

Best Practices in B2B e-commerce: The case of Dell and IBM in the computer hardware industry

By

Adriana Maria Noreña

M.B.A.
Babson Graduate School of Business,
Wellesley, MA, 1995

B.S. Business Administration,
ICESI University, Cali, Colombia, 1990

SUBMITTED TO THE SLOAN SCHOOL OF MANAGEMENT
IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS OF THE DEGREE OF

Master of Science in the Management of Technology

At the

Massachusetts Institute of Technology
June, 2000

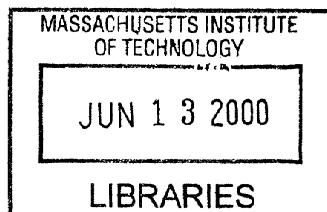
© 2000 Adriana Maria Noreña
ALL RIGHTS RESERVED

The author hereby grants to MIT permission to reproduce and to distribute publicly copies of this thesis document in whole or in part.

Signature of Author: _____
MIT Alfred P. Sloan School of Management
May 8, 2000

Certified by: _____
Henry Birdseye Weil
Senior Lecturer in Management
Thesis Supervisor

Accepted by: _____
David A. Weber
Director, Management of Technology Program



ARCHIVES

Best Practices in B2B e-commerce: The case of Dell and IBM in the computer hardware industry

By

Adriana Maria Noreña

SUBMITTED TO THE SLOAN SCHOOL OF MANAGEMENT
ON MAY 8, 2000 IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
OF THE DEGREE OF MASTER OF SCIENCE IN THE MANAGEMENT OF TECHNOLOGY

ABSTRACT

Research was done on several public sources to identify the B2B practices of two players in the computer hardware industry. As key players in a technology intensive industry, such as computer hardware, yet coming from different starting points, IBM as an incumbent and Dell as an attacker should provide insights in key success factors in e-commerce and their application to a more general group of players in other industries.

A framework for analyzing the specifics of the B2B strategy for these two companies was developed. This framework was an adaptation and evolution of the Value Chain and the Integrated Value Chain concepts. This framework provides a better understanding of the relationship between the B2B strategy and the overall strategy of the company.

From the results achieved by these companies' B2B practices, several conclusions and recommendations were drawn for IBM and Dell. Specific recommendations on the key issues brought about by the Internet in areas such as channel restructuring, customer relationship management and trends towards providing full customer solutions are provided. This work also shows how specialization and partnerships will play an increasingly important role for computer hardware vendors, as clients look for integrated solutions and one stop buying for products and services.

An assessment of the future challenges brought about by new marketplaces such as e-marketplaces, specifically B2B exchanges, shows how companies need to be prepared to embrace e-business rather than e-commerce in order to survive. Other new challenges are analyzed, particularly those related to the commoditization of the computer hardware industry, the birth of PC substitutes, such as wireless appliances, and the use of the Web as the software holder.

Finally, a partnership or strategic alliance between these two companies is discussed as a plausible strategy to leverage on their distinct core strengths: Dell's capability to effectively manage outsourcing and the direct channel, and IBM's skills on building in-house capabilities for creating new service lines and developing world class software.

Thesis Supervisor: Henry Birdseye Weil

Title: Senior Lecturer in Management and Strategy

Acknowledgements

First and foremost I wish to thank Pedro Cordeiro, my husband, who supported my decision to come to MIT. He continuously provided me with the encouragement that motivated me to complete the MOT program while we were far apart from one another. Without his boundless love and support and his professional advice I would not have been able to complete this work.

I also want to thank my thesis advisor, Henry Birdseye Weil, who provided me with intellectually challenging insights and counsel based on his broad experience. He truly helped shape and improve my thinking.

Finally, I wish to thank all the members of the Sloan community, faculty, administrative staff and students who devoted time and effort sharing their knowledge and experience with me.

Best Practices in B2B e-commerce: The case of Dell and IBM in the computer hardware industry

Table of Contents

	<u>Page</u>
Introduction	5
Chapter 1 General Overview	7
Chapter 2 A Framework for Analysis	21
Chapter 3 Competitive Position	29
Chapter 4 The Case of Dell Computer Corporation	41
Chapter 5 The Case of IBM	62
Chapter 6 Conclusions and Recommendations	84
Bibliography	109

Introduction

This thesis is written primarily to understand the best practices of business to business B2B e-commerce and their implications for companies which want to grow by leveraging upon the World Wide Web. More specifically, by comparing and contrasting the B2B e-commerce practices of Dell and IBM, two of the top players in the computer hardware arena, Dell and IBM, I pretend to draw some conclusions about what are the sources of competitive advantage for these companies. This document does not attempt to provide forecasts or predictions for the future; instead, the reader will find my conclusions and insights as well as some specific recommendations for these two companies.

The following key questions summarize the focus of this thesis:

- How do companies improve their operations by doing business electronically?
- How do companies manage the e-commerce supply chain?
- What are the economic implications of B2B e-commerce practices on a firm's capital intensity and working capital?
- How do companies use B2B e-commerce to create competitive advantages in building long term customer relationships?
- What are the challenges to an organization's culture brought about by B2B e-commerce?
- Which companies and industries have made the most significant strides in B2B e-commerce?
- What actions or market conditions have allowed some firms to create value with their B2B e-commerce plays?
- What appear to be the critical factors to succeed in such plays?
- What have been the key constraints companies face when pondering such moves?

In order to answer these questions, the focus of my analysis will be on how "traditional" players like IBM have seized B2B e-commerce opportunities compared to new entrants like Dell.

Methodology

As key players in a technology intensive industry, such as computer hardware, yet coming from different starting points, IBM as an incumbent and Dell as an attacker should provide

insights in key success factors in e-commerce and how they are applicable to a more general group of players in other industries.

The research has been conducted by using the following sources of information:

- Articles (journals, newspapers and Internet information).
- Literature (papers, thesis, books, write-ups).
- University and Institute research documents.
- Public information either from the companies or industry analysts.

Synopsis

Chapter 1 presents the Internet, its origins and main concepts. Here, I also provide an overview of the Internet as well as B2B and B2C e-commerce and the common views about the benefits of B2B e-commerce.

Chapter 2 describes the framework used for analyzing the companies and thus provides the unifying theme of the thesis. Chapter 3, which applies the first part of the framework described in chapter 2, presents an analysis of the competitive situation of the two companies. A general performance analysis (big picture) is presented here and sets the tone for the coming chapters. Chapter 4 focuses on Dell's case, while Chapter 5 presents IBM. They both start with a brief history of the companies. The emphasis moves onto the last four years of operations (1996-1999) and their B2B e-commerce practices during this period.

Finally, the last chapter focuses on outlining my conclusions from both cases and recommendations arising from them. The discussion will also point out the main challenges for these companies in the future and my view on how they should overcome them. This will in turn lead to developing and presenting my expanded views and recommendations for firms engaging into B2B e-commerce at large. I conclude this work with topics for further reflection.

Chapter 1

General Overview

A clear understanding of the Internet, how it evolved to incorporate commercial applications, and what technologies and capabilities allowed this to happen, is required by any person interested in doing business in the Net. The purpose of this chapter is to address these important points and provide the reader with the basic knowledge required to understand better how the Internet can bring specific opportunities to businesses seeking to gain a competitive advantage. I start by defining the Internet, briefly presenting its history and then I move forward to understand how the commercial applications of its more ubiquitous persona, the World Wide Web, gave birth to e-commerce. Finally, I explore the new opportunities brought about by the use of the Internet for commerce, and those related to business to business (B2B) in particular. I also present a short assessment of the common views of successful B2B practices as a starting point to be confirmed in future chapters through the use of the evidence presented in the case studies.

1.1 The Internet

Internet Definition

In 1995, the Federal Networking Council (FNC) issued a resolution defining the term Internet. This definition was developed with members of the Internet and intellectual property rights and Internet communities.

“RESOLUTION: The Federal Networking Council (FNC) agrees that the following language reflects our definition of the term "Internet". "Internet" refers to the global information system that -- (i) is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/follow-ons; (ii) is able to support communications using the Transmission Control Protocol/Internet Protocol (TCP/IP) suite or its subsequent extensions/follow-ons, and/or other IP-compatible protocols; and (iii) provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein.”¹

“The Internet has been defined as a network of networks, connecting thousands of commercial, university and government computer networks around the globe”². In today’s world, networks have created powerful new sources of value that go beyond the acceleration of raw computing power. The computer is no longer a simple tool to do calculations and programs. With the emergence of networks, computers were transformed into communication tools that link users together. This communication capability gave birth to new business opportunities and created new industries.

Two special characteristics of the Internet are openness and scalability. Both characteristics have allowed the Internet to achieve explosive growth. Internet standards are open and widely used. This openness allowed the Internet to get the critical mass required to benefit quickly from network externalities. On the other hand, scalability is the capability to grow and add as many point destinations, locations, and resources as desired, without the need to re-engineer or re-design the Net.

In addition to the above mentioned characteristics, the Internet has the following qualities of special importance for business players:

1. Ubiquity: the network is accessible by all. The value of the network is higher when it can be used anywhere with available equipment.
2. Value added activities: the Network is a powerful tool for the delivery of useful information.
3. Specialization: the Internet allows firms to specialize in their key capabilities
4. Sharing: the efficiency of the network is enhanced when allowing reciprocity

Prior to entering into the business applications of the Net, I consider of special importance to have a brief overview of its history and evolution. This is the focus of the next section.

¹.Barry M. Leiner, Vinton G. Cerf ,David D. Clark, Robert E. Kahn, Leonard Kleinrock, Daniel C. Lynch, Jon Postel, Lawrence G. Roberts, Stephen Wolff. *A Brief History of the Internet -ISOC*

² Haim Mendelsson. *A note on Internet Technology*. Graduate school of business . Stanford University. Las Rev July 1999.

Brief History of the Internet

The past three years have seen tremendous changes brought about by the Internet and its development as a mechanism to link businesses and people. The Internet has revolutionized the computer and communications world like nothing before. Other inventions such as the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities. "The Internet is at once a worldwide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location".³

It all started back in 1973, when the U.S. Defense Advanced Research Projects Agency (DARPA) initiated a research program to investigate techniques and technologies for interlinking packet networks of various kinds. Interestingly, the Internet thus started as a defense project to develop a communication network able to resist nuclear attacks and whose objective was to develop communication protocols which would allow networked computers to communicate transparently across multiple, linked packet networks. This was called the Internetworking project and the system of networks that emerged from the research was known as the "Internet."

I will summarize the history of the Internet into three phases: 1. The Advanced Research Projects Agency Network or ARPANET, 2. The National Science Foundation Network or NSFNET and, 3. the Commercial Internet.

The ARPANET

In 1969, the U.S Department of Defense was looking for a communication network that could resist nuclear attacks. This task was assigned to the Arpanet, which created the network embryo that would lead to the Internet. Initially, this core network connected only a few points: from a humble beginning of four nodes, it quickly grew to thousands of them to serve the research and defense communities. The first four nodes were at UCLA, the Stanford Research Institute, UCSB, and The University of Utah.

