E-BUSINESS

E-BUSINESS MANAGEMENT STRATEGIES: A BUSINESS-TO-BUSINESS CASE STUDY

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Electronic business today plays a major role in the world’s economic growth, thanks to the rapid advance in information technology. Recent estimates from Forrester Research show that by 2003 the value of E-commerce in the United States and Europe will reach $3 trillion. There have been many spectacular E-business successes, but there have also been numerous failures.

This article presents a study of a business-to-business E-business deployment success at Intel Corp. in 1998. Intel successfully handled $1 billion in E-business sales in the first month of the deployment. For the year 2000, Intel’s profits climbed to $10.5 billion to become the fifth most profitable company in the United States, up from its rank of eighth in 1999. The article concludes with lessons learned and success factors.

As information technologies developed, novel ways of business process redesign emerged, creating turmoil in the industry. Organizations today frequently redesign their processes in ways that provide new competitive advantages. Success breeds imitation and invites more entries to E-business. There are many spectacular successes, but there are also many failures. As technology continues to develop, organizations are in constant search for new business models and available resources to gain competitive advantages.

Chairman of Microsoft, Bill Gates, frequently expressed his fear that Microsoft is about two years away from failure, that somewhere out
there is a formidable competitor, unborn and unknown, who will use better business models to put companies like Microsoft into obsolescence. And the hottest and most dangerous new business model out there that he referred to is the E-business model.

**E-BUSINESS CONCEPTS AND STRATEGIES**

There are basically six categories of E-business: business to business (B2B), business to consumer (B2C), consumer to business (C2B), consumer to consumer (C2C), Nonbusiness, and Intrabusiness. Without face to face contact, all E-business transactions are done electronically by using computer and communication networks. Applications of E-business are classified into three categories:

1. **Electronic markets**: Buying and selling goods and services
2. **Interorganizational systems**: Facilitating inter- and intra-organization flow of information, communication, and collaboration
3. **Customer service**: Providing customer service, help, handling complaints, tracking orders, etc. (Senn, 1996)

The infrastructure of E-business can be built on the existing information technology. Kalakota and Whinston (1997) suggest that four infrastructures are necessary in implementing electronic commerce applications:

1. Common business service (i.e., security, authentication, electronic payment, and electronic catalogue, portals, etc.)
2. Messaging and information distribution (i.e., EDI, e-mail, and HTTP, etc.)
3. Multimedia content and network publishing (i.e., WWW, HTML, XML, Java, CGI, etc.)
4. Network information superhighway (i.e., cable TV, Internet, telephone, wireless media, etc.)

**E-Business Strategies**

Studying the evolution of business organization in companies has received a great deal of attention in organization theory and MIS research (Carroll, 1984; Phan, 1990; Porter, 2001). Because these companies or organizations are not internally self-sufficient, they require resources from the environment, and thus become interdependent with those elements of the environment with which they transact. Pfeffer (1982) and Pfeffer and Salancik (1978) argued that organizations develop internal and external strategies that seek to minimize the uncertainty arising from dependence on the environment for resources.

As the technology advances and the computer industry develops and grows, market niches open and close frequently, creating rapid changes in the industry. The prevalence of technical innovations may be regular, sporadic, or only once; these patterns of change have different implications for organizational populations. When they occur often, a niche may open up, and the organization would compete to take advantage of the cost savings and market penetration that often results in better profits and market shares.

Porter (1985) developed the value chain model that highlights interdependent activities in the business where competitive strategies can be best applied and where information systems are most likely to have strategic impacts. As information technologies developed, novel ways of business process redesign emerged. Organizations today frequently redesign their processes in ways that provide new competitive advantages, and E-business is viewed as the most attractive solution in managing organizational resources’ interdependence through supply chains. The two types of E-business strategies are:

1. **Competitive strategies**: Used to attack a competitor’s position or to defend the business enterprise from competitor’s position in the market
2. **Cooperative strategies**: Involves strategic alliance through joint venture or value chain partnership to gain competitive advantages (Turban, 2000)

At the beginning, many people perceived E-business to be the new economy that decides the success of future business organizations. Andy Grove, chairman of Intel, boldly stated in 1998: “Within five years, all companies will be Internet companies or they won’t be companies” (Intel, 2000).

