

Business Process Modeling: Variability and Scope

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Abstract

Maintaining numerous variants of a given business process is very important for companies, which have dissimilar procedures such as book-keeping and trade used to present various goods for different countries. Languages of business process modeling are of routine type and do not contain the families of business process variants description clearly. The analysis of variability in business process modeling is carried out to cover gaps which were observed in the past. This study demonstrates key concepts of business process variants using an example in present methodologies in the area based on a common set of values. The outlines exhibit that initial methods are defined by the fact that they expand a conservative process modelling language with constructs that formulate it and make it capable to define personalized business process models. A personalized business process model defines a relations of process variants in such a way that every variant can be made by adding up or removing up its pieces in accordance to conFig. field model parameters. The research work involves an enormous amount of personalized business process modeling languages is used to represent a different set of constructs. In short it is a tool that support for investigating and creating personalized business process models, in view of lack of experimental valuations of languages in the field. The existence of numerous variants of the similar business process is a broad extend procedure in modern organizations. For example, a state has around 230 municipalities which carry out the identical or a very similar set of procedures. In case, all municipalities have procedures linked to construction permits such as the procedure of managing applications for permits and the procedures for routing the applications for smooth working. Because of geographical and political choices each municipality carry outs its procedures in different ways.

Keywords: Languages of Business process modeling, Business process variants, analysis of variability in modeling, personalised business process models.

1. Introduction

Various companies are interested in improvement of the efficiency and quality of their internal business processes and in optimizing their interactions with customers. In past few years there is increasing trend of use of business process management models by different firms and increasing awareness for business process modelling and adoption of these models to meet out their requirements. Use of conventional business process modeling approaches for the families of process variants such as the above ones, may be have two types of variants. One may be prepared separately, resulting in similar type of variants have much in common, or multiple variants are modelled together, but then the complication of the consolidated model grows very fast and it becomes very difficult to understand and maintain individual variants. This survey depicts the problem space of business process modelling and provides the criteria for evaluating approaches in this area. Survey also identifies and provides a comprehensive comparative overview of the identified approaches, in view of the assessment.

2. Scope of Business Process Modeling

Recently, different types of business processes models have been used depending on their level of prediction. For example [Georgakopouloset al. 1995] describes a wide range of business processes from fully automated processes to ad-hoc processes which consider human involvement and a considerable level of ambiguity. The problems in managing ad hoc business processes are described by various research workers [Weber et al. 2012; van der Aalst et al.2009]. Therefore, flexibility in business processes is an important aspect in the area of business process management [Reichert and Weber 2012]. Business process variability has also relations with flexible process management. In order to explain this relation, it is desirable to understand the differences between three phases in the lifecycle of customizable process models.

2.1 Design-time

This phase is the creation of customizable process model. The choice of design which is considered in this phase will influence the whole process family covered by the customizable process model.

2.2 Customization-time

During this phase, the customizable process model is customized to understand a process variant. Customized process model takes care of a single process variant that is used in the process. The customization choices involved in this stage will affect selected groups of process instances.

2.3 Run-time

During this phase, the customized process model is run for each process instances. For every instance, run-time choices are operated, for example, to accept or to reject a claim on the basis of the facts collected. These types of choices influence only one type of instance.

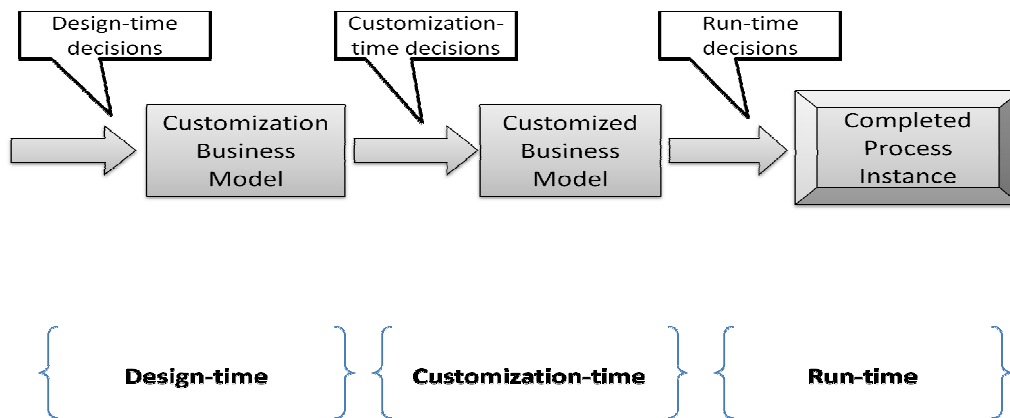


Fig. 1: Three main parts of customizable process models.

The taken in designing and time required for customization decisions influence various process instances and also the multiple organizational units.

3. Variability in Business Process Modeling

On the basis of these facts it can be concluded that that flexibility and variability of a particular model depend on various stages at which decisions on a particular business process are taken. Flexibility is mainly depending on run-time decisions, while variability is associated with design-time and customization-time decisions. This may be further described in four types of flexibility as explained by the Fig. 2 given below.

