to decide which piece of literature found by the search term will be excluded/ ignored. The criteria are listed below:

- Studies that is not relevant to the research question.
- Studies that don’t describe intercultural challenges/problems in offshore software outsourcing relationships
- Studies that don’t describe the factors that cause the intercultural problems in offshore software outsourcing relationships
- Studies other than offshore outsourcing

3.3.3. Selecting Primary Sources: Initial selection of the primary sources will be performed by reviewing the title, keywords and abstract. The purpose is to exclude/ignore only those

results which have no relevance to the problem/research questions. The primary sources chosen in the initial selection process will be checked against the aforesaid inclusion/exclusion criteria by reviewing carefully through full text of the studies. The source will be sent to the secondary reviewer, for review in case of any uncertainty regarding the inclusion or exclusion decision.

3.4. Publication Quality Assessment

The measurement of quality is performed after final selection of publications. The quality of publications will be assessed in parallel at the time of data extraction. The quality checklist contains the following questions:

- Is it clear how intercultural challenges were measured/evaluated in offshore software outsourcing relationships?
- Is it clear how intercultural factors causing problems between clients and vendors were identified in offshore software outsourcing relationships?

Each of the above factors will be marked as “YES” or “NO” or “Partial” or “N.A”
 A secondary reviewer will score a small subset for validation.

3.5. Data Extraction Strategy

The review will be undertaken in a team work by the researchers. The inter-rater reliability test will be performed once the data is extracted

3.6. Data Synthesis

The data will be synthesized by creating one summary table having the columns (S.No, Intercultural challenges, Frequency, Percentages) showing the list of all the Intercultural challenges along with their frequencies and percentages.

4. Preliminary Results

The SLR protocol is currently in the implementation phase and we have got results for some of the aforementioned sections of the protocol. These are Sections 3.2, 3.3 and 3.4.

After applying the aforementioned search strategy described in Section 3.2 on the specified digital libraries we found 852 papers in total from the six digital libraries. The information of the primary and final selection for each digital library is given in the Table 1. Finally 60 papers were selected after applying the inclusion/ exclusion criteria. The list of these finally selected papers for data extraction is provided at the Appendix. Four papers were repeated in the ScienceDirect digital library, which were omitted from the final list of papers to remove duplication.

Table 1. Data Sources with Publication Results

Resource	Total results found	Primary Selection	Final Selection
IEEEExplore	59	25	12
ScienceDirect	308	44	15
ACM Portal	55	26	17
CiteSeer	35	8	7
Springerlink	341	25	3
Google scholar	54	13	6
Total	852	141	60

5. Conclusion and Future Work

Various studies have shed light on the impact of intercultural challenges in outsourcing relationships. However, so far, no systematic literature review process has been conducted for the identification of intercultural challenges in OSDO relationships. In this paper we discussed our study plan in the form of a SLR protocol. We have developed the SLR protocol and currently we are in the process of its implementation and have got preliminary results for few sections of the protocol. Our expected outcomes will be the identification of intercultural challenges faced by vendors in OSDO relationships. We will conduct an empirical study in outsourcing industry for the validation of our SLR outcomes and to find the practices for addressing these challenges.

Our ultimate aim is to develop an Intercultural Challenges Mitigation Model (ICMM). This paper contributes to only one component of the ICMM, i.e. the identification of the intercultural challenges via SLR. The eventual outcome of the research is the development of ICMM to assist OSDO vendors in managing relationships efficiently. The ICMM proposed will bring together and advance the work that has been undertaken on frameworks and models for outsourcing relationships.

