

Success Factors for Software Outsourcing Partnership Management: An Exploratory Study Using Systematic Literature Review

SIKANDAR ALI^{1,2,3}, LI HONGQI^{1,2}, SIFFAT ULLAH KHAN⁴,
YANG ZHONGGUO^{1,2}, AND ZHU LIPING^{1,2}

¹Department of Computer Technology, China University of Petroleum, Beijing 102249, China

²Beijing Key Laboratory of Petroleum Data Mining, China University of Petroleum, Beijing 102249, China

³Department of Computer and Software Technology, University of Swat, Pakistan

⁴Department of Computer Science and IT, University of Malakand, Pakistan

Corresponding author: Sikandar Ali (sikandar@uswat.edu.pk)

ABSTRACT Software outsourcing partnership (SOP) is a type of cooperative client–vendor relationship for achieving mutually beneficial goals and is totally based on mutual trust and commitment. SOP is an emerging strategy and is different to ordinary software development outsourcing (SDO). Usually, a successful and long-lasting outsourcing association between client and vendor organization might be converted to outsourcing partnership. The overarching target of this exploratory paper is to analyze a list of factors that are considered important for vendors in the renovation of their surviving contractual outsourcing relationship to a partnership. We have executed a systematic literature review (SLR) process. We have performed all the SLR phases, like protocol development, publication collection, publication quality assessment, data generalization, and reporting. We have analyzed the factors found, through SLR, based on different variables such as continents, decades, and study strategy. Some factors like “mutual trust,” “effective communication,” “organizations proximity,” “mutual inter-dependence and shared values,” “3C (coordination, cooperation, and collaboration),” and “quality production” are marked as critical, because these momentarily assist vendors in renovation of the standing outsourcing relationship with client into partnership. The factors are correlated to finding any significant relationships among the factors. Vendors should address all the listed success factors, especially the critical success factors in order to attain partner position in SDO. Our outcomes will help practitioners working on outsourcing collaboration in the SDO industry. They can determine from the results of the study where to outsource and which are the emerging trends in software outsourcing.

INDEX TERMS Client–vender relationship, software outsourcing partnership, success factors, systematic literature review.

I. INTRODUCTION

Collaborative relations such as outsourcing partnership, superseding the traditional organizational limits and are an essential measure of today’s trade success. Organizations that struggle for competitive advantages via mutual aid create new inter 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 as one of the key stratagems for growing organizations, in order to be competitive in the global market [4]. A partnership is a cooperative association of the autonomous organizations (client and vendor). Partnerships might benefit organization to persist in the competition by increasing efficiencies [4], joining new markets [2], developing new innovative products, and gain access to new resource pool [1].

From 1980 onwards various types of business networks have been shaped such as strategic networks, multi-vendor contracts, subsidiary, alliances, coalition, joint ventures and partnership etc [1], [2], [5]. Since different kinds of companies having different kinds of needs, consequently, considerably many kinds of associations are obligatory [1]. These days software development companies use a wide variety of methods to source software development work; such as ,they outsource, develop in-house, broaden in-house competence through acquirements, and shape joint ventures, or partnerships with overseas organizations [1].

According to Kishore *et al.* [5], outsourcing associations can be branded into four brands. These are ordered as support, alignment, reliance and alliance. A collaborative relationship with low control and high trust in executing the contract is called an alliance. Partnership in outsourcing is one type of an alliance [6]. It is that type of alliance, which is a combination of both partnering and outsourcing. Thus, thoughtful understanding of both terms is obligatory to understand the collective term outsourcing partnership. Kinnula *et al.* [2] expressed outsourcing as “The process of transferring the responsibility for a specific business function from an employee group to a non-employee group”.

Software outsourcing partnership (SOP) is a relation for a long stint, based on the renegotiations of the mutually adjusted task and commitment, that supersedes the stated contractual terms and conditions specified in the opening stage of the alliance [6]. 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 [5]. It cannot be instantly developed, but rather, it shapes with the passage of time [2]. 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 [7]. Outsourcing partnership is a good tool to overcome technological uncertainty, because it can effectively deal with uncertainty, by sharing information of unexpected events during developments [8]. It is a relationship with certain characteristics to build trust [9].

In the field of Management Studies, the partnership has been explored extensively [3]. For example, collaboration between firms has been examined in the marketing discipline [10], i.e partnership between producers and suppliers [8], [11], manufacturers and sales agents [12], buyers and sellers [13] as well as auditors and clients [14]. While in the field of Computer Science empirical literature survey on the partnership relationship started to grow after 2000 in the Europe, US, and Asia. For the present study, a partnership is a mutually beneficial, continuous and long-lasting relationship. In partnership future plans, visions, and confidential information are shared with partner organizations, willingly and proactively, in demand to help each other. It lets partners focus on their capitals in the right direction by adopting the right track [15].

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 due to pressure on an organization to stay alive in the current highly competitive industrial setting. SOP is more valuable as compared to conventional outsourcing arrangements [16]. Currently, a lot of new organizations involved in the global outsourcing of production and services [16]. Regardless the growths of international collaboration, the studies of partnerships between clients and their foreign vendors have not attained sufficient consideration in the academic literature [16].

Businesses usually create SOP with the counterpart vendor organizations due to numerous reasons. These include:

- They want complementary skills that are not available in-house
- Project involves huge uncertainty
- Innovative skills are required
- Access to new technology, market and resources are obligatory
- To cope with commercial exploitation
- To improve profit on investment and to open new revenue sources

To overcome problems and to obtain greater benefits, organizations like UPS (Universal Postal Service) and Motorola [17], IBM, Kodak and digital equipment corporation (DEC) [13], Shenzhen development bank (SDB) and Hi Sun [10], IBM and United States Achievement Academy (USAA) [13], [14] and, Electronic Data Systems (EDS) and Xerox [14] established partnerships. In view of Kinnula *et al.* [2], previous research not reports how a partnership is formed.

Engaging in partnership with other firms might improve firms' enactment. Conversely, a partnership is not a threat-free trade. According to the literature [1], [16], [18], outsourcing partnership has a high failure rate. A research conducted by Piltan and Sowlati [18] conveyed that above 80% of CEOs mentioned that outsourcing partnerships were the core source of producing nearly 26% of their organization's incomes. Still, outsourcing partnerships have high failure proportions. Cost saving is an attractive factor (outsourcing may save 50% of the development cost or even more), but what if the budget will be wasted (you get a software with very ruthless quality) [18]. Moe *et al.* [1], Koh *et al.* [12], and Piltan and Sowlati [18] report the failure ratios of outsourcing partnerships from 30% to 70%. For this reason, observing the performance of an outsourcing partnership and assessing the elements that have a negative or positive impact on its performance is crucial. Information sharing, joint decision taking panel, risk and reward sharing, trust, long-term commitment, and relation-specific assets investment are recognized equally the foremost factors that have a positive impact on the performance of an enduring partnership [1], [12], [16], [18].

According to Tuten and Urban [19], the failure reasons are somehow certainly connected to the lack of putting into practice of factors like lack of upfront planning, pitiable communication, lack of relationship management, lack of trust, diverse goals, and unsatisfactory performance signs indication.

In this research paper, we consider SOP as “a strategic partnering relationship for software development between client and vendor organization(s) with mutual adjustment and renegotiations of tasks and commitments that exceed mere contractual obligations stated at the initial phase of the collaboration” [2]. SOP is a mutually beneficial, continuous and long term relationship, in which future plans, visions, and confidential information are shared with partner organizations proactively and willingly, with the aim to help each other in concentrating on their skills and resources towards the right track [15]. The development of SOP depends on the employment of various factors like ‘mutual inter-dependence and common goals’, ‘bi-directional trust’, ‘organizations proximity’, ‘effective communication’, and ‘quality of service provision’. Moreover, the implementations of factors in SOP in the software industry are very little [20].

We have identified success factors (SFs) in SOP for vendors using a systematic literature review (SLR). The preliminary findings of the SLR (list of SFs) have already been published [20]. The present paper is an extension to our previous findings in the form of analyses based on continent, decades and study strategy used. Further, we have correlated the identified SFs. This paper is also an update after validation of a questionnaire-based survey [21]. We have updated the results by including more relevant papers using snowballing analysis, in order to achieve quasi-gold standard developed by Zhang and Ali Babar [22]. Using snowballing method we have found forty one more relevant papers.

To understand the different aspects of SOP in details from the perspective of vendor’s we verbalized the succeeding research question (RQ).

RQ1. What factors are important for vendor’s organization in promoting their exiting outsourcing relationship into partnership with client organization? (RQ1 has been addressed and published [20]).

RQ2. Do the identified factors show any significant variation from one continent to another continent?

RQ3. How are these factors related to the study strategies used?

RQ4. Do the identified factors show any significant variation over time?

RQ5. What factors, as identified in the systematic literature review, show the impact on all other factors?

RQ6. Do the identified factors show any perfect correlation?

The remaining paper is arranged as background and motivation are presented in section 2. Section 3 presents the methodology. Section 4, refers to the study results. Section 5 describes summary and discussion. Section 6

discusses the limitations while Section 7 lists future research work and concludes the paper.

II. 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 [11]. 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 it centers on issues such as mutual trust, equity, and cooperation. Further, there are communal goals and a written bond of mutual sureties between the parties [23]. Here, the formal contract exists but it is not enough alone for the success of outsourcing arrangements [16]. In this perspective dissolution or extension of relationship is grounded on the bi-directional agreement [23]. 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 [16], classify the organizational relationship into two types:

1) Transactional style

This type of relationship is established through a proper agreement, here the procedures are well stated and in the case of disappointment to deliver the supposed services by any party is set on through a court case or forfeit as defined in the agreement.

2) Partnership style

It is based on sharing of risks and benefits. 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 [16].

From partnership perspective, there are dual outsourcing types.

1) Service outsourcing

Here system management and integration services are provided without asset transfer.

2) Asset outsourcing

It involves shifting of people hardware and software to partner site [16].

A. DIFFERENCE B/W ORDINARY OUTSOURCING AND PARTNERSHIP OUTSOURCING

A key difference between the ordinary outsourcing and partnership outsourcing is in the level of depth; SOP is a deeper relationship in which many traditional borders between companies are wrecked [2]. A relationship is said to be SOP, if the parties share confidential information about future plans, work together, combine resources, and share ownership, risks, and benefits [2] and take joint decisions to undertake

mutually beneficial business [7]. Outsourcing partnership is a good tool to overcome technological uncertainty because outsourcing partnership is the unique type of outsourcing relationship where partners share information of unexpected events [2]. Here both the parties share tacit information, human resources, and workload to achieve mutual goals [7]. The main difference between partnership and contractual relationship is that in the partnership relationship, the stress is given on the trust and achieving general business goals while in the contractual relationship the stress is given on the obligation of a formal contract and on achieving specific business goals [2]. In summary, partnerships are about relationships, not contracts [9].

B. RELATED STUDIES

A numeral investigators have shed light on some of the problem of SOP, such as Moe [1], Kinnula *et al.* [2], Kedia and Lahiri [15], Lee and Lim [16], Piltan *et al.* [18], Tuten and Urban [19], Lai [24], Dwyer *et al.* [25], Yilitalo [26], Zahedi *et al.* [27], Garousi [28], Bocij and Hickie [29], Venkatraman [30], and Kirkegaard and Jacob [31]. Summary of the few of these are presented as follow:

Recently published studies by Lai [24] on the factors affecting partnership quality between service receiver and providers in outsourcing ventures, shed light on the connection flanked by the quality of partnership in outsourcing and the ultimate attainment of outsourcing benefits. The outcomes of their studies suggest that factors such as shared knowledge positively affect shared benefits, organizational linkage positively affect commitment and predisposition, bi-directional dependency positively affects mutual benefits, commitment and predisposition and commitment have a positive effect on outsourcing success.

Garousi *et al.* [28] conducted a study, they 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 their study where 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-term cooperative relation among two diverse organizations appears to be more complicated and demanding as generally expected. According to Dwyer *et al.* [25], partnership development is a multifold practice in which economic, psychosocial, and legitimate procedures are concurrently proceeding. Common objectives and directions, timely communication, reciprocal trust and assurance, and partner compatibility are the constituent elements of a productive outsourcing partnership [26]. The main motives for outsourcing partnership are cost savings, increased flexibility, bi-directional decision making, acquiring to professional expertise, quality of service, free management time when there is lack of resources, and improved financial control [29].

C. LIMITATION OF EXISTING STUDIES

Instead of offshore outsourcing numerous research work on outsourcing partnership are restricted to onshore outsourcing [2]. In most of the study, researcher keeps study unit to the firm level only [11], [19]. Merely limited number of studies have investigated outsourcing partnership on a project level [1], [13]. Furthermore, various of them focus on the client's perception only [3], [11]. The highest number of the investigators has investigated the issues related to the selection of partner [32], [33]. Many organization states that they are outsourcing partners but in practice their behavior not demonstrating partnership essential characteristics. Therefore the partnership label is vain without these fundamental deeds [20], [32]. Partnership helps organization in refining their performance in plentiful means i.e taking full advantage of individual concentration by sharing operational risks and increasing group effort by division of responsibilities [34].

To date, no SLR is carried out from the perspective of vendor's to find out factors that help in the formation of SDO partnership. Our results have complimented the study conducted up to date in the outsourcing and partnership domain. Further, no sufficiently broad SDO partnership framework for the development and ongoing management of an outsourcing partnership can be found in the relevant literature. This exploration based SLR study addressed the issue from a vendor's perspective and aims to fill some of the research gaps by exploring the SFs from the angles.

Initially, we have conducted SLR for the identification of SFs for SDO partnership and the results have been published [20]. In the present paper, SFs identified through SLR is explored using different variables like publication venue, continent, decades and study strategies used. Further, the SFs are correlated using Pearson correlation, in order to identify a significant correlation between factors. For validation of the SLR findings, a questionnaire-based survey was conducted [21]. The present study is also an update after validation of the SLR findings in the industry. We increase the paper sample in the updated version of the analysis from 111 to 152.

III. METHODOLOGY

SLR [35] is chosen as a method for data gathering. It is an unbiased method of data collection on the basis of pre-defined research queries. It helps to collect facts from the included primary studies in a systematic way. It is also used as the main methodology in our preceding studies. The main steps of the methodology are shown in Figure 1.

A. SLR PROTOCOL DEVELOPMENT

To increase thoroughness, repeatability, and to reduce the researcher biased in our review, proceeding to the actual review process, we have settled a review plan called protocol. The protocol proposes the review procedures by cataloging the particulars of several approaches for executing the systematic review [35]. Fig. 1 outlines the protocol development process. The first two steps have already explained in the introduction. Detailed of the next steps is given below.

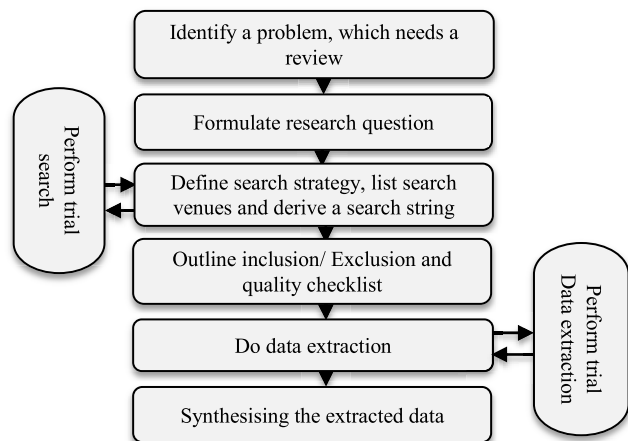


FIGURE 1. Development process for the SLR protocol.