³ Ibid 1.

The NSFNET

In 1986, the NSF (National Science Foundation) created the NSFNET in order to allow the research community to have access to five new supercomputer centers in Princeton, Pittsburgh, UCSD, The University of Illinois and Cornell.

By 1987 the number of host computers (computers that run application programs and store data on an Internet node) exceeded 10,000, and in 1989, the first experimental version of the World Wide Web, developed by Tim Berners-Lee, was released.

The use of the Internet in this early part of its history was limited to research and educational programs. However, pressures from the private sector, which recognized the commercial potential of the Internet, forced the NSF to expand what it deemed as acceptable uses for the Network. This resulted in the development of regional networks to start providing services to the private sector. By 1992 the number of Internet hosts exceeded 1,000,000. In 1993, the National Center for Supercomputer Applications (NCSA) at the University of Illinois released the first Internet browser, Mosaic. Finally in 1995, the new and larger infrastructure developed for the NSFNET would pave the way for the Internet to explode.

The Commercial Internet

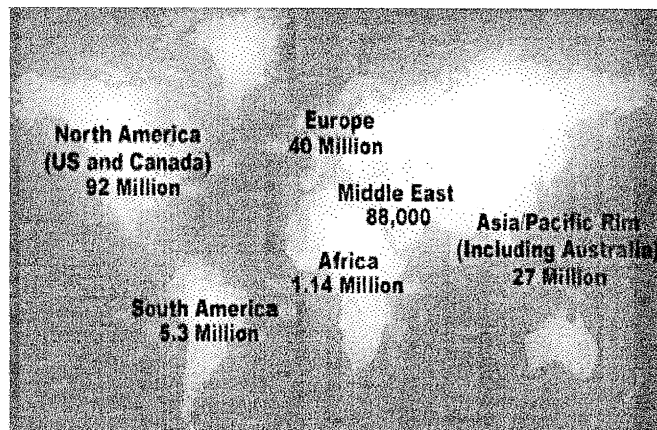
With this new structure in place, the government left the Network to evolve on its own by allowing the commercial sector to take over its ownership. The first business applications of the Internet basically focused on e-mail and file sharing. However, with the introduction of the World Wide Web in 1995, the Internet was converted into a platform to create and foster major opportunities for businesses. Millions of individuals became aware and entered this ever expanding network and applications through Internet Service Providers (ISP). Several commercial uses such as Internet-based retailing and business-to-business electronic commerce emerged. In future sections I will be explaining these developments in greater detail.

With the development of these commercial applications, the Internet grew explosively. Such growth can be explained by an analogy to a virtuous cycle and its positive feedback elements. In such a cycle, each element feeds each other leading to rapid development. In the Internet, more and more consumers and firms feel the need to participate and thus contribute to each

other's development. Users have become fascinated with the new technology, buying modems, and paying for Internet connections. Providers have seen this opportunity and rushed to create new brands and services. As technology adoption speeded up, more and more applications have developed. Several processes of diffusion have taken place within the cycle and this has positively affected the growth of Internet users⁴.

Some figures prove the explosive growth of the Internet. It is estimated that today the worldwide Internet population reaches 171 million people, with the majority located in the United States and Canada, followed by the Asia Pacific Rim (see figure 2). The North American region is the one that has shown the largest growth, with 32MM in 1996 up to 92 MM in 1999.⁵

Figure 2. Internet worldwide population 1999: 171 million



Source: CommerceNet Research Center-1999

1.2. The World Wide Web

In this section I provide an overview of the World Wide Web, its definition and origins, and the technologies allowing for content management in the Web. I also clarify the main difference between the Internet and the World Wide Web, terms that have been used indiscriminately by most people.

⁴ Hanson, Ward. *Principles of Internet Marketing*. South-Western.-1999

⁵ Nielsen CommerceNet Surveys-1999

The Web or WWW (short for World Wide Web) can be defined as an “abstract (imaginary) space of information.”⁶ The Web is an interactive service providing more user-friendly ways to organize and deliver information than it was possible with the original set of Internet services.⁷ The origins of the Web are very recent. In 1989 Tim Berners-Lee, in his desire to enable information sharing between physicists around the world, created what it is today the Web. The first experimental version was released during that year and a more developed version later on in 1991 in Geneva, Switzerland. In few words, the “abstract space of information” that is the WWW is physically grounded on a group of servers located around the world that are connected to the Internet and can communicate using what is known as the HTTP or Hypertext Transport Protocol. The HTTP is the protocol that allows for easy communication via Hypertext, text with links that enable readers to jump from one document to another. From the users’ perspective, the WWW is a collection of linked multimedia documents that can be reached at the click of the mouse⁸: text, graphics, audio and video can be combined on the WWW. A major watershed in Internet history occurred in 1993. This year the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana- Champaign released Mosaic. This was a most important advance since Mosaic was a Web navigator with a graphical user interface, which allowed to broaden the appeal and friendliness of the Net to non-technical people using it.

The Internet and the WWW

In trying to differentiate the WWW from the Internet, we could think of the latter as a set of computers and cables, the network of networks previously mentioned, that is able to deliver packets of information anywhere in the world in a matter of seconds. On the Internet, the connections are cables between computers; on the Web, connections are hypertext links. The Web exists thanks to programs that communicate between computers on the Internet. Thus, the Web could not exist without the Internet. The Web has been extremely successful because people do not want to know about programming, computers and cables, but are rather interested in information. People want to use the Net to communicate easily, regardless of how it works.

⁶ Berners-Lee interviewed by the Press. www.w3.org/people/Berners-Lee/FAQ

⁷ Ibid. #5

⁸ Mendelson, Haim. *A Note on Internet Technology*. Stanford graduate school of business. Rev 1999

As the creator of the WWW pointed out when referring to the dream behind the Web: "The Web's universality is essential: the fact that a hypertext link can point to anything, at a personal, local or global levels, as a draft or as a highly polished document. There was a second part of the dream, too, dependent on the Web being so generally used that it became a realistic mirror of the ways in which we work, play and socialize. That was that once the state of our interactions was on line, we could then use computers to help us analyze it, make sense of what we are doing, where we fit in as individuals, and how we can work better together".⁹

Several business opportunities were created with the take-off of the Web. These opportunities were not only limited to strictly carrying communications and executing transactions but to also integrated business strategies. The following section presents how businesses started to take advantage of the Web and how they have evolved. As Matthew Symonds said: "Within a few years, the Internet will turn business upside down. Be prepared –or die"¹⁰.

1.3. Internet E-commerce

Definitions of Internet e-commerce exist in abundance. In general, e-commerce could be defined as follows: "The buying and selling of products and services by businesses and consumers over the Internet"¹¹. On the other hand, a more complete, strategic definition states that "e-commerce is a dynamic set of technologies, applications and business processes that link enterprises, consumers and communities through the electronic exchange of goods, services, transactions and information"¹².

From now on I will use the term e-commerce for the action of buying, selling, sharing information, linking activities, collaborating and providing services using the Internet.

Commercial applications of the Internet started in 1995 with the growth of the user-friendly World Wide Web. Today, business and consumers are embracing the Internet for several reasons; among them are increased productivity, better efficiency, and the creation of new

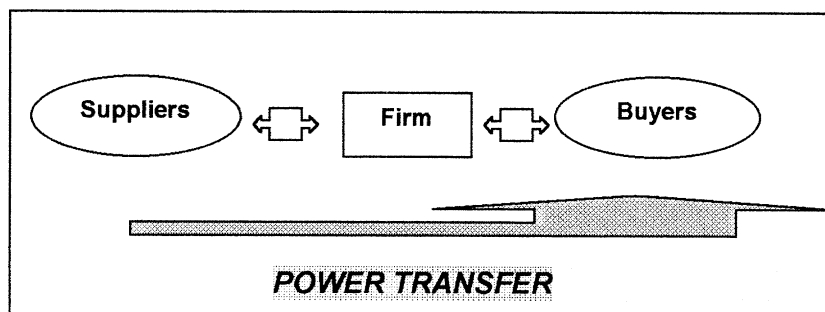
⁹ Tim Berners-Lee. *Extract from A Short Personal History of the Web*. –FAQ General questions 1998-www.w3.org

¹⁰ Symonds Mathew. *Cited by the Economist. Survey: Business and the Internet*. June 26th, 1999

¹¹ <http://www.investorwords.com>

businesses and social opportunities. Companies see the integration of existing businesses and increasing revenues or reducing costs as the primary goals of e-commerce. Our research and current evidence however shows that something much more important is happening: new business models are emerging in almost every single industry, from chemicals (Chemdex.com) to computers (Dell.com) and services (Fidelity.com). These new business models not only attempt to put buyers and sellers together but also aim to integrate their operations in such a way that all participants benefit. E-commerce is helping companies to reduce costs dramatically across the supply and demand value chain. Companies such as Dell are being able of adjust prices instantly to better reflect their supply costs, thus sharing the benefits with their customers. E-commerce is also allowing firms to get closer to customers and develop a better understanding of their needs. On the other hand, e-commerce is helping buyers reduce search costs as well as gain access to more information on products and services. The more information available, the better decision buyers would take, thus transferring power from suppliers to them (see figure 3).

Figure 3. Shifting Power from Suppliers to Buyers



As more and more firms move to the Internet, network effects take place. Since both buyers and sellers benefit from investing to do business in the Internet, it is in their best interest to persuade more and more of their business partners to do the same, thus creating a self-reinforcing cycle¹³.

E-commerce can be better understood by differentiating business to consumer (B2C) from business to business (B2B) e-commerce. I will be describing these in the following section.

¹² Oracle Corporation Web pages.

¹³ The economist *Survey: Business and The Internet.*, June 26th, 1999

1.3.1 Business to Consumer (B2C) E-commerce

Business to consumer electronic transactions represent about 20% of the on-line market (Forrester 1999) and are mainly focused on information products and tangibles. In general, the industries that appear to be more likely to move on-line are those with high information content and large intermediary costs relative to the total cost of the product¹⁴. Entertainment, travel, news and information, financial services, consumer electronics and groceries are the more obvious cases.

Several business models have emerged in this arena. More and more existing bricks and mortar companies extend their offerings through the Internet. In this context, companies see the on-line alternative as a distribution and marketing channel. Barnes and Noble's early answer to Amazon.com is an example. In addition, we see totally new business models, 100% on-line or virtual, with e-bay as probably one of the most representative examples.

The benefits of e-commerce for consumers are lower prices, more choices, higher information, and lower search costs. Manufacturers on the other hand are likely to increment their sales, but they have to be very cautious at pricing their products since consumers will be, in principle, able to compare prices at no cost. In other words, manufacturers should have a good understanding of their product or services' price elasticity before committing to a specific on-line price strategy.

