Emerging Patterns from the Dynamic Capabilities of Internet Intermediaries

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Table of Contents

- Abstract
- Introduction
- Disintermediation Debate
- The Personal Computer Industry
- Theoretical Background on Dynamic Capabilities
- Types of Intermediaries in the PC Industry
  - Internet Supplemented Direct Market
  - Threatened Intermediaries
  - Cybermediaries
  - Internet Supplemented Intermediaries
  - RosettaNet
- Dynamic Capabilities Analysis of the PC Industry
  - Internet Supplemented Direct Market
  - Threatened Intermediaries
  - Cybermediaries
  - Internet Supplemented Intermediaries
- Conclusion
- References
- About the Author

Abstract

The Internet has had a major impact on threats and opportunities
available to intermediaries in many industries. Prior research using transaction cost theory shows four possible outcomes: Internet supplemented direct market, threatened intermediaries, cybermediaries and Internet supplemented intermediaries. This paper extends the "four outcomes" framework, by integrating it with research on dynamic capabilities. This new framework explains emerging patterns of response from threatened intermediaries in the personal computer industry. The specific scenario chosen by the threatened intermediary depends on its dynamic capability. Future research can use the integrated framework to predict Internet impacts on intermediaries in other industries.

**Introduction**

Early predictions for electronic commerce were relatively simplistic. Based on transaction cost theory, they predicted disintermediation for organizations that communicated between producers and consumers. The rationale was that lower transaction costs (Malone, Yates, & Benjamin, 1987) would enable producers to bypass intermediaries and deal directly with consumers. While the benefits to producers would be a greater share of the profits, the benefits to the consumer would be lower overall prices (Benjamin & Wigand, 1995; Wigand & Benjamin, 1995).

Despite the logic of this argument, a debate on distintermediation has raged in both practitioner and research publications. My objective in this paper is to clarify emerging patterns of intermediary response to the Internet, and in doing so provide a deeper theoretical explanation for the impacts of the Internet on intermediaries. This research addresses the issue of alternative strategies for threatened intermediaries and provides the basis for predicting future actions.

Using the dynamic capabilities framework, which is based on research by Teece, Pisano and Shuen (1997), I extend the "four outcomes" framework developed by Sarkar, Butler and Steinfeld (1995). The new integrated framework is applied in a case study of the fast-paced personal computer (PC) industry, which is undergoing many dramatic intermediary changes associated with the Internet.

The next section reviews articles on Internet-impacted disintermediation, presenting both sides in the lively debate as well as new perspectives. The third section on the PC industry introduces some of the intermediary stakeholders in the case study. The next section presents a theoretical background on dynamic capabilities (Teece, Pisano, & Shuen, 1997), in preparation for our analysis of the PC industry. The fifth section classifies intermediaries in the PC industry using the "four outcomes" framework (Sarkar, Butler, & Steinfeld, 1995). Extending the "four outcomes" framework with a dynamic capabilities analysis of the PC industry, in the sixth section I provide alternative strategies for
threatened intermediaries. Finally, in the conclusion, I consider implications of the findings for both practitioners and researchers.

**The Disintermediation Debate**

Previous publications address both sides of the disintermediation debate. Disintermediation is a term used by researchers and journalists to denote the shedding of the middleman. Although there is no doubt that the direct model is one alternative for electronic commerce, experience over the last few years has shown that other models are also feasible. In fact, there are many reasons why disintermediation is neither desirable nor mandatory. The argument for disintermediation stresses the advantages of streamlining processes, while lowering costs and increasing speed (Davenport, 1993). In particular, the music, travel, banking and retail industries, government, insurance brokers and real estate brokers are threatened with disintermediation (Bloch, Pigneur, & Segev 1996; Stepanek, 1998; Tapscott, 1997). On the other hand, there are new roles for intermediaries that add value. 'Infomediaries' act as price discovery agents, aggregators, match makers, auctioneers, and third-party guarantors providing trust-based relationships and ensuring the integrity of markets (Bailey & Bakos, 1997; Bakos, 1997, 1998; Barling & Stark, 1998, *The Economist*, 1999; Zwass, 1998). For example, NARLINK provides information on regulatory issues for realtors (Tapscott, 1997) and Intuit provides links between their software and banks to provide value added services to customers (Bloch, Pigneur, & Segev, 1996).