1) SEARCH STRATEGY

We have used automatic search to search through the selected venues. Automatic search means searching papers in listed publisher sites using customized search string of major terms and their synonyms. For a single publisher site like ScienceDirect, we may have several thousand published articles [27], [33], [35], so it is not feasible to search manually. But we are still incorporating a manual search (i.e., “quasi-gold” standard) into the search process to confirm that the search string works properly. We include any type of study (empirical, theoretical, etc.) as long as it is relevant to the research domain.

2) SEARCH TERMS FOR AUTOMATIC SEARCH

One of the main challenges of performing an automatic search is to find relevant studies in the domain are the lack of standard and well-defined terms in the field under study. Considering this problem and to avoid missing any relevant paper in the automatic search, we prefer to use a more generic search string and include a wider number of papers in the primary results. Later, we filter the irrelevant studies to get the final papers for data extraction purpose.

We have used the research questions and a stepwise strategy to obtain the search terms; the strategy is as follows:

- Identify intervention, population, and outcome from on the basis of research questions
- Identify the main term and construct search term
- Find the synonyms for each main term
- Validate the terms and synonyms in any related paper
- Combine these terms using boolean OR/AND operators

3) SEARCH THE LITERATURE

A manual search was piloted for the determination of source to be explored. In this phase, we firstly develop a trial search string which was used in selected digital libraries during the automatic search. The available different digital libraries are

- ACM portal (ACM)-[acm.org]
- IEEEExplore (IEEE)-[ieeexplore.ieee.org]
- CiteSeer (CS)[citeseer.ist.psu.edu]

- ScienceDirect (SD)-[sciencedirect.com]
- GoogleScholar (GS)-[scholar.google.com]
- SpringerLink (SL)[springerlink.com]

The selections of these resources are based on our preceding SLRs [20], [27], [33]. Table 4, presented the list of searched sources along with results found.

KEYWORDS_ABSTRACT_TITLE
 (“Outsourcing partnership” OR Partnership) AND
 (“Software Outsourcing” OR “IT outsourcing” OR “IS outsourcing”).

We had used above search string as a test search string. Major terms were validated using this information. The below final search string was used in search phase:

KEYWORDS_ABSTRACT_TITLE
 (“Joint-venture” OR Partnership OR “Outsourcing partnership” OR collaboration OR GSD OR alliance OR “Global Software Development”) AND (“information systems outsourcing” OR “Software outsourcing” OR “information technology outsourcing” OR “IT outsourcing” OR “IS-outsourcing OR “distributed software development”) AND (drivers OR factors OR motivators OR characteristics OR elements OR parameters OR upgrade OR promotes OR convert OR leads OR establish OR builds OR Enter) AND (“Service-provider” OR vendors OR outsourcer OR clients OR customer OR consumer OR buyer OR “service receiver”).

4) LITERATURE SELECTION CRITERIA

This section includes two sub sections.

- 1) Inclusion criteria / Exclusion criteria
- 2) Study quality check list

The inclusion/Exclusion criteria are publicized in Table 1 while quality checklists are presented in Table 2.

TABLE 1. Enclosure criteria/elimination criteria.

Enclosure Criteria	
1	Papers that refer to factors for SOP
2	Papers that are transcribed in English only and full text is available
Elimination Criteria	
1	Papers those are not related to the research questions
2	Paper that does not follow inclusion criteria

The quality check was performed at last phase using checklist mentioned in Table 2. For each paper, the checklist is coded as No = 0, Yes = 1, and partially = 0.5.

5) DATA EXTRACTION PROCESS

Data extraction processes are pictorial in Fig.2. What data to be extracted from each selected study are shown in Table 3.

TABLE 2. Publication quality valuation checklist.

Criteria
1 Is it clear in what way the SFs for SOP were identified?
2 Has there adequate data to support the results?
3 Is the researcher giving the impression to report optimistic results larger than adverse results?

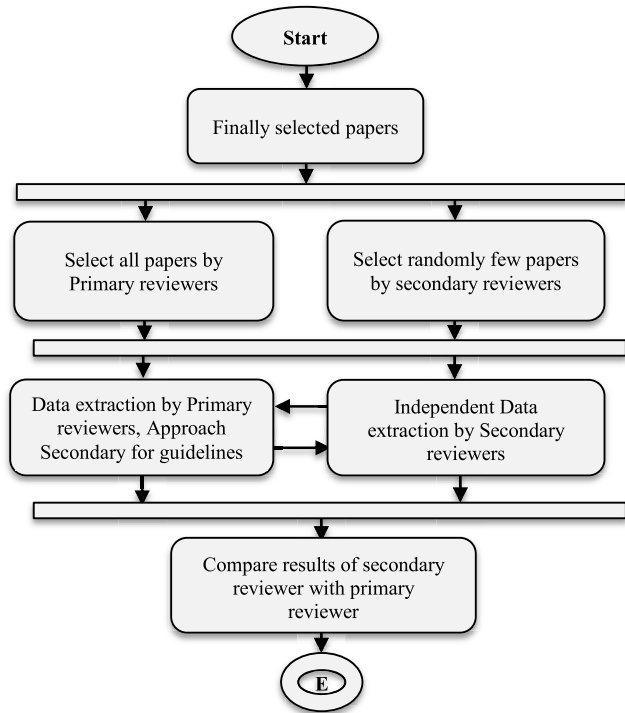


FIGURE 2. Data extraction process.

The first two authors work as a primary investigator while the next two authors are the secondary investigator. Each primary reviewer independently reviewed all papers and then compares the results obtained with each other. In the case of any disagreement, secondary reviewers were approached. Secondary reviewers only review a few randomly selected papers, in order to assure uniformity and completeness of the reviewed data.

6) DATA SYNTHESIS

After extracting the data, at the last phase of the data extraction stage, we noted a list of factors from the sample of 152 papers. The primary investigator in discussion with the secondary investigator goes through these in order to come up with a list of groups and to classify these factors into the identified groups. Initially, a list of 39 groups was recognized. These were further looked up by an external reviewer and selected groups were merged together. Finally, we got a list of 26 factors as shown in Table 9.

7) REVIEW TIMELINE

The review took from September 2014 – December 2016 to complete.

TABLE 3. Data extraction form.

#	Note	Description
N1	Author(s)	Author(s) of the included studies in the SLR.
N2	Title	Title of the paper included studies in the SLR
N3	Year	Year in which the study was published?
N4	Venue	Publication category of the included article: For example Conference, Journal, etc.
N5	Research Methodology	A kind of research methodology incorporated in the included article? It can be a case study, experience report, etc.
N6	Data Gathering Method(s)	A kind of research tool used for gathering data. For example Interview and questionnaire survey, literature review etc.
N7	Citation count	It is the number of citation of the selected study on scholar.google.com.
N8	Study Perspective	The study Perspective is grouped into academic (e.g. student cases) and industry.
N9	Components of Analysis	The basic unit (e.g., organization or a project) that is under investigation in the study.
N10	Company Size	It is the size of organization where the studied project is selected from or the researcher carried out the study.
N11	SOP factors	The success factors reported in the study

TABLE 4. Study sources and results found.

Source	IEEE	SD	ACM	GS	SL	CS	SB
Total Results Retrieved	1,273	880	1,158	2,209	194	226	120
Exclusion based on title and abstract	1,229	842	1,118	2,169	185	217	75
Primary selection	44	38	40	40	09	09	45
Exclusion based On full text	11	12	20	16	07	03	04
Final selection	33	26	20	24	02	06	41
Total exclusion	1,240	854	1,138	2,185	192	220	79
Selection/ Exclusion Ratio	2.66%	3.04%	1.76%	1.10%	1.04%	2.73%	51.90%
Overall selection	152						
Overall exclusion	5,908						

B. REPORTING THE REVIEW

This section presents results in the form of frequency analysis. It includes the following sub-sections.

1) TOTAL RESULTS FOUND

By using major search string as derived in section A.3 on the pre-mentioned publisher sites as listed in the same section, we found 5,940 papers. While using snowballing techniques we found 120 more papers. The results of the primary and final selection are given in Table 4. Only 161 papers out of 6,180 qualify the inclusion/exclusion criteria. Finally, the duplication was removed by excluding 09 papers from the final list of papers. Which repeated across different digital libraries and we get a final total of 152 papers as pictorial in Fig.3.

One of the main challenges of performing SLR in the domain of software engineering is the lack of standard and well-defined terms. Considering this problem and to avoid missing any relevant paper, we prefer to use more generic search string which retrieves a large number of papers.

Later, we filter the irrelevant studies to get the final papers for data extraction purpose as shown in Table 4.

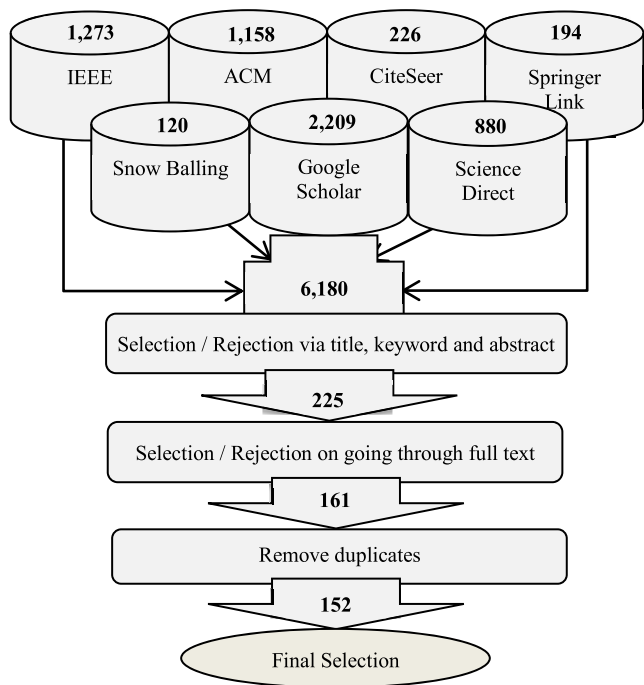


FIGURE 3. Article selection process.

TABLE 5. Classification based on quality.

Quality Scale	Poor	Fair	Good	Very Good	Total
# of studies	6	34	68	44	152
Percentage	3.95	22.37	44.74	28.95	100%

2) CLASSIFICATION STUDIES BASED ON QUALITY

An article was considered very poor which score less than 1. Any studies which score ≥ 1 and < 2 will be considered fair. Any studies which score ≥ 2 and < 3 will be considered good. While very good are those articles which pass all criteria as yes. The classification based on study quality is presented in Table 5. Table 5 confirms that most of the included studies were high-quality paper.

3) COUNTRIES INVOLVED IN SOP

According to Venkatraman [30], with growth in offshore outsourcing, the research dispute has changed from how to outsource towards where to outsource. The finally included articles point out thirty different countries from where firms have practice SOP Table 6 shows countries with high counts are, Unites States (34 cases), India (25 cases), China (24 cases), UK (14 cases), Canada and Australia (10 cases each), Germany (09), Korea (06), Netherland, Finland, Ireland, and Thailand having (03 cases respectively). The US-Indian partnerships were described in most of the included studies in our SLR. The Asian republics such as India, China, and Malaysia, mostly take part as vendor partner in outsourcing partnership as, these are very widely held stations for outsourcing. Other cited countries are

TABLE 6. Studies countries.

Country	Count	Country	Count	Country	Count
USA	34	Ireland	04	South Africa	02
India	25	Thailand	04	Switzerland	02
China	24	Japan	03	Poland	02
UK	14	Malaysia	03	Pakistan	02
Canada	10	Singapore	03	Brazil	01
Australia	10	Denmark	03	Italy	01
Germany	09	France	02	Turkey	01
Korea	06	New Zealand	02	Spain	02
Finland	04	Sweden	02	Lithuania	01
Netherlands	04	Norway	02	Ukraine	01

Singapore, Italy, Turkey, Pakistan, Brazil and New Zealand. Our study outcomes disclose that the European republics such as France, Thailand, Norway, Denmark, Sweden, and Switzerland are emerging countries focusing on outsourcing partnership. Ukraine and Lithuania are the newcomers to outsourcing partnership.

According to Kirkegaard and Jacob [31], offshore outsourcing is progressively affecting the EU-15 countries, both in the development and service area. According to 2013 Outsourcing in Europe report, Finland, Denmark, Sweden, Netherlands, Germany, Norway, Sweden, Spain, United Kingdom are the emerging players [36]. Access to particular expertise, tools, and knowledge might be a key factor for collaboration in outsourcing arrangements, which affects the offshore country choice for farm out services [36]. According to Kedia and Lahiri [15], apart from India, Russia, China, Philippines, and Ireland, clients today have a wide number of sites to select their partner from like Romania, Mexico, Argentina, Vietnam, Costa Rica, Nicaragua, Poland, Sri Lanka, Botswana, Jordan, South Africa, Malaysia, Tunisia, Ghana, and many more.

4) COLLABORATION MODELS

Using the taxonomy proposed by Khan for outsourcing [33], we classify the papers according to collaboration models. Three type of collaboration model were identified:

- Onshore partnership –partner located in the same country
- Nearshore partnership– partner from a different country but in the same continent
- Offshore partnership– partner from an overseas country commonly located on a different continent

In our SLR most of the partnerships formed are offshore (46%) and Nearshore (32%) as shown in Fig. 4. A partnership formed in Europe is usually Nearshore. According to Butterworth *et al.* [36], Finland, Spain, Norway, Sweden and the UK outsource less to offshore countries. Most of the offshore partnership is formed between US-India and US-China [36].

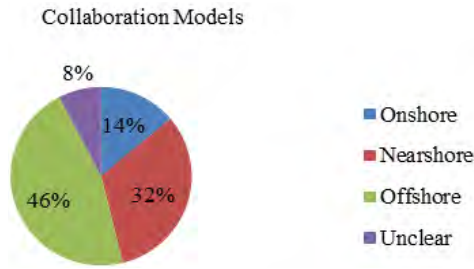


FIGURE 4. Distribution of studies over collaboration model.

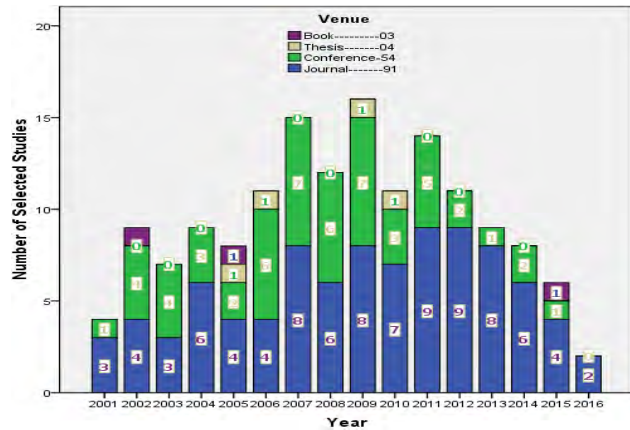


FIGURE 5. Year wise distribution of studies over publication venue.

5) CHRONOLOGICAL OBSERVATION

Fig.5 denotes the quantity of the included papers published in each year from 2001 to 2016. It shows that the number of studies on outsourcing partnership published per year has been increased since 2005. The reasons might be ICGSE conference which starts in 2006. The results show that outsourcing partnership is receiving increasing attention and interest from practitioners and researchers. But still the published paper per year is very low; it means the field is not mature enough and more work need to be done. A similar view was presented in [27].

