Business Process Modeling with EPC and UML: Transformation or Integration?

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Abstract: *Process* and *object-orientation* are basic concepts of modeling, implementing and customizing information systems. In this paper we present two approaches of combining those concepts into a coherent way. In the first approach we discuss how to transform business process models *(Event-driven Process Chain (EPC) diagrams)* into object-oriented models *(Unified Modeling Language (UML) diagrams)*. The main focus is to support the co-existence of both modeling methods focusing on the modeling context. The second approach deals with the integration of both modeling methods extending the *EPC*-model by *business object classes*.

1 Business Modeling

Today, analysis and design of *business processes* are the major tasks of *business engineering* (Scheer (1994), Österle (1997), Hammer et al. (1993), Davenport (1993)). In research as well as in practice, the *Architecture of integrated Information Systems (ARIS)* (Scheer (1992)) is accepted as a standard framework for business process (re-)engineering. It supports the whole process management life cycle consisting of *process design, process management , process workflow* and *process application implementation* (Scheer (1996)).

The *Unified Modeling Language (UML)* (Rational Software (publisher) (1997)) is a common standard for object-oriented modeling. The *UML* is derived of a shared set of commonly accepted concepts which have successfully been proven in the modeling of large and complex systems, especially software systems. With the *UML extension for business modeling*, a first object-oriented *UML* terminology has been defined for the domain of *business modeling*.

ARIS as well as *UML* are based on integrated meta models supported by several modeling tools. The core business modeling concepts of both methodologies will firstly be introduced and compared afterwards.

1.1 Event-driven Process Chain (EPC)

The method of *Event-driven Process Chains (EPC)* (Keller et al. (1992), Nüttgens (1997)) has been developed within the framework of *ARIS* in order to model business processes. In the *EPC model*, a process consists of sequences of events triggering business functions, which are themselves the results of other functions apart from initial events triggering the whole process. By introducing boolean operators ("and", "or", "exclusive or"), the event-driven control structure can

M. Schader et al. (eds.), *The Unified Modeling Language*

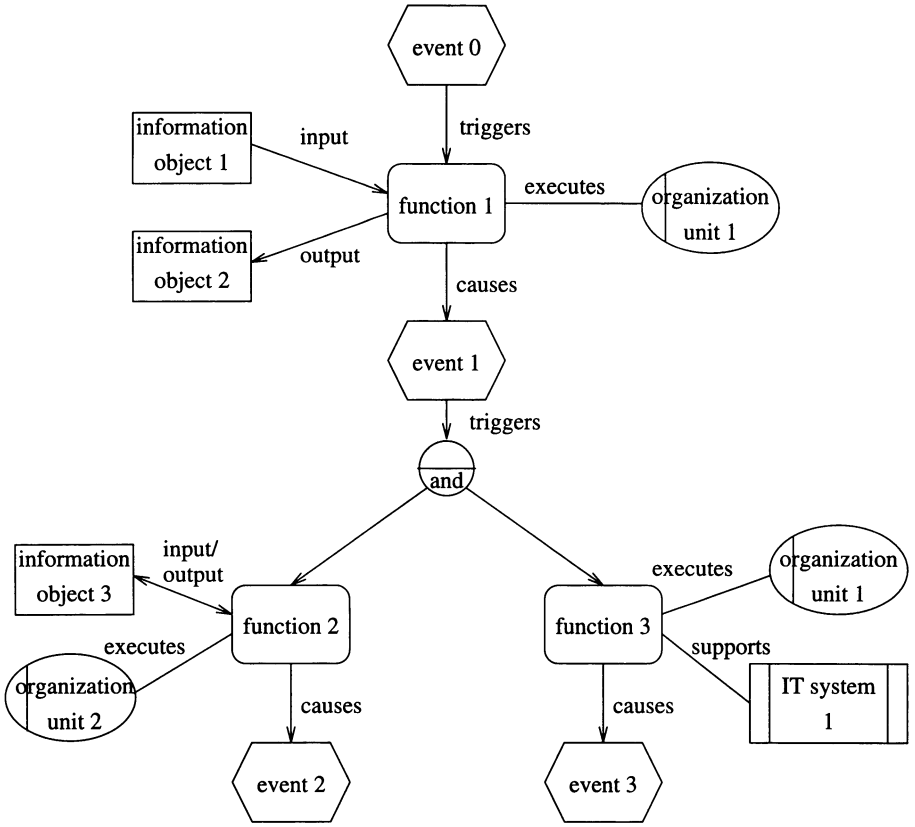

Figure 1: Event driven process chain (EPC)

be expanded to a variously complex *control flow* illustrating business relevant decisions.

This basic model of the *EPC* can be extended by further semantic components of description. The illustration of *data flows*, responsibility of *organizational units* and the use of *IT systems* are examples for such an extension (see figure 1).

Furthermore, on the basis of formal descriptions of the *EPC* method, tool-supported concepts for analysis and simulation are being developed. The approach of Langner/Schneider/Wehler (Langner et al. (1997)) aims at the translation of *EPC models* into *petri networks* and at the algorithmic verification of the resulting networks. In contrast to this, the approaches of Rump (Rump (1997)) and of Keller/Teufel (Keller and Teufel (1997)) are based on an own formal description of the *EPC*.