Davenport (1993) used disintermediation to describe a consequence of reengineering or business process innovation. To streamline a process, redundant or unnecessary steps that slow down completion and may introduce errors should be removed. Inefficient, paper-based instances were documented of hand-offs dominating the bottlenecks. The obvious solution was to eliminate hand-offs that cause delays when documents lay idle on employees' desks, forgotten or buried under other papers. Often, the document just required a signature or minimal processing. Engineering change notices (ECNs), for example, usually require signatures from marketing, production and engineering, to ensure each area is aware of the impact of the change. Product data management software automates the process by sending e-mails to each area simultaneously. This is a definite improvement on the old paper-based process that required sequential collection of signatures, and delays when the paper sat on managers' desks or even when the form was hand-carried.

Tapscott (1997) lists disintermediation as one of twelve themes that impacts the new economy, new enterprise and new technology. His disintermediation examples include the music, travel, and retail industries, government, and real estate brokers. On the other hand, he also gives an example of a new value-added intermediary, NARLINK, which provides information on regulatory issues for
Using examples from the retail, banking and travel industries, Bloch, Pigneur and Segev (1996) discuss the dangers of electronic commerce to current intermediaries. To add value and differentiate their offering, intermediaries should provide an integrated package of information and products. For example, Intuit provides links between their software and banks to "allow customers to get on-line statements, transfer money between accounts, pay bills or get portfolio updates" (Bloch, Pigneur & Segev, 1996). Moreover, there are predictions that 25% of the global electronic payment market will be taken by non-banks and high-technology companies acting as new intermediaries.

At this stage, disintermediation has affected book-sellers, travel agents and insurance brokers the most (Stepanek, 1998). There are predictions that the Web will, at least in the short term, eliminate more middlemen jobs than it will create. For example, the Net will accelerate economic and technological trends, which have, since 1995, led to a 20% fall in the number of insurance agents. While 100,000 cybermediaries (new intermediaries enabled by the internet) may already have cropped up, 84% of insurance companies worry about the Net (Stepanek, 1998).

Barling and Stark (1998) believe the disintermediation "prediction that the Internet's ability to deliver graphical storefronts, to anyone, anywhere, means that suppliers will be empowered to cut out their distribution channel, and go direct," has come and gone. On the contrary, the Internet provides opportunities for intermediaries to be market match-makers, bringing together buyers and sellers in the industry.

The Economist (1999) argues that such 'infomediaries' provide three new business-to-business market models. Infomediary models are: (1) aggregators, which help buyers in fragmented markets select products by providing up-to-the minute price and product information and a single contact point for service; (2) online auctioneers, which offer a reliable channel for sellers to dispose of perishable or surplus goods or services at the best possible prices, and for buyers to get bargain prices without taking a leap into the unknown; and (3) exchanges, that create liquidity in otherwise fragmented markets, lower average stock levels by matching bid/ask offers and act as neutral third parties, enforcing market rules and settlement terms.

Peterson, Balasubramanian and Bronnenburg (1997), using a marketing perspective, analyze types of channels and characteristics of products and services being marketed over the Internet. Distribution channels facilitate physical exchange of products and services, incorporating sorting, holding inventory and building up assortments. An Internet intermediary is not likely to substitute for a traditional one, unless the product is a digital asset such as software, music or reports. For digital assets or an information good, the Internet is an ideal distribution channel because the variable cost is close to zero. For the second type of
channel, transactions, the Internet is more likely to displace traditional intermediaries because of its ability to overcome geographical and time constraints. However, the characteristics of the products and services need to be considered. The third channel, the communication channel, is the most likely of the three to substitute and dominate traditional intermediaries, especially for broadcasting, personalization and interaction.

Classifying products and services along the three dimensions, (1) cost and frequency of purchase, (2) value proposition and (3) degree of differentiation, (Peterson, Balasubramanian, & Bronnenburg, 1997) is useful for assessing the suitability of the Internet. For example, low cost, frequently purchased products that need physical delivery (e.g., milk) are not likely candidates for electronic commerce. On the other hand, a value proposition of an intangible information good is very efficiently transacted over the Internet. Commodities, which have a low degree of differentiation, are subject to price wars because of the relatively low search costs over the Internet.