However, Porter (2001) argued that the key question is not whether to deploy E-business now to take advantage of the Internet technology, but how to deploy it. Gaining competitive advantage requires building on the proven principles of effective strategy. A business enterprise can gain competitive advantage by operational effectiveness — doing the same things the competitors do but doing them better — or by strategic positioning — doing things differently from competitors in a...
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Buyer behavior and customer personalization

Support from top management

Company

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Web-centric marketing strategy

Company’s virtual market place established

Company’s strategic position in the market strengthened

To succeed, companies will need to constantly search and implement innovative strategies that capitalize on both the power of the Internet and the changes in both traditional and electronic markets. The companies that will be most successful will be those that use E-business to make traditional business processes better and those that invent and implement new combinations of virtual and physical activities. Without understanding how to deploy Internet technology, E-business can bring disastrous consequences. Commenting about the recent failures of numerous dot.com companies, Porter stated:

Caught up in the general fervor, many have assumed that the Internet changes everything, rendering all the old rules about companies and competition obsolete. That may be a natural reaction, but it is a dangerous one. It has led many companies, dot-coms and incumbents alike, to make bad decisions — decisions that have eroded the attractiveness of their industries and undermined their own competitive advantages. Some companies, for example, have used Internet technology to shift the basis of competition away from quality, features, and service and toward price, making it harder for anyone in the industries to turn a profit. Others have forfeited important proprietary advantages by rushing into misguided partnerships and outsourcing relationships...

Implementation of strategic alliance in E-business has established a new value chain that links the core business with sales and the supply chain. The new value chain in turn created tremendous demands on high speed data communications resulting from the electronic cooperation and collaborations. Studies have shown that applying new network technologies helped companies to operate more efficiently, extending traditional to electronic markets, and creating larger interorganization-al virtual structures that are composed of the company and its customers, distributors, and suppliers. To succeed, companies will need to constantly search and implement innovative strategies that capitalize on both the power of the Internet and the changes in both traditional and electronic markets. E-business companies are required to develop more responsive, and deeper and broader relationships with customers, suppliers, and distributors (Scarborough and Spatarella, 1998).

In addition, the supply chains within E-business companies also continue to change. Businesses need to be sure that customers and suppliers can gain access to their Web sites to gain important product information for decision making. This information will give customers and suppliers the ability to receive and ship products or services at the right price, time, place, and speed.

Currently, the major barrier to customers’ and suppliers’ access to the Web is ease and speed of access. Other barriers include risk, privacy, confidentiality, and security. User expectations about convenience, speed, competitive price, and service are also key factors in the success of E-business (Hammel and Sampler, 1999).

Based on studies of Mouggayar (1998), Raisch (2000), Turban (2000), and Porter (2001), major success factors for E-business include:

- Internet technology fully integrated into the company’s overall strategy
- Basis of competition not shifted from traditional competitive advantages such as cost, profit, quality, service, and features
- Support from top management
- Buyer behavior and customer personalization
- First-mover advantage and quick time to market
- Right digital infrastructure
- Good cost control
- Innovation allowed when risks are low
- Good E-business education and training to employees, management, and customers
- Distribution and supply chain model frequently reviewed to maximize company’s gain
- Customer’s and partners’ expectations from the Web well-managed
- Good products and services offered by E-business
- Current systems expanded to cover entire supply chain
- New competitors and market shares tracked
- Web-centric marketing strategy
- Company’s virtual market place established
- Company’s strategic position in the market strengthened

INTEL AND ITS B2B E-BUSINESS STRATEGIES

Intel Corp., located in Santa Clara, California, is the world’s largest producer of Integrated Circuits Chips in the world today. Founded in 1968 to build semiconductor chips, Intel invented the microprocessor more than 25 years ago. Today, the company has evolved
from a processor manufacturer into a supplier of network and server hardware, Internet hosting services, and other E-business components. Its technological leadership ranges from microprocessor design to advanced manufacturing and packaging, and it maintains production and research facilities around the world.

Most of Intel’s business is in the PC market. For the past several years, it was under intense competition from other chip makers such as Advanced Micro Devices (AMD), Cyrix, Texas Instruments, Motorola, and IBM. In the past, Intel customized its paper catalogs and sent them to its potential customers along with product availability information. Until summer 1998, this process was done entirely on paper. However, when large customers such as Dell Computers and Cisco Systems started to use the Web to do their business in 1996, they pressured Intel to convert its B2B activities to online.

