

# Market of Resources: A Cost and Effort Model

**Maria Manuela Cunha**

*Polytechnic Institute of Cávado and Ave Higher School of Technology, Portugal*

**Goran D. Putnik**

*University of Minho, Portugal*

## INTRODUCTION

Partners search and negotiation, selection, establishment of contracts, virtual enterprise integration, monitoring and enforcement of contracts, and so forth are complex and risky activities required by the virtual enterprise (VE) model.

The need to keep a close alignment with the market environment in permanent change implies the high dynamics of the organizations' structure reconfigurability, introducing a new concept of *dynamically reconfigurable global networked structures*, traduced by the agile/virtual enterprise (A/VE) organizational model. In the BM\_virtual enterprise architecture reference model, Putnik (2001) presents "fast adaptability" or "fast reconfigurability" as the main enabler of business alignment and the main requirement for competitiveness.

Two critical factors against this concept of dynamically reconfigurable global networked structures, that is, against reconfigurability dynamics and networking, can be identified:

- The *transaction costs*, that is, the firm reconfiguration cost, associated to partners search, selection, negotiation, and integration as well as permanent monitoring and the evaluation of the partnership performance.
- The *preservation of firm's knowledge* on organizational and management processes, as it is the firm's competitive factor.

The efficient implementation of the A/VE model requires tools to overcome the networking and dynamics disabling factors.

The main tools suggested in the BM\_virtual enterprise reference model (BM\_VEARM) (Putnik, 2000) for managing, controlling, and enabling networking and

dynamics, overcoming the two critical factors against networking, are:

- The *market of resources* as the environment for enabling and management of efficient configuration, and assuring virtuality at low transaction costs and reduced risk of knowledge leakage.
- The *broker* or organization configuration manager is the main agent of agility and virtuality, acting either between two operations of the A/VE (offline reconfigurability, providing agility only) or online with the operation (online reconfigurability, providing virtuality, and a higher level of agility).
- *Virtuality* makes possible the transition from one physical structure (instance) to another in a way that the enterprise or process owner is not affected by the system reconfiguration and is not aware of the reconfiguration; the underlying service structure and reconfiguration process are hidden.

Internet and World Wide Web technologies are raising hopes of helping from procurement processes until activities such as search of partners, negotiation, contractualization, in terms of quality, flexibility, speed, and cost efficiency. These technologies and applications can be used in the search of resources to integrate a VE and will be designated as the "*e-based traditional way*." However, they do not cope with the VE requirements, and the authors have proposed a market of resources as an institution, providing an alternative environment for VE integration (see articles under the topic market of resources in this encyclopedia and also Cunha & Putnik (2006a, 2006c; Cunha, Putnik, Gunasekaran, & Ávila, 2005).

In order to achieve its maximum competitiveness, that is, to be competitive in delivery time, quality, and

cost and to yield satisfactory profit margins, the implementation of the A/VE model requires a supporting environment assuring two main interrelated aspects (designated A/VE requirements): (1) Reconfigurability dynamics (assuring fast transition between A/VE instantiations) and (2) Business alignment (aligning the A/VE with the market). This section introduces and discusses these two A/VE requirements.

We will designate by *resource* any function, service, or product provided by the independent enterprises (*resources providers*), candidates to integrate an A/VE.

## BACKGROUND

### The Market of Resources

Market of resources is an institutionalized organizational framework and service assuring the accomplishment of the competitiveness requirements for A/VE dynamic integration and business alignment. The operational aspect of the market of resources consists of an Internet-based intermediation service, mediating offer and demand of resources to dynamically integrate in an A/VE, assuring low transaction costs (demonstrated in Cunha & Putnik, 2003a, 2003b) and the partners' knowledge preservation. Brokers act within the market of resources as intermediation agents for agility and virtuality.

In this "virtual" environment, offer corresponds to *resources providers* (individuals, enterprises) that make their *resources* (products, components, operations) available, as potential partners for A/VE integration, and demand corresponds to *client* or A/VE owner, the entity looking for resources to create/integrate/reconfigure an A/VE to satisfy a given *customer*. *Customer* is the entity giving rise to a business opportunity and is considered outside the market of resources, as the *client* entity is the bridge between the market of resources and the *customer* (Cunha & Putnik, 2005).

