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# Towards Implementation of Requirements Management Specific Practices (SP1.3 and SP1.4) for Saudi Arabian Small and Medium Sized Software Development Organizations

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**ABSTRACT** There is a significant need to give careful consideration to Capability Maturity Model Integration (CMMI) Level 2 specific practices—SP 1.3 “manage requirements changes,” and SP 1.4 “maintain bidirectional traceability of requirements,” especially in the context of small- and medium-sized software development organizations in Saudi Arabia, in order to assist such organizations in getting one step closer to achieving CMMI Level 2 certification. The objective of this research is to implement CMMI Level 2 specific practices—SP 1.3 and SP 1.4. In this paper, a workflow model for each specific practice has been developed. In addition, initial evaluation of the models has been discussed. It is necessary to highlight that this paper contributes not only to the implementation of SP 1.3 and SP 1.4 of Requirements management process area in the context of small- and medium-sized software development organizations but also to the body of empirical studies in various context. Data has been collected by exploring published research articles and high-level software process descriptions. Moreover, previous research works that dealt with the implementation of CMMI Level 2 process areas have been reviewed. Furthermore, research articles that provide guidance to software development organizations for implementing process areas of CMMI Level 2 in their environments have been considered. After careful analysis of the collected data, we have proposed the models for two specific practices of CMMI level 2, i.e., managing requirements change and maintaining bidirectional traceability of requirements. Each model is divided into core stages, and different activities associated with each stage are clearly indicated. Initial evaluation of the proposed models was also conducted using the expert review process. Based on the initial evaluation, we are confident that our proposed models are clear and easy to learn, follow, and use. Moreover, our models are applicable to small- and medium-sized software development organizations in Saudi Arabia. The proposed models can also assist such organizations in implementing these two specific practices. For further evaluation, we need to perform multiple case studies in an industrial setting to test the proposed models.

**INDEX TERMS** Software process improvement (SPI), capability maturity model integration (CMMI), small- and medium-sized software development organizations, project management.