In 1997, Intel began to investigate the feasibility of building the E-business system. The project started with the forming of the Virtual Worldwide E-business Project Team (see Exhibit 1). Because the project strongly emphasized customer market needs, the team gave Intel’s sales and marketing the responsibility to drive the project forward.

B2B Project Structure

In 1998 Intel approached E-business as a new way of doing business. Intel’s management also wanted customers to know that Intel was serious with E-business. Intel created a self-service extranet called E-business program that focused on procurement and customer support for its products. Access to the site was restricted to Intel’s authorized business partners and customers.

As illustrated in Exhibit 1, teams that participated in the early development of the E-business system at Intel included:

- A project planning team, which consisted of customers and technical and logistical representatives, was created to define the scope and objective of the project.
- Business analysts were brought in during the early stages to help define the business workflow and to assess how information is given to customers.
- Intel’s sales and marketing staff was asked to study and define how to work with customers via the E-business system.
- Intel’s Planning and Logistics group was also included on the planning team to help the IT department develop the solutions to integrate the new E-business with existing business activities.
- The IT department was positioned as an “enabler” of business. Its role was to implement the integration solutions from the planning and logistic groups.

Intel’s Mission and Goals

Intel’s early mission was to use Internet technology to complement its current business activities. The goals were to design and deploy a worldwide E-business solution for its current business and to build an infrastructure that worked with existing business processes rather than cannibalize the traditional activities. The intent was to integrate Internet technology into the company’s overall strategy in order to expand existing business and exploit sales channels.

With over 50 percent of its revenues and many customers coming from outside of the United States, the benefits of a global E-business system for Intel was too great to be ignored. To support over $25 billion annual sales in 1998 and a worldwide network of business partners, resellers, and original equipment manufacturers (OEM), Intel needed to improve its efficiency by automating its business to business (B2B) processes. Traditional business processes at Intel at that time were too slow and thus the decision was to deploy a Web-based order management system.
E-Business Strategies

Rather than attempt to build the entire business
infrastructure from ground zero, Intel focused
on building relationships with direct cus-
tomers, including OEMs and distributors
online. These strategies include broadening
and deepening sales outreach, targeting middle
tier companies, and customizing Web sites to
personalize information delivery. “We picked
one thing we could build very quickly and
deploy to our customers,” said Sandra Morris,
vice president of the marketing group at Intel.

Broader and Deepen Sales Outreach

The first goal was to extend the reach of Intel’s
sales force. To do this, Intel automated its
order management and information delivery
system. The greatest opportunity for efficiency
was with the customers who
were not already electronically connected to
Intel. By converting the “unwired” to “wired,”
Intel replaced the traditional phone and fax as
a means of communication with PC-based
online communication tools.

Target Middle Tier for Better Efficiency

Rather than aiming at a large number of small
customers, which accounted for 70 percent of
the total number of accounts, Intel aimed the
pilot program at the middle-tier customers
who accounted for only 25 percent of total
accounts in 35 countries. In the past, main-
taining a consistently high level of one-to-one
contact for all middle-tier customers was diffi-
cult because these medium-sized customers
typically were not invested in EDI.

The benefits of this pilot program to cus-
tomers and Intel were numerous. By providing
access to real-time information, Intel allowed
them to be more knowledgeable about Intel
products and future direction for better decision
making. Online access also made customers feel
more connected by having access to more Intel
resources and having closer contact.

For Intel, connecting this large customer seg-
ment electronically brought multiple benefits.
First, the company was able to move resources
away from the phone and fax toward more effi-
cient and productive tasks. Second, salespeople
seldom needed to hand deliver confidential
product information as they had done in the
past. Third, with this customer segment, Intel
was dealing with at least $1 billion per quarter of
order processing right from the start.

Improve Customer Service by Delivering
Personalized Information

Intel took great effort to convert its system and
data from the old vendor-centric model to the
new customer-centric model. The goal was to
improve customer service by personalizing
information delivery and then automating
information delivery and routine sales tasks.

Because management, procurement, sales
and marketing, and engineering all have dif-
f erent informational needs, Intel customized
its Web sites within customer accounts. Being
able to deliver personalized information
online allows Intel to support multiple levels
of the customer organization in a manner that
best meets an individual’s needs. This makes it
easier for customers to do their own research
and to take the appropriate actions.

Customers visiting the Intel extranet Web
site will find their name and specific applica-
tions available to them based on their person-
al profile. The user profile allows a customer
to obtain confidential information that is
important to just that customer. The customer
in this example can be a general manager with
access to pricing and availability, order place-
ment, backlog status, committed delivery
dates, or the information desk.