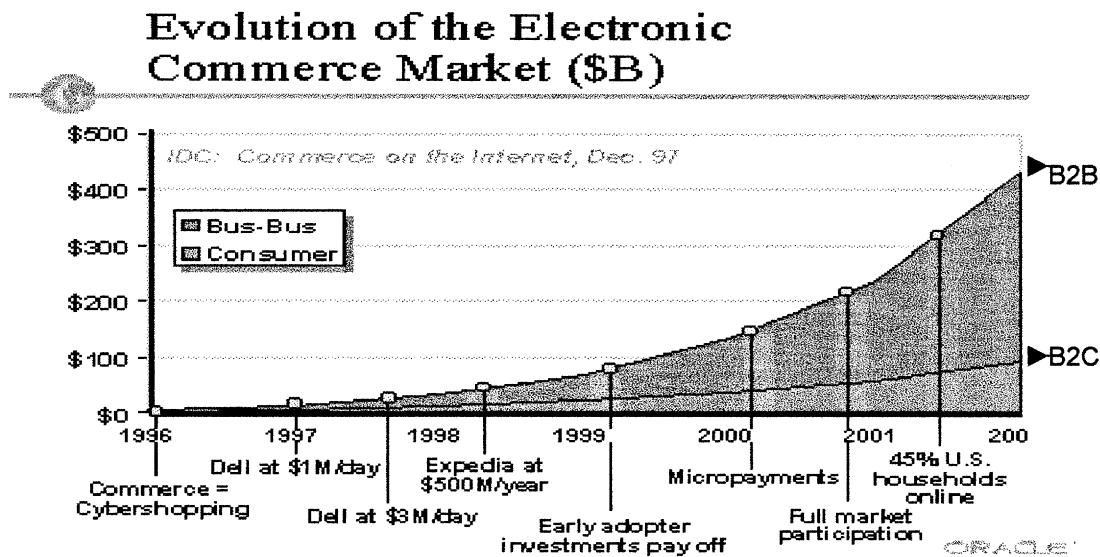
Because of the intrinsic characteristics of the Web, some new business models will emerge in B2C e-commerce. Market intermediaries will strengthen their position beyond matching supply and demand by building capabilities that allow them to offer personalized and customized marketing and advertising services. Shopping advisors and several other intermediation businesses, such as auctions and aggregators, will evolve. In some cases, this will be valid not only for B2C but also for B2B e-commerce.

¹⁴ Morgan Stanley Dean Witter. *Internet Data Services report*. August 11, 1999

1.3.2 Business to Business (B2B) E-commerce

Most experts agree that despite all the hoopla behind B2C e-commerce, the driver of value creation through the use of the Internet will be transactions between businesses. It is here that the Internet business enabling capabilities started to show. It is also here that most of the growth associated to the Internet will be, not to say the continuous productivity gains that will be key in maintaining the surprising economic growth without inflation associated to the current US economic expansion. Figure 4 shows the accelerated pace of growth of B2B compared to B2C.

Figure 4



According to the OECD figures, B2B transactions accounted for 80% of the US 26 billion in Internet e-commerce in 1997 and the US 41 billion in 1998.¹⁵ It is expected that B2B e-commerce continues to dominate e-commerce.

The Internet has changed the economics of connecting businesses. Thanks to the shared nature and openness of the Internet, the costs of participating in business on-line are

¹⁵ Ibid.

dramatically reduced. As an example, the cost of participating in an Internet based e-commerce system is one tenth of that of using an EDI (Electronic Data Interchange) system¹⁶, the previous state-of-the art in on-line industry applications. This drop in costs will allow small and medium firms to start conducting their business on-line. The Internet is not only cheaper than EDI, but also less complex and easier to implement.

Several factors will combine to drive B2B e-commerce continued growth. The use of the Web will enable companies are being able to manage more efficiently activities such as procurement, pricing, inventories, and product cycle control. This in turn is shortening product design cycles, improving customer service, allowing for more targeted marketing activities, and reducing advertising coverage waste while building stronger customer relationships. As we can see, this is creating a whole new set of rules for doing business and some of the consequences this new modus operandi will have are yet to be understood by both individuals and corporations.

Intranets and Extranets

The greater involvement of the parties in a transaction is one of the most powerful features of B2B e-commerce. Unlike EDI, which only allows the interchange of data, B2B e-commerce has dramatically enhanced features by connecting the operating systems among companies, thus letting them communicate and share information in real time through the virtual integration of Intranets and Extranets.

Intranets:

An Intranet is the use of Internet technologies within an organization (or company) to achieve better results than the conventional means of data access and transfer. An Intranet helps companies to cut costs and have an easy and fast access to day to day information.

Generally speaking, an Intranet is different from the Internet in the following ways:

1. An Intranet is a network within the organization whereas the Internet is a worldwide network.
2. An Intranet has access to the Internet but not vice-versa

¹⁶ Ibid.

Extranets

An Extranet is a private network that uses the Internet protocols and the public telecommunication system to securely share part of a company's information or operations with suppliers, vendors, partners, customers, or other businesses. An extranet can be viewed as part of a company's internal network that is extended to users outside the company. It has also been described as a "state of mind" in which the Internet is perceived as a way to do business with other companies as well as to sell products to customers.

An Extranet requires security and privacy. These in turn require firewall server management, the issuance and use of digital certificates or similar means of user authentication, the encryption of messages, and the use of virtual private networks, or VPN's, to tunnel proprietary information through the public network.

Companies can use an extranet to:

- Exchange large volumes of data using Electronic Data Interchange -EDI
- Share product catalogs exclusively with wholesalers or those "in the trade"
- Collaborate with other companies on joint development efforts
- Jointly develop and use training programs with other companies
- Provide or access services provided by one company to a group of other companies, such as an online banking application managed by one company on behalf of affiliated banks
- Share news of common interest exclusively with partner companies

Operationally, several companies ranging from Mobil Corp to NationsBank Corp are embracing Extranets with key businesses partners over the Net¹⁷. Many companies have integrated Extranets as part of corporate strategy. Dell on-line is a good example. Dell is optimizing external business processes and trade relations by bringing its trade partners into an Extranet. At the customers' site, some buyers have linked these Extranets with Intranets. In companies such as Statoil, employees are able to order their computers and track their orders directly by using Intranet/Extranet capabilities.

¹⁷ Business Week. *Log-in Link-up, Save big.* www.businessweek.com/1998/25/b3583009.html

In summary, Extranets are currently the core of most Internet B2B commerce. Several features such as customization and community building are brought about by Extranets and provide firms with tools to offer better services to their customers.

Today, companies are taking advantage of both Intranets and Extranets. Use of these networks has been widely adopted with benefits for both the companies and their employees.

1.4. Some issues to be resolved

Many factors will need to be further considered in the near future in order to capture fully the value of B2B and B2C Internet e-commerce. Many of the current state-of-the-art solutions that will help on this will need more proven functionality before they become widely accepted.

Some of these factors and challenges are:

- Human resources availability: labor shortage in the e-commerce sector is becoming a reality. As Richard Owen (Dell-on-line VP) has pointed out, "we are already experiencing several challenges with regards of availability of skilled labor. For sure, we won't see massive movements towards picks and shovels; instead, we will expect strong efforts towards building the required technology infrastructure to overcome lack of human resources".
- Operational challenges: companies engaging in business on line will have to face and solve several operational issues, such as the need for fully shareable and accepted standards for handling secure payments, the use of multi-currency, and the growth of globalization. How to improve IT capabilities for existing invoicing and inventory systems, efficient and easy order fulfillment, better and high system availability (7 to 24), and privacy concerns, also present barriers to be overcome.
- There are also several areas in which the government and the managers of the Internet should collaborate. Some of these areas are intellectual property, commercial law, taxation, free speech regulation, individual privacy, and media regulation.
- Reliability and lack of bandwidth in telecommunications could also limit the growth of Internet businesses. This is an international problem yet the solution stays within the bounds of each and every nation. Obviously several countries will end up with

better capabilities than others, thus interfering with globalization because of differing or even incompatible telecom standards.

- With regards to new developments, in the computer sector, the focus of this thesis, current B2B e-commerce practices are being challenged by the appearance of business models such as aggregators, auctions and exchanges. A study conducted by Forrester Research ¹⁸ shows that aggregators and exchanges will have a considerable impact on both the computers and the telecom supply chains by both supplementing their selling and distribution activities and changing the way the sales are made, as for instance an increased need to adjust quickly to evolving pricing dynamics.

Overall, one of the key challenges is to determine how a completely networked world will change the way people deal with each other¹⁹. Businesses today are used to a simple strategy: beat your competition, squeeze your suppliers and fight to retain your customers. The Internet and the new technologies applied in the on-line world make of collaboration a must. However, nobody knows to what extent this collaboration will be used by individual firms and how fast people/customers will adapt to shifting business alliances and partnerships.

In summary, how to be successful in the emerging e-business world is showing more and more to be a strategy issue rather than the leveraging on technology to do business as usual that most people envisioned originally. We are already witnessing an evolution towards more efficient ways of doing business. But in particular, I would like to explore the evolutionary and revolutionary movements in B2B e-commerce in an industry that by its very nature has enabled the birth of the Internet revolution, the computer hardware industry. Computers have become the base, and in many ways, some of the most affected areas by their own creation. Understanding how incumbents and attackers have risen to the challenge should hopefully provide insights about what makes and will make e-commerce tick. This will be the focus of the following chapters.

¹⁸ Forrester Research. *Anatomy of New Market Models*. February 1999 p. 13

¹⁹ The Economist: *Survey Business and the Internet*. June 26th, 1999

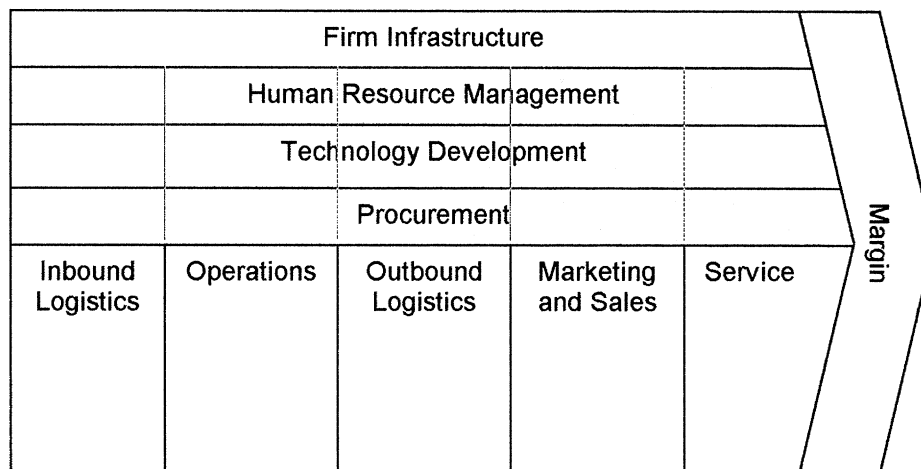
Chapter 2. A framework for Analysis

The purpose of this chapter is to present a framework for analyzing the companies object of my study under the lenses of their B2B e-commerce practice. I start by re-visiting the concept of the value chain developed by Michael Porter (1985) and then I present my framework, which is an adaptation of Porter’s model to explain more specifically the sources of competitive advantage for companies engaging in B2B e-commerce.