Fig.5 shows the categories of papers (i.e conferences, journals, thesis or book) involved in our SLR study. It is clear from the Fig.5 that Journal is the utmost widely held publishing venue with a count equal to 91 (60% papers). The rest of articles have been available in other venues, such that conference (54 studies, 36%), thesis (04 studies, 3%), and book (03 cases, 2%).

6) STUDY METHODS IN DIFFERENT CONTINENTS

We have distributed the finally included papers in different continents based on study strategy used. We have selected only four study strategy because for the other the count is very low. It is clear from Fig.6 that ‘case study’ is the most popular research methodology in the ‘Europe’ (25 cases) and America (10 cases). While is it is on number 2nd in the ‘Asia’ (14 cases). It is also a top method in the mixed continent study. It can also be noted from Fig.5 that ‘Survey’

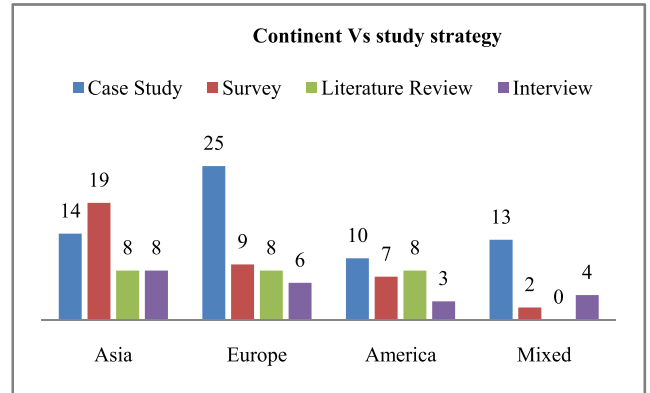


FIGURE 6. Continent-wise distribution of study strategies

is most widely used method for data gathering in ‘Asia’ (19 cases). It is 2nd in ‘Europe’ while 3rd in ‘America’ and mixed continent studies. ‘Interview’ is 2nd in ‘Mixed’, 3rd in ‘Asia’ and 4th in ‘Europe’ and ‘America’. ‘Literature review’ is equally distributed amongst the three continents. We have not found any literature review in the mixed continent setting. The results confirm the findings of Zahedi et al. [27] and Khan et al. [33].

7) PUBLICATION CLASSIFY BY VENUE

Table 7 and Table 8 listed the journals and conferences, having frequencies ≥ 3 for our included studies, along with their impact factor (edition number in case of a conference) and their ERA rank. Table 7 and 8 indicate that most of the studies are selected from a very high ranked Journals and Conferences, which an unblemished signal of the thoroughness and quality of data sources included in this study. The included 152 papers were published in 93 different venues. Out of 93, we have (55) 36.2 % different journal and 31 (20.4%) different conference venues. Nine Journals and two Conferences have a count greater than three as shown in Table 7 and 8. HICSS and ICGSE are the top conferences for publishing work on SF in SOP as they have 11.2% (17 papers) and 2.6% (04 papers) of the overall included papers published respectively. ‘The Journal of Strategic Information Systems’, ‘International Journal of Production Economics’, ‘Information & Management’, and ‘Journal of International Management’, are the top journals with count equal to 7(4.6%), 6(3.9%), 5 (3.3%) and 5 (3.3%) respectively.

It should be noted that 53.9 % (82 papers) was published in 23 (17 Journals and 06 conferences having count > 2) venues while the rest 46.1% (70 papers) were published in 70 different venues including 38 Journals and 25 conferences).

The results might be beneficial for the new researcher working in the domain, interested in knowing about the relevant journal and conference for their publication. Likewise glancing on Table 7 and 8 researchers can catch the quality of the listed journals and conferences respectively.

TABLE 7. Top journals in our SLR study.

#	Name of journal	# of studies	ERA rank	Impact factor
1	'The Journal of Strategic Information Systems' https://www.journals.elsevier.com/the-journal-of-strategic-information-systems/	07	A	2.595
2	'International Journal of Production Economics' https://www.journals.elsevier.com/international-journal-of-production-economics	06	A	2.782
3	'Information & Management' https://www.journals.elsevier.com/information-and-management/	05	A*	2.163
4	'Journal of International Management' https://www.journals.elsevier.com/journal-of-international-management/	05	B	1.982
5	'IEEE Transactions on Engineering Management' http://ieeexplore.ieee.org/xpl/aboutJournal.jsp?punumber=17	04	A	1.454
6	Information and Software Technology https://www.journals.elsevier.com/information-and-software-tech	03	B	1.569
7	'Human Resource Management Review' https://www.journals.elsevier.com/human-resource-management-review	03	A	2.236
7	International Journal of Information Management https://www.journals.elsevier.com/international-journal-of-information-management/	03	C	2.69
8	European Management Journal https://www.journals.elsevier.com/european-management-journal/	03	B	1.437
9	International Journal of Project Management' https://www.journals.elsevier.com/international-journal-of-project-management/	03	A	2.885

TABLE 8. Top Conferences in our SLR study.

S.No	Name of Conference	# of studies	ERA rank	2017 Edition
1	'Hawaii International Conference on System Sciences (HICSS)' http://hicc.hawaii.edu/	17	A	50 th
2	'International Conference on Global Software Engineering (ICGSE)' http://icgse.org/	04	C	12 th

IV. RESULTS

This section presents the results related to our research question in the form of statistical analysis on different variables. In the sub-sections, from A to F, we have answered RQ1, RQ2, RQ3, RQ4, RQ5, and RQ6 respectively.

A. FACTORS IDENTIFIED THROUGH SLR

We have used SLR as a research method for identification of the success factors. Further, we have used SPSS for the statistical tests. SPSS is a software tool used to test different variables using sample data. The sample data set comprises of 26 factors extracted from 152 research articles using

the SLR. Continents, decades and study strategies are the test variables. For the analysis purpose, we have found the significant differences of the success factors using different variables. For significant difference chi-square (linear by linear association) and correlation test are used. For analysis of the significant differences amongst nominal and ordinal variables, the linear by linear chi-square test is considered more powerful as compared to Pearson chi-square test [33].

In response to RQ1, Table 9 listed SFs identified via the SLR that can lead outsourcing vendors towards the partnership with their client organization. In Table 9 high percentage of a factor indicates its general recognition and popularity in the literature. 'Mutual inter-dependence and shared values' (68%) is the most commonly reported SFs in our study. By 'mutual interdependence and shared values', we mean communal objectives and aims, shared ownership, sharing risks, reward and workload. This inter-dependence is bi-directional in nature, often in practice, the vendor firm is intensely reliant on the recognition of decided service provision [38].

According to Alexandrova [39], it is considered as most important SF of the outsourcing partnership because it assumes "goal symmetry" between the client and vendor firms. Lee and Lim [16] define outsourcing partnership as "an inter-organizational relation involving a long-term commitment between client and vendor where both parties collaboratively work towards shared goals while sharing both risks and rewards".

'Mutual trust' is the 2nd most quoted SF (59% occurrence) in our SLR. Niazi et al. [40] define 'trust' as "one party's willingness to be vulnerable to another party based on the belief that the latter party is 1) competent, 2) open, 3) concerned, and 4) reliable". In view of Niazi et al. [40], formation of long-term relationship is strongly linked with mutual transparency and trust. Trust between outsourcing partners pays compensation in case of possible shortcomings of the formal agreement and the absence of strong penalty phrase in the outsourcing contract [39].

In our study, 58% of the authors have mentioned 'effective communication' as a generally recognized SF from vendor's perspective in the formation of outsourcing partnership with their respective clients. By 'effective communication' we mean swapping project status efficiently between trading partners.

Agreeing to Webb and Laborde [41] active and effective communication b/w client and vendor firms gives them equal opportunity for the improvement of mutual respect, mutual understanding, and bidirectional talents. This can greatly increase the perpetuity of an outsourcing relationship. In view of Sun et al. [23] active and effective communication between outsourcing allies is considered to be vital for the fruitful association. This factor is highlighted extensively in the academic literature as a key contributing factor in outsourcing partnerships formation. It strengthens the existing level of understanding and helps in interchanging bi-directional knowledge and information [39].

TABLE 9. Success factors identified through SLR.

#	Success factors	F=152	%	S.No of the selected studies from which the corresponding factor is extracted
1	'Mutual inter-dependence and shared values'- (MISV)	103	68%	1, 4, 6, 7, 8,9, 12, 13, 14, 17, 18, 19, 20, 21, 22, 23, 27, 28, 29, 31, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 45, 46, 47, 49, 50, 51, 52, 53, 54, 55, 56,57, 60, 61, 63, 64, 65, 67, 68, 69, 70, 71, 72, 73, 75, 76, 78, 79, 82, 83, 84, 85, 86, 87, 89, 91, 92, 93, 94, 96, 97, 98,99, 101, 102, 103, 104, 106, 107, 109, 111, 112, 115, 117, 118, 121,124, 127, 129, 131, 133, 134, 136, 138, 139, 140, 141, 143, 146, 148, 150, 151,152
2	'Mutual trust'- (MT)	90	59%	1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 26, 27, 29, 31, 32, 33, 34, 36, 39,40, 41, 42, 46, 47, 48, 49, 50, 52, 53, 55, 56, 61, 62, 63, 64, 66, 67, 73, 76, 83, 86, 87, 88, 89, 90, 92, 93, 95, 96, 97, 98, 99, 101, 102, 103, 104, 105, 106, 107, 108, 109, 111, 118, 120, 122, 127, 131, 133, 134, 138, 140, 141, 142, 143, 144, 146, 149, 150, 151
3	'Effective and timely communication'- (EaTC)	88	58%	1, 4, 9, 11, 12, 13, 15, 17, 22, 25, 26, 27, 29, 30, 31, 33, 36, 37, 38, 40, 41, 42, 43, 45, 46, 47, 49, 50, 53, 55, 59, 61, 62, 63, 64, 67, 69, 70, 73, 74, 76, 77, 78, 79, 80, 82, 85, 86, 87, 88, 90, 91, 93, 94, 97, 98, 101, 103, 104, 105, 107, 108, 109, 110, 111, 112, 113, 117, 118, 121, 122, 129, 130, 131, 132, 133, 135, 136, 138, 139, 140, 143, 145, 146, 148, 149, 150, 152
4	'Quality production'- (QP)	87	57%	1, 2, 4, 5, 6, 8, 9, 10, 11, 16, 18, 19, 20, 21, 23, 24, 25, 26, 28, 29, 31, 32, 36, 37, 38, 41, 42, 43, 44, 45, 46, 47, 49, 52, 53, 56, 57, 60, 61, 62, 65, 68, 70, 73, 75, 76, 78, 79, 84, 86, 87, 88, 90, 93, 95, 97, 98, 99, 100, 101, 103, 104, 105, 110, 112, 114, 115, 116, 117, 118, 124, 125, 130, 133, 134, 135, 136, 137, 138, 139, 141, 143, 145, 146, 147, 148, 152
5	'Organizational proximity'- (OP)	79	52%	1, 4, 7, 8, 9, 10, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 29, 31, 32, 33, 34, 37, 38, 39, 45, 47, 49, 50, 55, 57, 59, 60, 61, 62, 64, 66, 68, 70, 71, 73, 74, 76, 78, 80, 82, 83, 84, 86, 87, 88, 90, 93, 95, 96, 97, 98, 102, 103, 104, 107, 108, 109, 110, 111, 113, 115, 117, 118, 125, 127, 132, 134, 136, 138, 139, 144, 145, 149, 152
6	'Cooperation, coordination, and collaboration'- (3C)	76	50%	1, 4, 6, 7, 9, 11, 12, 13, 15, 17, 22, 25, 27, 29, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 45, 46, 47, 49, 50, 53, 54, 55, 59, 61, 62, 64, 67, 69, 70, 73, 76, 78, 83, 84, 85, 86, 87, 89, 93, 94, 95, 96, 99, 101, 103, 107, 108, 109, 110, 112, 116, 117, 118, 130, 132, 134, 135, 136, 138, 143, 146, 148, 149, 150
7	'Flexible service level agreements'- (FSLA)	65	43%	6, 12, 13, 18, 20, 22, 23, 25, 27, 29, 33, 34, 38, 39, 42, 46, 48, 50, 52, 54, 56, 58, 59, 60, 61, 62, 63, 66, 67, 69, 70, 72, 73, 74, 76, 78, 82, 83, 85, 86, 87, 88, 89, 90, 91, 92, 93, 95, 96, 102, 103, 104, 105, 106, 110, 115, 117, 119, 122, 132, 134, 135, 138, 144, 147
8	'Bidirectional transfer of knowledge'- (BTK)	59	39%	7, 8, 10, 12, 14, 15, 18, 23, 26, 33, 37, 38, 39, 40, 43, 46, 47, 49, 50, 52, 54, 58, 60, 63, 69, 75, 77, 78, 82,84, 86,87, 91, 95, 101, 102, 103, 105, 107, 108, 110, 111, 117, 118, 120, 121, 124, 130, 132, 133, 134, 135, 138, 140, 143, 145, 146, 148, 150
9	'Long term commitments'- (LTC)	56	37%	3, 4, 10, 12, 13, 18, 20, 22, 23, 25, 29, 31, 32, 33, 37, 47, 48, 49, 50, 53, 54, 58, 64, 65, 66, 69, 70, 76, 78, 83, 84, 85, 87, 89, 93, 94, 95, 97, 99, 101, 103, 105, 107, 108, 111, 112, 115, 116, 118, 126, 133, 138, 139, 149, 150, 151
10	'Joint management infrastructure'- (JMI)	50	33%	1, 8, 12, 13, 16, 18, 19, 20, 27, 28, 37, 38, 46, 47, 48, 49, 52, 55, 56, 58, 59, 67, 73, 74, 78, 82, 85, 87, 93, 98, 101, 102, 104, 105, 109, 110, 111, 112, 113, 117, 119, 130, 132, 134, 136, 138, 143, 147, 149, 152
11	'Cross cultural understanding and sensitivity'- (CCUS)	49	32%	1, 3, 5, 7, 12, 15, 19, 22, 25, 29, 30, 31, 33, 35, 38, 41, 46, 47, 49, 50, 52, 60, 61, 63, 67, 69, 70, 76, 78, 80, 82, 83, 86, 88, 90, 98, 105, 107, 109, 110, 112, 113, 118, 132, 138, 141, 144, 149, 152
12	'Success stories of previous projects'- (SSPP)	49	32%	5, 8, 9, 12, 13, 19, 22, 29, 32, 35, 36, 37, 40, 42, 44, 45, 46, 50, 57, 59, 62, 65, 67, 70, 73, 75, 78, 79, 81, 84, 86, 88, 89, 90, 92, 93, 95, 99, 107, 108, 112, 113, 118, 125, 135, 140, 145, 150, 152
13	'Access to new technologies, markets, and complementary skills'- (ANTM)	47	31%	3, 4, 6, 9, 11, 12, 16, 17, 26, 29, 31, 32, 33, 35, 37, 43, 49, 52, 56, 57, 58, 67, 69, 71, 73, 74, 77, 79, 81, 87, 95, 96, 97, 99, 100, 102, 103, 104, 112, 118, 122, 130, 134, 138, 139, 140, 146
14	'Governance and control'- (GaC)	47	31%	3, 4, 7, 12, 13, 15, 18, 22, 25, 26, 27, 28, 29, 32, 33, 37, 38, 39, 40, 46, 48, 50, 62, 65, 71, 74, 75, 85, 87, 88, 92, 98, 102, 104, 105, 110, 112, 116, 119, 122, 132, 133, 136, 138, 144, 147, 151
15	'Financial stability and relation specific investment'- (FSaI)	38	25%	6, 7, 17, 20, 24, 27, 29, 34, 37, 43, 45, 51, 55, 67, 73, 78, 83, 85, 87, 90, 93, 94, 97, 100, 104, 107, 112, 119, 123, 128, 132, 135, 139, 141, 144, 145, 147, 150
16	'Organizational transparency and receptivity'- (OTaR)	36	24%	1, 4, 7, 8, 10, 12, 14, 15, 26, 27, 29, 33, 34, 39, 43, 46, 53, 76, 78, 87, 91, 99, 103, 106, 119, 128, 132, 134, 139, 142, 143, 145, 147, 150, 151, 152
17	'Flexibility and reliability'- (FaR)	36	24%	6, 8, 17, 21, 24, 29, 31, 34, 38, 42, 45, 46, 49, 50, 52, 54, 59, 61, 72, 76, 79, 82, 97, 106, 107, 110, 115, 117, 119, 122, 132, 134, 135, 138, 144, 147
18	'Spurring innovation'- (SI)	35	23%	8, 21, 22, 24, 26, 27, 29, 31, 38, 41, 42, 43, 52, 55, 57, 69, 75, 76, 77, 83, 87, 97, 99, 104, 112, 116, 119, 125, 131, 135, 140, 142, 144, 146, 149
19	'Win-win strategy'- (WWS)	29	19%	1, 2, 7, 8, 9, 10, 20, 26, 27, 37, 45, 52, 55, 62, 78, 83, 101, 104, 107, 109, 115, 117, 126, 131, 134, 139, 142, 146,148
20	'Effective relationship management'- (ERM)	24	16%	1, 20, 21,24,37,52,59, 60, 73, 74, 78, 82, 93, 94, 101, 102, 105, 110, 117, 126, 131, 139, 142,146
21	'Constructive conflicts resolution mechanism'- (CCRM)	23	15%	1, 12, 13, 18, 20, 23, 37, 47, 49, 58, 62, 76, 93, 97, 103, 107, 109, 117, 126, 131, 139, 142, 146
22	'Top management engagement'- (TME)	23	15%	7, 20, 25, 27, 29, 31, 32, 37, 47, 49, 58, 62, 87, 91, 93, 108, 111, 112, 117, 126, 131, 139, 142
23	'Social networking'- (SN)	21	14%	1, 12, 15, 26, 34, 38, 59, 61, 67, 77, 88, 90, 104, 109, 110, 112, 118, 121, 124, 129, 138
24	'New business opportunity'- (NBO)	18	12%	8, 27, 37, 40, 56, 70, 73, 83, 84, 87, 95, 97, 104, 112, 113, 124, 134, 142
25	'Honesty and openness'- (HaO)	18	12%	13, 15, 17, 22, 26, 32, 33, 42, 55, 83, 88, 97, 102, 113, 118, 124, 129, 141
26	'Human resource management'- (HRM)	09	6%	14, 28, 38, 47, 59, 60, 62, 112, 125

