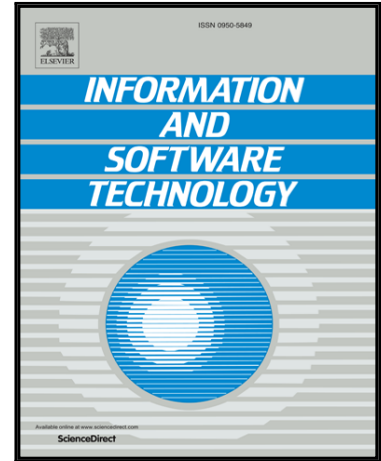


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# Systematic Literature Review and Empirical Investigation of Barriers to Process Improvement in Global Software Development: Client– Vendor Perspective

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## Abstract:

**Context:** Increasingly, software development organizations are adopting global software development (GSD) strategies, mainly because of the significant return on investment they produce. However, there are many challenges associated with GSD, particularly with regards to software process improvement (SPI). SPI can play a significant role in the successful execution of GSD projects.

**Objective:** The aim of the present study was to identify barriers that can negatively affect SPI initiatives in GSD organizations from both client and vendor perspectives.

**Method:** A systematic literature review (SLR) and survey questionnaire were used to identify and validate the barriers.

**Results:** Twenty-two barriers to successful SPI programs were identified. Results illustrate that the barriers identified using SLR and survey approaches have more similarities. However, there were significant differences between the ranking of these barriers in the SLR and survey approaches, as indicated by the results of *t*-tests (for instance,  $t = 2.28$ ,  $p = 0.011 < 0.05$ ). Our findings demonstrate that there is a moderate positive correlation between the ranks obtained from the SLR and the empirical study ( $r_s(22) = 0.567$ ,  $p = 0.006$ ).

**Conclusions:** The identified barriers can assist both client and vendor GSD organizations during initiation of an SPI program. Client-vendor classification was used to provide a broad picture of SPI programs, and their respective barriers. The top-ranked barriers can be used as a guide for GSD organizations prior to the initiation of an SPI program. We believe that the results of this study can be useful in tackling the problems associated with the implementation of SPI, which is vital to the success and progression of GSD organizations.

## Keywords

Software process improvement, global software development, systematic literature review, barriers, client, vendor

## 1. INTRODUCTION

A variety of techniques have been introduced for the effective management of the software development process. The most significant of these is software process improvement (SPI), the purpose of which is to refine the steps involved in software development phases [1, 2].

Various process improvement models were developed in order to help software organizations to achieve effective management of software development processes. For example, capability maturity model integration (CMMI) [3] consists of structured and methodical practices for process assessment and process improvement. The implementation of CMMI begins with the improvement approach IDEAL (Initiating, Diagnosing, Establishing, Acting, and Learning) model [4]. IDEAL model assist the organization to initiate, plan and implement the SPI program. It provides understandable guideline to continuously and successfully improve the process improvement activities. The Software Engineering Institute (SEI) has

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