E-Business Deployment

The initial E-business pilot system launched in
1998 was a one-stop, 240 shopping sites for
customers throughout the world. Personalized
data and applications are tailored to users’
needs to provide an individualized experience.

E-Business Infrastructure

In order to simplify the system maintenance
and support, Intel decided to standardize the
E-business architecture to one hardware ven-
dor and one operating system and minimized
the number of database and application ven-
dors. The infrastructure was designed to be
flexible and scalable to help manage the cost
of ownership as the system grows.

Servers: Intel’s initial E-business system
infrastructure was built around three main
clusters of Pentium based servers. Web-
servers, database servers, and data analysis
servers. Standardizing on one hardware ven-
dor simplifies maintenance costs, makes
growth easier, and allows Intel to inter-
change components as necessary without
compatibility issues.

OS and Databases: Intel’s E-business system
is standardized on Windows NT from
Microsoft. In the database area, Intel has
 limited it to two vendors.

Application Development: Intel provides
a number of applications that serve specific
needs and has made a great effort to use off-the-shelf applications.

Deployment Problems and Challenges

For transaction security, Intel sites let customers place and track orders using standard Web browsers with secure socket layer (SSL) encryption. However, the U.S. government at that time banned the export of 128-bit encryption technology to foreign nations. To enable a strong encryption technology worldwide without violating the U.S. export ban, Intel encouraged its customers to acquire a third-party 128-bit encryption application that was developed outside of the United States for their own protection.

Despite the strong encryption technology that was used worldwide within Intel’s value chain of partnership, Intel’s choice of Pentium servers and Windows operating systems created some security concerns. This is because Microsoft Windows operating systems and its networks are riddled with security problems. Defaced Web sites and illegal sales price changes on the Web caused by hackers on Windows-based Web-servers are commonplace. However, because Intel E-business activities were mainly B2B through extranet among trusted value chain partners, the risks of outside hackers were minimal.

To increase network throughput, data compressions were used. Within the first month of pilot project deployment, Intel found that encrypted file transfers are very sensitive to packet loss when used with SSL security. The problem was that when packet loss rate exceeds 15 percent, the download times for encrypted pages skyrocket. It was critical for Intel to reduce the packet loss rate to successfully deploy its E-business system. In addition, most of the transmission problems at customers’ sites were located in the connections between customer’s workstations to end-offices and tandem offices of the telephone companies. One of the solutions is to reduce the number of elements that need to be transferred through the network. This can be done by redesigning the Web pages so that only compressed data needs to be transferred. Another solution is to increase connection speed between customers’ sites and the tandem office. With some incentives, Intel urged all of their value chain partners to upgrade their network connections to ISP servers with high bandwidth pipes and high speed network routers.

Results

On July 1, 1998, Intel officially began taking orders from OEM and distribution customers using a new series of personalized Web sites (see Exhibit 2). The new E-business system enabled approximately 200 of Intel’s customers in almost 30 countries to place orders for Intel products, check product availability and inventory status, receive marketing and sales information, and obtain customer support—all in real time, 24 hours a day, seven days a week. Major successes at Intel E-business deployment are cited below:

❑ Intel moved $1 billion dollars in revenue to its online E-business system in the first 15 days, surpassing the company’s initial launch goal of moving $1 billion in the first three months.
❑ The company was able to eliminate most faxes to its customers worldwide. For value chain partners in Taiwan alone, it claimed that it eliminated 45,000 faxes per quarter.
❑ Intel revenues from Web orders are projected at 90 percent of Intel revenues by 2001.
❑ The company quickly “ramped” $1 billion of online orders per month in 1998.
❑ Independent customer surveys rated Intel’s E-business at 94 percent satisfaction level.

LESSONS LEARNED AND SUCCESS FACTORS

Despite thorough planning by Intel’s worldwide team, the most significant payoff from deploying the E-business solution was how much the company learned. Key success factors are:

❑ Receiving support from top management
❑ Thanks to the vision and support from the
CEO, all Intel E-business teams received necessary resources and cooperation to develop and test the system. Because implementing E-business requires radical changes in business activities, it is critical for development teams to receive support from top management.

- Tailoring to customer’s needs. The first and most important key is to focus on the customer. Intel converted its systems from the vendor-centric model to the customer-centric model. It designed the system around what customers said they wanted in an E-business system.

