

Chapter 1

Metrics and Models for Evaluating the Quality of ERP Software: Systematic Mapping Review

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ABSTRACT

ERP system provides a central system that integrates most of the core business processes such as human resources, finance, production, and so on. Due to the integration of such complicated functionalities and rapidly evolving customers expectation, ERP systems evaluation has an important impact on organization business success. The aim of this chapter is to understand the evaluation approaches of the ERP systems, and then to map the identified primary studies into a classification scheme to answer the research questions. A systematic mapping study was employed. A total of 36 studies published between the years 2002 and 2018 were collected, analyzed, classified, and discussed. A list of relevant ERP quality attributes that have been measured is identified. Reliability of the metrics methodology and the validity of indicator generated by the metric are two major issues in the current research. It is worth noting that while both the academic and professional literature has shown a great interact in ERP, there does not exist an evaluation approach that is widely accepted.

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INTRODUCTION

Enterprise resource planning (ERP) software is playing an increasing role in the software industry and is considered to be the new engine to sustain the high growth of data and information technology. Huge investments are being made by organizations with great expectations for the gains to be made through ERP systems. The claim is that ERP systems allow the reduction of cost and time through the reuse of such systems in different enterprise environments. Generally, ERP system is designed to fit the needs of all organization requirements, but it could be useless or even harmful if the system does not adequately fit specific organization needs. In most cases, ERP system might be ill-fitting with the organization requirements for the following reasons:

- ERP systems implement package software rather than software written for or by one customer.
- ERP systems operate on organization's internal and external operations, and affect its business and strategy
- ERP system provide central systems that have a variety of associated stakeholders and the relationships between them.
- Different organizations may implement the same ERP system using different development methodologies.

Evaluation model and metric are two different but closely related concepts. This is because both metrics and evaluation models are used to determine or predict the quality of the product or process. They differ in their aims and results. The goal of the evaluation is to determine if a software product, process or project passes assessment and achieves minimum requirements. Evaluation model outcomes are descriptive and do not have to be quantitative. On the other hand, the goal of the metric is to obtain objective and quantifiable measurement of some attribute of a software product or process. Metrics are convenient and easily understandable evaluation methods. In some cases, evaluation models employees' metrics composed of multiple measures to overcome the descriptive results.

Having the right metric is the first step toward delivering high-quality product. Metrics can explore, but does not solve, the problem. In order to control the quality of ERP systems, many kinds of metrics and evaluation models exist, but not all of them are meaningful in the specific context of an organization. Therefore, defining the right metrics in the proper context is very important. To make sure that the metric is defined in a meaningful way, the author of metric should clearly describe these five elements: 1) Measured Element: which element of an ERP system are being measured? 2) Purpose: why are we measuring the element? 3) Focus: what

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