Is e-Business A Disruptive Technology?

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ABSTRACT

Disruptive technologies introduce a very different package of attributes than the ones that mainstream customers value. They often under-perform along traditional metrics of functionality initially. Thus mainstream customers are unwilling and unable to use disruptive products in applications they know or understand. However, once disruptive innovators have secured a foothold in a low-end or emerging market, up-market impetus push the disruptive innovators to shift to the large mainstream market. Is e-business a "disruptive technology"? If so, so what? These questions sparked fresh debate recently, particularly in the light that numerous *dot-com's* have crashed and burned. The "e" in e-business means the replacement of paper-based, human-agent based or telephone-based personal transaction with transactions over electronic networks. Today, e-business must contend with massive technology, business, and legal and education barriers. However, once these barriers are overcome, e-Business will eventually transform the structure and working methods of industries worldwide. Before long, electronic business will almost certainly evolve to such an extent, and its impact on business will be so pervasive that it won't be long before the 'e' in e-Business is gone.

DISRUPTIVE TECHNOLOGY

Hammer and Champy first identified disruptive technologies when they wrote about reengineering [5]. Disruptive technologies introduce a very different package of attributes than the ones that mainstream customers value. They often under-perform along traditional metrics of functionality initially. Thus mainstream customers are unwilling and unable to use disruptive products in applications they know or understand. However, once disruptive innovators have secured a foothold in a low-end or emerging market, up-market impetus push the disruptive innovators to shift to the large mainstream market.

Figure 1 below illustrates how technologies that under-perform what key customer demand today may improve to squarely address what those same customers demand tomorrow.
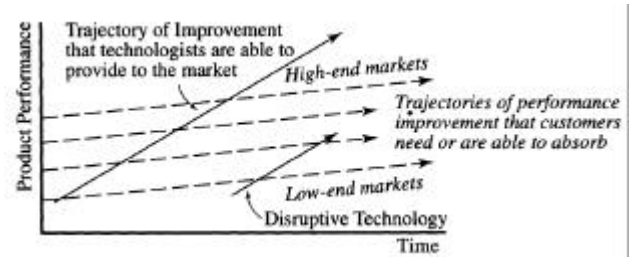

Figure 1. Trajectory of technological improvement is steeper than customer's need. Source: [4]

Christensen ([3], [4]) provides an eloquent explanation of Figure 1. Customers' needs are constrained by their capacity to absorb technological improvement, by the time customers have to learn how to use new products with new features, by how rapidly their work and lifestyles can change to utilize those capabilities, by regulatory factors, and by performance constraints created by insufficient complementary products or services. Cases on disruptive technology chronicled by Christensen include computer disk drives, microprocessor speed, insulin, hydraulic excavators, and executive education [4]. A technology presently ignored by the major players in the market can eventually become good enough for the mainstream market, thereby shoving the major players out of the market.

Christiansen argues that disruptive technologies start as cheap, low-margin, convenience-focused products that initially appeal to an emerging market but that eventually move upstream to become viable broad-reaching products across an existing market. He contends that the innovation of a disruptive technology lies in its novel application to a specific market, not in the complexity of the technology itself.

Disruptive Technology is a quantum change, not an incremental step that finally affects mainstream operations. It is a technology that under-performs established products at first. The light bulb, the telephone, the automobile and the computer are examples of technologies that have had profound effects on how we live. But at the times of their introductions, their impacts were seen as incremental, if not inconsequential.

Most companies do not realize the impact of this technology until it is too late and others have taken over their field/product. Intel, Bloomberg Financial Markets, Honda, Charles Schwab, Wal-Mart, Intuit, Sony, Nucor, Sun, Cisco, J&J Lifescan, Staples, U.S. Surgical, and McDonald's are some examples of prominent firms that originally entered their industries as disruptive technologies.

IS E-BUSINESS A "DIS RUPTIVE TECHNOLOGY"?

Christiansen [3] describes disruptive technology as an innovation that does not threaten a particular market initially but that eventually revolutionizes that market. Is e-business a "disruptive technology"? If so, so what?

These questions sparked fresh debate recently, particularly in the light that numerous *dot-com's* have crashed and burned. The once highly hyped "new economy" hasn't proven to be very sturdy. Even much-respected strategist Michael Porter argued that the Internet is just another channel to market goods and services and shouldn't be considered disruptive. It's not the kind of technology that would lead to industry restructuring, he claimed [2].

Technology generally improves faster than customers' need, and e-business is not likely to be an exception. Technologies that under-perform what key customer demand today may improve to squarely address what those same customers demand tomorrow. Will this be true with e-business? Champy offers the following five questions that will help predict what might become a disruptive technology [2]:

1. Will the new technology enable work to be done at dramatically increased speeds?

2. Will the new technology lead to radical cost reductions?

3. Can the new technology lead to substantially improved quality?

4. Will the new technology change companies' relationships with their customers?

5. Will the new technology accelerate companies' ability to innovate?

PRECIPITATING CONDITIONS

E-Business is a new term, but not a new technology. It utilizes the means of telecommunications networks to share business information, maintain business relationships, and conduct business transactions. It covers a wide range of commercial activities, including all internal and outward-facing processes (see Figure 2 below). It includes EDI, support for interpersonal communications such as e-email, transfer of money such as electronic fund transfer, and sharing of databases in the conduct of business.
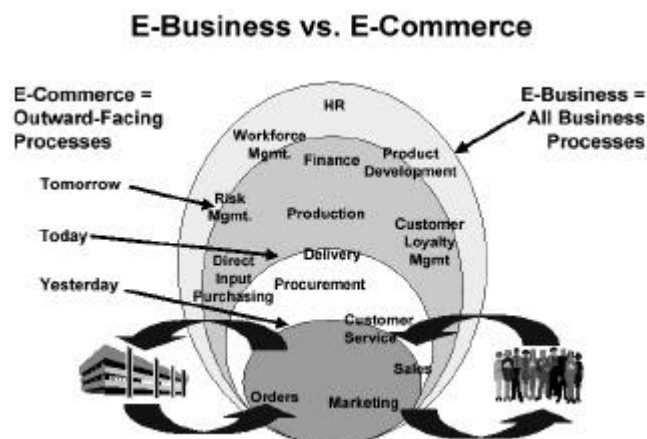

