Process Modelling Approach for Collaboration Networks

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Abstract

In the article, the approach towards an integrative process modelling for collaboration networks is presented. The authors depict a possibility for global modelling of business processes with a module-based modelling language in combination with established Event-driven Process Chains for local modelling. The approach helps to create and to distinguish model knowledge for its collaborative application.

1. Introduction

Regarding the value-added chain of enterprises, a transition from an intra-organisational perspective (value-creation within enterprise borders) towards a cross-organisational view (value-creation within a network of specialised firms) can be observed [1]. The borderless enterprise has been the subject of scientific discussion for years [2], and the collaborative production of goods and services has been established in the consciousness of economic entities. Thus, the management of collaboration networks meets new challenges regarding flexibility, decentralisation and support for interoperability.

From a conceptual point of view, business processes have proven to be ideal design items in conjunction with the use of graphical methods and tools [3]. Process coordination turns out to be a highly complex task in collaboration networks with information gaps across enterprise borders. Hence, adequate methods and tools are required on a network-wide level. For network planning and design, process modelling serves as a fundamental instrument. Process models depict attributes and parameters necessary for as-is descriptions and requirement definitions. As traditional Business Process Management approaches and tools do not provide support sufficiently [4], existing approaches have to be extended.

In the article, modelling requirements in collaboration networks [4] are met with a two level modelling approach. Following the approach, an appropriate set of modelling languages is introduced. Finally, the article ends with a short conclusion and an outlook on future work.

2. Process Modelling in Networks

The systematic planning and design of business processes in networks demands an approach that offers a set of integrated methods and tools from the business concept level up to the implementation into application systems. This requires increased communication and coordination efforts between network partners. Information is exchanged in the form of models depicting e.g. partner input and output descriptions, interface requirements or process data. Due to a lack of trust in networks, it is only shared with business partners under given circumstances. Thus, modelling has to meet security requirements. The authors differ modelling knowledge as such to be managed on a global level and such to be managed on a local level [4] hereunto. Global knowledge comprises partner-spanning relevance on the one hand, as e.g. a change of network structure due to partners leaving a network. Such information is globally important. On the other hand, local knowledge as detailed processes and interface data is kept within enterprise borders and at least exchanged bilaterally with direct business partners.

Based on the classification, an approach towards global modelling with the Process Module Chain (PMC) and local modelling with the Event-driven Process Chain (EPC) is described. In value-adding
networks local, private processes have to be made public and mapped onto global process descriptions. In a global process model, this is achieved by an encapsulation of information on detailed processes, organisational units, and global process interfaces.

The Event-driven Process Chain [5] is a semi-formal business process modelling language. It is applied in SAP R/3 reference process models. The EPC is user-friendly and extensible to a vast expressiveness. EPC models do not focus on collaborative issues as interfaces are not of paramount importance for EPC modelling. The Process Module Chain (PMC) [4] represents an EPC enhancement dedicating special importance to the characteristics of cross-organisational processes. For a precise description of global business processes within in value-adding networks, the PMC is limited to express organisational, functional as well as process-oriented aspects only. It connects entire organisations being part of a network. Organisational and output-oriented relationships between network partners are described through a connection of process fragments on a high level of abstraction. This facilitates a provision of highly aggregated data for managerial purposes due to common network strategies and goals.

![Figure 1. Global and local model](image)

Protecting critical information organisations only publish abstract process modules in a PMC on a global process description level. Their granularity is defined in detail by network partners themselves. Information to be published for global PMC models is derived from private models build with private modelling languages as the EPC (cf. Fig. 1). A service-oriented description of products and services builds the connection between partner organisations from a managerial point of view. To obtain such a connection, products and services as well as additional information like order documents are added to interface descriptions. This information fills the gap between process information and organisational responsibilities. Global PMC models help to describe value-adding networks from a process-oriented point of view. Global models are necessary for a partner-wide design and execution of collaboration networks. Interdependencies are published on a high level of abstraction.

3. Conclusions and Future Work

The approach shortly presented in this article has been developed within the research project ArKoS (Architecture for Collaborative Scenarios), funded by the German Federal Ministry of Education and Research. The modelling approach classifies information cast in models which is necessary for partner coordination in collaboration networks. The approach has been demonstrated with the PMC for a global and EPC for local business process modelling.

An evaluation of the approach has already started but the approach still needs support by appropriate ICT systems in order to ease modelling and model mapping tasks in the future.

4. References