Bailey and Bakos (1997), using case studies, analyze the following roles for intermediaries: (1) aggregating the demand of many customers and/or the products of many suppliers, (2) preventing opportunistic behavior and generating trust, (3) facilitating the exchange of information, and (4) matching customers and suppliers. Although the Internet changes these traditional roles, overall disintermediation is not likely. For example, search engines reduce the need for a third party to aggregate and match on the web, yet the success of portals like America Online, and the potential for bundling large numbers of information goods show promise for these intermediary roles on the Internet. However, search engines themselves are intermediaries, whose success and popularity depends on their search algorithms and search purposes. While Bailey and Bakos (1997) found that Bargainfinder was blocked from several sites, Firefly provided useful information for a potential CD purchase. The fact that suppliers blocked Bargainfinder to prevent competitive price comparisons shows that intermediaries need to provide value and incentives to both customers and suppliers.

Bakos (1997, 1998) researched Internet search costs from a theoretical perspective. Buyers gain power and lower costs by using search engines, software agents and bots. However, Internet sites can block these automated software programs from doing price comparisons, and an exploratory study shows that a diversity of prices do prevail. The functions of markets are to (1) match buyers and sellers, (2) facilitate transactions and (3) provide an institutional infrastructure (Bakos, 1998). Intermediaries perform the first two functions with increased effectiveness and lower transaction costs over the Internet. Other functions for intermediaries include providing product information to buyers and marketing information to sellers, aggregating, managing physical deliveries and payments, providing trust-based relationships and ensuring the integrity of markets.
Zwass (1998) assesses the channel impacts of e-commerce. He acknowledges the intermediary bypass possibility and poses the question: which intermediaries are doomed? Other expected impacts are that traditional intermediaries may be replaced by cybermediaries, an increased role in price discovery is possible and intermediaries may be material as third-party guarantors. Other questions include: How can intermediaries add value in E-commerce? What are the successful new business models for intermediaries? How can traditional intermediaries become new intermediaries? What will be the categories and the role of the new intermediaries? How will the profits and welfare be redistributed among the parties in the business transactions?

Riggens (1998) identified altered roles of intermediaries as a value creation opportunity. For example, Virtual Vineyards acts as an intermediary between the consumer interested in wine and hundreds of small geographically dispersed wineries.

Such sites in their match-making role add value to both buyers and sellers by efficiently aggregating products and providing a focal point, with expert suggestions. Although bypassing the middleman has potential to streamline a process, it is important to assess whether the middleman adds value. Not every producer wants to handle all the functions in its business. In fact, outsourcing has become more widespread in recent years as companies focus on their core competencies and capabilities. In the extreme, a trend to disintermediation could imply a return to vertical integration. The make-versus-buy dilemma has received much attention over the years. A parallel in the electronic commerce context is to decide whether to distribute, sell or do other middleman functions or outsource these functions to other organizations.

Looking beyond disintermediation or lack thereof, Sarkar, Butler and Steinfield (1995) argue for four possible outcomes based on the costs of transactions between (1) producers and consumers, (2) producers and intermediaries and (3) intermediaries and consumers before and after the introduction of the Internet. Sarkar, Butler and Steinfield (1998) move toward theory building with a set of propositions on the emergence of cybermediaries and the development of virtual channel systems.

In summary, the Internet triggers both threats and opportunities for intermediaries. Specifically, threatened intermediaries need to examine opportunities to add value. New roles for intermediaries include providing product information to buyers and marketing information to sellers, aggregating, managing physical deliveries and payments, providing trust-based relationships and ensuring the integrity of markets. The types of channels and characteristics of products and services being marketed over the Internet influence the potential for disintermediation. Similarly, the impact of the Internet varies by industry.
The Personal Computer Industry

The personal computer industry illustrates particularly well both the threats and opportunities triggered by the Internet. Such fast-paced high-tech industries behave like lab fruit flies, who have such short life cycles that studying them accelerates research considerably (Fine, 1999). This section examines the traditional and emerging intermediaries in the personal computer industry to further our understanding of disintermediation and to predict future developments in general.

