A Review of Approaches in Modeling Adaptive Business Process

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Abstract

Although nowadays the ideas of adaptive business process orientation become widely distributed, exact definition for adaptive business processes, does not exist. The goal of this paper is to describe the concept of adaptive business process and to choose an approach, which best suits for modeling adaptive business process.

Index Terms: Adaptive business process, UML, IDEF0, RAD.

I. INTRODUCTION

Nowadays the ideas of adaptive business process orientation become widely distributed. More and more companies face the task of choosing an approach to modeling their business processes, so that it meets the requirements of adaptability. In practice, this task can be formulated as:

- We need to choose a method for business process mapping and analysis;
- We need to choose a notation/tool for drawing maps of our processes.

The choice is difficult to make, especially for companies without previous experience in the field of adaptive business process modeling. Independently of how the question is formulated, one will meet a number of vendors each of which will claim that they are the best ones. Quite often, a vendor presentation will be illustrated with a process notation/diagrammatic tool, and for a novice it will be difficult to understand the difference between this tool and the previous one. The material presented in this paper is written with the aim to give some orientation on how to choose an appropriate method/tool for business process modeling. The paper is written in a prescriptive manner. The paper is based on the analysis of literature and on our own experience in the field of adaptive business process identification and modeling.

II. MAIN PART

There are several definitions for what does business process mean. Here are some of them. A business process is an activity or set of activities that will accomplish a specific organizational goal [1].A business process is a collection of related, structured activities or tasks that produce a specific service or product (serve a particular goal) for a particular customer or customers [2].A business process is a collection of activities designed to produce a specific output for a particular customer or market. It implies a strong emphasis on how the work is done within and organization, in contrast to a product's

focus on what. A process is thus a specific ordering of work activities across time and place, with a beginning, an end, and clearly defined inputs and outputs: a structure for action [3].

What does adaptive mean? It refers to internal changes caused by outside conditions that become permanent and make the entity more fitting to those new conditions. Those changes are performed by means of the entity itself and not by some external force. So if you need consultants to design or change your processes it may be agile but not adaptive. With Adaptive Process, end users do not just collaborate in flowchart design, but they actually create the real-world process on the fly. Not just a simple ad-hoc activity, but with substantial complexity using metadata models from the repository and business rules in natural language for well-defined goals. Being adaptive is not about predicting how a process will work or to agree on all possible mutations.

Adaptive business process means that real-time knowledge from the last process execution can influence the execution of the next.

The most essential feature that differentiates various approaches to adaptive process modeling from each other is the way of presenting the development of a process instance in real time, i.e. business process dynamics. There are many different approaches to representing process dynamics. In a simplified manner, we can classify all approaches into 4categories according to the main view they take over the business process dynamics:

1. Functionally-focused approach. The focus is on passive participants that are being produced, changed, or consumed by the activities. This flow can be represented as a diagram (graph), where activities serve as nodes. The arrows connect the activities in accordance to results of one activity are being used in one or another way by the next activity. Such a diagram does not reflect the order of activities directly, it reflects the causal order, and i.e. the results of one activity are used by another activity. The causality establishes a partial order between activities indirectly, i.e. the results should be produced before they could be used. The most common approach to represent this kind of flow is IDEF0. IDEF0 (Integration Definition for Function Modeling) is a function modeling methodology for describing manufacturing functions, which offers a functional modeling language for the analysis, development, reengineering, and integration of information systems; business processes; or software engineering analysis.[7] [4].

2. Agent-related approach. The focus is on the order in which agents get and perform their part of work. The typical notation to represent this kind of flow is Role-Activity Diagrams –RAD and collaboration diagrams of UML. UML Collaboration diagrams (interaction diagrams) illustrate the relationship and interaction between software objects. They require use cases, system operation contracts, and domain model to already exist. The collaboration diagram illustrates messages being sent between classes and objects (instances). A diagram is created for each system operation that relates to the current development cycle (iteration)[8].

3. State-oriented approach. Each activity produces changes in the part of the real world that embraces the given process instance. Some changes may concern the state of passive participants, e.g., their form, shape, or physical location. Other changes may concern the state of active participants, e.g. the state of the mind of a human agent trying to find a solution for a complex problem. The focus of the

state flow view is on changes produced in the part of the world that embraces the given process instance [4].

4. Activity focused approach. The focus is on the order of activities in time. This flow can be represented as a diagram (graph) where arrows represent activities. Nodes show the results of one or more activities that end in a particular node. Typical notations for representing this kind of flow are Bossiness process diagram of BPMN, Activity Diagrams of UML, and Petri Nets [5]. Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency [9].

III. CONCLUSION

If a company is functionally structured and processes are not identified, it is suitable to use functionally-focused approach or agent-related approach. Functionally-focused approach suit mostly companies that have formal ways of internal communications via some objects (documents, files, etc.). Then the processes can be discovered by following the movement of these objects inside the organization. Agent-related approach suit mostly companies that strictly define responsibilities for each organizational unit. The communication channels might be informal (phone calls, informal meetings, etc.). When the processes are identified it is suitable to use activity focused approach or state-oriented approach, or both. as they are better suited for expressing details of each process. Activity focused approach can be used only if there is some normal order in which activities are completed one after another. If this order is difficult to establish, the state-oriented approach should be used. Anyway considering the specificity of adaptive business processes the best approach in modeling adaptive business process is the combination of activity focused approach and state-oriented approach because there is a need to ensure that all activities are completed in the right order, to ensure who does the operations and what passive participants are changed during them. It is important to focus on position reached in relation to the goal after execution of activities.

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