2.1. Re- visiting the value chain

The value chain could be explained as a tool that helps us dissect the important components of value as a way to understand competitive advantage. Porter defines a firm as a “collection of discrete, but interrelated economic activities such as products being assembled, salespeople making sales visits, and orders being processed”¹. As such, Porter considers that the sources of competitive advantage of a firm center around the firm’s activities and that the strategy of a firm is the one that defines how these activities are interrelated and configured. The activities performed by firms can be schematically presented in what is known as the value chain framework (see figure 1).

Figure 1. The Value Chain



Source: Porter, Michael E. *Towards a Dynamic Theory of Strategy* (1991)

¹ Porter, Michael E. *Towards a Dynamic Theory of Strategy*. Strategic Management Journal, 12, 95-117. 1991. John Wiley and Sons Ltd

Under the value chain framework, a firm's activities could be classified in two groups. In the first group are included those activities that are directly related to the production, marketing and delivery of the product. As shown in figure 1, these are represented by the five blocks located at the bottom half of the chart : inbound logistics, operations, outbound logistics, marketing, and sales and service. In the second group are all the activities that provide support to the activities of the first group. In other words, these are the activities that create or source factors and inputs required to perform the activities of the first group. Supportive activities are shown in figure 1 as the four top half blocks; Firm Infrastructure, Human Resource Management, Technology Development, and Procurement.

Porter further develops its concept by emphasizing that discrete activities are part of a system and as such, the outcomes, costs or effectiveness of one activity affect, and are affected by, the performance of other activities. As an example, poor quality control over raw materials could cause production problems and also an increase in the cost or the time to produce the good. In addition, all these linkages are not only internal but are extended to outside of the firm by also embracing the activities of suppliers, channels and buyers.

In summary, Porter does not view a firm's value chain as an independent system. A company's value chain is part of what he calls the "value system" or an interrelated set of value chains both upstream and downstream to the firm. This value system is then formed by the supplier value chains, the firm's value chain, the channel value chains and the end-user value chains. All of these perform activities that affect the value chain activities of the players located at either the upstream, or downstream ends, or both sides.

The Integrated value Chain

The consulting firm Cambridge Technology Partners took the value chain concept and developed a more encompassing view, the integrated value chain. This is basically an expansion of Porter's "value system" concept . The value chain integration is defined as "the process by which multiple enterprises within a shared market channel collaboratively plan, implement, and electronically as well as physically, manage the flow of goods, services and information... along the entire value chain, from point of origin to point of consumption, in a

manner that increases customer-perceived value and optimizes the efficiency of the chain, creating competitive advantage for all stakeholders in the value chain.”².

In my view, this concept represents an adaptation of the value chain to reflect the dynamics of the networked marketplace in which enterprises are doing business today. The value chain integration involves collaboration between the different activities performed by firms in order to deliver higher value to, and ensure it is perceived by, the ultimate customer. The concept is also consistent with the Internet world, where the power is shifting from sellers to buyers (chapter 1) and, because of that, where companies need to optimize all internal and external activities involved in delivering their value propositions to their customers. Such optimization allows companies both to capture surplus value from other parts of their own and others' value chains, and deliver more of this value to their customers. Companies that do not pursue such value capturing aggressively will be eventually doomed to irrelevance, as the value intrinsic in their activities is squeezed out by other value chain participants, from suppliers to consumers, that move more proactively to do so by embracing Internet enabled capabilities.

In the electronic commerce arena, companies would better understand their sources of competitive advantage by looking at their business as integrated value chains. Enterprises are a set of activities that are linked from point to point both internally and externally. They do not only include the demand and supply streams, but also embrace the whole spectrum of the firm's business model and processes from the customers' customers to the suppliers' suppliers.

2.2. A framework for analyzing B2B e-commerce practices

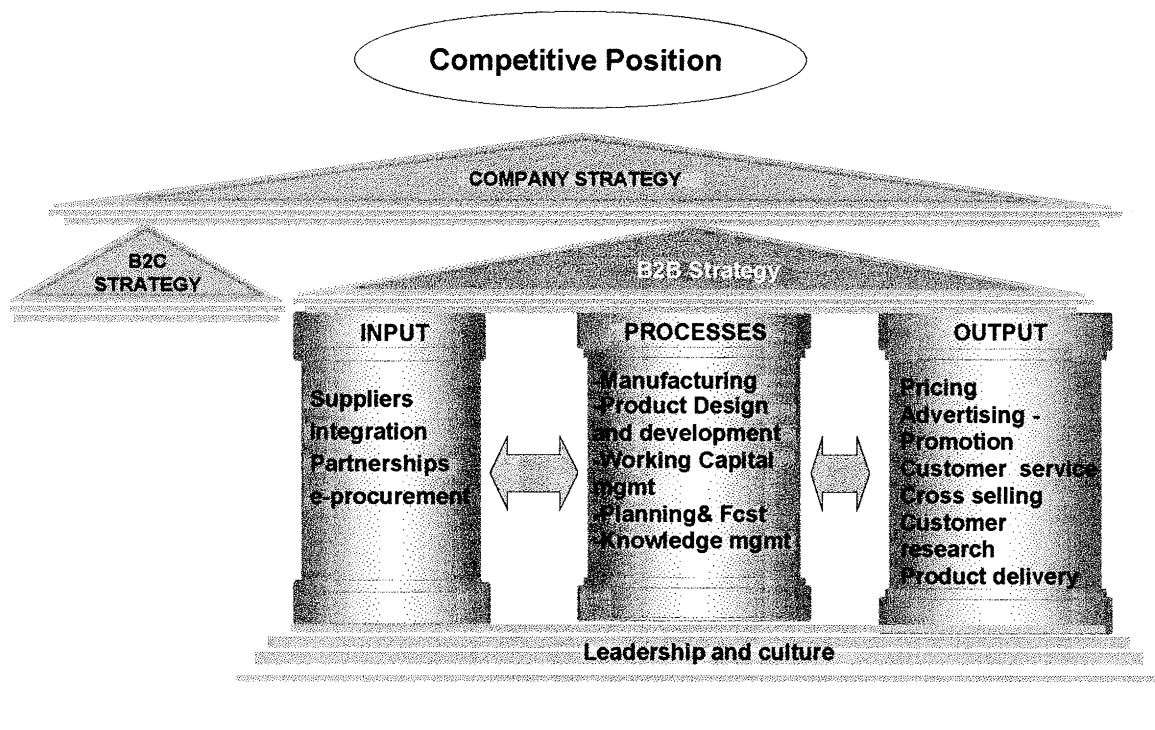
From the value chain and its integrated value chain version I developed a framework that focuses on the specific activities and processes performed by firms engaging in B2B e-commerce. In other words, only those activities that by means of using the Internet could be leveraged in such a way that enhance the value provided (and thus the firm's competitive position) to the customer are part of the framework. As an example, some supportive activities such as procurement of office supplies are not included. Although by using e-

² The Cambridge Technology Partners. *Competition's Battleground: The Integrated Value Chain*. 1999

procurement for office supplies, operational efficiencies that result in lower costs are achieved, this does not have direct impact on the company's business relationship with its corporate customers. One can argue that any improvement in the overall performance of the company would allow the company to improve its offerings to customers. However, efficiencies achieved here could be kept inside the firm and improve the overall profit. My point here is basically a matter of scope and focus: my framework focuses on the variables, processes and activities that are deliberately part of a B2B e-commerce strategy and are not a result of other management decisions, equally valid in a non-Internet world, in search of other operational efficiencies.

Figure 2, schematizes the framework I will use throughout the following chapters to compare and contrast the B2B e-commerce practice of two players in the computer hardware industry: Dell as the newcomer and IBM as the incumbent. An explanation of the framework follows.

Figure 2. Framework for Analyzing B2B e-commerce practices



The strategy of a firm is defined as “ the match an organization makes between its internal resources and skills... and the opportunities and risks created by its external environment”³. As such, internal capabilities, skills and resources are the main source of profit for the firm. How the firm decides to exploit these resources and capabilities determines its strategy and, as a result, its competitive position.

The proposed framework considers the competitive position (measured by market share, profitability, value creation, etc) as a consequence of the chosen strategy and the companies capabilities to execute against it. Firms, by establishing their strategic intent, identify which set of capabilities, skills and resources are required to achieve a target position. For companies engaging in e-commerce, whether B2B or B2C, the e-commerce strategy should be consistent with, and support the overall strategy of the firm.

Three pillars support the B2B strategy. These pillars are formed by several processes and activities that hinge on the use of the Internet to ultimately enhance the firm’s competitive position. As I mentioned previously, I based most of my framework on Porter’s value chain model. It is important to have this in mind since the pillars are basically a variation and refinement of the value chain to focus on B2B e-commerce issues.

Input

This pillar will provide the guide to examine what IBM and Dell are doing to integrate electronically and physically their suppliers into their business models. The objective here is to identify the main sources of value creation such as lower acquisition costs, shorter purchasing and delivery periods, reduced inventories, better supplier selection, efficiencies on operations (paperless transactions, error minimization), and supplier management that would result in such value growth. In Porter’s model, this is inbound logistics, part of operations at the supplier level, given that Dell or IBM also coordinate the production part of the value chain of some of their suppliers, and also involves all four support activities.

An example of a key element of this pillar, one that also shows the difference between what will be included or not in the analyses, is part inventory management. For instance, Dell only

³ Grant. Robert. *The Resource Based Theory of Competitive advantage*. California Management

assembles a multitude of parts to make computers to basically deliver them to order. This implies that Dell does not have large part inventory costs. In a simplistic answer in line with old economic models, this would represent an asset reduction to Dell, something all companies must aspire too but is not necessarily a key strategic lever in a B2B strategy. Toyota's just-in-time processes are old and tried, resulting in leaner manufacturing processes and lower cost products. Dell had to aspire to have this too, as just-in-time allows to reduce costs and pass them on to consumers in lower prices; yet nobody can say Toyota has a B2B strategy supported by this. Dell does have such a strategy. This company uses just-in-time processes throughout its own value chain and that of its suppliers by passing information from the consumer to the last link of the chain in real time, by designing products that can minimize part inventories even in this last link, and by making sure that such information enhances the client's purchasing experience by leveraging on the immediacy, responsiveness and speed that using a combination of the World Wide Web for the client, Intranets within Dell, and Extranets with non-Dell parts of the value chain can provide.

Processes

This part analyzes how the case companies are integrating manufacturing, working capital management, product design and development, planning and forecasting and knowledge management into their B2B e-commerce strategy.

Manufacturing could be more efficient by streamlining the information flow from the customer and supply sides. Activities such as manufacturing programming and planning, and inventory management could be performed in a more efficient way when information is available in real time in both directions. For instance, on one hand and as stated previously, planning across the value chain is better accomplished when all parts of the chain have access to all the relevant information simultaneously, thus facilitating joint problem solving and aligning incentives and goals. On the other hand, consumer expectations can also be managed by creating mechanisms that keep clients close to the progress of their orders, proactively inform them of problems that might hinder meeting the service levels that the company has committed to, and explicitly state the solutions the company is working on to meet those commitments in the best possible way.

