Chapter 12
Towards Dynamic Collaborations in Virtual Organisation Alliances

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ABSTRACT

This chapter introduces a service oriented relative workflow model as a means of helping organisations promptly create flexible and privacy-safe virtual organisation alliances. It argues that virtual organisation alliances are highly advocated to adapt to dynamic B2B collaborations, driven by the fast changing service demand-and-supply requirements. However, the temporary partnership and low trustiness between collaborating organisations put challenges to effectively manage collaborative business processes, and correspondingly an organisation centred design method and a visibility mechanism are discussed in this chapter to provide a finer granularity of authority control at contacting and collaboration design phases. Furthermore, the authors hope that understanding the establishment of a virtual organisation alliance through the use of relative workflows will not only inform researchers a better business process design methodology, but also assist in the understanding of the dynamic behaviours inside a virtual organisation alliance and the supporting approaches.

INTRODUCTION

Recent years have witnessed the booming of global business collaboration which urgently drives organisations to dynamically form virtual organisation alliances. A virtual organisation alliance seamlessly integrates the business processes of different organisations to adapt to the continuously changing business conditions and to stay competitive in the global market (Osterle, Fleisch, & Alt, 2001; van der Aalst & van Hee, 2004).

Different from virtual enterprises, which are typically large-scale organisations centred, a virtual organisation alliance is mainly constructed from small-to-medium sized organisations. These organisations join a virtual community to share each other's business services and capabilities. The collaborations in such a virtual organisation alliance are always motivated by prompt business service demand-and-supply requirements, such as service outsourcing or business service complementation. The collaborations are rather temporary and dynamic, which reluctantly conflict with the traditional pre-fixed inter-organisational workflow design mechanisms. In a virtual organisation alliance, each member organisation needs to publish and update its business services that can be provided or outsourced. In turn, other member organisations can choose partner organisations and create corresponding collaborations to best fit its requirements or profit benefits.

The dynamic structure and the collaboration openness mostly characterise the virtual organisation alliance. These two characteristics also put challenges to the management of collaborative business processes for virtual organisation alliances. Especially at contracting and collaboration design phases, the temporary and dynamic partnership requires high flexibility in describing and implementing collaboration processes between member organisations. Furthermore, the dynamics and temporality in turn result in the lack of trustiness between member organisations in loose-coupling business collaborations, and therefore complicates the authority control (Zhao, Liu, Sadiq, & Kowalkiewicz, 2008; Zhao, Liu, Yang, & Sadiq, 2007).

Aiming to solve these problems, this chapter extends our previously proposed relative workflow model into the service oriented computing environment to well support the collaboration behaviours of dynamic virtual organisation alliances. This model treats each participating organisation as an autonomous entity, and empowers the organisation to design inter-organisational workflow processes from its own perspective. With regard to the authority control, this organisation oriented mechanism enables the visibility differentiation for different partner organisations in the open collaborating environment of a virtual organisation alliance. In the proposed approach, contracts are not only used to define and regulate business service collaborations, but also to assist developing the visibility constraints for the business process integration. The research reported in this chapter is based on our previous work (Zhao, Liu, & Yang, 2006) with a lot of extension and improvements.

The rest of this chapter is organised as follows: Section 2 first presents the relation between business services and functional services, and then briefly reviews the proposed relative workflow model with an extension towards service oriented computing. Section 3 discusses how to support business collaborations in the environment of a virtual organisation alliance with the relative workflow model, especially at the phases of contracting and collaboration design. In Section 4, an application example is used to demonstrate how to practically apply the relative workflow approach to accommodate dynamic collaborations in a virtual organisation alliance. The implementation of a prototype is briefly introduced in Section 5 for the proof-of-concept purpose, and related work is given in Section 6, together with a discussion on our approach's advantages. Section 7 discusses the future trend of modelling collaborative business processes for virtual organisation alliances, and Section 8 concludes the whole chapter.

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