In the personal computer industry, traditional intermediaries in the supply chain include distributors, resellers, retailers, etc. Although Dell does bypass the distributors, resellers, and retailers, it relies on many suppliers and outsources some logistics, delivery and other tasks. The direct business model has definite appeal and has been used extremely successfully by Dell Computers. However, Dell was already using this direct model before adopting electronic commerce, and adapted very easily to taking orders over the Internet. On the other hand, most of Dell's competitors have had a more difficult time emulating the direct model with or without the Internet.

Interestingly, some "producers" in the PC industry outsource production itself. For example, Solectron manufactures components and Ingram Micro assembles personal computers that are sold under several brands including Compaq and IBM (Hamm & Stepanek, 1999). Similarly, there are several "fabless" semiconductor companies that outsource production and focus on design and marketing. In these complex supply chains, there are many intermediaries between the "producers" and consumers. Although there is considerable potential for delays and mistakes, this is balanced by potential gains in specialized skills and capabilities, economies of scale and other value added benefits.

Theoretical Background on Dynamic Capabilities

To further our understanding of disintermediation in the PC industry, I review the literature on dynamic capabilities and related research. The dynamic capabilities framework will enable us to explain alternative strategies for threatened intermediaries in the PC industry. The Internet's impact on the PC industry has been dramatic. As a result, many PC organizations have undergone transformation. Although threatened intermediaries need to transform, some have resisted change.

The literature on IT-based organization transformation draws on
research in organizational change (Scott-Morton 1991). Traditionally, papers have used deterministic logic in describing the impact of IT. More recently, a logic of opposition is used to present opposing forces that oppose as well as promote IT-related change (Robey, 1995; Robey & Boudreau, 1999). Theories on organizational culture (Fiol, 1991; Schein 1992, 1993, 1996) and organizational learning (Cohen & Sproull, 1996; Fiol & Lyles, 1985; Levitt & March, 1988; Huber, 1991) explain forces that oppose IT-based organizational change.

Opposing forces explain why technology is not always a panacea for the organization (Gill, 1995). New technologies in particular are often problematic because of immature tools and a shortage of expertise. Organizational learning is needed to develop the capabilities to deploy the technology (Ciborra & Andreu, 1996). However, learning may be trial-and-error if there is no experience to draw on. As experience accumulates the organization develops routines that become embedded in organizational memory (Cohen & Bacdayan, 1994; Stein & Zwass 1995; Walsh & Ungson, 1991). Nevertheless, in the long run core capabilities may become core rigidities if the organization becomes complacent and resists transformation needed for new technologies (Leonard-Barton, 1992). Because of the need to balance innovation and efficiency, there is a constant tension between exploration and exploitation (March, 1991). While exploration is a type of learning that searches for new routines, exploitation is a type of learning that makes use of established routines.

Routines are an important facet of organizational culture, and several researchers have found a link between organizational learning and organizational culture (Adler & Shenhar, 1990; Brown & Duguid, 1991; Cook & Yanow, 1993; Kofman & Senge, 1993; Sackman, 1992; Schein, 1992, 1993, 1996). Theories on organizational culture explain the cultural drag that can make it difficult to change organizational routines (Schein, 1992, 1993, 1996).

Routines are also an important characteristic of a firm's business processes (Winter, 1987). Processes, as well as positions and paths, are the fundamental units of analysis in the dynamic capabilities perspective (Teece, Pisano, & Shuen, 1997). Dynamic capabilities are defined as "the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments" (Teece, Pisano, & Shuen, 1997). This ability is influenced by path dependencies and market positions (Leonard-Barton, 1992). Path dependencies reveal that "history matters" (El Sawy, Gomez, & Gonzalez, 1986), because, for example, a supporting infrastructure and "learning by using" experiences give a firm competitive advantages. Advantages are also based on market positions from complementary, technological, institutional, financial and other various assets (Teece, Pisano, & Shuen, 1997).