6. Acknowledgment

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Appendix: List of Finally Selected Papers

1. Global software development and collaboration: barriers and solutions
2. Cultural intelligence and collaborative work: intercultural competencies in global technology work teams
3. Cultural influences and globally distributed information systems development: experiences from Chinese IT professionals
4. Removing barriers to trust in distributed teams: understanding cultural differences and strengthening social ties
5. Barriers in the selection of offshore software development outsourcing vendors: an exploratory study using a systematic literature review
6. Information “Bridging” in a global organisation
7. A comparative study of important risk factors involved in offshore and domestic outsourcing of software development projects: A two-panel Delphi study
8. Cross-Cultural collaboration in ICT procurement
9. Vendors’ perspectives on trust and control in offshore information systems outsourcing
10. Managing cross-cultural issues in global software outsourcing
11. Effects of culture on control mechanisms in offshore outsourced IT projects
12. Imparting the importance of culture to global software development
13. A framework for the analysis of coordination in global software development
14. Software, sports day and Sheera culture and identity processes within a global software organisation in India
15. The impact of cultural differences in offshore outsourcing—Case study results from German–Indian application development projects
16. Exploring agility in distributed information systems development teams: an interpretive study in an offshoring context
17. Scrum practices in global software development: a research framework
18. Global software development in practice lessons learned
19. An empirical study on global software development: offshore insourcing of IT projects
20. Offshore software development: Two case studies concerning culture and coordination
21. Global software development: Challenges and perspectives
22. A framework for considering opportunities and threats in distributed software development
23. Flexible and distributed software processes: Old petunias in new bowls?
24. An empirical study on global software development: Offshore insourcing of IT projects
25. Analyzing intercultural factors affecting global software development – A position paper
26. Knowledge management in distributed software development teams – Does culture matter?
27. Offshore outsourcing to India by U.S. and E.U. companies legal and cross-cultural issues that affect data privacy regulation in business process outsourcing
28. Knowledge sharing practices and the impact of cultural factors: Reflections on two case studies of offshoring in SME
29. Shared understanding and the effects of culture in the global software development team -A case study
30. The affects of behavior control mechanisms on trust in virtual teams
31. Goal and risk factors in offshore outsourced software development from vendor's viewpoint
32. An analysis of capabilities of Pakistan as an offshore it services outsourcing destination
33. An empirical investigation of client managers’ responsibilities in managing offshore outsourcing of software-testing projects
34. Managing an IT-outsourcing partnership in Asia case study: The relationship between a global outsourcing company and its global IT services supplier
35. Offshoring: What can go wrong?
36. Influence of culture on risks in offshore outsourcing of software projects: A quantitative study on mum effect
37. Information technology and distance-induced effort to manage offshore activities
38. Culturally influenced risk exposure: a new approach to tackle risks in offshore outsourcing
39. Limitations and measures in outsourcing projects to geographically distributed offshore teams
40. Improving management of outsourced software projects in Pakistan
41. The supporting technology of business document proofreading based on intercultural differences
42. Managing cognitive and cultural diversity in global IT teams
43. Cultural differences in project management capabilities: a field study
44. Some political and cultural issues in the globalization of software development: case experience from Britain and India
45. Information systems outsourcing: replicating an existing framework in a different cultural context
46. Establishing and maintaining trust in software outsourcing relationships: An empirical investigation
47. International outsourcing of services: A partnership model
48. A typology of offshoring and outsourcing in electronically transmitted services
49. Governance decisions for the offshore outsourcing of new product development in technology intensive markets
50. Stakeholder analysis is key to client–supplier relationships of global outsourcing project success
51. Solutions for customer complaints about offshoring and outsourcing services
52. Situational construction of Dutch—Indian cultural differences in global IT projects
53. Cross-cultural differences and information systems developer values

54. The role of culture in technology management research: national character and cultural distance frameworks
55. Building long-term orientation in buyer-supplier relationships: the moderating role of culture
56. An investigation of relationship learning in cross-border buyer-supplier relationships: The role of trust
57. Knowledge sharing among high-tech MNCs in china and India: invisible barriers, best practices and next steps
58. Addressing cultural dissimilarity in the information security management outsourcing relationship
59. Managing cross-cultural issues in global software outsourcing
60. Trust facilitating good software outsourcing relationships

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