Similarly, it was identified that 57% of the included article in our SLR study have mentioned ‘quality production’ by vendors can lead vendor organization in the direction of partnerships with their clients. From ‘quality production’, we mean producing high-quality products or providing up to the mark service quality using new technology, core competencies, unique expertise, and capabilities. Due to the outstanding evolution in free marketplaces under the conditions of globalization and improvements in ICT, organizations have to consider outsourcing strategies, not for utilization of the cost compensations but also to advantage from the better-quality that offshore vendors offer [23], [42].

Additionally, greater than 50% of the research papers in this SLR labeled ‘organizational proximity’ (52%) as a commonly relevant SF in conversion to/formation of the partnership. Organizational proximity is the extent of strategic compatibility of the outsourcing partner. Proximity can be calculated based on allies’ level of business understanding, technology and language symmetry (mean using the same technology and speaking the common language). Greater proximity means more chances of conversion to the partnership. Organizational proximity can be defined as follows “belonging to the same space of reference and manifested by shared representations, norms, standards and work practices” [26].

Likewise exactly 50% of the included research papers in our SLR investigation have stated ‘3C’ as generally acceptable SFs for outsourcing partnership. By ‘3C’ we mean cooperation, coordination, and collaboration. Shahin *et al.* [27] discloses that the present inter-organizational setup is moving from antagonism towards cooperation, coordination, and collaboration.

B. COMPARISON OF THE FACTORS THROUGH VARIOUS CONTINENTS

The aim of this analysis is to discover whether or not the identified SFs vary from continent to continent. By comparing the factors across these categories, we have brought into being only one substantial variance in the distribution of factors among the continents i.e. access to new markets, technologies, and complementary skills as shown in Table 10 and 11.

We argue that most of the partnerships in Europe are formed not just for the sake of cost saving but to gain access to specialized expertise and up to the mark development skills. Secondly, most of the vendors are from Asia like India, China, and Russia, so the client(s) from America form a partnership with Asian vendors because they are outsourcing leaders having new technology and best skills.

According to Kirkegaard and Jacob [31], offshore outsourcing is progressively affecting the EU-15 countries, both in the development and service area. According to the outcomes of outsourcing in Europe report 2013 [36] ‘access to particular expertise, tools, and knowledge’ is a key factor for collaboration in outsourcing arrangements, which affects the offshore country choice for farm out services. Finland, Denmark, Sweden, Netherlands, Germany, Norway, Sweden,

TABLE 10. Distribution of SFs across four continents.

Continents	No of SFs	No. of CSF(Critical Success Factors) (cited in $\geq 50\%$ of the articles)
Asia (N=52)	26	We have identified the following six CSFs: 1. ‘Mutual interdependence and shared values’ 2. ‘Mutual trust’ 3. ‘Effective and timely communication’ 4. ‘Quality production’ 5. ‘Organizational proximity’ 6. ‘3C’
Europe (N=49)	26	We have identified the following five CSFs: 1. ‘Mutual interdependence and shared values’ 2. ‘Mutual trust’ 3. ‘Effective and timely communication’ 4. ‘Quality production’ 5. ‘Organizational proximity’
America (N=30)	26	We have identified the following seven CSFs: 1. ‘Mutual interdependence and shared values’ 2. ‘Mutual trust’ 3. ‘Effective and timely communication’ 4. ‘Quality production’ 5. ‘Organizational proximity’ 6. ‘3C’ 7. ‘Flexible service level agreements’
Mixed (N=21)	26	We have identified the following five CSFs: 1. ‘Effective and timely communication’ 2. ‘Quality production’ 3. ‘Organizational proximity’ 4. ‘3C (coordination, cooperation, and collaboration)’ 5. ‘Access to new technologies, markets and complementary skills’

Spain, United Kingdom are the emerging players from Europe [36]. According to Sangaiah and Thangavelu [42], Indian software development firms have technologically advanced in multifold way i.e they offer the international outsourcing and it the same times contests worldwide with leading outsourcee across the software research and development spectrum. It is clear from their outcomes that 65% of all CMMI level-5 firms are established in India [42].

Similarly, other success factors are listed as follow:

‘Mutual trust, ‘mutual interdependence and shared values’ are important in all continents except in mixed type.

In mixed type continent the outsourcing partnership is offshore in nature which is the most mature type of relationship. That might be the reason that ‘mutual interdependence and trust is not mentioned explicitly in the dual continent study. It means it is not the burning issue in offshore study anymore.

‘Effective communication’, ‘quality production and ‘organizational proximity’ are critical in all categories of the continents. These are the main constituent element of the outsourcing partnership. Therefore, it is not specific to any continent.

‘3C is critical in all except in Europe. The reason might be that most of the partnership formed in Europe is onshore instead of offshore. So, coordination would not be a big issue in this type of partnership. Referring to outsourcing 2013 in Europe report [36]. Counties in Europe like Denmark, Germany, Finland, Netherlands, Spain, Norway, UK and Sweden using offshore outsourcing only from 3% to 16%, nearshore strategies between 9% to 26% while the rest 59% to 86% work is done onshore.

TABLE 11. Summary of SFs based on continents as identified in the SLR.

Factors	Occurrence in SLR (N=152)								Chi-square Test (Linear-by-Linear Association) $\alpha = .05$		
	Asia (N=52)		Europe (N=49)		America (N=30)		Mixed (N=21)		X ²	Df	P
	f	%	f	%	f	%	f	%			
‘Mutual inter-dependence and shared values’	40	76	30	72	18	59	10	47	3.169	1	0.075
‘Mutual trust’	34	66	24	58	18	59	10	47	1.369	1	0.242
‘Effective and timely communication’	29	55	24	58	18	59	13	60	0.143	1	0.705
‘Quality production’	29	55	22	53	19	64	13	60	0.231	1	0.630
‘Organizational proximity’	26	50	21	50	15	50	14	67	0.533	1	0.654
‘Cooperation, coordination, and collaboration’	26	50	18	44	18	59	11	53	0.167	1	0.682
‘Flexible service level agreements’	23	45	16	39	15	50	8	40	0.007	1	0.934
‘Bidirectional transfer of knowledge’	18	34	16	39	14	45	8	40	0.512	1	0.474
‘Long-term commitments’	20	39	15	36	12	41	7	33	0.068	1	0.795
‘Joint management infrastructure’	15	29	15	36	10	32	8	40	0.487	1	0.485
‘Cross-cultural understanding and sensitivity’	15	29	15	36	10	32	7	33	0.153	1	0.696
‘Success stories of previous projects’	22	42	14	33	4	14	6	27	3.620	1	0.057
‘Access to new technologies, markets, and complementary skills’	8	16	12	28	14	45	11	53	9.292	1	0.002
‘Governance and control’	17	32	11	25	10	32	8	40	0.113	1	0.737
‘Financial stability and relation-specific investment’	9	18	12	28	10	32	6	27	1.143	1	0.285
‘Organizational transparency and receptivity’	15	29	8	19	8	27	4	20	0.408	1	0.523
‘Flexibility and reliability’	9	18	13	31	5	18	7	33	0.802	1	0.371
‘Spurring innovation’	9	18	11	25	10	32	4	20	0.516	1	0.473
‘Win-win strategy’	14	26	7	17	14	45	1	7	2.526	1	0.112
‘Effective relationship management’	7	13	5	11	8	27	4	20	1.107	1	0.293
‘Constructive conflicts resolution mechanism’	12	24	6	14	3	9	1	7	3.559	1	0.059
‘Top management engagement’	8	16	6	14	3	9	6	27	0.094	1	0.759
‘Social networking’	8	16	5	11	4	14	3	13	0.114	1	0.735
‘New business opportunity’	3	5	8	19	3	9	3	13	0.969	1	0.325
‘Honesty and openness’	7	13	5	11	4	14	1	7	0.201	1	0.654
‘Human resource management’	5	10	1	3	1	4	1	7	0.891	1	0.345

The results might benefit the researcher interested in knowing about who involved in outsourcing partnership. The outcomes will also help practitioners working on outsourcing collaboration in the software development industry.

C. COMPARISON OF FACTORS BASED ON STUDY STRATEGY USED

Both Table 12 and 13 show our SLR results for RQ3 grounded on the study method used. We have grouped our final sample of articles, identified via the SLR, based on the research method used i.e. interviews(I), case studies(CS), literature reviews (LR), surveys(S), systematic literature reviews (SLR), experience report (ER), thesis (T), experimental study (ES) and other. These eight study strategies were identified by the authors in teamwork and validated by an external reviewer. The results of our SLR study signpost that 26 out of 26 SFs have been described in the related literature via experience report, literature reviews, case studies, thesis, and experimental study.

However, different SFs were reported with different weightings across the eight study methods, for example.

- ‘Mutual interdependence and shared values’ is critical in all except literature review, SLR, and experiment.
- ‘Mutual trust’ is critical in the interview, survey, literature review, experience report, thesis and experimental study
- ‘Effective and timely communication’ is critical in all except case study, SLR and other
- ‘Quality production’ is critical in all except case study, interview, and experimental study
- ‘Organizational proximity’ is critical in the case study, survey, literature review, experience report, and ‘other’
- ‘3C (coordination, cooperation, and collaboration)’ is critical in survey, literature review, experience report, thesis, and experimental study
- ‘Flexible service level agreements’ is critical in the literature review, and thesis
- ‘Bidirectional transfer of knowledge’ is critical in literature review only
- ‘Cross cultural understanding and sensitivity’ is cited mostly in SLR, experience report, and thesis.

TABLE 12. Summary of SFS based on study strategies.

Factors	Occurrence in SLR (n=152)									Chi-square Test $\alpha = .05$	
	Study strategy									X ²	p
	CS (N=62) %	I (n=21) %	S (n=37) %	SLR (n=1) %	LR (n=22) %	ER (n=1) %	T (n=4) %	ES (n=1) %	Other (n=3) %		
'Mutual inter-dependence and shared values'	60	67	78	0	12	100	100	0	100	2.378	0.123
'Mutual trust'	47	73	70	0	63	100	100	100	0	1.196	0.274
'Effective and timely communication'	49	53	70	0	69	100	67	100	0	0.834	0.361
'Quality production'	49	47	52	100	94	100	67	0	50	3.923	0.048
'Organizational proximity'	51	40	59	0	56	100	67	0	50	0.151	0.697
'Cooperation, coordination, and collaboration'	38	47	67	0	63	100	67	100	0	2.286	0.131
'Flexible service level agreements'	44	40	33	0	69	0	67	0	0	0.017	0.896
'Bidirectional transfer of knowledge'	31	33	44	0	63	0	33	0	50	1.632	0.201
'Long term commitments'	31	33	48	0	44	100	33	100	0	0.698	0.404
'Joint management infrastructure'	36	27	37	0	38	0	33	0	0	0.496	0.481
'Cross cultural understanding and sensitivity'	33	13	33	100	38	100	67	0	0	0.280	0.597
'Success stories of previous projects'	36	33	30	0	31	0	0	0	50	0.808	0.369
'Access to new technologies, markets, and complementary skills'	36	33	19	0	31	100	33	0	50	0.036	0.850
'Governance and control'	31	40	22	0	31	0	33	0	100	0.211	0.646
'Financial stability and relation specific investment'	29	13	26	0	31	0	33	0	0	0.201	0.654
'Organizational transparency and receptivity'	20	27	26	0	38	0	33	0	0	0.187	0.665
'Flexibility and reliability'	22	20	26	0	31	100	33	0	0	0.187	0.665
'Spurring innovation'	16	20	26	0	31	100	67	0	50	5.187	0.023
'Win-win strategy'	18	7	19	0	38	0	33	0	0	0.697	0.404
'Effective relationship management'	20	7	11	0	31	0	0	0	0	0.115	0.734
'Constructive conflicts resolution mechanism'	16	7	22	0	13	0	33	0	0	0.015	0.904
'Top management engagement'	20	13	15	0	6	100	0	0	0	1.506	0.220
'Social networking'	16	7	22	0	6	0	0	0	0	1.224	0.269
'New business opportunity'	16	13	0	0	19	0	33	0	0	0.041	0.839
'Honesty and openness'	16	0	15	0	6	0	33	0	0	0.264	0.608
'Human resource management'	7	7	7	0	6	0	0	0	0	0.258	0.612

- 'Success stories of previous projects' are critical in 'other' category only
- 'Access to new markets, technologies, and complementary skills' is critical in experience report
- 'Governance and control' is critical in 'other' only.
- 'Flexibility and reliability' is critical in experience report only
- 'Spurring innovation' is critical in experience report, thesis and 'other'
- 'Top management engagement' is critical in experience report only

The remaining is critical in none of the study strategies as shown in Table 13.