The Internet connection with clients can also enhance product design and development through the capture in real time of information on customer needs and wants. In addition, by leveraging the use of the Internet, other activities such as working capital management could be done more efficiently and result in reduced inventories, better accounts payable controls, and reduced accounts receivable periods. Improvements in planning and knowledge management could be achieved also by using the Internet capabilities to share information within the organization through Intranets and suppliers and distributors through Extranets.

This pillar will be the equivalent to most of the operations activity, particularly within Dell and IBM, and elements of all support activities in Porter's framework.

Output

This pillar includes all the customer-side activities that have been moved on-line. It also explains in which ways the Internet could represent a source of advantage or not. In general this pillar states for which specific marketing activities are the companies using the Internet and in which way.

In general, this is the most obvious element of the use of the Internet as a strategic element in a B2B strategy. Most people see the client-company interface that the Internet enables as the main difference between new and old economy strategies. Although this is true to a great extent, our previous discussion on the other pillars proves the inadequacy of such a perspective. Goes without saying that the Internet has given birth to new ways to reach and interact with customers, all the way from advertising, first contact processes, channel and key account management, to customer service and cross-selling. Nonetheless, companies that focus only on this dimension, without understanding and taking advantage of the seamless inter-relationships that the Internet has created with the other two pillars, will be capturing half of the value in a successful e-commerce strategy. Some people⁴ will argue that this pillar is the basis for "buying and selling over digital media. E-business, in addition to encompassing e-commerce, includes both front and back office applications that form the engine for modern business". This is my perspective, and the why for the emphasis and analysis involved in the

⁴ Kalakota and Robinson. *E-business Roadmap for Success*. Addison-Wesley November 1999

other two pillars. However, for the sake of consistency, I will continue referring to e-commerce strategies as those that consider all three pillars as defined.

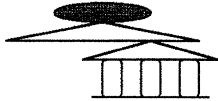
The equivalent activities in Porter's value chain in this case are outbound logistics, marketing and sales, and service.

Culture and Leadership

Finally, by moving some activities on-line, companies might have to change some part of their organizational structure and re-allocate tasks and people. This in turn might impact the company's culture. Changes such as having people moving out of their offices to work more on a virtual way, reduced face-to-face communications, the creation of independent business units to build a new paradigm unhindered by "old offline" business models, would have tremendous impact in the day to day operation and overall in the culture of the firm. The role of the leaders of the organization would then be crucial to avoid internal problems, such as conflicts and motivation, and define and forge new relationships with third parties, to allow capturing all the power on a consistent strategy across all three pillars. Companies without the leaders with the vision and courage both to relinquish power to others, within and without the organization, and to create new ownership structures that build incentives for cooperation in the goal to serve customers better, will never be able to create state-of-the-art B2B e-commerce strategies.

2.3. Summary

The value chain model has proven to be very useful to identify the main sources of competitive advantage for a firm. I presented a more Internet based, e-commerce specific view of this model as a framework to analyze the B2B e-commerce practices of two players in the computer hardware industry: Dell and IBM. In the following chapter I start applying the framework and present an analysis of the competitive position for the two companies.



Chapter 3 Competitive Position

This chapter addresses the first part of the previously described framework, the competitive position. In the first part a description of the industry and observed trends is presented. The second part presents a general comparative analysis of two key players in this industry, Dell and IBM. The purpose of this chapter is to provide a clear picture of what are the most important challenges faced by the players in the industry and, more specifically, how the two companies object of this study are positioned to face this challenges.

3.1 Overlook of the Hardware Industry

Products and Players

The hardware Industry is composed by personal computers or PC's -laptops, notebooks and desktops, servers and mainframes. In 1999, servers and mainframes accounted for 23.4% share of the total hardware market while portables and desktops for the balance 76.6%. It is expected that this revenue mix will be maintained for the coming years. In units, because of the wide difference in prices between computers and servers and mainframes, the mix is 3% for the big machines while desktops and portables account for 97%. Currently, the main players (see table 1) in this industry are Compaq, the worldwide leader, Dell, IBM, Gateway, Hewlett Packard, Apple, NEC, Fujitsu, Toshiba and ACER.

Table 1. Hardware Industry – Main Players

Manufacturer	Main Offerings	Comments
Compaq	Servers, Desktops, Notebooks, Services	<ul style="list-style-type: none"> ▪ 1998 acquired DEC and Tandem ▪ Not known as to be aggressive on prices ▪ Incipient use of the Internet ▪ Strong in the enterprise segment
IBM	Servers, Desktops, Notebooks, Workstations, Software, Storage Components, Printers, Networking Products, Consulting, Venture Capitalist	<ul style="list-style-type: none"> ▪ 1998 and 1999 reported high losses from its computer lines ▪ Full solution provider, strong in the enterprise segment. ▪ Strong partnerships ▪ Full service Web site

Manufacturer	Main Offerings	Comments
Dell	Desktops, Notebooks, Low-end Servers, Low-end Workstations	<ul style="list-style-type: none"> ▪ Pioneer of the direct Model ▪ Launching higher end servers and workstations ▪ Service provided mostly through third parties ▪ Strong presence in the enterprise/institution segment
Gateway	Desktops, Notebooks, Low-end Servers	<ul style="list-style-type: none"> ▪ Primarily replicating Dell's direct model ▪ Main focus on consumers, low/increasing presence in the enterprise segment.
Hewlett Packard	Servers, Desktops, Notebooks, Printers and Services	<ul style="list-style-type: none"> ▪ Focuses strongly on solutions ▪ Relatively poor leverage of the internet ▪ Strong presence in business segment

For 1998 and 1999 Compaq has been the worldwide market leader, followed by Dell and IBM. In 1998 IBM was second in market share but in 1999 Dell surpassed it. In the US market, Dell achieved market leadership in 1999, followed by Compaq, the leader in 1998 (see table 2). Worldwide, Dell's shipments grew by 53% year over year, Hewlett Packard was second in growth with 32%.

Table 2. Worldwide and US hardware markets (units share) % and year over year units growth

Vendor	Worldwide Market			US Market		
	1998	1999	% growth	1998	1999	% growth
Compaq	14.5	14.0	19.0	16.7	16.0	19.0
Dell	8.5	10.5	53.0	13.2	16.6	56.0
IBM	8.7	8.2	17.0	8.2	7.2	10.0
HP	6.3	6.7	32.0	7.8	8.8	40.0
Gateway				8.4	8.9	32.0
Others	62.0	60.6	23.0	45.6	42.6	16.0
Total	100.0	100.0	23.0	100.0	100.0	25.0

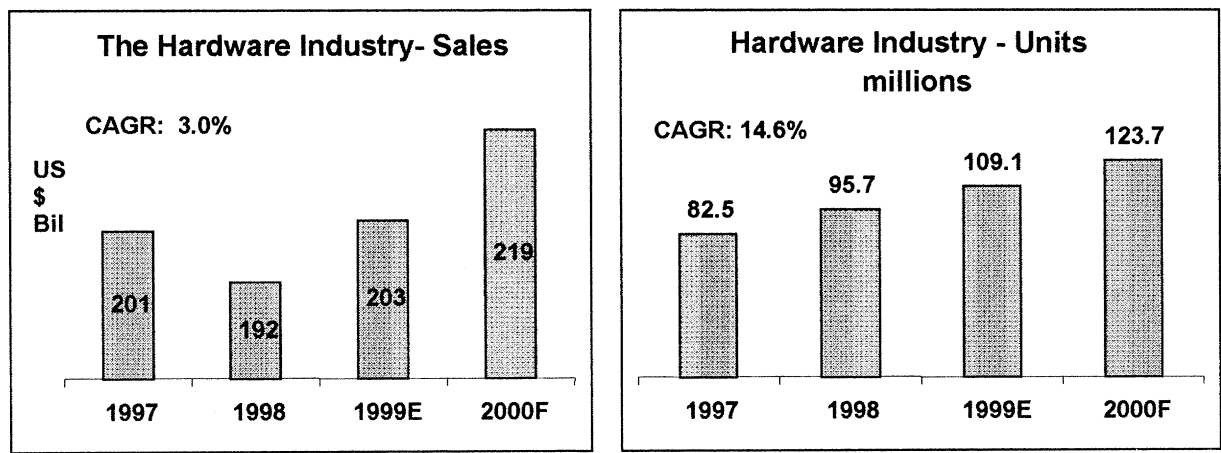
Source: IDC. 1999,2000

Trends

The hardware industry is experiencing fundamental change. Desktops and laptops sales prices will continue to drop dramatically. The market unit volume is also not expected to grow much, and it could even decline. This will move growth from such products to other lines such as services and servers. Vendors who focus only on PC's will be facing fierce competition to get a larger piece of a slowly growing market.

Even including servers and despite the industry's continuous growth over the past 3 years, there is an enormous pressure due to declining unit prices. Prices dropped by an average of 8.4% from 1997. As a result, revenue growth has been, and is expected to continue, being very low compared to unit growth (see figure 1).

Figure 1. The Hardware Industry. Three year performance¹



Source: Dataquest (Personal Computer Worldwide, April 1999; Servers Worldwide, June 1999)

Several factors are forcing prices to go down. The first one is clearly the way companies think about purchasing hardware. Forrester Research² shows that price, and then only service support and quality is the main factor to select a PC vendor. This will be more the case as products from top-tier manufacturers such as IBM, Compaq and Dell, are more and more look alike.

¹ Revenue figures include supercomputers

² The Forrester Report. PC Industry Roller Coaster. 1998

A second factor for the rapid price decline in the hardware industry is Moore's law, which states that computing power doubles every 18 months. Every new chip doubles in performance but not in price. The PC oversupply in the year 2000 is putting even more pressures on prices. The year Y2K issue prompted companies to spend heavily on the replacement of computers. Most of the companies upgraded their machines or replaced them in order to avoid Y2K problems. It is not expected that demand will pick up in the next 2 years as, once companies have up-graded their machines for Y2K compliance, they will probably avoid any further expenditure unless there is a clear need. Forrester shows that within 50 Fortune 1000 companies, 44% of the companies will not increase their PC budget while 38% of them will reduce it in the year 2000.³

The lost of market power of Intel and Microsoft will also decrease the profitability of the industry, at least on PC's. Both companies seem to have lost part of their ability to influence corporate prices and purchases. As an example, two chip makers, AMD and Cyrix offered their products at substantially lower prices than the Intel Pentium, and this motivated computer manufacturers to reduce prices down below US \$ 1000. For instance, Hewlett Packard has a line of PC's that sells for just US \$ 800. As a result, even if margins stay constant as a percentage of sales, this drop in the price of chips will drive down the absolute value of these margins.

Finally, new market dynamics are driving towards a commoditization of the industry. For example, in the consumer market, several Internet Service Providers (ISPs) were offering special packages to acquire customers. One observed practice was the bundling of PCs with the Internet access service. This has affected the consumer perception of PC's, which seem more and more like white boxes, thus driving prices down.

Channels of Distribution

Two main models exist in the industry for distribution, the indirect and direct model.

