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Internet-based Technologies: Value Creation for the Customer and the Value Chain Across Industries

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Introduction

The focus of this paper is to investigate issues related to Internet-based technologies and their enabling effects on the value chain of companies in various industries. Additionally, we are also in the process of investigating whether firms are using Internet-based technologies for differentiation or cost strategies (Porter, 1985) through coordination and bundling of service offerings across several industries. This is a research in progress.

Conceptual Foundation

Porter (1985) proposed the value chain framework for analyzing and understanding competitive strategy. Porter defined value activities as the physically and technologically distinct activities a firm performs. The value activities are classified in two broad groups: primary value activities and support value activities. The competitive strategy of the firm ultimately depends upon the extent the value activities of the firm affect and are related to the buyer's value chain. The impact is of course greater if it is with respect to the "value system" Porter (1985). The value system consists of the value chains of a firm's suppliers, its own value chain, that of its channel members and also includes buyers value chains.

Value activities are related by linkages within the value chain. Linkages are relationships between the way one value activity is performed and the cost or performance of another. Linkages provide two avenues for competitive advantage: optimization and coordination. Evidently, effective exploitation of linkages to achieve competitive advantage requires information and information flows that allow optimization or coordination to occur.

The Role of Internet-based technologies

The critical advantage offered by Internet-based technologies is that they build upon the already existing information technology infrastructure and that they allow the creation, storage, sharing, dissemination and access to useful information very cost effectively across the entire value system. The advent of Internet-based technologies have finally broken some of the technological barriers that had always limited the degree of product bundling that businesses could offer to its customers. Additionally, new linkages among the value activities of buyers and sellers can now be identified due to the flow of information that

is possible through the use of Internet-based technologies. It is possible to model and study the cost advantages of these new technologies with the aid of information economics (Parker, Trainor, and Benson, 1989). This methodology measures and justifies the value of information technology and its integration into an organization based on its business performance. It employs additional techniques to quantify the new risks brought about by an introduction of new technology into the traditional value chain of an organization.

Generic Strategies and Issues of Coordination and Customized Product Bundling

Porter (1985) has defined two major generic strategies that firms could follow: cost leadership and differentiation. Internet-based technologies help improve coordination by streamlining information flow that ultimately either provides a cost advantage or creates differential advantage by providing premium service or information to customers. Product bundling is usually defined as, that all buyers are provided with the same package of products and services, regardless of differences in their needs. We define customized product bundling as an array of product or service offerings from which the customer is able to choose the bundle that creates the most value. Obviously, the customized product bundle requires a higher degree of coordination and information flow both within and among the value chains of all participating firms in that bundle. Based on the above discussion the conceptual research framework is presented in Figure 1.

Research Methodology and Data

Content analysis of published articles from industry press and company web sites is used to classify companies from each industry in our sample according to the conceptual research model. A structured instrument was initially developed and pilot tested with 15 corporate web sites and 30 articles from industry publications and was then subsequently standardized. Following content analysis guidelines (in accordance with Kassarian, 1977; Smith and Kidder, 1991; and Patton, 1990) the instrument was used for data collection. Members of the research team was randomly allotted to different web sites to reduce researcher bias. The Perreault and Leigh's (1989)

interrator reliability index was 0.97. To reduce errors in coding, a simple coding scheme was incorporated. The coding categories consisted of either presence or absence of the characteristics investigated in the instrument.

The following is a list of industries and SIC codes in the sample:

Apparel 23 (SIC), Manufacturing 39, Oilgas 13, Real Estate 65, Hotel 70, Executive and Management Service 87, Environmental Quality 95, Trucking 42, Insurance Agent 64, Social Services 83, Printing and Publishing 27,

Legal Services 81, Industrial Machinery 35, Paper Industry 26, Chemicals 28, Rubber 30, Museums 84, Air Transportation 45, Business Services 73, Educational Services 82.

The preliminary data in Table 1 represents a snapshot of the use of Internet-based technologies in Primary and Support value activities of the Conceptual Research Framework (see Figure 1). The rest of the analyses (currently underway) focuses on the other components of the research framework.