Table 12 divulges that case study is the utmost used study strategy in our study. Across eight study strategies 'mutual trust', 'Organizational proximity', 'mutual inter-dependence and shared values', 'effective communication', and 'quality production' are the most important SFs to be implemented. We have identified significant difference for only two of the identified SFs among different study strategies. These are 'quality production' and 'spurring innovation'. Significant difference for a particular factors means that this factor is not

likewise reported by various research methods e.g 'quality production' is reported with a weigh of 49%, 47%, 52%, 100%, 94%, 100%, 67%, 0%, 50% and 'spurring innovation' is reported with a weigh of 16%, 20%, 26%, 0%, 31%, 100%, 67%, 0% 50% in case study, interview, survey, SLR, literature review, experience report, thesis, experimental study and other respectively, which is a clear demonstrations of differences in weight for this SFs across the eight research methodologies used.

These findings can be used in order to identify the position of the various research methodologies i.e which study method is more influential for producing information. These findings may also support scholars in their research designs, who wish to engage in research work in the area of empirical software engineering.

D. COMPARISON OF SUCSESSES FACTORS BASED ON DECADES FROM 1990 TO 2009

Comparing the SFs across first two decades, mentioned in both Table 14 and 15, we came across similarities greater than differences. However, our results specify a substantial difference in the SLR sample size of the two decades.

TABLE 13. Distribution of SFs across various study strategies.

Study strategies	Number of factors	Number of CSFs (cited in >=50% of the articles)
Case study N=62	26	1. 'Mutual interdependence and shared values' 2. 'Organizational proximity'
Interview N=21	25	1. 'Mutual interdependence and shared values' 2. 'Mutual trust' 3. 'Effective and timely communication'
Survey N=37	25	1. 'Mutual interdependence and shared values' 2. 'Mutual trust' 3. 'Effective and timely communication' 4. 'Quality production' 5. 'Organizational proximity' 6. '3C'
SLR N=1	02	1. 'Quality production' 2. 'Cross-cultural understanding and sensitivity'
Literature review N=22	26	1. 'Mutual trust' 2. 'Effective and timely communication' 3. 'Quality production' 4. 'Organizational proximity' 5. '3C' 6. 'Flexible service level agreements' 7. 'Bidirectional transfer of knowledge'
Experience report N=1	12	1. 'Mutual interdependence and shared values' 2. 'Mutual trust' 3. 'Effective and timely communication' 4. 'Quality production' 5. 'Organizational proximity' 6. '3C' 7. 'Long-term commitments' 8. 'Cross-cultural understanding and sensitivity' 9. 'Access to new technologies, markets, and complementary skills' 10. 'Flexibility and reliability' 11. 'Spurring innovation' 12. 'Top management engagement'
Thesis N=4	21	1. 'Mutual interdependence and shared values' 2. 'Mutual trust' 3. 'Effective and timely communication' 4. 'Quality production' 5. 'Organizational proximity' 6. '3C' 7. 'Flexible service level agreements' 8. 'Cross-cultural understanding and sensitivity' 9. 'Spurring innovation'
Experimental Study N=1	04	1. 'Mutual trust' 2. 'Effective and timely communication' 3. '3C' 4. 'Long-term commitments'
Other N=3	07	1. 'Mutual interdependence and shared values' 2. 'Quality production' 3. 'Organizational proximity' 4. 'Success stories of previous projects' 5. 'Access to new technologies, markets, and complementary skills' 6. 'Governance and control' 7. 'Spurring innovation'

For decade-1, the sample size is 24, while for decade-2; it is 87 almost three times bigger than for decade-1. One possible reason may be due to the greater involvement of companies in SDO partnership activities in the second decade might caught the attention of researchers. The findings of this study complement the previous findings in this domain, regarding the growth in SOP global industry with respect to time [5], [23], [27], [42].

The chi-square test illustrates a significant difference for only one factor, 'effective relationship management' for which the p value is less than 0.05 as shown in Table 15.

This indicates that previously the relationship management is given full attention but in the 2nd decade since 2000 it is not a factor of interest anymore.

According to Verwaal and Hesselmanns [11], partnerships are relationships with certain characteristics to build trust. The main difference between partnership and contractual relationship is that in partnership the stress is given on trust and achieving general business goals while in a contractual relationship the stress is given on the obligation of the contract and on achieving narrowly specific business goals [8], [11]. Since, in the second decade (2000-2009), most of the relationships were reported to be a partnership that might be the reason that stress is not given to 'effective relationship management'.

TABLE 14. Distribution of SFs in two decades (1990-2009).

Continents	Number of Factors found	Number of CSFs (cited in >=50% of the articles)
Decade1 1990-1999 (N=24)	26	We have identified the following five CSFs: 1. 'Mutual interdependence and shared values' 2. 'Mutual trust' 3. 'Effective and timely communication' 4. 'Organizational proximity' 5. 'Flexible Service Level Agreements'
Decade2 2000-2009 (N=87)	26	We have identified the following five CSFs: 1. 'Mutual interdependence and shared values' 2. 'Mutual trust' 3. 'Effective and timely communication' 4. 'Quality production' 5. '3C (coordination, cooperation, and collaboration)'

The results presented in Table 14 endorse a growth in the occurrence of eleven SFs from 1990 to 2009 as mentioned below.

- '3C (coordination, cooperation, and collaboration)' rises from 38% to 54%
- 'Bidirectional transfer of knowledge (BTK)' rises from 33% to 40%
- 'Cross-cultural understanding and sensitivity' rises from 25% to 34%
- 'Governance and control' 29% to 31%
- 'Financial stability and relation specific investment' rises from 8% to 26%
- 'Organisational transparency and receptivity' rises from 13% to 28%
- 'Spurring innovation' rises from 17% to 25%.
- 'Win-win strategy rises' from 17% to 20%
- 'Top management engagement' rises' from 13% to 16%
- 'Social networking' rises from 13% to 14%

The reason might be that these factors are new and only introduce in the 2nd decade (2000-2009). Therefore, both clients and vendors are advised to give serious attention to addressing these factors.

TABLE 15. Summary of SFs across two decades from 1990 to 2009.

Factors	Occurrence in SLR (N=111)				Chi-square Test (Linear-by-Linear Association) $\alpha = .05$		
	Decade1 1990-1999 (N=24)		Decade2 2000-2009 (N=87)		X ²	df	p
	Freq	%	Freq	%			
‘Mutual inter-dependence and shared values’	19	79%	57	66%	1.609	1	0.205
‘Mutual trust’	16	67%	50	57%	0.654	1	0.419
‘Effective and timely communication’	16	67%	47	54%	1.214	1	0.271
‘Quality production’	11	46%	53	61%	1.738	1	0.187
‘Organizational proximity’	16	67%	42	48%	2.527	1	0.112
‘Cooperation, coordination, and collaboration’	9	38%	47	54%	2.036	1	0.154
‘Flexible service level agreements’	12	50%	36	41%	0.564	1	0.452
‘Bidirectional transfer of knowledge’	8	33%	35	40%	0.374	1	0.541
‘Long term commitments’	11	46%	31	36%	0.825	1	0.364
‘Joint management infrastructure’	10	42%	27	31%	0.948	1	0.330
‘Cross cultural understanding and sensitivity’	6	25%	30	34%	0.765	1	0.382
‘Success stories of previous projects’	8	33%	27	31%	0.046	1	0.831
‘Access to new technologies, markets, and complementary skills’	9	38%	25	29%	0.674	1	0.412
‘Governance and control’	7	29%	27	31%	0.031	1	0.861
‘Financial stability and relation specific investment’	5	21%	23	26%	0.310	1	0.577
‘Organizational transparency and receptivity’	3	13%	24	28%	2.305	1	0.129
‘Flexibility and reliability’	7	29%	20	23%	0.387	1	0.534
‘Spurring innovation’	4	17%	22	25%	0.772	1	0.379
‘Win-win strategy’	4	17%	17	20%	0.100	1	0.751
‘Effective relationship management’	7	29%	11	13%	4.278	1	0.039
‘Constructive conflicts resolution mechanism’	4	17%	13	15%	0.043	1	0.836
‘Top management engagement’	3	13%	14	16%	0.185	1	0.667
‘Social networking’	3	13%	12	14%	0.027	1	0.870
‘New business opportunity’	3	13%	10	11%	0.018	1	0.893
‘Honesty and openness’	4	17%	9	10%	0.721	1	0.396
‘Human resource management’	2	8%	5	6%	0.211	1	0.646

According to Sangaiah and Thangavelu [42], ‘knowledge sharing’, ‘trust’, ‘team commitment’, ‘knowledge transfer’, ‘social interaction’, ‘interpersonal trust’, ‘organizational commitment’, ‘absorptive capacity’, ‘arduous relationship’, and ‘shared understanding’ as the key success factors of partnership quality. This literature complements the above results.

There is a downturn in percentages for the rest of the SFs across the two decades as mentioned in Table 15. For example

- ‘Flexible service level agreement (FSLA)’ dropped from 50% to 41%
- ‘Long-term commitments’ dropped from 46% to 36%.
- ‘Effective and timely communication’ dropped from 67% to 54%
- ‘Mutual interdependence and shared values’ dropped from 79% to 66%
- ‘Joint management infrastructure’ dropped from 42% to 31%
- ‘Access to new technologies, markets, and complementary skills’ dropped from 38% to 29%.
- ‘Flexibility and reliability’ dropped from 29% to 23%
- ‘Constructive conflicts resolution mechanism’ dropped from 17% to 15%.

- ‘New business opportunity’ dropped down from 13% to 11% and ‘Honesty and openness’ dropped from 17% to 10%

This may be the reason that these are no longer the first choice of clients in making partnerships with their software development vendors. A partnership is based on the relationship as compared to conventional outsourcing which is based on strict contract [42], [43]. Furthermore, ‘long-term commitment’, ‘effective and timely communication’, ‘mutual interdependence and shared values’, ‘joint management infrastructure’, ‘access to new technologies, markets and complementary skills’, ‘flexibility and reliability’, ‘constructive conflicts resolution mechanism’, ‘new business opportunity’, ‘honesty and openness’ are the known property of partnership. These factors are mostly covered and largely belong to the initial level of partnership.

The inclinations to SDO are changing from contractual relationship to partnership. In order to gain the client’s trust for partnership in SDO projects, vendors need to implement these emerging success factors appropriately [43].

Table 14 illustrates that ‘mutual interdependence and shared values’, ‘mutual trust’, and ‘effective and timely communication’ are critical in both decades. The reason may

be that these are the essential constituents of the SOP and the vital SFs for SOP formation and management. ‘Organizational proximity’ is important SF in the 1st (1990-1999) decade but not important in the 2nd decade (2000-2009). The reason might be that most studies of SOP are confined to a single country perspective and neglecting the insight gained from multinational or cross-cultural research. Therefore, it is the cry of today to improve the study of partnership in offshore software outsourcing context.

Table 14 also reveals that ‘Flexible service level agreement (FSLA)’ is an important factor in the 1st decade (1990-1999) but not in the 2nd decade (2000-2009). One reason may be that in the 1st decade (1990-1999), inter-organizational relationships are based on the control mechanism such as formal and informal. In the period (1990-1999) of the 1st decade most of the inter-organizational relationships were contractual. It was carried through strict contracts [29]. In view of Lacity and Hirschheim [44], to design a contract that maximizes control and flexibility, minimizes risks, better deal with uncertainty and changes, we have to create a measurable partnership. In such partnerships, the client and their vendor established shared goals and complementary assets and skills.

While in the 2nd decade (2000-2009) the trends have been changed. Here formal controls are represented by the written legal agreement i.e flexible service level agreements (SLA), whereas informal controls are not put into black and white. Further social exchange based activities were designed to influence the process and behavior based on trust and social bonds [29]. In current trends of partnership, customers believed that vendors would provide additional services free of cost or at reduced prices under the spirit and trust of the partnership [27].

In summary partnership of the 1st decade (1990-1999) in real sense was contractual relationship based on formal controls and strict contract, because the partnership related factors are not investigated at that time. According to Marcolin [45], many firms state that they are outsourcing partners but the behavior of few of them resembles partnership demonstrating comportment. The partnership tag is vain without these constituent behaviors.

It is also clear from Table 14 that ‘quality production’ and ‘3C is an important SFs in the 2nd decade (2000-2009) but not in the 1st decade (1990-1999).

Its basic reason might be that in the 1st decade (1990-1999) ‘quality production’ was not the top motive for outsourcing, at that time ‘cost saving’ was the burning drive for outsourcing. Today, ‘quality production’ is the top priority of clients for outsourcing. Most of the world’s outsourcing projects go to India because India is the leading quality software provider. According to a report by National Association of Software and Service Companies (NASSCOM) 65% of all Capability Maturity Model (CMM) level five companies are based in India [42]. Moreover, ‘coordination, cooperation, and collaboration’ were not a critical issue till 2000 as well. The reason might be that most of the SOP relationship

was onshore or nearshore at that time. Now SOP is exercised across the globe, so most of the SOP relationships are offshore these days [34].

E. COMPARISON OF SUCCESSES FACTORS BASED ON UPDATED DECADES FROM 2000 TO 2016

The main purpose of the decade-based analysis is changes seen over time. Comparing the SFs across the second and third decade, as mentioned in both Table 16 and Table 17, we came across similarities greater than differences. While comparing the SFs across the updated decades from 2000 to 2016 we found three significant differences namely ‘organizational proximity’, ‘flexible service level agreements’, and ‘long-term commitments’.

The percentage of the organization proximity in decade-2 (2000-2009) is 58% while in decade-3(2010-2016) is 43 %. This indicates that previously organization proximity is given full attention but in the 3rd decade since 2010 it is not a factor of interest anymore. The reason might be that outsourcing becomes one of the crucial parts in today business. Therefore, most of the large organization finds ways to cope with problems arising with organization asymmetries such as language symmetry and technology diversity. In the present decade, a large number of the organization open offshore centers and hire staffs fluent in client’s language. They also arrange offshore meeting and training, in order to cope with cultural and technology asymmetry. Upon comparison of Table 15 and Table 16, we notice the percentage of ‘organizational proximity is decreasing since 1990.

Schmitt and Biesebroeck [46], suggest a number of ways to bridge the gap of proximity. According to them, organization proximity might not be as beneficial in today’s business context as previously thought.

Similarly ‘long term commitment’ is significantly different across the decades from (2000 to 2016). The percentage of ‘long term commitment’ is reduced from 41% to 25% in the present decade from 2010 to 2016. The reasons might be that in the present decade outsourcing partnership practice increase as compared to previous decades. Kishore *et al.* [5] state that, in practice, only a mature and fully committed outsourcing relationship is eligible to promote to outsourcing partnership. Long term commitment is also decreasing since 1990.

The results presented in Table 16 endorse a growth in occurrences of just three SFs from 2000-2009 to 2010-2016 as mentioned below:

- ‘Cross cultural understanding and sensitivity’
- ‘Financial stability and relation specific investment’
- ‘Top management engagement’

The reason might be that in today’s business since the relationship become mature and trusted, therefore top management take interest in partnering and willing to invest in the outgoing relation. At the same time, culture difference is highlighted more than in the previous decade.