³ The Forrester Report. PC Industry Roller Coaster. 1998

Indirect Model

The indirect model could involve one or several layers between the computer manufacturer and the final customer. There are basically three channels that can be considered indirect: Value Added Resellers (VARs), Retail, and National Resellers.

VARs receive the products from master distributors or large companies such as Tech Data, Ingram Micro, and Merisel. The product flows from the manufacturer to these master distributors to the Independent VARs. In this channel, the master distributor plays a very important role since it supplies the full range of hardware, software and peripherals for the industry. Master distributors do only the distribution part and VARs take charge of the systems integration as well as the provision of services, specialized software and in many cases customization. VARs are basically the owners of the relationship with the customer. They are the preferred vendor channel to take care of small and medium business needs.

The retail channel is dominated in the US by large "Category Killers" such as CompUSA, Circuit City and Best Buy. These retailers buy directly from the manufacturer, which delivers the products to their distribution centers, which in turn send the products to their wholly owned retail stores all across the country. This channel is basically focused on individual consumers, small home and business offices.

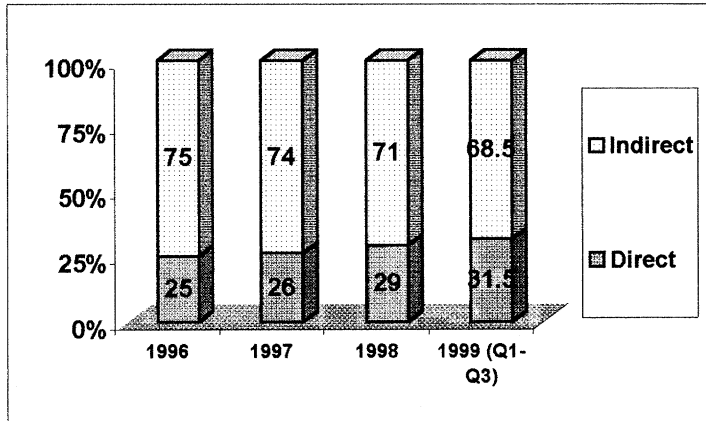
National resellers purchase computers from the manufacturer and distribute them through their wholly owned network of retail store-fronts and sales and service companies (usually franchised). Among the largest resellers are Entex Information Systems, Vanstar, MicroAge and CompuCom Systems. Resellers customize systems to better satisfy customer needs. They can also reassemble, upgrade installations and perform tests. Similar to VARs, national resellers serve small and medium business

The main advantages of the indirect model have historically been reach, service and the ability to offer a one-stop-shop to the end customer. This is evidenced by the large market shares of Compaq and other companies that have traditionally relied on these channels. However, as prices go down, and vendors margins are reduced, the indirect channel faces pressures over its ability to maintain low prices by reducing their absolute markups and compensate in the supply of value added services.

Direct Model

The direct model involves no layers between the manufacturer and the end customer. The contact is direct both ways, direct outbound and direct response. Vendor sales-forces, fax, telephone calls and Internet are the means used by the direct channel to communicate/approach their customers. Products flow from the manufacturer directly to the customer either by using the vendor’s own delivery system or by contracted third parties, such as UPS and Federal Express. Most direct vendors pursue a “build-to-order” strategy. By using this approach, they avoid the high risk of inventory obsolescence that vendors face when selling into indirect channels. The direct channel is gaining a larger share of the PC sales in the US market (see figure 2) and is being used to approach both institutions (business, government, education) and individual customers

Figure 2. Channel share of PC sales



Source: Dataquest and IDC⁴

PC shipments through the direct channel are increasingly gaining more acceptance. In 1998, shipments through the channel increase by an average of 27% compared with a 15% increase for the entire market⁵.

Business economics will dictate what will happen in the marketplace. The Internet is changing the economics of many businesses. In particular, for PC vendors, such as Dell and Gateway,

⁴ IDC , *The Direct Channel Ships More PCs than the Commercial Channel for The First Time in 3Q99*. Jan 12, 2000

it has proven to be a very efficient way to communicate, sell and provide some service to their customers. How channels will adapt their business models to new market demands and how PC vendors will leverage on the channels to achieve or maintain competitive advantage will be analyzed in a future chapter.

The PC Industry-Potential Growth Venues

Given the trends observed in the industry, not many alternatives for growth appear obvious in the short term. Dropping prices reduces manufacturer and channel margins. Manufacturers like IBM that are experiencing losses from their computer lines are looking for ways to cut those losses and are moving out of the retail channel by toying with distribution through the direct channel as a way to improve margins.

In the corporate segment, of the overall revenue annual growth estimated in 10% for the next two years, the main drivers appear to be the medium-small business and home office segments which are expected to grow annually by 14%⁶. The Internet is also driving part of this growth by bringing new business opportunities. In the last year we have witnessed millions of start-ups. Several start-ups will not survive, but the ones that do will dramatically grow. In order to support their growth, these companies will need to invest heavily in IT infrastructure. With regard to specific products, thanks to the booming of Internet e-commerce, many companies are in need for servers that run with web based applications.

Lastly, for those companies that overestimated hardware demand for 1999, the overseas market offers an opportunity. For those companies that are not yet selling overseas, or whose presence in other countries is still low, going international seems plausible. However, there are already many global players in this industry such as IBM, HP, and Compaq.

3.2. Comparative Analysis. Dell and IBM two players in the PC Industry.

The previous section gave us a clear picture of the key factors affecting players in the computer hardware industry. External factors such as those presented in the previous section combined with more firm specific factors such as size, organization, product/service portfolio,

⁵ IDC. *IDC Expects Shipments Through Direct Channels to Surpass Those Through Commercial Channels by 2001*. August 1999.

⁶ IDC and Dataquest 1999.

past profitability and experience, affect management decisions. In this section a general comparison of two key players in the industry, Dell and IBM is provided. By carrying out this comparison, my objective is to emphasize specific facts that are relevant to the companies' competitive position and that are either enablers or obstacles for achieving competitive advantage through their B2B e-commerce business.

Dell and IBM: The big picture

Dramatic differences exist between these two companies when analyzing them from a broad perspective. These differences are basically, size, manufacturing facilities, countries in which they operate, product spectrum, and years in operation. Table 3 presents this comparison.

Table 3. Dell and IBM –Facts

	IBM	DELL
Founded in (year)	1911	1984
Years in operation	89	16
Number of employees	291,067	24,400
Geographic presence-business	North America Asia & Pacific Europe Latin America	North America Asia & Pacific -Japan Europe Just built a factory in Brazil to serve better South America
Manufacturing facilities	27	6
Current CEO (years in charge)	Lou Gerstner - 7	Michael Dell-16
Annual Sales 1998 \$ Bill	81.7	18.7
Net Income ⁷ -1998 \$ Bill	6.3	1.5
Offerings	Hardware, software. Services, consulting, venture capitalist, finance	Hardware. Initiated efforts in services, consulting, venture capitalist, and finance
Organization	Matrix. Business Units and Geography	Initially by Business Units – moving toward matrix Geography

Sources: 1998 IBM and Dell annual Reports. IBM National Accounts Payable Web-EDI. By Robert Hughes. Dell and IBM interviews.

⁷ Net Income after taxes.

From table 3, we can generate some hypothesis to be addressed in future chapters. On one hand, IBM as an incumbent could be in better position to face newcomers and keep them at bay because of its financial strength, reputation and knowledge of the market underlying dynamics. On the other hand, size could also become a core rigidity.⁸ Bigness many times makes the organization less flexible to react fast enough to rapid changes in the environment. Additionally, large sunk costs could stop incumbents from killing an existing technology or business on behalf of a new one.

Furthermore, an Incumbent like IBM has in many cases less risk if it were to take a more aggressive stance when competing because it has a wider and diversified portfolio of offerings. This would allow the company to use one business to subsidize another if the competitive environment requires it. This diversification hypothesis also applies to the geographic expansion, despite the fact that other elements not being considered such as currency fluctuations could eliminate any advantage.

Finally, history and tradition could also make a difference because of customer lock-in. It is more difficult for a long-term relationship with a customer, with a strong legacy element such as that created by mainframe systems in IBM's case, to be undermined to the point of rupture by the entrance of a new player. Customer loyalty is further reinforced specially if the incumbent has a well-deserved reputation of consistent customer satisfaction. This difficult the creation of attacker beachheads, specially in large clients when change might be perceived as increasing risk.

All the aforementioned hypothesis will be addressed in the coming chapters, when studying the specific companies. In the following paragraph, I will provide a clear picture of the scenario in which these two companies are competing.

Dell and IBM: Performance highlights

Undoubtedly, both companies are being successful. Success can be measured and interpreted in many ways. For the purpose of this chapter, let us examine the main key indicators of strong financial and market performance such as revenue and profit growth, stock performance and return on equity (the market share for the whole industry was already

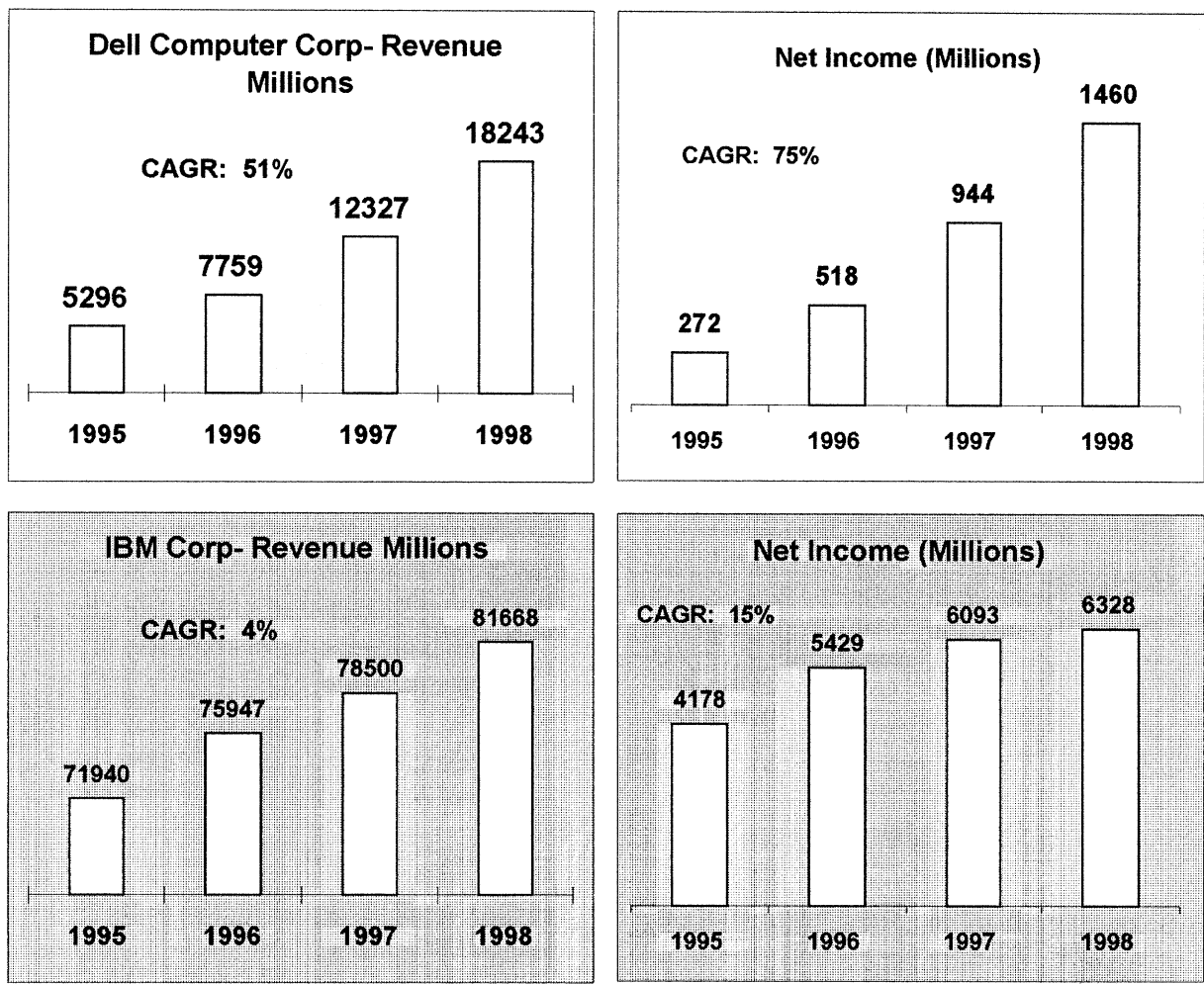
⁸ Leonard- Barton Dorothy. Core Capabilities and Core Rigidities: A Paradox In Managing New Product

