Using Data-Centric Business Process Modeling for Discovering Requirements for Business Process Support Systems: Experience Report

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Abstract. Building a process model is a natural part of the requirements engineering (RE) when creating requirements for a computerized system/service to support a business process. When the process in question is workflowable (i.e. a process in which the order and the flow of tasks/ operations/activities can be predefined), there are plenty of modeling techniques, notations and tools that can help in this undertaking. These techniques, however, are of little use for discovering requirements for support of non-workflowable processes in which the information artifacts created in the process (e.g. reports, lecture slides, budget documents) are of more importance than the flow of tasks/operations/activities. Other types of techniques, notations and tools are required in this case. This paper reports on a project of using a data-centric modeling approach supported by a computerized tool in RE. The goal of the project was to test whether the approach could be useful for the task of discovering requirements on a computerized system/service supporting the process, and which and how much of requirements could be captured using it. The process used in the test is a process of course preparation in the authors' own department. The paper reports on the environment in which the project has been conducted, results achieved, and lessons learned.

Keywords: Requirements Engineering, RE, Requirements discovery, business process, data-centric.

1 Introduction

Following Ian Alexander [1], we consider that all important requirements cannot be gathered from stakeholders directly, but need to be discovered, which warrants using special techniques and tools different from the ones used for managing already discovered requirements. As our concern is requirements for computerized systems/services that support business processes, discovering details of the process to support is an essential part of the requirements discovery.

A systems/services can be aimed at supporting an already existing process, or a process that needs to be designed or improved alongside with developing a support system. Independently of which of the above is the case, it is people who are (will be)

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engaged in the process who have relevant tacit knowledge that needs to be unearthed during the discovery of requirements. Therefore, the role of techniques and tools used in the requirements discovery is to facilitate the existing or future process participants to reveal the tacit knowledge they possess. According to [1], techniques and tools for requirements discovery should be quite simple so that the focus will not be moved from discovering requirements to designing the system.

When there is a good chance that the process to be discovered has a strict order of tasks/operations/activities, usual process modeling techniques based on the workflow-thinking could be tried in the discovery process. These range from simple charts to complex workflow diagrammatic languages such as BPMN 2.0, and they are supported by a number of modeling tools. However, when the chances that the process will be workflowable[1] are small, these techniques and tools might not be appropriate, and other means should be engaged in the requirements discovery phase.

In this paper, we consider the problem of discovering requirements for processes in which information/data processing by collaborative teams constitutes the core of the process. In addition, we do not require such process to be workflowable. We believe that for this kind of processes, a data-centric process modeling technique is more appropriate as far as process discovery is concerned.

In this paper, the term data-centric modeling is understood in a broad meaning. Namely, as data-centric we consider any process modeling technique that permits to start structuring data/information processed in the frame of the process before the details of the flow of tasks/operations/activities are known. To this category, for example, belong artifact-based modeling [3], data-driven modeling [4] and state-oriented modeling [5]. Defining folder structures for case-based systems [6] could also be considered as belonging to the data-centric process modeling[2].

The goal of the project reported in this paper was to investigate whether a data-centric modeling technique supported by a computerized tool is suitable as a means for discovering requirements for business process support (BPS) systems/services. More specifically, we aimed at getting answers to the following **three questions**:

1. Whether such an approach is suitable for use in requirements discovery facilitating workshops.
2. Whether the requirements discovered in the workshops could be represented in a form suitable for discussing them with a broader audience that includes stakeholders who have not participated in the facilitating workshops.
3. Which and how much of requirements could be discovered with this approach .

Our search of the works related to the above questions produced no results, thus, to the best of our knowledge, the current work is the first attempt to get answers to these questions[3].

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[1] As workflowable, we consider a process where the order and the flow of tasks/operations/activities can be predefined. For more exact definition of workfloability see [2].

[2] The main difference between a data-centric and traditional workflow process modeling is that in the former the focus is on information artifacts, e.g. reports, lecture slides, budget documents, while in the latter the focus is on operations/activities that produces the artifacts.

[3] Our past experience of state-oriented process modeling [4] lacked proper tool support.