ABSTRACT

Business Process Reengineering (BPR) is one of the existing methods in the literature that lead to evolutionary changes and adjustments that have become a necessity in today’s business. As part of BPR projects, we need to compare process models to reference models to detect differences and propose improvements thereafter to remedy them. This paper presents a state of the art on works that were interested in comparing models of business process models and defines an approach for comparing two business processes and measuring the gap between them. The proposed approach has been developed and was tested with software development processes.

Keywords: Business Process Model, Business Process Reengineering (BPR), Comparison of Models, Reference Model, Software Development

INTRODUCTION

Under the influence of competition and technological change, the successful company must not only produce and distribute services but also create value and grow. To grow, it must change. The company is seen as an organization composed of several business processes; therefore the change has to begin from these processes. The business processes are defined by ISO as a “Set of interrelated or interacting activities which transform inputs into output”. A business process is a collection of related tasks that lead to a specified goal. Many modeling notations are available to capture business processes, including Event-driven Process Chains (EPC) (J. Mendling et al., 2007), UML Activity Diagrams (Andy Evans et al., 2000) and the Business Process Modeling Notation (BPMN) (M. Weske, 2007).

Many are the methods of improvements in business processes that exist in literature from which we notice the Total Quality Management which is a management of an organization centered on quality and the long-term success through customer satisfaction and providing

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benefits for members of the organization. It provides a gradual improvement in business processes, but it is very spread out over time.

Another method is benchmarking which is seen as a lever for innovation in the enterprise. It is at the same time an analysis to calibrate the best drawing points, a mindset and a management style. Benchmarking can be done internally between departments, or entities, and externally, with its various suppliers, distributors, competitors, market products. The idea is to compare different objective or subjective criteria, but at least quantifiable rules that can be made to have the same analysis systems between the different members who will perform the benchmark. The goal is to determine the criteria on which we do not need to invest because they are satisfied better than others and those where improvement work is necessary to achieve the optimum.

In addition, we have Business Process Re-engineering (BPR) to which we are particularly interested in this paper. BPR is described by Hammer and Champy as “questioning fundamental and radical redesign of organizational processes to achieve dramatic improvements in current performance on cost, service and speed.” That means that existing processes are carefully reviewed and redesigned in order to improve and complete more effectively and efficiently the functions of the company. It must be supported by a modeled process because it was increasingly necessary to explicitly define the process. In the context of reengineering business processes, organizations compare business process models to identify operational commonalities and differences. Such comparisons are, for example, necessary when organizations merge and need to determine and resolve the differences between their operations, and when an organization needs to check whether its operations conform to a company-wide or industry-wide standard. This standard or these reference models are models that have proven their effectiveness and success. In such way companies will find improvements to remedy problems or gaps in its business process.

Particularly, the objective of the work presented in this paper is to study the way in which process models can be compared, and thus find a comparison method that will detect the gaps and provide an opportunity to complete a draft reengineering business processes, minimizing waste of resources and time and improving products.

The paper is structured as follows. Section 2 presents works that have focused on the comparison of business process models which inspired us to define an approach to compare two business processes, measure the gap between them and so find ways for improvement. This method will be described in the third section. In section 4, we present a prototype implementing the proposed approach. Next, in section 5 we illustrate our work with a case study. Finally, in section 6 we conclude and refer to future work.

**RELATED WORK**

Our work can be related to three areas of research: measuring similarity between business process models based on behavioral comparison (M. Weske et al., 2006; W.M.P. van der Aalst et al, 2006), Measuring similarity between semantic business process models (Marc Ehrig et al., 2007) and finally measuring similarity between business process models’ labels using tools and components to develop matchers that determine matchings between the activities of two business process models, particularly, we focused on the “ICoP” framework: Identification of Correspondences between Process Models (Weidlich et al., 2010).

In the context of comparison of business process models a novel approach for measuring the degree of similarity of business process models has been studied. This approach considers linguistic and behavioral aspects of process models to calculate a degree of similarity (Boudewijn van Dongen et al., 2007). It builds on the vector model from information retrieval, an abstract representation of process behavior as causal footprints (B.F. van Dongen et al., 2006) and an automatic matching of func-
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