The view-based approach to dynamic inter-organizational workflow cooperation

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Abstract

This paper presents a novel approach to inter-organizational workflow cooperation. Our goal is to provide support for organizations which are involved in a shared but not pre-modeled cooperative workflow across organizational boundaries. Our approach allows for partial visibility of workflows and their resources, thus providing powerful ways for inter-organizational workflow configuration. Varying degrees of visibility of workflows enable organizations to retain required levels of privacy and security of internal workflows. Our presented view concept provides a high degree of flexibility for participating organizations, since internal structures of collaborative workflows may be adapted without changes in the inter-organizational workflows. Furthermore, we provide workflow participants with the freedom to change their workflows without changing their roles in the cooperation. This increases flexibility and is an important step to increase efficiency as well as reduction in costs for inter-organizational workflows. The presented approach is inspired by the Service-oriented Architecture (SOA). Accordingly, our approach consists of three steps: workflow advertisement, workflow interconnection, and workflow cooperation.
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1. Introduction

In context of globalization, a high competitive pressure characterizes the general situation on businesses. Competition is a dilemma many organizations face every day. It can lead to intensive re-structuring of organizational structures and processes to make production and services more efficient and less expensive. Additionally, new forms of inter-organizational collaboration between organizations may emerge. In this case organizations especially Small and Medium sized Enterprises (SMEs), cooperate to fulfill conditions of complex, often concurrent projects.

Parallel to this evolution, organizations are increasingly utilizing process-aware information systems to perform their workflows in an automated way. Based on such information systems, organizations focus on their core competencies and access other competencies through cooperation, moving towards a new form of network known as virtual organization.

There is still no agreed-upon definition of virtual organizations. Broadly speaking, a virtual organization is often defined as a temporary organization formed from strategic alliances or partnerships ("real organizations") that can be dissolved when the common business or the common project is finished. For Davidow and Malone [1], the word "virtual" comes from the idea of "potential" meaning "excellent", "high quality" or "advanced". A virtual organization is considered as the modern organizational form, and hence, as being the more advanced and the most efficient one [2]. Byrne defines a virtual organization as a temporary network of independent companies, suppliers, customers, and even rivals, linked by information technology to share costs, skills and access to markets. It will have neither central offices nor organizational charts, nor hierarchies, and no vertical integration [3].

As for us, we define a virtual organization as a set of partners ("real organizations") distributed in time and in space sharing resources and competencies (similar or dissimilar) and cooperating to reach some shared objectives using information technologies. Thus, partners with complementary competencies and knowledge can be gathered to carry out projects, which are not within the range of only one organization: cooperation allows each partner to benefit from knowledge of the other partners in the virtual organization. With this intention, partner workflows are not carried out in an isolated manner, but interact during their execution, while sharing data in a coordinated way [e.g., 28]. Coordination brings a synergy that contributes to the improvement of each partner work performances.

The rest of this paper is organized as follows. Section 2 identifies the requirements our contribution aims to meet. Section 3 presents the existing approaches for inter-organizational workflows. Section 4 proposes a three steps approach for inter-organizational workflow cooperation: workflow identification and advertisement, workflow interconnection, and workflow cooperation. All steps are discussed, and the second step is presented in more detail in Section 5. Section 6 provides a brief overview on the cooperation prototype platform we are developing. Section 7 concludes and presents our future work.

2. Requirements for inter-organizational workflows

2.1. Flexibility support

Cooperation between partners within a virtual organization is established according to needs for businesses and their competencies and roles. This leads to a dynamic character of coopera-