Table 17 shows, that ‘mutual interdependence and shared values’, ‘mutual trust’ and ‘effective and timely

TABLE 16. Summary of SFs across two decades from 2000 to 2016.

Factors	Occurrence in SLR (N=152)				Chi-square Test (Linear-by-Linear Association) $\alpha = .05$		
	Decade 2 2000-2009 (N=91)		Decade 3 2010-2016(N=61)		X ²	df	p
	f	%	f	%			
'Mutual inter-dependence and shared values'	57	63%	37	61%	0.061	1	0.805
'Mutual trust'	56	62%	34	56%	0.509	1	0.476
'Effective and timely communication'	52	57%	36	59%	0.53	1	0.819
'Quality production'	55	60%	32	52%	0.950	1	0.330
'Organizational proximity'	53	58%	26	43%	3.569	1	0.059
'Cooperation, coordination, and collaboration'	49	54%	27	44%	1.342	1	0.247
'Flexible service level agreements'	48	53%	17	28%	9.235	1	0.002
'Bidirectional transfer of knowledge'	36	40%	23	38%	0.530	1	0.818
'Long term commitments'	37	41%	15	25%	4.190	1	0.041
'Joint management infrastructure'	32	35%	18	30%	0.529	1	0.467
'Cross cultural understanding and sensitivity'	29	32%	20	33%	0.014	1	0.905
'Success stories of previous projects'	33	36%	16	26%	1.683	1	0.194
'Access to new technologies, markets, and complementary skills'	31	34%	16	26%	1.050	1	0.306
'Governance and control'	32	35%	15	25%	1.912	1	0.167
'Financial stability and relation specific investment'	23	25%	16	26%	0.009	1	0.924
'Organizational transparency and receptivity'	20	22%	16	26%	0.365	1	0.546
'Flexibility and reliability'	21	23%	15	25%	0.046	1	0.830
'Spurring innovation'	19	21%	16	26%	0.590	1	0.442
'Win-win strategy'	19	21%	10	16%	0.476	1	0.490
'Effective relationship management'	16	18%	08	13%	0.548	1	0.459
'Constructive conflicts resolution mechanism'	15	16%	08	13%	0.323	1	0.570
'Top management engagement'	14	15%	10	16%	0.011	1	0.915
'Social networking'	13	14%	08	13%	0.042	1	0.838
'New business opportunity'	13	14%	05	8%	1.297	1	0.255
'Honesty and openness'	12	13%	06	10%	0.393	1	0.531
'Human resource management'	06	7%	03	5%	0.184	1	0.668

TABLE 17. Distribution of SFs in two decades (2000 to 2016).

Continents	Number of Factors	Number of CSFs (cited in >=50% of the articles)
Decade-2 2000-2009 (N=91)	26	We have identified seven CSFs: 1. Mutual interdependence and shared values 2. Mutual trust 3. Effective and timely communication 4. Quality production 5. Organisational proximity 6. 3C (coordination, cooperation, and collaboration) 7. Flexible service level agreements (SLA)
Decade-3 2010-2016 (N=61)	26	We have identified four CSFs: 1. Mutual interdependence and shared values 2. Mutual trust 3. Effective and timely communication 4. Quality production

communication', and 'quality production' are critical in both second and third decades. 'Organizational proximity', 3C and flexible SLA are critical in the second decade

(2000 to 2009) but not critical in 3rd (2010 to 2016). The reason might be that these factors are mostly implemented and are not the burning issue anymore.

Comparing Table 15 and 16, we noted that 'mutual interdependence & shared values', 'Effective and timely communication', and 'mutual trust' are critical across the three decades from 1990 to 2016.

F. SIGNIFICANT CORRELATION BETWEEN FACTORS

In order to find the significant correlation, we kept the significance level 0.05 in the Pearson correlation test. The complete correlation detail can be found in the Appendix. From the results of SLR, we identified that every factor is significantly positively related to at least one factor. It is clear from Table 18, that the most correlated factor is 'organizational proximity-OP', with a frequency equal to 9(36%). The results suggest that an organization having technological, cultural and geographic symmetry; will develop mutual understanding and common collaborative environment very soon.

Moreover, it will help in implementing quality production, long-term commitment, and win-win mind set. An organization with high proximity will have greater executive support,

TABLE 18. Significant correlation between factors AT 0.05.

#	Factors	Correlated factors	f	%
1	OP	={MISV, QP, 3C, FSLA, LTC, CCUS, FaR, WWS, TME}	09	36%
2	3C	={ MISV, MT, EaTC, OP , FSLA, LTC, CCUS}	07	28%
3	NBO	={MISV, JMI, SSPP, ANTM, FSaI, SI, WWS}	07	28%
4	MISV	={ MT, OP, 3C , LTC, JMI, NBO }	06	24%
5	EaTC	={MT, QP, 3C , BTK, CCUS, SN}	06	24%
6	QP	={ EaTC, OP , BTK, SSPP, ANTM, HRM}	06	24%
7	LTC	={ MISV, MT, OP, 3C , CCRM, TME}	06	24%
8	JMI	={ MISV, FSLA , GaC, ERM, CCRM, NBO }	06	24%
9	CCR M	={ MT, JMI, LTC, WWS , ERM, TME}	06	24%
10	FSLA	={ OP, 3C, JMI , CCUS, GaC, FaR}	06	24%
11	MT	={ MISV, EaTC, 3C, LTC, CCRM }	05	20%
12	WWS	={ OP, ERM, CCRM, TME, NBO }	05	20%
13	TME	={ OP, LTC, WWS, ERM, CCRM }	05	20%
14	CCUS	={ EaTC, 3C, OP, FSLA , SN}	05	20%
15	ERM	={ JMI, WWS, CCRM , TME}	04	16%
16	BTK	={ EaTC, OP , OTaR}	03	12%
17	FaR	={ OP, FSLA , SI}	03	12%
18	SI	={ FaR, NBO }	03	12%
19	SN	={ EaTC, CCUS , HaO}	03	12%
20	SSPP	={ OP, NBO }	02	08%
21	ANT M	={ OP, NBO }	02	08%
22	GaC	={ JMI, FSLA }	02	08%
23	FSaI	={ OTaR, NBO }	02	08%
24	OTaR	={ BTK, FSaI }	02	08%
25	HaO	={ SN }	01	04%
26	HRM	={ OP }	01	04%

Correlation is significant at significance level 0.05. The strikethrough factors indicate the bi-directional correlation; means already have correlation with the preceding factor in the Table

high coordination and cooperation, and greater flexibility in shaping the SLA and managing the ongoing relationship.

According to Kedia and Lahiri [15], with increasing proximity mean increasing cultural understanding. Strong proximity let partner continue on a long-term basis and helps in across the border collaboration and coordination.

Further, they stated proximity difference between partners will moderate the effects of drivers on the quality production and will dissuade partners' enthusiasm to renew the SLA.

In view of Allen et al. [47], partner proximity could create a mutually dependent environment which will be more flexible, reliable and collaborative as normally available. According to Schmitt and Biesebroek [46], proximity is directly connected to the level of mutual interdependence, cultural and business understanding. Greater proximity means more chances of top management engagement in collaboration".

Likewise, '3C- collaboration coordination and cooperation' and 'new business opportunities (NBO) are correlated with 28% (07) of the factors. The outcome suggests that increasing collaboration, cooperation, and coordination will increase interdependence, proximity, commitment, and trust between partner firms. The results also reveal that the greater coordination and cooperation in the collaboration will make communication more effective and on time. Further, it deters the need of strict contract and penalty clause in the agreement.

Agreeing to Khan et al. [33], cultural diversity may lead to wrong decision and can have a negative impact on coordination, collaboration, and communication. According to them, trust can be built by effective cooperation, coordination, and collaboration. The lack of proper communication tool results in poor coordination and cooperation, and ultimately negatively affects collaboration.

We note from the findings of this SLR, vendor having a high chance to engage in new business partnership with the client if they have the following capabilities.

- High inter-dependency.
- Joint management with win-win mind set up.
- Competitive skills with innovative capabilities.
- Access to latest technology and market.
- Good track records.
- Financial stability and are willing to invest.

According to the results of Khan et al. [33], critical factors that influence client for taking vendor as a partner are:

- Vendor's reputation in the market
- Performance history
- Technical capability
- Financial stability
- Flexibility in working behavior
- Market share
- Quality production, and
- Previous working experience in the market

Khan et al. [33] suggest, technical capability, strategic fit between companies, financial stability, performance history, quality of product and services, cooperation, mutual dependencies, reliability to achieve milestones, market share, location, innovation and commitment, business potential and experience are the factors to be considered in selection of vendor as partner.

Similarly, 'mutual interdependence and shared values-MISV', 'effective and timely communication-EaTC', 'quality production- QP', 'long term commitment-LTC' 'joint management infrastructure- JMI' and 'CCRM-constructive conflict resolution mechanism' are the 3rd top correlated factors with '24%' (06) correlation connections. The complete correlation model is shown in Fig. 7.

The outcomes of Lai [24] suggest that factors such as shared knowledge have a positive effect on shared benefits. Also, 'organizational linkage' has a positive effect on commitment and predisposition. Bi-directional dependency has a positive effect on mutual benefits, commitment, and predisposition. And last but not the least; commitment has a positive effect on outsourcing success.

Agreeing to Webb and Laborde [41], active and effective communication between client and vendor firms give them equal opportunity for the improvement of mutual respect, mutual understanding, and bidirectional talent.

Alexandrova [39], states that it strengthens the existing level of understanding and helps in interchanging bi directional knowledge and information.

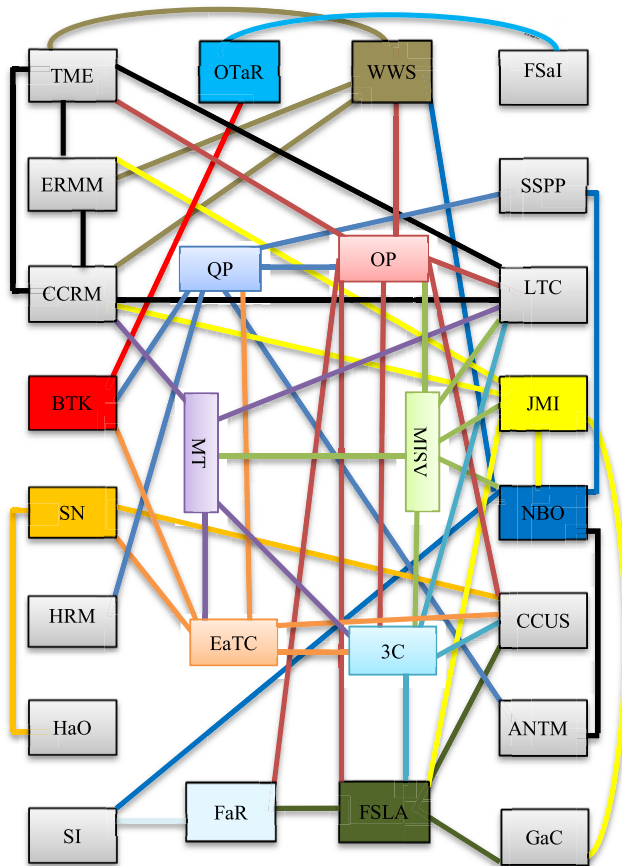


FIGURE 7. Correlation model, correlation is significant at significance level 0.05.

TABLE 19. Perfect correlation between factors.

#	Factors	Correlated factors	f	%
1	TME	= {LTC, WWS, ERM, CCRM}	04	16%
2	ERM	= {JM, WWS, CCRM, TME }	04	16%
3	CCUS	= {EaTC, 3C, OP, SN}	04	16%
4	LTC	= {MT, 3C, CCRM, TME }	04	16%
5	3C	= {MISV, EaTC, LTC , CCUS }	04	16%
6	CCRM	= { LTC , WWS, ERM , TME }	04	16%
7	EaTC	= {3C, CCUS , MT, SN}	03	12%
8	FSLA	= {JMI, GaC, FaR}	03	12%
9	JMI	= { FSLA , GaC, ERM }	03	12%
10	WWS	= {ERM, CCRM , TME }	03	12%
11	GaC	= {JM, FSLA}	02	8%
12	MT	= {EaTC, LTC}	02	8%
13	SN	= {EaTC, CCUS}	02	8%
14	FaR	= {FSLA}	01	4%
15	OP	= {CCUS}	01	4%
16	MISV	= {3C}	01	4%

Correlation is significant at significance level 0.01. The strikethrough factors indicate the bi-directional correlation; means already have correlation with the preceding factor in the Table

G. PERFECT CORRELATION BETWEEN FACTORS

The top six factors with respect to perfect correlation are: ‘TME’, ‘ERM’, ‘CCUS’, ‘LTC’, ‘3C’, and ‘CCRM’, with occurrence 16% (04), as given in Table 19. Perfect correlation was significant at level 0.01.

It is clear from Table 19 that, ‘top management engagement-TME’ can benefit in creating ‘long term commitment’, ‘win-win thinking’, and ‘constructive conflict resolution method. Moreover, due to the active participation of the top executive, it can help in effectively managing the on-going relationship between outsourcing allies. According to Lacity and Hirschheim [44], at the most senior levels, there must be a connection between trading partners to deal with differences and major issues in relationship management and reshaping by using a constructive approach.

The outcomes also state that ‘effective relationship management- ERM’ is connected with ‘joint management infrastructure-JMI’ and ‘top management engagement-TME’. It means relationship will be effective, if the team is built jointly and compose of the top executive from both organizations. The team should work for the conflict resolution in a win-win manner. Shi *et al.* [48] state that for better results the relationship management team should be jointly built with the top executive from both firms and must have the following three relationship management capabilities.

- The capability of team personnel to manage the sourcing strategy that runs into the mutual interests of both organizations.
- The capability to manage negotiates and execute conflicts resolution plan in such way to protect the business’s contractual position over time.
- The capability to manage the outsourcing relationship in such a way to achieve the long-term commitment for creating win-win situations.

The results of SLR as demonstrated in Table 19 states that, ‘cross cultural understanding and sensitivity- CCUS-’ should be achieved by effective communication, collaboration, social networking, and organization compatibility. According to Schmitt and Biesebroeck [46], cultural diversity may lead to the wrong decision and can have a negative impact on coordination, collaboration, and communication. Cultural differences should be better dealt with formal and informal communication [46]. According to Kedia and Lahiri [15], cultural understanding can add in increasing proximity between partner organizations.

Similarly, ‘long-term commitment- LTC’ is connected to bi-directional trust, constructive conflict resolution, and collaboration, coordination, cooperation and top management engagement. According to Ylitalo [26], there is a significant positive relationship between trust and commitment. Niazi *et al.* [40], conditions that trust is not created suddenly; it is alliance-specific commitments to indicate good faith. Long-term commitment and trust, at the same time help in cultural adaptation, solve conflicting situations, create strong social and personal bonds between top individuals from both parties [2], [26], [49].