presented in table 2). The focus of this work is on the last four years, the ones in which the exponential growth of the Internet has occurred.

Revenue and Profit Growth

Both companies have shown a very good performance in both factors with profits increasing faster than revenues. This is the result of both good cost/expense management and control, and the introduction of higher value added products. Figures for Dell are particularly outstanding, with revenues surging at an average of 51% and net income at 75% for the past four years (see figure 3).

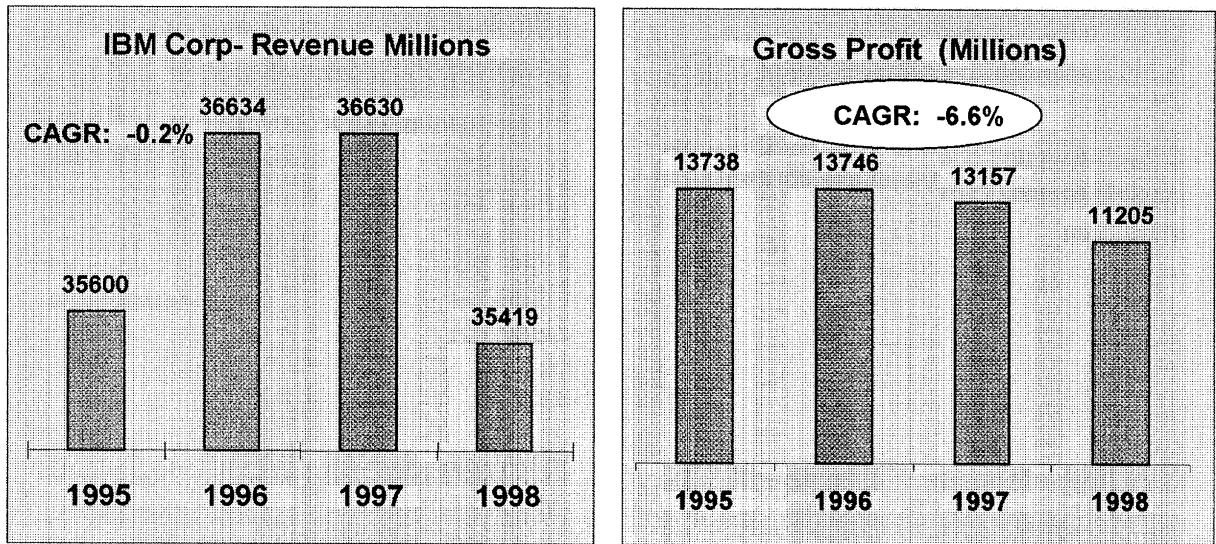
Figure 3. Dell and IBM Revenue and Profit Growth 1995-1998



Source: IBM 1998 and 1997 annual reports. Dell 1999 10K.

A more detailed view of IBM results is warranted, as this comparison shows the whole of IBM, a misleading view given its rich product portfolio. It is clear that in the period between 1995 and 1998 IBM competed only in the hardware segment directly with Dell. Tellingly, the results are not very encouraging when looking only at the hardware division of IBM. IBM has not growing its hardware business at all. In addition, when looking at the gross profit, the scenario becomes more negative in the sense that on average, IBM hardware business decreased by 0.2% per year while the gross profit (sales minus cost of goods sold) dropped by 6.6% during the period of analysis (see figure 4).

Figure 4. IBM Hardware Business 1995-1998



Source: IBM 1998 and 1997 annual reports.

For Dell, cost of goods sold (COGS) as percentage of total revenue has been decreasing despite reductions in hardware prices. This is a reflection of Dell's tight cost control philosophy. COGS as a percentage of revenue dropped from 80% in 1995 to 77.5% in 1998. The opposite happened at IBM; while benefiting from higher gross profits due to the premium prices in mainframes, the largest part of its hardware business, IBM saw its COGS as percent of revenue for the hardware segment go from 61.4% in 1995 to 68.4% in 1998⁹.

⁹ Dell and IBM 1998 annual reports. Author's estimates.

Shareholders Value: Return on Equity ,Working Capital and Stock Performance

Both companies have outperformed the industry in terms of return on equity (ROE). For 1998, Dell reported an incredible ROE of 62.9% while IBM stood at 32.6%. These results are well above 10.19% for the industry and 13.18% for the S&P 500.¹⁰ With regards to the stock price, shareholders of the two companies have received a return on their investment which by far was higher than the market. Dell and IBM's stock prices have outperformed the S&P 500 over the past 5 years. Dell, however, presented higher increased value over this period. Another measurement of stock performance, price per earnings, shows how well these two shares have performed over the last five years. As of February 2000, IBM's stock currently had a price/earnings ratio of 28.34x while Dell's stood at 66.70x.

With regards to market capitalization, as of February 2000, IBM and Dell were valued at \$202.8 and \$102.8 billions, respectively. It is worth pointing out that Dell, a company a quarter the size of IBM in terms of sales and profits, has a market capitalization of half the value of IBM.

3.3. Summary

This chapter was devoted to assess the competitive position part of the framework. I have presented the major forces affecting the PC hardware industry, as well as a comparison of the overall performance of two players in the industry. In the next two chapters I will analyze in detail the B2B e-commerce strategy of these two companies, as well as provide a perspective on how it fits with each company's overall business strategy. I will also present an assessment of their B2B e-commerce practices as a source of competitive advantage and value creation.

¹⁰ Investext. Mergent Fis Company report. Dell Computer Corp. # 3573577



Chapter 4

The Case of Dell

The purpose of this chapter is to apply the framework proposed in chapter 2 to Dell Computer Corporation. In particular I will be analyzing Dell's B2B e-commerce practice from the "pillars of value" (see chapter 2) perspective as it enhances the B2B strategy and also the overall strategy of the firm. I start by describing briefly the history of the company and then enter into the B2B practice specifics. Throughout the chapter, I will point out the company results obtained through the use of the Internet to serve business clients.

4.1. Dell –Brief History

Dell's history is a good example of the dream of an entrepreneur who has an idea, and with un-wavered belief and relentless pursuit of it, makes it come true. In 1983 Michael Dell started the business that gave birth to what today is Dell Computer Corporation, a company that reported sales of \$ 25 billion for 1999. At age 18, while attending the University of Texas at Austin, Michael Dell spent his weekends and evenings pre-formatting hard disks for IBM-PC compatible upgrades. He was delivering the up-grades door to door to local businesses. In fact, his concept of the business reflected his lifetime believe on the benefits of eliminating the unnecessary steps. With this simple concept of up-grading IBM compatibles and delivering them directly, he was selling \$ 6 million dollars by 1985. The increasing size of the business forced him to leave school. It was also this year that, Michael Dell decided to focus on assembling its own brand of PCs, a decision that led to exponential business growth.

High growth rates and attractive margins allowed Dell to fund growth internally, and Dell began fielding orders for up to a hundred computers at a time, from large oil companies to government agencies¹. Buyers wanted to meet directly with Dell, and this set the stage for the strong emphasis that Dell has put on serving large corporations, which drove most of the sales to the B2B segment. The change in focus, from selling up-grades to assembling of its own line of PC's, made the company achieve revenues of \$ 70 million by the end of 1985. By 1990, Dell was selling \$ 500 millions.

¹ Harvard Business School. *Product Development at Dell Computer Corporation*. Case 9-699-010. Rev Feb 1999. P 3.

Dell was profitable since the very beginning. It has only reported losses in one year, 1993. Dell attributes its 1993 poor performance to quality problems with its laptop line as well as to its poor execution in a forray to sell the products through the retail channel. Because of performance problems Dell had to cancel a new line of laptops under development that year and as a result, the Profit and Loss statement was hit with a write-off of \$ 20 million.² Dell's management reacted quickly by exiting both the retail channel and the laptop segment, which got the company back into profit the next year. Dell decided to re-enter the laptop segment only when the product managed to match or exceed the quality of its PC desktop line.

Dell's product line evolved with the PC market.³ Today, Dell offers several models of desktops, portables, servers and workstations. In the last years, Dell evolved to offer more value added solutions by providing services such as customized software and peripherals installation, and financing. I will be providing a complete view of Dell's offerings in the next section.

Along its history, most of all Dell's revenues come from B2B clients. Dell concentrates its sales efforts on large corporate accounts, medium and small businesses, federal and state governments, and educational institutions. Individual consumers are a growing but a small fraction of total sales. These individual customers have gained share of Dell's sales over the last four years due to the use of the Internet as an enhancement to Dell's business model, the Dell direct model.

4.2. Dell's strategy

Dell's strategy has been evolving from a best product focus to that of a provider of complete customer solutions, as conceptualized by Arnolddo Hax and Dean Wilde in what they called the Delta model triangle.⁴

Hax and Wilde define these two strategic options as follows. The best product strategic option builds on the classic view of competition through low cost or differentiation. The customer solutions option is based on a broad range of products and services that seeks to satisfy most, if not all, customer needs. The success of strategy based on providing customer solutions

² Harvard Business School. *Product Development at Dell Computer Corporation*. Case 9-699-010. Rev Feb 1999. P8.

³ Harvard Business School. *Dell Online*. Case 9-598-116. Rev March 1999 . P2.

hinges on being able to understand the overall economics of the client and provide him with a tailored offering that creates value for them. In this option, the customer bonding obtained through the creation of a close relationships with the client allows the company to better understand needs, anticipate them and work jointly to develop new solutions. These solutions might not even require superior products, thus moving the focus from superior value through the overall solution rather than through the individual elements in it.