In the following section I extend the "four outcomes" framework
Types of intermediaries in the PC Industry

Most articles on intermediaries assume homogeneity. A deeper analysis of the assumptions gave rise to a "four outcomes" framework based on the relative costs of direct commerce and intermediation both before and after the adoption of the Internet (Sarkar, Butler, & Steinfield, 1995). In this paper, I analyze each quadrant using the personal computer industry as an example. The reasons for choosing this industry are several. First, Dell Computers is an exemplar of the use of the direct model, both before and with the Internet. Second, the recent experiences of Compaq Computers illustrate the relationship among all four quadrants. Three, the formation of a consortium, RosettaNet, shows a strategy to transform threatened intermediaries into Internet-enabled intermediaries. Figure 1, based on Sarkar, Butler and Steinfield (1995), shows computer organizations in each quadrant.

<table>
<thead>
<tr>
<th>Pre-Internet</th>
<th>Post-Internet</th>
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<tr>
<td>Direct costs &lt; Intermediary costs</td>
<td>Direct costs &gt; Intermediary costs</td>
</tr>
<tr>
<td>I Internet Supplemented Direct Market</td>
<td>II Threatened Intermediaries</td>
</tr>
<tr>
<td>Dell</td>
<td>Compaq's Resellers</td>
</tr>
<tr>
<td>III Cybermediaries</td>
<td>IV Internet Supplemented Intermediaries</td>
</tr>
<tr>
<td>Cyberian Outpost</td>
<td>RosettaNet Members</td>
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Figure 1. Four Outcomes from Internet Intermediation/Disintermediation. Adapted from Sarkar, Butler, and Steinfield (1995).

Internet Supplemented Direct Market

The best example for quadrant I is Dell Computers. Dell now generates 30% of its revenue online and has set a goal of 50%. Despite Dell's success with the direct business model, competitors have had a great deal of difficulty emulating it. Compaq, in
particular, has had problems in adopting the direct model. Its attempts have alienated its resellers, who retaliated by removing support for Compaq. Following poor earnings, the board of directors removed the CEO and is reformulating Compaq's strategy (McWilliams, 1999).

Can the distributor/reseller model compete with the direct model used by Dell? The advantages of Dell's direct model include near-zero inventory, less risk of obsolescence, more up-to-date state of the art components, and a favorable cash flow. The advantages of the distributor/reseller model include more choice at one-stop shopping, convenient price/performance comparisons, a large sales force and lower transportation costs. From the perspective of the supply chain members, an important advantage is the opportunity to focus on a core capability and rely on the specialized capabilities of others.

**Threatened Intermediaries**

In an effort to remove excess inventory from its supply chain, Compaq is cutting the numbers of its resellers from 39 to 4, and other vendors, including Apple Computer Inc., Hewlett-Packard Co., IBM Corp., Seagate Technology Inc. and Unisys Corp. are all cutting back on distributors (Kindley, 1999). To counter the threat of extinction, resellers, as well as other traditional intermediaries, need to add enough value so that they will have opportunities to participate in business.

Brick-and-mortar retailers, such as CompUSA, are also threatened. Their main rivals are start-up Internet companies, which dramatically undercut their prices. According to the Gartner Group (1999), "retailers must create a partnership with manufacturers to enable efficient fulfillment and to discourage manufacturers from selling direct, disintermediating the retailer. Retailers setting up a Web storefront must determine the optimal fulfillment strategy, and this may include having suppliers fulfill certain items (e.g., those with high transportation costs, high product value or sporadic demand) directly rather than fulfill them from a retail warehouse".

Along these lines, The Associated Press (1999) reports that "CompUSA will close its distribution center in Grapevine, Texas, and will no longer stock, configure or custom assemble computers for its commercial customers." As part of a $10 billion, five-year deal, Ingram Micro, one of four distributors selected by Compaq, will take over these operations.

**Cybermediaries**

The start-up Internet Companies, such as Buy.com and Cyberian Outpost, cut prices to gain market share. Buy.com expects to earn revenue from advertising rather than from profit margins on the computer products. Traditional retailers maintaining Compaq's minimum advertised pricing (MAP) policies and playing by other rules have been "justifiably furious over the flagrant skirting of MAPs
by Buy.com" (Harrington, 1999, pg. 10). Compaq stopped shipments to these cybermediaries temporarily from February 1999 to April 1999 to "re-evaluate the authorization agreements".