The service provided by the market of resources is supported by (1) a knowledge base of resources and historic of previous performance results, (2) a normalized representation of information, (3) computer aided tools and algorithms, (4) brokers, and (5) a regulation, that is, management of negotiation and integration processes, as well as contract enforcement mechanisms. It is able to offer (1) knowledge for resources search and selection and its integration in an A/V E, (2) specific functions of A/VE operation management, and

(3) contracts and formalizing procedures to assure the accomplishment of commitments, responsibility, trust, and deontological aspects, envisaging the accomplishment of the A/VE objectives.

The *market of resources* is subscribed by independent resources providers. To this subscription corresponds the formal description of the resources using a resources representation language and its integration in a knowledge base. The organizational aspect of the market of resources consists of an electronically delivered intermediation service between the Resources Providers, integrating the knowledge base and clients, which are organizations looking for resources to integrate in an A/VE to answer to a market opportunity.

### The E-Based Traditional Way

The *e-based traditional way* can be supported by:

- *Internet search engines* and *Internet directories* that help users find items by using keywords supporting the information phase, in particular to find new sources. After identifying a search domain, the process is performed by e-mail contacts (exchange of information, negotiation, and contractualization).
- *Internet-based catalogues* allow buying organizations to browse, search, and/or place orders online.
- *Internet-based marketplaces*, namely e-marketplaces for indirect procurement (i.e., nonproduction related procurement such as office supplies or computer equipment) that let buyers combine catalogues from several suppliers, check the availability of items, place and track orders, and initiate payment over the Internet. Some e-marketplaces offer negotiation tools (online auctions and bidding systems based on price) and support payments and contractualization.

## DEVELOPMENT OF THE COST AND EFFORT MODEL

The authors have developed a model to support the identification of the effort associated to the main activities undertaken in the search and selection of resources providers to integrate or reconfigure a VE, applicable both for the market of resources and for the e-based traditional way. The model makes possible the com-

6 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/market-resources-cost-effort-model/17703](http://www.igi-global.com/chapter/market-resources-cost-effort-model/17703)

## Related Content

---

### Framework for Stress Detection Using Thermal Signature

S. Vasavi, P. Neeharica, M. Poojitha and T. Harika (2018). *International Journal of Virtual and Augmented Reality* (pp. 1-25).

[www.irma-international.org/article/framework-for-stress-detection-using-thermal-signature/214986](http://www.irma-international.org/article/framework-for-stress-detection-using-thermal-signature/214986)

### An Empirical Investigation of the Impact of an Embodied Conversational Agent on the User's Perception and Performance with a Route-Finding Application

Ioannis Doumanis and Serengul Smith (2019). *International Journal of Virtual and Augmented Reality* (pp. 68-87).

[www.irma-international.org/article/an-empirical-investigation-of-the-impact-of-an-embodied-conversational-agent-on-the-users-perception-and-performance-with-a-route-finding-application/239899](http://www.irma-international.org/article/an-empirical-investigation-of-the-impact-of-an-embodied-conversational-agent-on-the-users-perception-and-performance-with-a-route-finding-application/239899)

### Social and Citizenship Competencies in a Multiuser Virtual Game

Germán Mauricio Mejía, Felipe César Londoño and Paula Andrea Escandón (2011). *Metaplasticity in Virtual Worlds: Aesthetics and Semantic Concepts* (pp. 266-280).

[www.irma-international.org/chapter/social-citizenship-competencies-multiuser-virtual/50391](http://www.irma-international.org/chapter/social-citizenship-competencies-multiuser-virtual/50391)

### An Examination of Team Trust in Virtual Environments

Martha C. Yopp (2008). *Virtual Technologies: Concepts, Methodologies, Tools, and Applications* (pp. 1309-1318).

[www.irma-international.org/chapter/examination-team-trust-virtual-environments/30986](http://www.irma-international.org/chapter/examination-team-trust-virtual-environments/30986)

### Levelling (Up) the Playing Field: How Feminist Gamers Self-Identify and Learn in Online Communities

Sarmista Das (2014). *Educational, Psychological, and Behavioral Considerations in Niche Online Communities* (pp. 81-100).

[www.irma-international.org/chapter/levelling-up-the-playing-field/99295](http://www.irma-international.org/chapter/levelling-up-the-playing-field/99295)