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STRUCTURE AND LIQUIDITY OF B2B HUBS: AN INDUSTRIAL ORGANIZATION ECONOMICS THEORETIC FRAMEWORK

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Abstract

B2B exchanges are expected to play an important role in the digital economy. While these exchanges are thought to add value by reducing inefficiencies in industrial procurement, it is unclear the additional value that could be created by them and more importantly, who is likely to appropriate the created value. Drawing from the industrial organization economics perspective of strategy, key forces that are likely to impact the evolution and success of B2B exchanges are identified and a framework to classify B2B hubs based on their neutrality and ownership is proposed. We postulate how the traditional industry structure variables are likely to influence the structure and liquidity of B2B hubs. The hypotheses put forth will be tested using data collected from exchanges in a variety of industries.

Introduction

In the last few years, the Internet has emerged as an important medium of commerce. The global reach and interconnectivity of the Internet has spawned new business models and radically transformed existing ones. While the initial use of the network was to sell goods and services to consumers (B2C), in the last two years, automated business-business transactions over the Internet have become an important phenomenon (B2B). Organizations are exploiting the ubiquity and scalability of the web-based applications to automate inter-organizational business processes such as procurement, inventory management, invoicing and many others. Estimates suggest that B2B commerce is likely to grow exponentially, from $43 billion in 1998 to over $1.3 trillion by 2003 (Forrester Research, 1998).

A major segment of this revenue however will be absorbed not by the end suppliers of products and services, but by the new breed of company, called an information intermediary or infomediary. Infomediaries are electronic commerce companies that leverage the Internet to unite buyers and suppliers into a single, efficient virtual marketplace. The lower costs of web-based transactions have generally encouraged organizations to explore market-based procurement for goods and services that had traditionally been transacted through closed buyer-supplier relationships. This has fawned a variety of market making models and technology platforms to support these models. Collectively, these virtual marketplaces called exchanges or hubs enable any-to-any transactions between buyers and sellers, aggregate demand and supply and enable price determination through a variety of mechanism such as auctions and reverse auctions. For the buyers, these exchanges are expected to lower purchasing costs, while enabling them to reach new suppliers. For suppliers, they are expected to lower sales cost and create new market opportunities (Goldman Sachs, 1999, Sculley, 2000).

These potential benefits have fuelled the proliferation of B2B exchanges in the last few years. Estimates suggest that as of 2001, there are over 1500 exchanges and the number is expected to continue to grow in the near future (Goldman Sachs, 1999, Sculley, 2000). Industry hubs, which are vertical exchanges set up to cater to the procurement needs of specific industries have sprung up in almost every industry. Prominent examples include those in the steel, energy, plastics and paper industries. These hubs typically deal with direct materials that are bought and sold in large volumes within a specific industry. In contrast, horizontal hubs cater to indirect goods and services that are likely to be used by organizations across industries. A number of commodity/product category specific horizontal hubs have also been established in the last few years. In addition, meta-hubs that link industry verticals with horizontal hubs to provide a single gateway for buyers have also emerged.
While these exchanges are expected to reduce inefficiencies in industrial procurement, it is unclear the additional value that could be created by them and more importantly, who is likely to appropriate the created value. For this reason, both buyers and suppliers have been cautious in using these exchanges and refrained from becoming active members of these exchanges. Moreover, the multitude of exchanges in each industry as well as the number of intra-industry exchanges that have emerged poses buyers and suppliers a bewildering array of choices. However, the structures and the business models of these exchanges are still evolving and it is yet unclear which ones are likely to be successful. Given their novelty, very limited systematic research has been done on the structure and liquidity of B2B exchanges and the forces that shape them, resulting in a paucity of theoretical knowledge and guidelines for buyers and suppliers regarding how to choose the hubs to participate in.

This study is one step in addressing this void. We draw from the industrial organization economics perspective of strategy to identify key forces that are likely to impact the evolution and success of B2B exchanges. We propose a framework to classify B2B hubs based on their neutrality and ownership. We move on the postulate how the traditional industry structure variables are likely to influence the structure and liquidity of the exchanges. The hypotheses put forth will be tested using data collected from exchanges in a variety of industries.

Theoretical Framework

The industrial organization economics (IO) model of strategy originally proposed by Mason (1939) and Bain (1956) and later elaborated by Porter (1984) posits that the performance of a firm in an industry is dependent on the structure of the industry. Industry structure described by the five forces model (Porter, 1984) includes factors such as the bargaining power of buyers, bargaining power of suppliers, threat of new entrants, substitutes, and the performance of the rivals in an industry. The five forces framework maps out the forces that are driving an industry, specifically looking at suppliers, buyers, substitutes, new entrants and industry competitors. As the relative power and industry contributions of these actors are studied, it is often possible to identify the most probable winners and losers within the industry. The industry-level focus of the IO paradigm is particularly well suited for analyzing the structure and liquidity of B2B hubs because they could alter the relative bargaining power of the customers and suppliers in an industry as well as alter the cost structure of an industry.

We posit that the structure and liquidity of an industry hub is likely to be influenced by the structure of the industry. For example, it is likely that in industries with significant buyer power, the exchanges are likely to be owned or controlled by the buyers. It is also likely that in order to attain liquidity, exchanges in such industries are likely to be buyer-oriented, at least initially. Similarly, in highly fragmented industries, it is possible for outside players to establish a hub. However, whether the hub is neutral or aligned with the buyers or the suppliers is likely to be influenced by the relative bargaining power of the buyers and suppliers. Similarly, the likelihood of the cooperative ownership of industry hubs will depend upon the extent of rivalry among dominant industry players. In industries with fierce competition, it is possible that multiple exchanges emerge. In addition to these and other possible direct effects of the five forces on the structure and liquidity of the B2B hubs, the interactions between these forces define more clearly the industry context in which the hubs have to operate. Hence, it is important to examine how the industry structure variable interact to determine the structure and the market making models of B2B hubs.

In order to systematically examine these the effects of the industry structure on the nature of vertical hubs, we developed a framework to classify the vertical hubs in terms of their ownership and neutrality (Table 1). The vertical axis depicts the neutrality of the vertical hubs. Hubs could be either buyer aligned, supplier aligned or neutral. The horizontal axis depicts that an industry hub could be owned by 1) a supplier, 2) a buyer, or 3) a third party that does not have any prior affiliation with the industry. The shaded cells indicate structures that are unlikely. As depicted in the framework, the other seven structures are feasible ones. We posit that the specific structure of a hub will be influenced by the five forces that define the structure of an industry and, the interactions between the five forces.

Research Plan

The large number of hubs that have already been established and the wide range of industries they are affiliated with provide an opportunity to collect meaningful data to allow statistical analysis and testing of the research hypotheses posited in this study. We propose to collect data necessary for our analysis from secondary sources. These data include the industry structure variables and the ownership and neutrality of the vertical hubs in each industry. In addition, descriptive data about the hubs in terms of the services provided as well as the financial performance of the hubs will be collected. It should be pointed out that a large body of research exists in the strategy literature that has operationalized the industry structure variables using secondary data. These standard measures will be used in our research as well. We have commenced the data collection and expect to complete the same by August 2001. Data coding and analysis will be conducted soon after that, followed by statistical analysis.

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### Table 1. Classification Framework for Vertical Hubs

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<tr>
<th>Neutrality</th>
<th>Seller Aligned</th>
<th>Neutral</th>
<th>Buyer Aligned</th>
<th>Buyer owned or Buyer Cooperatives</th>
<th>Supplier owned or Supplier Cooperatives</th>
<th>Outsider</th>
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#### References