**Internet Supplemented Intermediaries**

Despite inefficiencies in the distribution model, and added cost to products from channel vendors, distributors are still an efficient and effective way to get products and services to market. A streamlined channel from an evolving integrated distribution model may allow indirect vendors to regain market share from direct vendors (Kindley, 1999).

Most of the threatened intermediaries will try to become "Internet supplemented" intermediaries. Ingram Micro, a major distributor in the PC industry, has initiated RosettaNet, a consortium of Intermediaries, to set standards for business-to-business electronic commerce. RosettaNet's stated objective is to improve the efficiency in the supply chain.

Coordinating the various entities requires management skills and many organizations exploit information technology. Management often relies on strong relationships developed over many years. The trust between partners lowers transaction costs, since contracts and monitoring can be kept to minimal levels. Cooperation can involve sharing information on inventory, orders and so on. In this way, each organization gains many of the benefits of vertical integration as well as benefits of specialized skills.

Nevertheless, the complexity of these supply chains gives rise to crucial decisions. For instance, drop shipments from a factory directly to a customers saves considerable time and money in some cases. What criteria determine whether an intermediary takes ownership of inventory or arranges a drop shipment? The risks of holding inventory are very high in the PC industry. Similar to other high tech industries, the threat of obsolescence is immense due to rapid technological change. When new products are introduced then the older model or version loses most of its value and in extreme cases becomes worthless.

Despite the pitfalls, intermediaries hold inventory in many cases as a service to other organizations in the supply chain. For example, producers may not want to deal with distribution or logistics. Fedex efficiently delivers goods including PCs for Dell and others. For instance, even Dell does not coordinate all of its products. It organizes for Fedex to match computers to monitors that are drop shipped from Sony (Magretta, 1998). In other words, Dell does not manufacture or hold inventory of these monitors. The only value Dell would add if the monitors were delivered to its factories would be to match each monitor to its PC. By using Fedex as an intermediary to do that task, Dell avoids inventory holding costs, and multiple step delivery costs.

**RosettaNet**

Similarly, Solectron or Ingram Micro drop ship PCs to retailers or other intermediaries for Compaq or IBM (Hamm & Stepanek, 1999). The supply chain potentially becomes more efficient and yet each organization focuses on its strengths. In 1998, Ingram Micro took the initiative to form a consortium of companies in the PC supply chain to set electronic commerce standards for the industry (Kerstetter, 1998). The purpose of the standards is to increase the efficiency of information transfer. By agreeing to common terms and processes, the members hope to enhance the flow of information and compete effectively with Dell's direct model.

According to reports (McGee, 1999), the consortium, known as RosettaNet, is progressing quite well. Its members include retailer CompUSA, distributors such as Ingram Micro and Tech Data, "producers" such as Compaq, IBM, Toshiba and HP, and suppliers Cisco, Microsoft, Intel, SAP and Oracle (Kerstetter, 1998). The existence of RosettaNet is testimony to an alternative to disintermediation. At this point in time, there are fresh challenges to the direct model and evidence of successful intermediaries in this industry. Collaboration in the industry to produce standards seems to be successful. However, there have been many casualties in similar endeavors. For example, Sematech's CIM Framework, although very promising technically, has run into problems from lack of participation and consolidation of software vendors in the semiconductor industry.

**Dynamic Capabilities Analysis of the PC Industry**

Threatened intermediaries in quadrant II attempt to use their own distinctive dynamic capabilities to transform themselves into Internet Supplemented Direct Market, Cybermediaries or Internet Supplemented Intermediaries. Using the Dynamic Capabilities Framework (Teece, Pisano, & Shuen, 1997), each quadrant of the "four outcomes" framework is analyzed to hypothesize which assets and capabilities are critical in the PC industry.

**Internet Supplemented Direct Market**

This quadrant represents disintermediation over the Internet, since producers are dealing directly with customers. Ironically, Dell is the obvious direct merchant example in the personal computer industry, yet there has been no disintermediation in its supply chain. Dell used the direct model before becoming an Internet supplemented direct market. Most of Dell's competitors are also selling direct to customers but not as successfully. They are experiencing problems with disintermediation. The dynamic capabilities framework clarifies this phenomenon.

