

Integrating Reuse Measurement Practices into the ERP Requirements Engineering Process

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Abstract. The management and deployment of reuse-driven and architecture-centric requirements engineering processes have become common in many organizations adopting Enterprise Resource Planning solutions. Yet, little is known about the variety of reusability aspects in ERP projects at the level of requirements. Neither, we know enough how exactly ERP adopters benefit from reuse as part of the requirements engineering process. This paper sheds some light into these questions and suggests a practical approach to applied ERP requirements reuse measurement by incorporating reuse metrics planning as part of the implementation of metrics on an ERP project. Relevant process integration challenges are resolved in the context of SAP R/3 implementation projects in which the author participated while being employed at the second largest telecommunication company in Canada.

1 Introduction

The business requirements for an Enterprise Resource Planning (ERP) solution in intra- or inter-organizational settings are the documents about the ERP adopter's organizational unit set-up, their business processes, data needs, and communication channels that are covered in the scope of the ERP implementation project. Requirements Engineering (RE) for ERP is the process concerned with all aspects of the reuse, the analysis, the adaptation, and the management of a large number of these descriptions. Its ultimate objective is to enhance the fit between the ERP adopting organization and its ERP system. The process begins once a business case for the ERP implementation project is finalized and business drivers are identified and it continues throughout the entire implementation cycle in the form of tracking of the life history of any particular requirement and business issue. The better the resulting business requirements are conceptualized, the faster the progress in subsequent phases, because the necessary decisions concerning the future ERP solution have been made and agreed upon [4,5,24].

To streamline the RE process and to assure high quality results, the ERP vendors and their consulting partners have invented and marketed systematic requirements reuse approaches, infrastructures of processes, people and tools for ERP adopters to reuse, and, since 2000, industry-specific solution maps that are descriptions of the most important business processes within an industry sector, the technologies (ERP elements and add-ons), and services needed to support the processes. These can be

seen as domain-specific frameworks [17] with three major features: an *architecture* defining the structure of integrated information systems within the business problem domain, a set of *business application components* engineered to fit the architecture, and a set of *tools* that assist the consultant in building component-based solutions using the domain knowledge within the architecture.

Nine years after the official launch of the first standardized ERP RE process by SAP, despite the increased attention to ERP requirements reuse, very few approaches have emerged to quantitatively measure the results from requirement reuse the customers have achieved [3]. As leading software metrics practitioners recognized earlier, we ‘can not do effective reuse without proper measurement and planning’ [19].

To obviate this issue, the present paper takes a measurement planning perspective [10]. We propose a practical solution that rests on a Goal-Question-Metrics-compliant process [1] of defining a requirements reuse measurement plan that links the reuse measurement needs to the ERP reuse goals and action items to be taken in the RE process. Our key objective is to provide a sound and consistent basis for incorporating reuse metrics planning as part of the implementation of metrics on an ERP project. We applied a case-study-driven research method [25] that was focused on the requirements reuse measurement activities in the context of implementing the SAP R/3 System, a leading product in the ERP software market [2,15,24]. However, our approach is generic enough and could easily be applied to any other ERP project implementation.

The layout of the paper is as follows: in the next section we motivate our approach. Section 3 is designed to answer some fundamental questions about the building blocks of our reuse measurement plan. Section 4 discusses how measurements are useful. Section 5 generalizes our experience. Section 6 concludes the paper.

2 Motivation

An ERP requirements reuse measurement process is a systematic method of (i) adopting or adapting standard reuse counting practices in ERP RE, (ii) measuring the ERP reuse goals, and (iii) indicating reuse levels targeted at the beginning and achieved at the end of each stage of the ERP implementation cycle. The main purpose of this process for ERP-adopters is to learn about their own business, technological and environment opportunities by learning how much reuse their ERP-supported business processes could practice. The motivation behind the integration of the reuse measurement process in the RE process is to achieve the following five goals:

- To enable the reuse process to be planned and reuse planning to be done as part of the RE process.
- To reduce the probability of errors and accidental omissions in the business process requirements.
- To spot requirements problems and conflict by identifying anomalous reuse measurements.
- To collect reuse data to serve as an input to an effort estimation model.