- Complementing rather than cannibalizing traditional ways of competing. Intel’s E-business system was aimed at strengthening its market and its competitive advantages. It did not shift its strategies away from the traditional ways of competing such as quality, features, services, costs, and profits. Thanks to its unique strategic positioning, Intel did not have to sell products below cost to compete or to expand its business to unfamiliar markets.

- Anticipating changes and focusing on continuous quality improvement. It is necessary to anticipate frequent changes in both internal and external behaviors and processes. Intel launched and operated its E-business system on a continual and iterative cycle of improvement.

- Delivering personalized Web content. Web content must be accurate, current, and appropriate for each individual customer. Intel continues to work closely with sales forces to ensure that customers are getting what they need and are coming back to the site.

- Focusing on quality of connections. For a global company like Intel, connectivity can be a real challenge throughout the world, especially in parts of Europe and Asia. After the deployment, Intel tested the connectivity with customers in the real production environment on a frequent basis. Because performance can vary significantly in different countries, Intel network engineers often went the extra mile to help customers’ connections to move up to the global standard.

- Providing worldwide support and customer training. In order to promote E-business cooperation to value-chain partners worldwide, Intel built the E-business case study Web site to educate its partners. Intel also developed online training to reduce the number of support calls. Some customers in many parts of the world even needed basic training on how to use the Web.

- Designing good E-business architecture. A robust system will allow E-business to move ahead quickly. By separating front-end functionality of the Web site from the back office systems, applications can be developed for customers with frequent updates without being affected by enterprise-type applications.

- Deploying best security protections. To protect the security and confidentiality of business transactions, Intel protected its E-business systems with the best security firewalls and encryption technology available. The commitment to security and privacy has created long-term trust between Intel and its customers.

A comparison of E-business success factors between the success factors mentioned by the literature and Intel’s study is presented in Exhibit 3. While the literature did not require network connection quality from or to users worldwide, this factor was very important to Intel’s early success in 1988.

Intel’s Network Infrastructure Improvements in 2000

With the success in the earlier E-business deployment, Intel continues to improve its interorganizational E-business by moving into mobile PCs (Intel, 2001). In order to improve worker’s productivity, Intel wanted 80 percent of its computer-using employees to use mobile computers by the end of 2000. It upgraded many conference rooms and venues such as the cafeteria with RJ-45 jacks, enabling employees to plug into the local area network. No matter where they are in the building, employees have access to e-mail, important information, or presentations without having to go back to their offices. Intel claimed that it achieved an 11-hour per week average productivity gain. Employee satisfaction also soared as a result of the sense of empowerment and personal flexibility accompanying the mobile PC.

CONCLUSIONS

With the rapid advance in technology, novel ways of business process redesign that include E-business emerged, thus creating turmoil in many U.S. industries. Organizations today frequently redesign their processes in ways that provide new competitive advantages. Success breeds imitation and invites more entries to
E-business in many combinations. Key success factors in B2B E-business include:

- **Top management support.** Because E-business activities often deeply impact corporate infrastructure and the supply chain, enterprises entering E-business need top management support and visions.

- **Internet technology well integrated to company’s overall strategy.** E-business solutions should complement rather than cannibalize company’s existing strategies to maintain competitive advantages. Traditional ways of competing such as market niche, proprietary content, low cost, high quality, superior service, and value-chain partnerships should be strengthened by E-business.

- **Continuous E-business quality improvement.** It is necessary to anticipate frequent changes. Enterprise E-business must continue to improve the total quality. B2B enterprises must frequently test the connectivity with customers in the supply chain to make sure that changes in Internet technology did not leave anyone in the value chain behind.

- **Delivering personalized Web contents.** B2B Web content must be accurate, current, and appropriate for each individual customer in the supply chain.

- **Good security and strong privacy protection.** Good B2B systems should have the strongest security protection available to maintain confidentiality, privacy, and trust with partners in the supply chain.

- **Good strategic position in the market.** With E-business, companies must maintain their value position, which includes a set of benefits that are different and better than those of competitors.

In the long run, companies like Intel that can integrate E-business strategy into overall competitive strengths will remain successful in the market. As exemplified by the success at Intel, the strategies and success factors discussed in this article can serve as a menu for
E-business managers to choose from in order to develop and integrate their E-business activities into their overall business operations. ▲

References

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