Figure 2. E-business includes
all internal and outward-facing processes
(Source: *Giga Information Group*)

The spread of ubiquitous computing and the Internet has created tremendous opportunities for new services and new ways of doing almost everything. New business models are emerging in startups, and in existing companies struggling to survive. Moore attempts to deal with the practical question of how companies can survive and thrive in such a peculiar environment [6]. He begins with the intriguing proposition that in the past most instances of disruptive technological change affected high tech industries, and meant nothing to managers in traditional industries. Moore points out that today, the disruptive technology of the Internet is rapidly impacting all industries, and hence everyone needs to become familiar with the dangers and the possible cures of this dilemma.

EDI was first developed in the 1960s to facilitate the exchange of standardized documents in electronic form in between businesses. From the 1960's through the early 1990's, because of lack of standards and the high cost of EDI, mainly large corporations use EDI. Today, the ubiquitous Internet is making business-to-business exchange of digital transaction information affordable.

Disruptive enterprises historically have shared the following qualities [8]:

1. They were enabled by infrastructural innovations;

2. They reshaped the prevailing business model to earn money in a new way;

3. They served customers as the portals of their day;

4. They enabled customers to do for themselves what only specialists could do before;

5. They migrated up-market, as they gradually satisfied the needs once filled by the over-served high end of the market; and branding opportunities shifted from the product to the channel.

E-BUSINESS BARRIERS

The Internet is not an inherently disruptive technology. Rather, it is an infrastructural technology that can be used in either a disruptive or sustaining way. The Internet enables disruptive enterprises [8]. Today, trading partners, large and small, are establishing computer-to-computer links for rapid information exchange. Indeed, few can deny that technology has dramatically "disrupted" all types of business in recent years.

Yet, e-business still has technology, business, and legal and education barriers to overcome. Technological barriers include security issues, lack of standards, public key infrastructure of encryption, integration with existing applications, and bandwidth costs. Business barriers are due to lack of business process integration, not enough proven business models, unpredictable cost justification, corporate structures as barriers to change, not enough qualified individuals, and channel conflict on-line or off-line. Legal and Educational barriers are due to lack of consistent rules and policies, customs and tax uncertainties, the role of governments and nations, trust and privacy, fraud, awareness of services, and E-money laundering.

BURSTING OF THE INTERNET BUBBLE

Peter Drucker, perhaps the most renowned management guru alive today, was featured on the cover page of the October 2001 issue of Business 2.0. When asked to comment on the bursting of the Internet bubble, Drucker remarked [7]:

> "In the public mind, size often is confused with importance. The two have little to do with one another. The Internet has tremendous importance, but only marginal size."

> "And so there is a misconception that size equals performance. During the Internet bubble, it was argued that because the Internet is important, it must be profitable. That does not follow. Whether the Internet will ever be profitable -- as a business or as an industry -- is doubtful. But its impact is unbelievably great. The same is true of the history of medicine. "

To make his point, Drucker cited motion picture as an example of a technology that is immensely important, but the only major players in the world are centered only in Hollywood and Bombay. Perhaps a better example is television. Undoubtedly, the television has found its ways to virtually all homes all around the world. Television plays a significant role in providing entertainment, news and information. In the United States, television is said to have profound impact on politics. Many believe, for example, that in the early 1960s, Richard Nixon lost the presidential election to John Kennedy because he appeared tired and haggard in a televised presidential debate!

Unlike the Internet, the advent of the television was not immediately followed by a surge of flashy start-ups engaged in the production of antennas, cameras, receivers, television programs, etc. There were no venture capitalists eager to jump in the television bandwagon. If there were, they were bound to fail. But this doesn't mean that television is passé.

E-business has the potential to streamline business systems and save operating costs. It uses Internet-centered technology in business activities, both internally (such as real-time inventory control) and externally (online marketing and sales). Whether the failed dot-coms will ever rise again is doubtful. But the impact of the Internet is unbelievably great.

UPMARKET IMPETUS

The "e" in e-business means the replacement of paper-based, human-agent based or telephone-based personal transaction with transactions over electronic networks. The networks could be proprietary networks, like EDI, or electronic fund transfer networks between companies, or Lotus Notes, or the internal networks embedded in ERP, or they could be the Internet or its cousins like extranets or intranets [1].

Today, E-business introduces a very different package of attributes than the ones that mainstream customers value. At present, E-business still under-performs along traditional metrics of functionality. Thus mainstream customers are unwilling and unable to use disruptive products in applications they know or understand. However, once disruptive innovators have secured a foothold in a low-end or emerging market, up-market impetus push the disruptive innovators to shift to the large mainstream market.

At the moment, e-business does not lead to industry restructuring. The once highly hyped "new economy" hasn't proven to be very sturdy. Today, e-business must contend with massive technology, business, and legal and education barriers. However, once these barriers are overcome, e-Business will eventually transform the structure and working methods of industries worldwide. Before long, electronic business will almost certainly evolve to such an extent, and its impact on business will be so pervasive that it won't be long before the 'e' in e-Business is gone. Is e-business a "disruptive technology"? Yes, it is a disruptive technology.

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