Dell's Internet strategy did not necessitate a radical change in its business processes and organizational routines for coordinating
customers and suppliers. It is easier to have an entry strategy that is close to one’s existing business (Teece, Pisano, & Shuen, 1997). Dell had a long history of using the direct model and had already developed the core capabilities. Because of path dependencies, it had the supporting infrastructure and experience from "learning by using" (Teece, Pisano, & Shuen, 1997). On the other hand, traditional competitors, whose routines focused on using distributors and resellers, had different assets than Dell. The Internet enhanced Dell's complementary assets, while "destroying the complementary assets" of many of its competitors (Teece, Pisano, & Shuen 1997).

**Threatened Intermediaries**

Threatened intermediaries in the personal computer industry have three choices for saving themselves. They can transform themselves to (1) compete in the Internet Supplemented Direct Market (quadrant I); (2) become cybermediaries (quadrant III); or (3) become Internet Supplemented Intermediaries (quadrant IV). For reasons that I explained above using the Dynamic Capabilities Framework (Teece, Pisano, & Shuen, 1997), the first option is not very feasible. Although Dell is not the only direct seller on the Web, most threatened intermediaries do not have producer skills and experience.

Nevertheless, an interesting development reported is that Ingram Micro, the largest PC distributor in the world, has opened huge factories where it does assembly of personal computers for Compaq, IBM and Hewlett-Packard (Hansell, 1998). Apparently, not only does Ingram Micro have the assets, routines and dynamic capabilities for production, but it will be delivering the products directly to either customers or resellers (Hansell, 1998; Teece, Pisano, & Shuen, 1997).

**Cybermediaries**

The dynamic capabilities needed to be a cybermediary are different than those needed for the other options. Because this is a new type of intermediary, new entrants have an advantage (Bower & Christensen, 1995). They do not need to reconfigure their organizational routines to take advantage of technological opportunities (Teece, Pisano, & Shuen, 1997). Since new entrants typically have no history and no routines at all, they do not need to unlearn their old ways of doing business (McGill & Slomczynski, 1993). Although new entrants have as much to learn as incumbents, they are not held back by their path dependencies (Teece, Pisano, & Shuen, 1997).

Despite the obstacles and difficulties, however, incumbents can become cybermediaries. Spinning off the Internet organization from the traditional firm usually is the most successful strategy (Teece, Pisano, & Shuen, 1997). The spin-off then behaves like a startup firm with no existing routines that need to be reconfigured. Nevertheless, there are steep costs, since the new organization may cannibalize the traditional parent. For example, Schwab did have a
temporary setback when its online spinoff took business away from the traditional brokerage (Schonfeld, 1998). In the personal computer industry, as far as I know, the cybermediaries are startups and incumbents have not spun off Internet companies yet (as of July, 1999). It remains to be seen whether displaced distributors or dealers have the innovative dynamic capabilities needed to reinvent themselves as cybermediaries.

**Internet Supplemented Intermediaries**

The best hope for threatened intermediaries is to become Internet Supplemented Intermediaries. Some of them will have enough dynamic capabilities, based on their assets and learning ability, to transform themselves (Teece, Pisano, & Shuen, 1997). RosettaNet illustrates how collaboration attempts to exploit the collective assets of its members. For example, setting standards uses and improves the institutional assets of each member (Teece, Pisano, & Shuen, 1997). Furthermore, the collaboration seeks to exploit complementary assets, reputational assets, structural assets and change organizational boundaries (Teece, Pisano, & Shuen, 1997). Since members come from many parts of the personal computer supply chain, many of their capabilities are complementary (Enslaw, Mesher, & Smith, 1997). For example, retailers such as CompUSA, distributors such as Ingram Micro, and "producers" such as Compaq, IBM and HP are members (Kerstetter, 1998). Working together as a virtual organization, members will benefit from the assets that each contributes related to reputations, organizational structure and specialized dynamic capabilities.