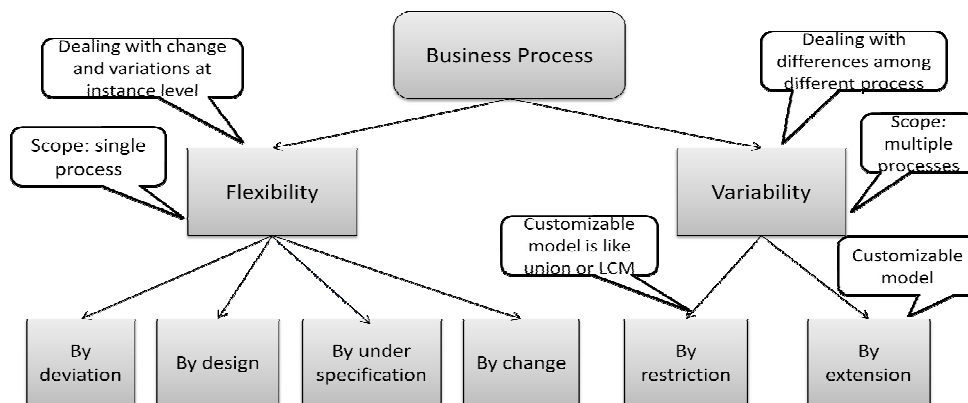


Fig. 2: Flexibility and Variability of business processes.

3.1 Flexibility and Variability

Flexibility of the Design is the capacity for incorporation of various different choices of paths to be followed in a process at design-time so that the choice of the most suitable execution path may be made at run-time for every process.

A process model which allows the user to select a route; this is a structure of flexibility by design business process. And also parallel business processes are more flexible than sequential processes, e.g., a business process that permits activities A and B to be implemented in parallel.

3.1.1 Flexibility by Deviation: This is an important process relating to the ability for a process. According to [Rosa et al. 2000] this is the ability for a process instance to deviate at run-time from the execution path prescribed by the original process model without altering the model. This type of deviation means for changes in sequence of execution for a specific process instance. This type of process does not refer to changes in the process definition or to the activities that it comprises. Thus the idea of this process in handling makes activities to be skipped and rolled back as long as people have the right authorization [Reijers et al. 2003].

3.1.2 Flexibility by under specification: This is another process in which measure the ability for execution of an incomplete process model at run-time. In this case the process which does not contain sufficient information is allowed to execute the completion. Therefore, flexibility in this case need not to the model to be changed during run-time, so this model should be completed by providing a concrete realization for the undefined parts. Under specification are of two types, one is late binding and late modelling. Another is late binding which controls a missing part of the model that is related to some pre-specified functions (e.g., a sub-process) at run-time. The process late modeling indicates that at run-time new functionality is modelled, for example a sub-process is specified.

3.1.3 Flexibility by Change: This is the ability for modification of the process model at run-time so that either one or all of the executing process instances at a time are shifted to new process model. Contrasting to the earlier three flexibility types, this model prepared at design-time is customized and in addition one or more instances are transferred from old to the new model. There are two types of Flexibility are of two types, i.e., momentary change and a change influencing the execution of one or more selected process instances and another is evolutionary change. This type of changing a process model may create the many types of problems. These types of flexibilities consider a single process and changes with change of circumstance and other changes at the instance level. Flexibility neither deals with maintenance of multiple process models that makes a family of process models, nor differentiates between models of various families of process variants and other models of individual variants.

3.1.4 Variability by restriction: The variability by restriction is a customizable process model which has all the process variants collection. By limiting the behaviour of the customizable process model customization is achieved, i.e., some activities may be over looked or blocked during the work of customization. Therefore, customizable process models of this type are generally known as configurable process models.

3.1.5 Variability by extension: The Variability by extension takes opposite starting point. The customizable process model does not relate to all the possible behaviour, In addition, it represents the most common behaviour or the behaviour that is shared by the majority of the process variants. On the customization time, the behaviour of the model required to be extended to serve a particular situation. Thus, one may require including new activities for creating a dedicated variant. Therefore, one may use a customizable process model as the intersection of all process variants under consideration. The study covers variability by limitation and by extension. In fact, as discussed afterwards in the paper, it is probable for one similar approach to combine both types of variability.

4. Conclusion

The analysis of variability in business process modeling is very important to fill up significant gaps which were observed in the past. This paper suggested main concepts of business process variants using an instance. Different types of methods were defined by the fact that they expand a conservative business process modeling language with its objects that help in formulating and make it capable to develop personalized business process models. A personalized business process model is defined by relations of business process variants. The study involved different types of personalized business process modeling languages which are used to signify a different set of objects. The multiple business process variants of the related business process model are general processes in present companies. It may be concluded that completely programmed approaches for personalized business process models invention are not expected to work properly. Additionally, the efforts in creating and handling personalized business process models is significant.

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