Chapter 3
Management of Virtual Organizations

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Abstract In the Virtual Organization (VO) Management area the main challenge has been to develop policies and models for governance and lifecycle management of a business-to-business (B2B) collaboration. This work included research and development in the areas of federated identity management and semantics in addition to VO, business registries and B2B collaboration management. The main results produced in the VO Management area include capabilities, patterns and software solutions to simplify governance and lifecycle management of B2B collaborations (VOs), and to manage applications distributed over several federated network hosts (e.g. Cloud Computing platforms).

3.1 Introduction

The activities of the VO Management area have led to the identification of Technical Requirements, Common Capabilities, Design Patterns and Software components to address the issues of governance and lifecycle management of a VO, including aspects of security and semantics in a VO.

The main challenges addressed by this area are the creation and management of a secure federated business environment among autonomous administrative domains, the separation of concerns between provision and management of application services and operational management of the VO infrastructure (e.g. separating the coordination of application execution from Resource monitoring), and the automatic discovery of available resources or services which meet a given set of functional requirements inside a VO or among different VOs.

The three key capabilities developed in this area are: (i) VO Set-up [14], this is a capability that facilitates business partner identification, and the creation and life-cycle management of a circle of trust among business partners. A competitive differentiator is that trust is aligned to consumer/provider relationships; hence

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supporting the evolution of circle of trust to a trust network that reflects supply relationships; (ii) Application Virtualization [15], this is a composite capability that enables managing the deployment, distribution and configuration of capabilities and resources required for offering a service that is distributed over multiple hosts/cloud platforms. It offers a unifying layer for managing identity, secure service integration, SLA fulfilment and performance monitoring across multiple platforms; (iii) Automated Resource Discovery [16], a capability that improves the process of resource and service discovery in a VO by adopting semantic models and technologies.

The former two of these capabilities have been validated in a project case study demonstrating a network-centric distributed platform for scalable, collaborative online gaming [2]. The concept of a Virtual Hosting Environment that underpins this Business Experiment is an innovation that is transferable across vertical market sectors and appears to offer a generic solution for distributing services and resources in multiple Cloud Computing platforms depending on SLA requirements and offering value add by strengthening security, identity management, performance monitoring and accounting. The latter of these capabilities (automated resource discovery) has been validated in another case study focusing or sharing anti-fraud data fro roaming users within an international Group of mobile operators [5].

The rest of the chapter is devoted to introduce the main challenges of the Virtual Organization Management area, a selection of the most relevant common technical requirements, a set of common capabilities, design patterns and software components, a sample scenario showing how components interact together and how they can be collectively adopted to address a common business issue, and lastly the lessons learnt during our analysis of the case studies and some good practices identified.

The chapter is concluded with some considerations on the business adoption of the developed components.

3.2 The Main Challenges

Within the VO thematic area we have firstly tried to fix terminology and concepts. During the analysis we have taken common VO concepts from ECOLEAD [7] and TrustCoM [25] into account, in recognition of the fact that substantial basic research has already been done in the area and also that basic research on VO models and foundations is outside of the scope of the project.

Nonetheless, we think it is worth mentioning the approach for VO creation that we have selected according to the analysis of the business experiments. In [6], some approaches investigated in R&D to create a VO are presented and described.

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1Many case studies analyzed rely upon the service concept and WS-* family of specifications.