

BPM+: Proposal of Specialized Stakeholders Operational-Level Perspectives and their BPMN Extensions

Ahmad Alomari¹, Alain April¹ and Carlos Monsalve²

¹Software Engineering Research Laboratory, École de technologie supérieure (ETS)
1100 rue Notre-Dame Ouest, Montréal, Québec, Canada

²Escuela Superior Politécnica del Litoral (ESPOL), Facultad de Ingeniería en Electricidad y
Computación Km. 30.5 vía Perimetral, P.O. Box 09-01-5863, Guayaquil, Ecuador
{ahmad.alomari.1@ens.etsmtl.ca, alain.april@etsmtl.ca, monsalve@fiec.espol.edu.ec}

Abstract. Business process modeling (BPM) is a critical element in Business Process Management that enables the processes of an organization to be represented, modeled, analyzed, and improved. A novel modeling approach, BPM+, has been proposed to allow business process models to be represented not only by IT-oriented stakeholders, but also by other organization's stakeholders as well. BPM+ proposes an abstraction hierarchy, which includes three levels of abstraction: strategic (Level 1), tactical (Level 2), and operational (Level 3). Levels 1 and 2 have been evaluated in previous research, while Level 3, the operational level, still requires refinement and evaluation. To describe the unique concepts of level 3, which emerge when modeling the needs of a specialized stakeholder, we illustrate an IT security incident response operation process represented in BPMN; in this work we will evidence the need of BPMN extensions to represent those unique level 3 concepts. Achieving the goal of integrating very specialized stakeholder perspectives to the existing organization BPM repository could allow easier understanding, training and improvement of specialized processes. This paper presents a proposal to define BPMN extensions aimed at integrating level 3 concepts through BPMN to help a number of specialized stakeholders that would profit from having their operational perspectives represented and included in the BPM repository of the organization.

Keywords: Operational level of abstraction, business process, business process management, BPM, BPMN.

1 Introduction

Many organizations incur noticeable investments in business process modeling (BPM) as a way to document the processes of their organizations. Besides helping to document the business processes, the integration of BPM in organizations provides them with the ability to monitor, control, improve and optimize their business processes. BPM allows organizations to get deep insight in hidden parts of their

processes and to support other technologies needed to communicate their business processes to participants in a large variety of application domains.

Together with the importance of documenting business processes, a major problem appears: the lack of common standards to represent them [1]. Furthermore, process participants need to agree on what is important to document and how is the best way to represent processes before initiating any modeling initiative. While everyone in the industry would like to use a common process representation, organizations are still struggling to determine what standards they need [1].

BPM+ is a modeling approach that allows the understanding and the coordination of the business processes by the various stakeholders of the organization. However “The BPM+ approach has been designed with the objective of closing the gap between IT and non-IT stakeholders when modeling a business process, allowing them to represent, in a consistent and structured way, their modeling needs and constraints”[5]. BPM+ has been designed based on an abstraction hierarchy that includes three levels of abstraction: strategic, tactical, and operational levels. Each abstraction level represents a particular perspective and detail level of the business process. From these three levels of abstraction, the strategic and the tactical levels have already been evaluated through a representation analysis and case studies in industry. The research reported here will focus on refining and evaluating the operational level of BPM+ and thus completing the evaluation of all the three levels of abstraction.

1.1 Background

Existing BPM notations might be categorized into two groups. Graphical modeling notations that are mostly concerned with capturing and understanding processes for project scoping tasks and for discussing business requirements and process improvements initiatives. Other BPM notation group is based on mathematical, rigorous paradigms, and these BPM notations might be used for process analysis, process execution, or experimentation with processes scenarios [3]. This research focuses on the graphical notations group. Because this “group of BPM notations have been designed for the first phase of the Business Process Management Systems BPMS lifecycle (i.e. design phase)” [5].

BPMN is a rich modeling notation with includes constructs for the representation of various types of control flow and events. A recent survey [1] shows BPMN as becoming a standard that organizations are increasingly using or interested on. Furthermore, Rosemann et al. [3] has presented a study of how the various BPM notations have evolved to become more expressive over time. Their results show that BPMN is the most appropriate among all the studied BPM graphical notations. Furthermore, BPMN provides an extensibility mechanism that allows extending its standard elements with additional attributes [4].

BPMN has been considered as the BPM notation for this research because: 1) its increasing popularity; 2) it a standard by the OMG; and 3) its considered as an easy of use notation [5].

Several language transformations might be required to go from the “real world to its final representation (e.g. from the real world to a conceptual model, from the conceptual model to a high-level programming language, and from the high-level programming language to a machine language), and that each of these transformations involves a specific mapping [5]”. Representation theory was developed by Wand and Weber as an adaptation of an ontology proposed by Bunge [6]. The theory suggests a model of representation, known as the Bunge-Wand-Weber (BWW) representation model [5], as a benchmark for the evaluation of the representational capabilities of a modeling technique in the Information Systems domain.

The process of using the BWW model as a reference standard for the evaluation of the representational capabilities of a modeling technique forms the core of the research method of representational analysis [5]. Representational analysis can be used to make predictions of the modeling strengths and weaknesses of the technique, and define its capabilities to provide complete and clear descriptions of the domain being modeled. In this context, “the constructs of the BWW representation model (i.e., thing, event, transformation) are compared with the language constructs of the modeling technique (i.e., event, activity, actor) in a bi-directional mapping” [6].

According to Wand and Weber [6] to be ontologically complete a modeling notation should be mapped with each of the concepts of the representation model. If the above mentioned mapping is one-to-one then they identify that notation as ontologically clear. Any ontological deficiency is caused by the deviation from this one-to-one mapping. As one of this research objectives is to refine and evaluate the operational-level concepts of BPM+. The BWW representational analysis will be used to formally identify the modeling concepts that should be represented in a business process model at BPM+ level 3 of abstraction.

2 Proposed Methodology

Toward achieving the research objectives our methodology has been divided into two phases as described below:

Phase 1: During this phase the goal is to represent the operational level of abstraction in BPMN 2.0. Extensions to BPMN will be developed if the set of concepts required by BPM+ is not fully available in BPMN. Phase 1 is composed of three stages: Stage 1) Refine the operational-level concepts of BPM+ by evaluating the BPM+ level 3 concepts using the BWW representational analysis; Stage 2) Propose BPMN extensions for BPM+ level 3 of abstraction.

Phase 2: This phase covers the evaluation and testing of the BPM+ concepts at the operational level of abstraction through a case study and a survey including: 1) test BPM+ level 3 of abstraction by modeling business processes toward generating consistent business process models that can be shared by the various groups of stakeholders; 2) use the findings of the case study to adjust the research propositions and findings, which will be tested by a survey.

3 Conclusion

Monsalve et al. [5] have proposed a BPM approach that incorporates Multiple Levels of Abstraction (MLA), selecting an appropriate set of business process modeling constructs for each level of abstraction. The result of Monsalve's approach, BPM+, is a modeling approach that allows the understanding and the coordination of the business processes executed by the different stakeholders of the organization. This research proposal has taken into account the state of the art in business process modeling and the most popular BPM languages, with particular focus on the BPM+ approach. Our research is a natural extension of the initiatives detailed in [5], where the author emphasizes the benefits of BPM+. The author has evaluated Level 1 (i.e. strategic level) and Level 2 (i.e. tactical level) of the model. However, a refinement and evaluation of the proposed Level 3 (i.e. operational level) is still need and we address it thoroughly. We contribute to a better formalized BPM+ approach by providing BPMN extensions.

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