Taxonomy of Broker's Functions in Virtual Enterprises

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INTRODUCTION

Not just with the emergence but also with the growing of the electronic market, that is, the growth of online suppliers of services and products and Internet users (potential consumers), the necessary conditions to the affirmation of the agile/virtual enterprises (A/VE) as a present and future enterprise organizational model are created. In this context, it is our understanding that the broker may have an important role in its development, namely, if the broker performs functions for the A/VE with better efficacy and efficiency.

In this article, we will present first a revision of the broker's models in a structured form. We present a taxonomy of possible broker's functions for the broker's actuation near the A/VE and then the classification of the literature broker's models. This classification will permit an analysis of a broker's model and establish a mainframe for our broker's model according to the BM_Virtual Enterprise Architecture Reference Model (BM_VEARM).

DEFINITIONS AND BROKER CONCEPT

As a definition of broker (Porto Editora, 2001), we can find: funds or stocks commission agent, intermediary, dealer of secondhand goods, and agent. However, for the purpose of this work, it is more important that we understand the set of the broker's attributed functions. Other expressions associated with the broker designation are cybermediaries, which means organizations that perform mediation tasks in the world of electronic commerce (Sarkar, Butler, & Steinfield, 1995), or resources manager, which means the A/VE configuration manager (Putnik, 2000). Considering the functions attributed to the broker under the several models of the agile/virtual enterprises, the broker is a necessary agent but assumes different functions according to the framework model. Actually, the broker is a flexible/dynamic agent because, for each A/VE, the broker will have to perform several functions according to requests from the principal (A/VE initiator).

If we consider the service supply chain models between the broker and the A/VE or other A/VE units (other than broker, when the broker is a part of A/VE) in different instances of the A/VE project as represented in Figure 1, the broker can act as the initiator, supplier, direct intermediary, and/or indirect intermediary.

a. When the broker behaves as the A/VE initiator, the service supply chain itself does not exist.
b. The chain is minimal, the broker and other A/VE units are the chain extremes, and the connections with others do not exist. An example is when the broker is asked to create a focused market of resources.
c. The chain is ternary, and the broker is the indirect intermediary between other A/VE units, that is, between the client and supplier. For example, when the broker participates in a negotiation process.
d. A long supply can be established between other A/VE units, that is, between the client and supplier, introducing broker's interoperability in a market of brokers.

Figure 1. Service supply chain between the broker and other A/VE units (adapted from Hands, Bessonov, Blinov, Patel, & Smith, 2000)
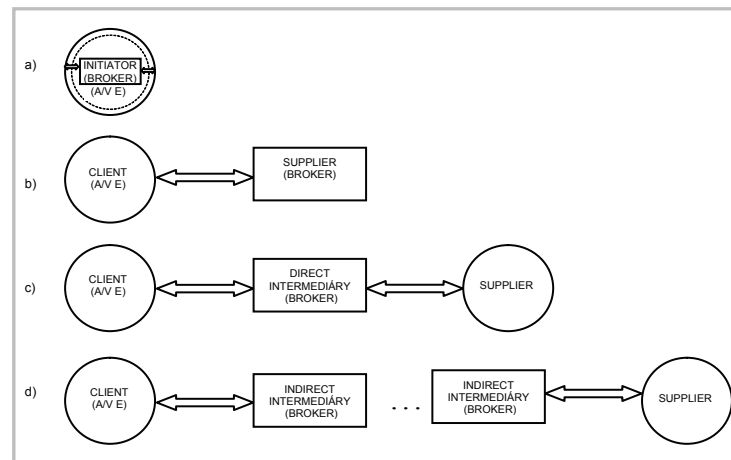
THE NEED OF THE BROKER IN A/VE

Several authors have justified that the broker can improve the performance of the A/VEs, but the principal justifications come to the electronic markets that can be seen as a particular case of the A/VEs.

In Resnick and Avery (1994), the broker's value is justified by costs reduction, privacy improvement for the consumer and for the supplier, bigger and better information availability to the consumer, namely, about quality product/service and market satisfaction, decreased un-accomplishment risks by the involved parts, and improvement of the prices through the creation of mechanisms that induce only the adequate sales.

According to Sarkar et al. (1995), with the elimination of barriers between client/supplier brought by the electronic market, should be predict the elimination of the traditional middle people, like the wholesalers and the retailers, enabling the costs reduction that in certain cases could achieve the 60%. However, the same author reiterates that the new information infrastructures create space for the growing of a new kind of middle people. Sarkar justified this affirmation, not only describing some middle people functions that are not easily performed by the producers and the clients, but also through calculus founded in transaction costs theory.

Caughey, Ingham, and Watson (1998) are of the opinion that the electronic market in a the future will yield a bigger number and variety of brokers. The authors justify this by pointing to reasons of how the broker may add value to the services that will supply as well as ag-gregate the services of different suppliers and present them in a more consistent format; inquire/search a set of services that match the client requisites; monitor a set of services and inform the clients of some that are interesting to them; combine and integrate information from different suppliers (e.g., combining bus timetable with the aeroplane ones); and supply the broker with other services about the information that the broker acquired and knew from the suppliers.

For Hands et al. (2000), the necessity of the electronic broker is justified with the answer to these kinds of questions: how the client locates the supplier; effectuates the purchase; finds the products and services that need with a just market price; and in which supplier the client must trust or vice versa. In their opinion, the mediation between suppliers and clients introduced by the broker is the ideal solution to overstep those problems.

Putnik (2000) infers that high agility (dynamic, real-time A/VE structure reconfiguration; the ideal goal is the reconfiguration within one second) intended to A/VE will be achieved with broker introduction only. The broker contributes decisively for the high performance of the A/VE agile design (project) and operation. Still, according the same author, A/VE virtuality is related with the fact that the physical structure from enterprise could be hidden to the project manager, that in fact, it is only obtained with the broker intermediation between two control levels from A/VE structure. In this sense, the broker serves as an agent of virtuality, or the broker supplies the mechanism of virtuality. In Figure 2, we see the broker actuation according to the BM_virtual

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