The outcome related to ‘3C’ suggests that increasing collaboration, cooperation, and coordination will increase interdependence, commitment, and trust between partner firms. The results also reveal that greater the coordination and cooperation in the collaboration will make communica-

tion effective and on time. Sun *et al.* [23] conduct a study on factors in information system outsourcing partnership. According to them, there is a positive association between ‘inter-dependence’ and ‘trust’, ‘collaboration’ and, ‘interdependence. Oza [50], found that regularly communicating the outcomes of the project milestone to a partner can increase collaboration and coordination. A study conducted by Khan *et al.* [33] states that ‘ineffective communication’ adversely affects coordination and collaboration.

‘Constructive conflicts resolution mechanism- CCRM’ is correlated with ‘LTC’, ‘WWS’, ‘ERM’, ‘TME’. Long-term commitment, win-win mind-set, top management support, and effective relationship management capability helps in managing the rising conflicts in the on-going partnership. Ndubisi [51], states that there is a direct association between conflict resolution mechanism and commitment. The author further presents, five-conflict resolution model win/win, compromise, win/lose suppression, and withdrawal. The study confirms the effectiveness of win-win strategy in conflict resolution.

The second most correlated factors with count 04(12%) are ‘EaTC’, ‘FSLA’, ‘JMI’, and WWS. Table 19 shows that ‘effective and timely communication-EaTC’ builds trust, increase social networking, and reduced cultural diversities adverse effects.

Sun *et al.* [23], conducted a study on factors in information system outsourcing partnership. According to them, there is a positive association between ‘communication’ and ‘trust. They also inform about the association of ‘inter-dependence’ and ‘commitment’. Oza [50], found that regular communicating outcomes of the project to a partner can build trust. Agreeing to Webb and Laborde [41], active and effective communication between client and vendor firms gives them equal opportunity for the improvement of mutual trust, mutual understanding, and bidirectional talents. Niazi *et al.* [52], state that informal communication can increase social bonds.

‘Flexible SLA’ can aid in establishing joint management infrastructure, providing flexibility and reliability in relationship execution, better governance, and control [23].

In view of Dekker [32], the more flexible the term of the SLA is, the more general the governance structure will be. According to Srinivasan *et al.* [53], SLA is a formally written agreement between client and vendor, developed jointly, that specifies a product or service to be provided. According to them, JMI is necessary to draft SLA.

JMI also affects governance and control, and help in relationship management. Sun *et al.* [23], state that in a well-recognized way to mitigate the risk, arising from the outsourcing, is the constitution of a joint governance structure.

V. SUMMARY AND DISCUSSIONS

We have found 26 success factors (SFs) for SOP in total, through SLR study, faced by vendors in SOP formation. These SFs will influence clients in the conversion of

conventional SDO relationship to SOP with their vendors. Our research aims to provide SOP vendors with a clear guidance that can assist them to implement and design successful outsourcing partnership initiatives. This paper recommends that vendors should focus on all of the reported SFs as mentioned in Table 9. SDO vendors should also focus on the given percentage of SOP factors as mentioned in Table 11, 12, 15 and 16. These findings may also be beneficial to client organizations, practitioners, and researchers in the area.

Success factors signify some of the critical areas where management should focus their attention in order to be successful in SOP initiatives. To decide criticality of SFs, the below-mentioned criterion will be used:

If a SF is quoted in the SLR sample with a percentage/frequency $\geq 50\%$, then that SF will be considered as critical SF (CSF) in this exploratory study. The same criterion was also incorporated in our previous study [20], [33], [54]. A comparable criterion has also been used by some other researchers [27], [43]. A study was conducted by Niazi *et al.* [52], to enlist key factors in software process improvement (SPI) with the criterion $\geq 50\%$. According to them, if a factor is reported in the literature with $\geq 50\%$, then that factor should be considered critical in SPI efforts. However, SDO practitioners and researcher may also delineate their own criterion in order to plump the criticality of the identified SFs.

To answer RQ1 in light of the aforementioned criterion, the followings are considered as CSFs: ‘mutual interdependence and shared values’, ‘mutual trust’, ‘effective and timely communication’, ‘Organizational proximity’, ‘quality production’ and ‘3C (coordination, cooperation, and collaboration)’. These CSFs play a vital role in the conversion of existing outsourcing relationship to a partnership.

To answer RQ2, we have found three factors common in all categories of the continent.

- ‘Effective and timely communication’
- ‘Quality production’
- ‘Organizational proximity’

‘Flexible service level agreements’ is critical in America only. The reason might be that most of the clients in outsourcing belong to America. SLA is a factor more critical for the client as compared to vendors.

‘Access to new technologies, markets, and complementary skills’ is critical in mixed types (more than one continent) only. The possible reason might be that organization outsource to an offshore country for getting access new technology, methods, tools, and skills that are not available in-house, or to enter into a new market.

We have noticed just one significant difference across all the continents categories i.e ‘access to new technologies, markets, and complementary skills’.

In order to address RQ3 using the criterion for CSFs, no CSF is found common in all study strategies. The cause could be that frequency of some of the strategy is very low. For example, the frequency of experimental study, experience

TABLE 20. Correlation table.

#	Factor	Value	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
			MT	EaTC	QP	OP	3C	FSLA	BTK	LTC	JMI	CCUS	SSPP	ANTM	GaC	FSal	OTaR	FaR	SI	WWS	ERM	CCRM	TME	SN	NBO	HaO	HRM	
1	MISV	r	.175*	.153	.142	.167*	.325**	.077	.153	.167*	.175*	.107	.078	.115	-.002	.109	.119	.119	.076	.106	.043	.143	-.008	.001	.162*	.078	.025	
		α	.031	.060	.080	.040	.000	.347	.059	.040	.031	.189	.338	.157	.981	.179	.144	.144	.354	.195	.599	.079	.918	.995	.046	.338	.761	
2	MT	r	1	.478**	.013	.140	.187*	.149	.029	.260**	.040	.114	.028	.092	.063	-.108	.116	-.010	.104	.062	-.044	.164*	.014	.022	.056	.138	-.132	
		α		.000	.872	.085	.021	.067	.720	.001	.627	.161	.730	.260	.441	.185	.155	.903	.201	.446	.587	.044	.862	.788	.496	.089	.105	
3	EaTC	r		1	.044	.167*	.453**	.037	.187*	.137	.200*	.303**	.132	.080	.080	.062	.036	.036	.055	.041	.077	.137	.137	.264**	.017	.106	.012	
		α			.591	.040	.000	.652	.021	.091	.013	.000	.105	.325	.325	.451	.657	.657	.501	.616	.346	.092	.092	.001	.832	.192	.884	
4	QP	r			1	.154*	.066	-.086	.681*	.007	.096	.001	.141*	.118*	-.055	-.023	-.019	.075	.094	.115	.083	.068	.031	.000	.111	.095	.114*	
		α				.048	.416	.291	.034	.935	.241	.987	.043	.048	.503	.778	.817	.359	.251	.158	.312	.404	.705	.993	.173	.245	.022	
5	OP	r				1	.198*	.192*	.009	.166*	.169*	.240**	.071	-.012	.045	.099	.009	.164*	.006	.165*	.127	.149	.185*	.041	.149	.067	.074	
		α					.015	.018	.912	.041	.038	.003	.382	.882	.584	.226	.913	.044	.942	.042	.118	.068	.022	.612	.068	.412	.366	
6	3C	r					1	.173*	.148	.250**	.084	.211**	.183*	.100	.043	.091	.124	.124	.047	.050	.072	.055	.092	.095	.041	.041	.028	
		α						.033	.068	.002	.303	.009	.024	.222	.601	.264	.129	.129	.566	.539	.377	.500	.261	.243	.618	.618	.733	
7	FSLA	r						1	.103	.105	.244**	.172*	.001	-.003	.256**	.084	.050	.332**	.031	-.081	.100	.043	.006	.078	.054	-.029	.009	
		α							.207	.196	.002	.034	.987	.972	.001	.301	.539	.000	.709	.320	.221	.597	.941	.341	.512	.726	.917	
8	BTK	r							1	.137	.132	.086	-.029	.051	.051	-.148	.191*	.033	.051	.060	.062	.078	.040	.072	.042	-.041	.029	
		α								.092	.105	.292	.719	.530	.530	.069	.018	.690	.534	.464	.445	.339	.621	.376	.605	.614	.723	
9	LTC	r								1	.026	.126	.066	.118	.118	.000	.055	-.108	.032	-.033	.030	.315**	.315**	-.128	.036	.036	-.063	
		α									.747	.123	.417	.149	.149	1.000	.501	.185	.695	.691	.713	.000	.000	.116	.658	.658	.438	
10	JMI	r									1	.146	.063	.047	.228**	.081	.038	.071	.050	.123	.273**	.173*	.134	.125	.177*	-.083	.121	
		α										.072	.437	.568	.005	.322	.641	.384	.538	.130	.001	.033	-.099	.123	.029	.308	.138	
11	CCUS	r										1	.096	-.066	.117	.041	.020	.112	.024	.084	.028	.016	.016	.254**	.079	.096	.066	
		α											.237	.423	.150	.619	.806	.168	.769	.303	.728	.842	.842	.002	.336	.241	.423	
12	SSPP	r											1	.026	-.005	.024	-.086	-.053	.009	.084	-.106	.056	.016	.009	.139*	.052	.066	
		α												.752	.955	.766	.291	.515	.908	.303	.195	.497	.842	.909	.047	.523	.423	
13	ANTM	r												1	.045	.041	.004	.004	.141	.035	.016	.035	.075	.062	.151*	.063	-.108	
		α													.580	.615	.957	.957	.083	.668	.841	.666	.358	.447	.043	.439	.187	
14	GAC	r													1	.008	.130	-.004	.040	-.107	.095	.084	.075	.103	.019	.107	.073	
		α														.920	.112	.957	.626	.187	.247	.304	.358	.205	.815	.188	.369	
15	FSal	r														1	.179*	.143	.153	.145	.083	.011	.138	-.011	.165*	.024	-.080	
		α															.028	.079	.059	.075	.307	.897	.090	.893	.043	.774	.324	
16	OTaR	r															1	.054	.063	.123	.071	.024	.067	.001	.035	.060	.074	
		α																.512	.442	.130	.382	.770	.412	.988	.666	.459	.364	
17	FaR	r																1	.173*	.005	.056	-.019	-.063	.046	-.060	-.060	-.009	
		α																	.033	.949	.494	.813	.444	.573	.459	.459	.916	
18	SI	r																		1	.132	.020	-.013	.074	.007	.186*	.090	.061
		α																			.105	.804	.875	.363	.927	.021	.272	.452
19	WWS	r																			1	.341**	.356**	.262**	.000	.185*	-.023	-.051
		α																					.000	.000	.001	.997	.023	.783
20	ERM	r																				1	.321**	.220**	-.017	.009	.103	.044
		α																						.000	.006	.840	.914	.207
21	CCRM	r																					1	.436**	-.009	.016	-.041	.050
		α																							.000	.908	.848	.615
22	TME	r																						1	.116	.129	.098	.127
		α																								.155	.112	.230
23	SN	r																							1	.030	.207*	.142
		α																									.711	.010
24	NBO	r																								1	.118	-.006
		α																										.149
25	HaO	r																									1	.092
		α																										

report, and SLR is just one. It also shows that these are not widely used methodologies in SOP context.

- 26 out of 26 SFs are found through case study and ‘literature review

- 25 out of 26 SFs are found through interview and survey
- 21 out of 26 SFs are found in the thesis
- 12 out of 26 SFs are found in experience report

- 07 out of 26 SFs are found using more than one study methods
- 04 out of 26 are found through experimental study
- Only two out of 26 are found via SLR as a study strategy

Moreover, none of the CSF is specific to only one study strategy. Across the study strategy, we have noticed two significant variations namely, 'quality production' and 'spurring innovation'.

The fourth research question (RQ4) is about CSFs in three decades. For RQ4, using the criterion for CSFs, we have identified the followings three CSFs that are common in all three decades.

- Mutual interdependence and shared values
- Mutual trust
- Effective and timely communication

We found only one significant difference namely 'effective relationship management' across the two decades from 1990 to 2009. On the other hand, from 2000 to 2016, we found three significant difference i.e 'organizational proximity', 'flexible SLA, and, 'long-term commitments'.

The fifth research question (RQ5) is about the significant correlation between the identified factors. For RQ5, we found that all factors are correlated to at least one factor. 'Organizational proximity', 'collaboration coordination and cooperation', and 'new business opportunities are the top correlated factors. Out of 26 SFs, 22 are correlated with just these three factors.

The last research question (RQ6) is related to the perfect correlation between the identified factors. For RQ6, we found six factors 'Top management engagement', 'effective relationship management', 'cross cultural understanding and sensitivity, 'long term commitments', '3C (cooperation, coordination, and collaboration)', and 'constructive conflicts resolution mechanism' have high correlation count with other factors. Out of 26 SFs, 17 factors are correlated with these factors.

VI. LIMITATION

In this section, the threats of validity concerning the SLR study have been discussed. By using SLR procedure, we mined SFs in SOP, but how valid are our findings? Related to internal validity ever first threat to be, for any particular study, they have not explicitly mentioned the cause to report SOP factors. We are unable to control this threat. However, we have validated the results through industrial survey with practitioners working in the industry [21].

Concerning to the threat of external validity, our sample size is composed of the articles reporting data from diverse countries. We have a full confidence in our results because, we found similarities greater than differences in our outcomes and the end result concluded by other peoples such as [2], [16], [21], [23], [39], [42], and [52]. This provides evidence for generalization. Additionally, the recognized SFs were corroborated via empirical survey in the outsourcing industry. For the execution of the empirical study, we have followed the same method as used in [21].

We have conducted our SLR in teamwork and consulted the software engineering research group (SERG_UOM) for validation of the search string and SLR protocol. To deal with subjectivity and researcher biases, we have also done inter-rater reliability check in every step of the SLR conduction.

We do not claim that we have included all digital libraries, so executing our SLR process; it is possible to miss some relevant paper (s). The first reason is abundant papers on partnership and outsourcing and the second reason is inaccessibility of every digital library due to lack of resources.

However, the included digital libraries are sufficient for the synthesis of results in our study. According to other academics investigator like [27], [33], and [37] using SLR as a method for data collection, this is not a methodical omission.

This study used various statistical methods as an analysis tool. Statistical methods are usually having certain limitations for handling human subjective vagueness and uncertainty in the decision making process. To solve such problems, an evaluation framework based on the fuzzy multi criteria decision-making approach [42] will be used in future.

VII. CONCLUSION AND FUTURE WORK

Based on the work conducted in this article, we suggest that client-vendor relation needs to move beyond that of a contractual arrangement into more beneficial, trusted, and collaborative form called partnership. Based on the interrelated literature a total 26 factors are identified. Out of 26 SFs, 06 SFs are considered critical success factors (CSFs), by qualifying the predefined criterion. The identified SOP factors are also associated on the basis of different variables such as 'continents', 'decades' and, 'study strategies'. Moreover, significant and perfect correlation is also identified between the factors.

We suggest that vendors involved in outsourcing relationships should emphasise on all the factors especially the CSFs (most cited factors in Table 9), in order to influence clients in converting their existing conventional outsourcing relationship into outsourcing partnership. Vendors engaged in cross-continents must focus on the mentioned frequencies of each factor in Table 11 (RQ2). If vendors want to know factors with respect to study strategy used, they must follow the findings in Table 12 (RQ3). For SFs in different decades, vendors should refer to Table 14 to 17 (RQ4).