**Figure 2. Dynamic Capabilities of Internet Intermediaries**

Integrated Framework

In summary, threatened intermediaries can transform themselves

and move into one of the other quadrants, depending on their
dynamic capabilities. Moving from quadrant II to quadrant I would
require that the intermediary become a "producer" as well as a
seller. In the PC industry, Ingram Micro is a giant distributor, and
also does some assembly. If Ingram Micro produces PCs and also
contacts customers over the Internet, then it will be using the
Internet Supplemented Direct Market model.

On the other hand, if Ingram Micro, (or another traditional
intermediary) through RosettaNet behaves more like an Internet
Supplemented Intermediary, it will move into quadrant IV. (I could
also argue that Ingram Micro is already in quadrant IV). The
dynamic capability to do this is based on collaboration in an Internet-
enabled supply chain (Rayport & Sviokla, 1995). Complementary
assets and relationships are important aspects of market position
(Teece, Pisano, & Shuen, 1997).

The remaining alternative is for the threatened intermediary to
become a cybermediary. This is the most difficult to do of the three
hypothesized alternatives. It requires a traditional organization to
become an entrepreneur, and in doing so cannibalizing its traditional
business. Sometimes the traditional organization spins off the
Internet unit and issues a tracking stock. For example, Barnes and
Noble did this with barnesandnoble.com. The dynamic capability to
do this is based on perpetual innovation.

**Conclusion**

This paper has extended theory on disintermediation over the
Internet. I revisited the academic and practitioner debate on
disintermediation, and applied the "four outcomes" framework
(Sarkar, Butler, & Steinfield, 1995) to the PC industry, which is
currently in some turmoil associated with the Internet. Next I
suggested possible transformations for threatened intermediaries
contingent on their dynamic capabilities. The "dynamic capabilities"
framework (Teece, Pisano, & Shuen, 1997) provides a useful
theoretical background for extending our understanding of
disintermediation. Our main contribution with this research is a new
framework that integrates both the "four outcomes" (Sarkar, Butler,
& Steinfield, 1995) and "dynamic capabilities" frameworks (Teece,
Pisano, & Shuen, 1997). Our new framework could be used to guide
future research in other industries. In fact, it might predict the future
direction of some industries. New research questions may be
derived from our research. How can we classify industries on the
basis of their dynamic capabilities and potential disintermediation?;
How can we identify the threats and opportunities triggered by the
Internet? How can we predict the impact of the Internet on various
industries? I hypothesize that the greater the scope and depth of
dynamic capabilities the lower the risk of disintermediation and the
greater the opportunities. Producers with holistic capabilities are
suited to the Internet-supplemented direct market; perpetual
innovative capabilities align with cybermediaries; and collaborative
supply chain capabilities suggest successful Internet supplemented intermediaries.

Simplistic hypotheses regarding disintermediation in electronic commerce are giving way to more realistic and more complex models. The models need to take into account the dynamic capability characteristics of the industry and its stakeholders. Furthermore, analysis of costs should take into account dynamic capabilities that may counterbalance coordination costs. Organizational learning and organizational culture theories explain some of the contradictory findings on disintermediation in electronic commerce. By focusing on its core competence, an organization may find it can compete through collaboration with partners that have complementary skills and knowledge. Dynamic industries require dynamic capabilities and provide opportunities for more than one business model. As the environment changes, different models offer better adaptation at different times. Similarly to biological evolution, there are cycles of increase in diversity and loss of diversity as just the fittest survive. Nevertheless, another increase in diversity provides alternatives for the next round of adaptations. Incumbents that seem to have found the secrets of success may find themselves destroyed by a new paradigm introduced by start-up companies, which in turn become incumbents.

In these pioneering days of electronic commerce, start-ups like Yahoo and Amazon have been wildly successful. They have introduced completely new paradigms and business models. However, the incumbents are rising to the challenge and many will survive. As the examples explained above show, we are entering an era of diversity, where start-ups and brick-and-mortar converted electronic commerce companies will probably coexist. In this setting, there will be some disintermediation as well as new intermediation. Opposing forces such as costs and opportunities based on dynamic capabilities will give rise to diversity. Similarly, simplistic hypotheses will be replaced by more sophisticated ones that better reflect context and reality.

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