Business Process Models Representation by Deducing Interpretative Evidences on Intuitively Common Symbols

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ABSTRACT

Through quantitative analysis, previous researchers have proven a significant preference towards a specific set of notations for modeling business processes. The drawn conclusion revealed a significantly correlated coefficient preference to Norm Process Chart for using easily recognizable symbols to intuitively elicit understanding in representing business process models. Further interpretative analysis to qualitatively enhance these findings will only prove and strengthen the above claimed beyond reasonable doubt. The approach is to measure respondent level of accuracy in interpreting 3 different case studies modeled using 3 different modeling techniques shown to respondents in 3 different randomized sequences. The analysis includes correlating the finding against the time taken as well as respondents’ level of confidence in interpreting these models. The significantly correlated results again confirmed beyond reasonable doubt Norm Process Chart being respondents ultimate choice. Further comparative analysis between results from an earlier investigation against the latter, revealed similar patterns in respondents’ responses despite respondents dispersed ethnicity and educational backgrounds.

Keywords: Business Process Modeling, Common Symbols, Norm Process Chart, Quantitative Analysis, Symbolic Notations

1. INTRODUCTION

Business Process Modeling (BPM), an approach to graphically display the way organizations conduct their business processes, has emerged as an important and relevant domain of conceptual modeling. It is considered a key instrument for the analysis and design of process-aware Information Systems (Recker et al., 2009).

Business Process Model (BPM) advocates the use of symbolic notations to represent
business processes. Influenced by system engineering and mathematics, the application of these notations involves technical processes designed by engineers, undertaken by technically trained analysts for the use of largely technical people (Recker et al., 2009). However, majority of business process stakeholders are non-technically inclined with business or administrative background. While some notations are comprehensive, their arbitrary geometrical symbols can be visually and technically complex; and cognitively difficult to understand with unclear semantics. While such representational constraints prevent effective communication of process knowledge, initial hypothesis proving investigation (Rowland et al., 2003) substantiated that Norm Process Chart (NPC) (Recker et al., 2009), a newly proposed set of notations for modeling business processes, is semantically clearer than existing BPM notations. Using various statistical analysis techniques (Carter, 1997; Howitt & Cramer, 1999) the investigation revealed a linear relationship among all the variables used for this comparative analysis. With its correlation coefficient significantly at 0.1 level, not only the various results eliminate possible chance of bias but also highlighted significant pattern in favor of NPC with the mean scores (asymptotic significance at .000 for its variable grouping) for other techniques almost double as compared to NPC (Rowland et al., 2003).

However, the investigation falls short at measuring confidently the level of accuracy in respondents’ interpretation of the given models. This generates a subsequent hypothesis that respondents are able to interpret processes represented using NPC more accurately than using other notations. Analysis will be based on experimental data collected through survey using different sets of respondents from the initial investigation. Using a free-format answer, respondents will be asked specific questions in relation to their interpretation of three process fragments, which will be represented by the three different notations in three different sequences. Respondents’ answers will be analyzed to measure the level of accuracy in terms of their understandings of the given model, their level of confidence as well as time taken to appraise the given models.

This paper presents an experiment designed to substantiate the developed hypothesis objectively by comparing NPC with two well-established approaches - Integrated Definition (Bose & Manvel, 1984; KBSI, 2000) and Roles Activity Diagrams (Ould, 1995; Holt et al., 1983). It will describe the experiment and present the results. Future work based on analyses of the outcome is also indicated.

2. DESIGNING AN INTERPRETATIVE SURVEY

An experiment was proposed with the aim of comparing which notation is accurately interpreting a given model. The term accurate interpretation determines the number of correct answers to questions in interpreting a given model for representing business processes. The hypothesis asserts that there is a significant accuracy in interpretation for one notation; its opposite asserts otherwise.

Using a conclusive research technique (Joppe, 2011), in the form of a questionnaire survey, respondents were asked to interpret the different process representations using Norm Process Chart (Figure 1), Role Activity Diagram (Figure 3) and Integrated DEFinition (Figure 5). These representations were applied to different process extractions (Insurance Claim, PhD Registration and Inter-Library Loan) in different randomized sequence based on Latin Square technique (Carter, 1997; Bose & Manvel, 1984). The latter produced randomized questionnaires with 36 sets of different combinations. Respondents must answer various questions for the purpose of identifying the accurate understanding of these models presented to them. The contention was to determine whether accurate interpretation for one notation in modeling business process is much higher as compared to another.

Similar design for the questionnaire (Rowland et al., 2003) was adopted to maintain
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