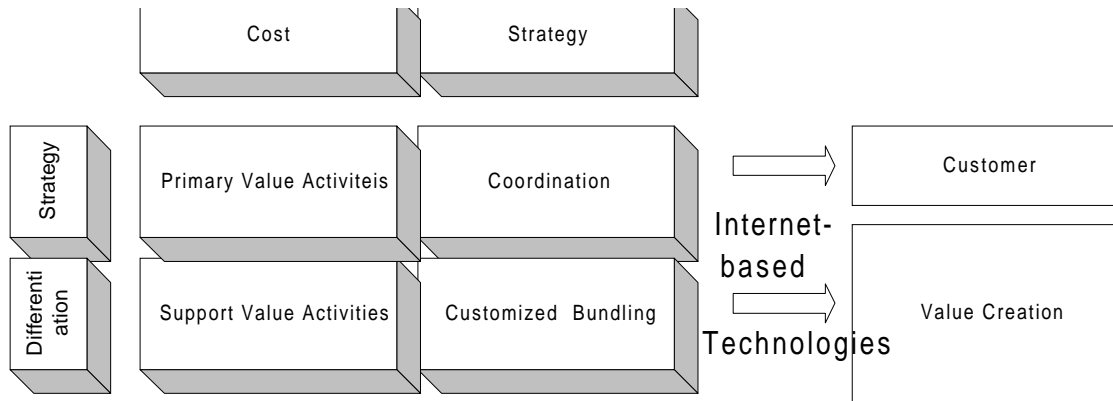


Figure 1: Conceptual Research Framework

Table 1: Preliminary Results

Primary Value	Internet-based	Support Value Activities	SIC Codes
Inbound Logistics	Intranet	Corporate Infrastructure	23
Inbound Logistics	Intranet	Human Resource Management	-
Inbound Logistics	Intranet	Technology Development	42,42
Inbound Logistics	Intranet	Procurement	-
Inbound Logistics	Extranet	Corporate Infrastructure	39,39
Inbound Logistics	Extranet	Human Resource Management	-
Inbound Logistics	Extranet	Technology Development	-
Inbound Logistics	Extranet	Procurement	-
Inbound Logistics	Internet	Corporate Infrastructure	-
Inbound Logistics	Internet	Human Resource Management	-
Inbound Logistics	Internet	Technology Development	-
Inbound Logistics	Internet	Procurement	13
Operations	Intranet	Corporate Infrastructure	13
Operations	Intranet	Human Resource Management	-
Operations	Intranet	Technology Development	42,42,67,70,87,95
Operations	Intranet	Procurement	-
Operations	Extranet	Corporate Infrastructure	45,64,64,64,64,64,64,67,67,67,70,73,87
Operations	Extranet	Human Resource Management	-
Operations	Extranet	Technology Development	64,64,64,64,64,64,64,67,67,70,73,87,87,87,87,92
Operations	Extranet	Procurement	-
Operations	Internet	Corporate Infrastructure	38,42,64,64,64,64,64,64,64,67,67,67,70,70,92,92,92,92
Operations	Internet	Human Resource Management	64
Operations	Internet	Technology Development	23,42,42,64,64,64,64,64,64,64,67,67,73,87,87,87,87,92,92,92,97,97
Operations	Internet	Procurement	-
Primary Value Act	Internet based	Support Value Act	SIC Code
Outbound Logistics	Intranet	Human Resource Management	-
Outbound Logistics	Intranet	Technology Development	-
Outbound Logistics	Intranet	Procurement	-
Outbound Logistics	Intranet	Corporate Infrastructure	23
Outbound Logistics	Extranet	Corporate Infrastructure	28,28,28
Outbound Logistics	Extranet	Human Resource Management	-
Outbound Logistics	Extranet	Technology Development	-
Outbound Logistics	Extranet	Procurement	-
Outbound Logistics	Internet	Corporate Infrastructure	23,23,23,23,23,23,23,23,27,27,27,42,64

Outbound Logistics	Internet	Human Resource Management	-
Outbound Logistics	Internet	Technology Development	27,27
Outbound Logistics	Internet	Procurement	-
Marketing and Sales	Intranet	Corporate Infrastructure	27,42,42,42
Marketing and Sales	Intranet	Human Resource Management	-
Marketing and Sales	Intranet	Technology Development	42,42,42
Marketing and Sales	Intranet	Procurement	-
Marketing and Sales	Extranet	Corporate Infrastructure	27,28,28,35,38,38,64,70
Marketing and Sales	Extranet	Human Resource Management	-
Marketing and Sales	Extranet	Technology Development	38,83
Marketing and Sales	Extranet	Procurement	-
Marketing and Sales	Internet	Corporate Infrastructure	23,23,23,23,23,23,23,23,26,26,27,27,27,27,27,27,28,28,28,28,28,30,30,35,38,38,38,38,64,64,64,64,64,64,67,67,67,67,70,70,81,84,84
Marketing and Sales	Internet	Human Resource Management	-
Marketing and Sales	Internet	Technology Development	23,27,27,38,38,42,42,45,92,92,92,92,92,95
Marketing and Sales	Internet	Procurement	-
Service	Intranet	Corporate Infrastructure	-
Service	Intranet	Human Resource Management	-
Service	Intranet	Technology Development	26
Service	Intranet	Procurement	-
Service	Extranet	Corporate Infrastructure	-
Service	Extranet	Human Resource Management	-
Service	Extranet	Technology Development	-
Service	Extranet	Procurement	-
Service	Internet	Corporate Infrastructure	64,64,92
Service	Internet	Human Resource Management	-
Service	Internet	Technology Development	92,92,95
Service	Internet	Procurement	-

Discussion and Conclusion

Table 1 identifies the value activities in companies, in a specific industry, that are using Internet-based technologies. Our preliminary data indicate that Internet-based technologies are being used more predominantly in some value activities compared to others. Investigation (based on this data) is underway to understand how Internet-based technologies are being used for either reducing cost or creating differentiation through improved coordination and customized bundling of products in different industries. Further analyses are required to develop a more comprehensive insight as to the current

state of application of Internet-based technologies in the value chain of various industries. Through this an improved understanding can be gained as to where the companies might use Internet-based technologies more effectively for a specific type of industry. This research is based on a broad array of industries in order to understand how Internet-based technologies can be used for competitive advantage.

References

References available upon request from the first author.