For correlation between factors, vendors should consult Table 18 and 19 (RQ5 and RQ6). We invited independent studies to explore further the correlation between factors, by conducting separate studies on each factor correlation bond. We have noted the following points, as a plan, from the findings of this study:

- The factors will be identified and analyzed in SOP relationships from client's perspectives
- To analyze, the critical risks in the conversion to or formation process of SOP from the vendor perspective
- To find the underlying reasons of why some factors are not important for the specific group of SDO organizations

- To determine, through empirical study, the implementation initiatives of the factors which have been frequently cited in our study
- To determine if there exist any common pattern of correlation among the SFs

APPENDIX

See Table 20.

ACKNOWLEDGMENT

The authors are thankful to software engineering research group (SERG_UOM) at University of Malakand for providing assistance. They are grateful to Sarah Beecham, Lero Limerick, Ireland, for her valuable review comments in finalizing the results. They are also indebted the software experts in the Beijing Key Lab of Petroleum Data Mining, China University of Petroleum (Beijing), China for their support.

REFERENCES

- [1] N. B. Moe, D. Šmite, G. K. Hanssen, and H. Barney, "From offshore outsourcing to insourcing and partnerships: Four failed outsourcing attempts," *Empirical Softw. Eng.*, vol. 19, no. 5, pp. 1225–1258, Oct. 2014.
- [2] M. Kinnula, V. Seppanen, J. Warsta, and S. Vilminko, "The formation and management of a software outsourcing partnership process," in *Proc. HICSS*, Waikoloa, HI, USA, Jan. 2007, p. 240.
- [3] M. S. Lane and W. H. Lum, "Examining client perceptions of partnership quality and the relationships between its dimensions in an IT outsourcing relationship," *Austral. J. Inform. Syst.*, vol. 17, no. 1, pp. 442–451, 2011.
- [4] K. Kemppainen and A. P. J. Vepsäläinen, "Trends in industrial supply chains and networks," *Int. J. Phys. Distrib. Logist. Manage.*, vol. 33, no. 8, pp. 701–719, 2003.
- [5] R. Kishore et al., "A relationship perspective on IT outsourcing," *Commun. ACM*, vol. 46, no. 12, pp. 86–92, 2003.
- [6] R. Srinivasan and T. H. Brush, "Supplier performance in vertical alliances: The effects of self-enforcing agreements and enforceable contracts," *Org. Sci.*, vol. 17, no. 4, pp. 436–452, 2006.
- [7] D. J. Bowersox, D. J. Closs, and T. P. Stank, "How to master cross-enterprise collaboration," *Supply Chain. Manage. Rev.*, vol. 7, no. 4, pp. 18–27, 2003.
- [8] E. Verwaal, "Global outsourcing, explorative innovation and firm financial performance: A knowledge-exchange based perspective," *J. World Bus.*, vol. 52, no. 1, pp. 17–27, Jan. 2017.
- [9] A. Parkhe, "'Messy' research, methodological predispositions, and theory development in international joint ventures," *Acad. Manage. Rev.*, vol. 18, no. 2, pp. 227–268, 1993.
- [10] B. Yang, M. Zuo, and X. Yao, "A case study of disaster backup outsourcing of SDB and Hi sun," in *Proc. ICEC*, Xi'an, China, 2005, pp. 801–803.
- [11] E. Verwaal and M. Hesselmann, "Drivers of supply network governance: An explorative study of the dutch chemical industry," *Eur. Manage. J.*, vol. 22, no. 4, pp. 442–451, Aug. 2004.
- [12] C. Koh, S. Ang, and G. Yeo, "Does IT outsourcing create firm value?" in *Proc. ACM SIGMIS CPR*, Apr. 2007, pp. 87–91.
- [13] S. J.-F. Ren, Q. Bu, M.-J. Zhou, and C.-H. Hu, "The influence of inter-enterprise value co-creation on innovation based on resource theories," in *Proc. IEEM*, Bangkok, Ireland, Apr. 2013, pp. 187–196.
- [14] S. M. Miranda and C. B. Kavan, "Moments of governance in IS outsourcing: Conceptualizing effects of contracts on value capture and creation," *J. Inf. Technol.*, vol. 20, no. 3, pp. 152–169, 2005.
- [15] B. L. Kedia and S. Lahiri, "International outsourcing of services: A partnership model," *J. Int. Manag.*, vol. 13, no. 1, pp. 22–37, 2007.
- [16] S. Lee and G. G. Lim, "The impact of partnership attributes on EDI implementation success," *Inf. Manage.*, vol. 41, no. 2, pp. 135–148, 2003.
- [17] M. Zviran, N. Ahituv, and A. Armoni, "Building outsourcing relationships across the global community: The UPS–Motorola experience," *J. Strategic Inf. Syst.*, vol. 10, no. 4, pp. 313–333, 2011.
- [18] M. Piltan and T. Sowlati, "Multi-criteria assessment of partnership components," *Expert Syst. Appl.*, vol. 64, no. 2016, pp. 605–617, 2016.
- [19] T. L. Tuten and D. J. Urban, "An expanded model of business-to-business partnership formation and success," *Ind. Marketing Manag.*, vol. 30, no. 2, pp. 149–164, 2001.
- [20] S. Ali and S. U. Khan, "Critical success factors for software outsourcing partnership (SOP): A systematic literature review," in *Proc. ICGSE*, Shanghai, China, 2014, pp. 154–162.
- [21] S. U. Khan and S. Ali, "Empirical investigation of success factors for establishing software outsourcing partnership from Vendor's perspective," *Proc. Pakistan Acad. Sci.*, vol. 52, no. 4, pp. 315–328, 2015.
- [22] H. Zhang, P. Tell, and M. A. Babar, "Identifying relevant studies in software engineering," *Inf. Softw. Technol.*, vol. 53, no. 6, pp. 625–637, 2011.
- [23] S.-Y. Sun, T.-C. Lin, and P.-C. Sun, "The factors influencing information systems outsourcing partnership—a study integrating case study and survey research methods," in *Proc. HICSS*, Jan. 2002, pp. 2810–2819.
- [24] Y. H. Lai, "The factors affecting partnership quality of hospital information systems outsourcing of PACS," in *Proc. IEA/AIE*, Morioka, Japan, Aug. 2016, pp. 484–492.
- [25] F. R. Dwyer, P. H. Schurr, and S. Oh, "Developing buyer-seller relationships," *J. Marketing*, vol. 51, no. 2, pp. 11–27, 1987.
- [26] J. Ylitalo et al., "Building mutuality and trust in strategic partnership," in *Proc. ICE*, Munich, Germany, Apr. 2005, pp. 1–8, doi: 10.1109/ITMC.2005.7461266.
- [27] M. Zahedi, M. Shahin, and M. A. Babar, "A systematic review of knowledge sharing challenges and practices in global software development," *Int. J. Inf. Manage.*, vol. 36, no. 6, pp. 995–1019, 2016.
- [28] V. Garousi, K. Petersen, and B. Ozkan, "Challenges and best practices in industry-academia collaborations in software engineering: A systematic literature review," *Inf. Softw. Technol.*, vol. 79, pp. 106–127, Nov. 2016.
- [29] P. Bocij and S. Hickie, *Business Information Systems: Technology, Development and Management for the E-business*, 2nd ed. Englewood Cliffs, NJ, USA: Prentice-Hall, 2008.
- [30] N. V. Venkatraman, "Offshoring without Guilt," *MIT. Sloan Manage. Rev.*, vol. 45, no. 3, pp. 14–16, 2004.
- [31] J. F. Kirkegaard and F. Jacob. (Mar. 2005). *Outsourcing and Offshoring: Pushing the European Model Over the Hill, Rather Than Off the Cliff!* [Online]. Available: <http://dx.doi.org/10.2139/ssrn.688183>
- [32] H. C. Dekker, "Partner selection and governance design in interfirm relationships," *Account. Org. Soc.*, vol. 33, no. 2008, pp. 915–941, 2008.
- [33] S. U. Khan, M. Niazi, and R. Ahmad, "Factors influencing clients in the selection of offshore software outsourcing vendors: An exploratory study using a systematic literature review," *J. Syst. Softw.*, vol. 84, no. 2011, pp. 686–699, 2011.
- [34] M.-Y. Wu et al., "Supply chain performance improvement through partner relationship management in the high tech industry," *Int. J. Manage. Sci. Eng. Manage.*, vol. 6, no. 2011, pp. 210–218, 2011.
- [35] B. Kitchenham and C. Stuart, "Guidelines for performing systematic literature review in software engineering," *Softw. Eng. Group, School Comput. Sci. Math., Keele Univ., Keele, U.K.*, Tech. Rep. EBSE-2007-0, Jul. 2007.
- [36] G. Butterworth et al. *Outsourcing in Europe: An in-Depth Review of Drivers, Risks and Trends in the European Outsourcing Market*. Accessed: Apr. 6, 2017. [Online]. Available: [http://www.ey.com/Publication/vwLUAssets/Outsourcing_in_Europe_2013/\\$FILE/EY-outsourcing-survey.pdf](http://www.ey.com/Publication/vwLUAssets/Outsourcing_in_Europe_2013/$FILE/EY-outsourcing-survey.pdf)
- [37] R. U. Khan, S. U. Khan, R. A. Khan, and S. Ali, "Motivators in green IT-outsourcing from Vendor's perspective: A systematic literature review," *Proc. Pakistan Acad. Sci.*, vol. 52, no. 4, pp. 345–360, 2015.
- [38] D. Assmann and P. Teade, "Towards partnership in software subcontracting," *Comput. Ind.*, vol. 54, no. 2, pp. 137–150, 2003.
- [39] M. Alexandrova, "IT outsourcing partnerships: Empirical research on key success factors in Bulgarian organizations," *Management*, vol. 17, no. 2, pp. 31–50, 2012.
- [40] M. Niazi, N. Ikram, M. Bano, S. Imtiaz, and S. U. Khan, "Establishing trust in offshore software outsourcing relationships: An exploratory study using a systematic literature review," *IET Softw.*, vol. 7, no. 5, pp. 283–293, Oct. 2013.
- [41] L. Webb and J. Laborde, "Crafting a successful outsourcing vendor/client relationship," *Bus. Process. Manage. J.*, vol. 11, no. 5, p. 437, 2005, doi: 10.1108/14637150510619812.
- [42] A. Sangaiah and A. Thangavelu, "An exploration of FMCDM approach for evaluating the outcome/success of GSD projects," *Central Eur. J. Eng.*, vol. 3, no. 3, pp. 419–435, 2013.

- [43] S. Ali and S. U. Khan, "Practices for implementation of the critical success factors in software outsourcing partnership from vendors' perspective: A literature review," *Proc. Pakistan Acad. Sci.*, vol. 53, no. 2, pp. 145–162, 2016.
- [44] M. C. Lacity and R. Hirschheim, "Outsourcing myths and contracting realities," In *Information Systems and Outsourcing*. London, U.K.: Palgrave Macmillan, 2009, ch. 6, pp. 185–211.
- [45] B. L. Marcolin and A. Ross, "Complexities in IS sourcing: Equifinality and relationship management," *ACM SIGMIS Database*, vol. 36, pp. 29–46, Oct. 2005.
- [46] A. Schmitt and J. V. Biesebroeck, "Proximity strategies in outsourcing relations: The role of geographical, cultural and relational proximity in the European automotive industry," *J. Int. Bus. Stud.*, vol. 44, no. 5, pp. 475–503, 2013.
- [47] B. A. Allen et al., "E-governance & government online in Canada: Partnerships, people & prospects," *Government Inf. Q.*, vol. 18, no. 2, pp. 93–104, 2011.
- [48] Z. Shi, A. S. Kunnathur, and T. S. Ragu-Nathan, "IS outsourcing management competence dimensions: Instrument development and relationship exploration," *Inf. Manage.*, vol. 42, no. 6, pp. 901–919, 2005.
- [49] R. S. Abhilash and M. N. Chandy, "Ensuring public realm through private-private partnership, in the context of rapid urbanization (case of CBD area Kochi)," in *Proc. ICETEST*, vol. 24, 2016, pp. 1652–1659.
- [50] N. Oza, "An empirical evaluation of client—Vendor relationships in Indian software outsourcing companies," Ph.D. dissertation, Dept. Comput. Sci., Univ. Hertfordshire, Hatfield, U.K., 2006.
- [51] N. O. Ndubisi, "Conflict handling, trust and commitment in outsourcing relationship: A Chinese and Indian study," *Ind. Marketing Manag.*, vol. 40, no. 1, pp. 109–117, 2011.
- [52] M. Niazi, D. Wilson, and D. Zowghi, "A maturity model for the implementation of software process improvement: An empirical study," *J. Syst. Softw.*, vol. 74, pp. 155–172, Jan. 2005.
- [53] M. Srinivasan, D. Mukherjee, and A. S. Gaur, "Buyer—supplier partnership quality and supply chain performance: Moderating role of risks, and environmental uncertainty," *Eur. Manage. J.*, vol. 29, no. 4, pp. 260–271, 2011. [Online]. Available: <https://ssrn.com/abstract>
- [54] S. Ali and S. U. Khan, "Software outsourcing partnership model: An evaluation framework for vendor organizations," *J. Syst. Softw.*, vol. 117, pp. 402–425, Jul. 2016.



SIKANDAR ALI received the M.Phil. degree in software engineering from the University of Malakand, Lower Dir, Pakistan, under the research supervision of Dr. S. U. Khan. He is currently pursuing the Ph.D. degree with the China University of Petroleum, Beijing, under the supervision of Dr. L. Hongqi. He is currently a Teacher with the University of Swat, Pakistan. His research interest lies in software outsourcing partnership, empirical software engineering, systematic literature review, requirements engineering, green computing, software testing and test automation, agile software development, and global software engineering. He has authored a number of articles in well reputed international conferences and journals, including ICGSE and *Journal of System and Software*.



LI HONGQI is currently a Professor and a Ph.D. Advisor with the Computer Technology Department, China University of Petroleum, Beijing. He is also the Director of the Beijing Key Laboratory of Petroleum Data Mining, China University of Petroleum, Beijing. He has supervised over 100 master and Ph.D. students. His research interests are swarm intelligence, particle swarm, optimization, intelligent information processing, software engineering, data mining, and big data mining.



SIFFAT ULLAH KHAN received the Ph.D. degree in computer science from Keele University, U.K. He is currently an Assistant Professor in Computer Science and IT Department, University of Malakand, Pakistan. He is also the Founder and the Leader of the Software Engineering Research Group, University of Malakand. He has been the Head of the Department of Software Engineering, University of Malakand for three years. He has successfully supervised ten M.Phil. and four Ph.D. scholars. He has authored over 100 articles, so far, in well reputed international conferences and journals. His research interest includes software outsourcing, empirical software engineering, agile software development, systematic literature review, software metrics, cloud computing, requirements engineering, and green computing/IT. He received the Gold Medal (Dr. M. N. Azam Prize 2015) from the Pakistan Academy of Sciences in recognition of his research achievements in the field of computer (software).



YANG ZHONGGUO received the degree in information and computational science from the Harbin Institute of Technology in 2010. He is currently pursuing the Ph.D. degree in artificial intelligence from the China University of Petroleum, Beijing. His research interests include data mining, parameter selection algorithm, genetic algorithm, and intelligent information processing and application.



ZHU LIPING is currently an Associate Professor and a Master Advisor with the Computer Technology Department, China University of Petroleum, Beijing. His research interests are swarm intelligence, reservoir protection, clustering, big data and data mining. He has supervised over 40 master students. She is the Administrator of the Beijing Key Laboratory of Petroleum and Data Mining.

...