Dell's initial strategy was to offer the best quality products at a very competitive price. This strategic positioning has evolved into a more encompassing one. Today the company's business strategy is "to deliver a superior *customer experience* through direct, comprehensive customer relationships, cooperative research and development with technology partners, computer systems custom-built to customer specifications and service and support programs tailored to satisfy customer needs"⁵.

As we see, Dell has evolved from providing good product value to delivering a superior customer experience. Evidence of this intent is shown by the initiatives the company is taking in services, financing and leasing (see table 1 for Dell's offerings).

Table 1. Dell Computer Corporation Current Offerings⁶

Line	Examples, comments
Desktop Computer Systems	<ul style="list-style-type: none"> ▪ <u>OptiPlex</u>, for corporate and institutional customers –for networked environments ▪ <u>Dimension</u>, for small businesses, workgroups and individuals
Notebook Computers	<ul style="list-style-type: none"> ▪ <u>Latitude</u>, for business customers seeking for reliability and maximum connectivity. ▪ <u>Inspiron</u> for home and small business
Enterprise Systems <ul style="list-style-type: none"> ▪ Workstations ▪ Network Servers ▪ Storage ▪ Software and Accessories 	<ul style="list-style-type: none"> ▪ <u>DellPrecision</u> line ▪ <u>PowerEdge</u> line ▪ <u>PowerVault</u> line ▪ Software and accessory programs (installation, customization etc) to enhance its computer systems: <u>DellWare</u>, <u>Gigabuys</u>, <u>DellPlus</u>, and <u>ReadyWare</u>
Service and Support	<ul style="list-style-type: none"> ▪ Custom hardware and software integration, leasing and asset management and network installation and support
Venture Capital	<ul style="list-style-type: none"> ▪ Dell Ventures

⁴ Hax Arnaldo and Wilde Dean. *The Delta Model: Adaptive Management for Changing World*. Sloan Management Review, Winter 1999.

⁵ Dell Computer Corp. Form 10K FYE 1/29/99

⁶ Ibidem

Even Dell's Venture Capital investments, which try to build new businesses that will strengthen Dell's overall customer solutions offer, is aligned with this vision.

The Dell Ventures is a group responsible for Dell's equity investments in businesses that enhance and support Dell's offerings. The long heritage of partnering with best-in-class companies for technologies and services that complement Dell's business allows Dell and its customers to benefit from having access to the latest innovations.

Finally, Dell is even partnering with its competitors in order to fulfill its vision of providing full customer solutions. In September of 1999, Dell signed an agreement with IBM Global Services, in which the former will provide an estimated \$ 6 billion worth of installation, basic and extended warranty, and high availability services to Dell's server, desktop, notebook, workstations and storage customers. Important to mention that this is not the only partnership in which Dell is engaged. Similar agreements have seen signed for service supply with companies such as Unisys Corp and Getronics Wang in Amsterdam. I will do my assessment of the strategic implications of the agreement with IBM in further chapters.

4.2.1. The Direct Model

As a fundamental part of its strategy, Dell has a unique business model called the direct model. Dell Computer used the principle of "eliminating the middle man" to sell its computers. Dell was the pioneer in selling its products directly to customers, without the intervention of distributors, retailers or any re-sellers. Before the Internet became a major force in the commercial arena, Dell used telephone, fax, and field-based representatives to approach and serve its customers. Today, the company has seen the power and potential of the Internet, moving a large part of its strategy to leverage on it and using these other "traditional" channels as complementors.

The direct model is a very efficient "custom built to order", high velocity, low cost distribution system characterized by direct customer relationships, build-to-order manufacturing, and products and services targeted at specific market segments⁷. As can be seen, this model does not only focus on the customer side but also on the integration of the whole value chain to include all the activities involved to deliver best customer satisfaction. The direct

⁷ Harvard Business School. *Dell Online*. Case 9-598-116. Rev March 1999 . P2.

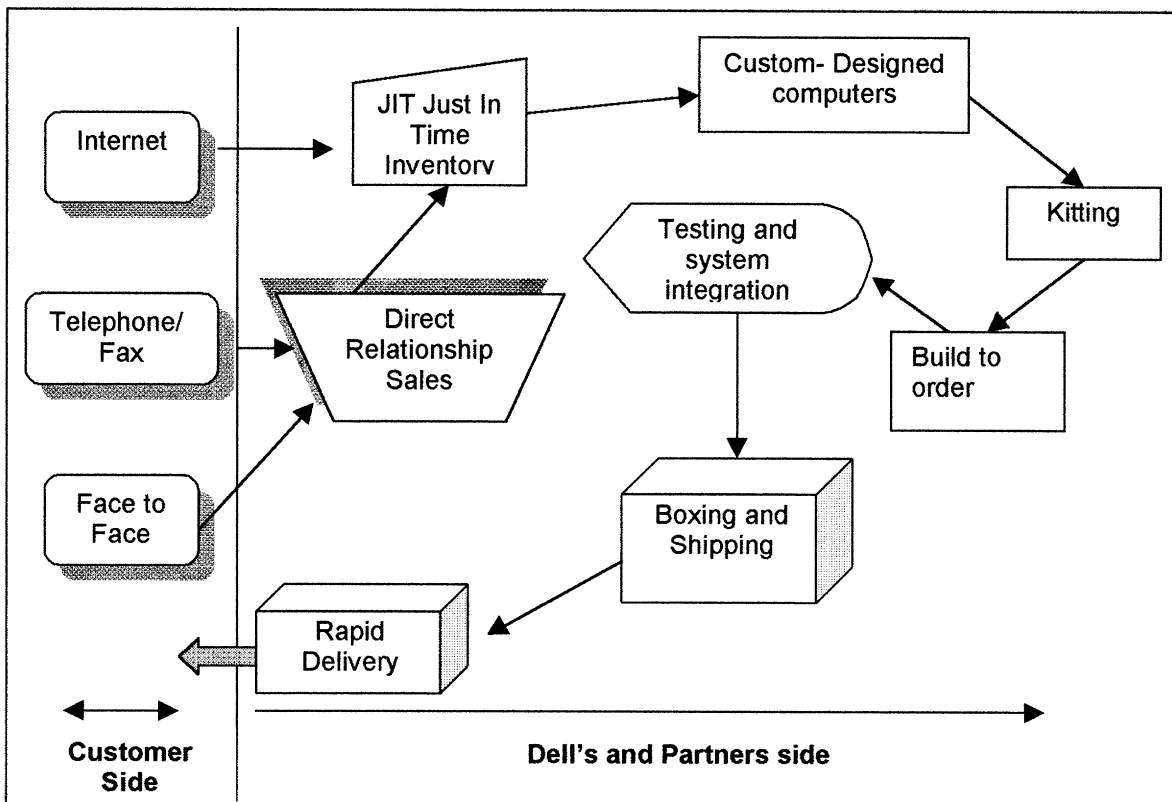
relationship with customers also allows Dell to benefit from real-time input and feedback from them regarding product and service requirements, products on the market, and future products they would like to see developed.

Custom built to order products are feasible, due to the flexibility of the manufacturing process which, together with strong supplier partnerships, enable the company to achieve faster inventory turnover and reduced inventories. This also results in a reduced risk of obsolescence, rapid incorporation of new technologies, and reduced time to market, factors that in a fast changing industry like hardware are determinants of success. But products are not the only ones that are custom built. The direct relationship with the customer also allows Dell to offer service and support programs designed to meet specific needs.

4.2.2. The Direct Model, Execution

Figure 1 illustrates the way the direct model works from end to end.

Figure 1. The Dell model⁸



⁸ Adapted from : *Direct From Dell*. Michael Dell and Catherine Fredman. Harper Business , 1999

In principle, the model continues the same as it was conceived. How the Internet has changed/improved or enhanced the model will be explained in the B2B e-commerce strategy section of this chapter. The following is a description of the fundamentals of the direct model.

Order, information and parts flow

Once Dell receives an order either by phone/fax, from its sales representatives (face to face) or through the Internet, it is sent to the factory. There, the configuration details are specified and broken down into a list of pieces and parts required to build the computer. This generates a specification sheet, and the pieces are supplied in a just in time basis. Just in time means that Dell receives only the materials it is ready to use immediately and only those specified as desirable to a particular customer. The specification sheet contains the configuration information for each customer. This sheet travels with the system being built throughout its assembly and shipping. When all the parts and components are in, they are put together into a kit (kitting in figure 1). Then, a team of workers takes the kit to assemble and initially test the system. Equipment is subject to intensive testing. At this stage, the standard or custom hardware and software is factory installed and tested. After the systems pass the tests, they are sent to be packed into boxes, and then they are delivered to customers. Usually the entire process from order receipt to product shipping requires only about 36 hours.⁹ Rapid delivery, 24x7 technical support, ongoing feedback from customers and real time information to customers regarding their orders help ensure customer satisfaction and the overall customer experience.

Direct Model-partnerships required

In order to achieve efficiencies all across the cycle, Dell has built partnerships with suppliers, and delivery service providers. Suppliers have direct access to information on levels of stocks and incoming orders. Dell establishes contracts or agreements with them to supply in a continuous basis. These partnerships are so strong that most of Dell's suppliers have located some of their distribution or manufacturing facilities next to Dell's plants in order to reduce delivery costs and time. But the partnership goes beyond that to also include collaboration in product development. As Michael Dell pointed out, " the supplier effectively becomes our partner. They assign their engineers to our design team, and we start to treat them as if they

⁹ Harvard Business School. *Dell Online*. Case 9-598-116. Rev March 1999 . P2

were part of the company. For example, when we launch a new product, their engineers are stationed right in our plants”¹⁰.

Dell has also signed agreements with delivery service providers such as Federal Express and UPS to provide the delivery of the goods for Dell. A good example of these partnerships is provided by Sony. Sony provides the monitors for Dell. The quality of these monitors is so high that Dell puts its name on them. Dell decided not to have any inventory of monitors based on the legendary reliability of Sony (Sony monitor’s defects per million are lower than 1000¹¹). As such, with the purpose of eliminating the unnecessary steps generated by bringing the monitors from Sony to Dell and then from Dell to the customers, Dell and Sony agreed on a logistics scheme that creates a virtual factory from distant Sony and Dell facilities with the help of UPS/Federal Express. Once a computer box order is ready for delivery, Dell communicates Federal express or UPS to go to Dell’s factory and pick up the number of computers in such order. Simultaneously, the shipping company picks up the corresponding number monitors at Sony’s plant in Mexico, then matches the computers and monitors and finally delivers the complete order to Dell’s customers.

Direct Model -Benefits

Dell’s has benefited from its direct model in many ways. Reduced inventories at Dell’s sites, the ability to offer lower prices due to channel avoidance, and increased customer knowledge (intelligence) are some of the main benefits.

Parts ordered in a just in time basis allow the company to operate with extremely low inventory levels. Dell’s 13 days of inventory (before the Internet) compared to 75 to 100 in the industry gave the company a hedge over competitors. Low levels of stocks, reduced time to market by eliminating the temptation not to sell a new model until the older one was depleted, and also liberated working capital that could be invested more efficiently.

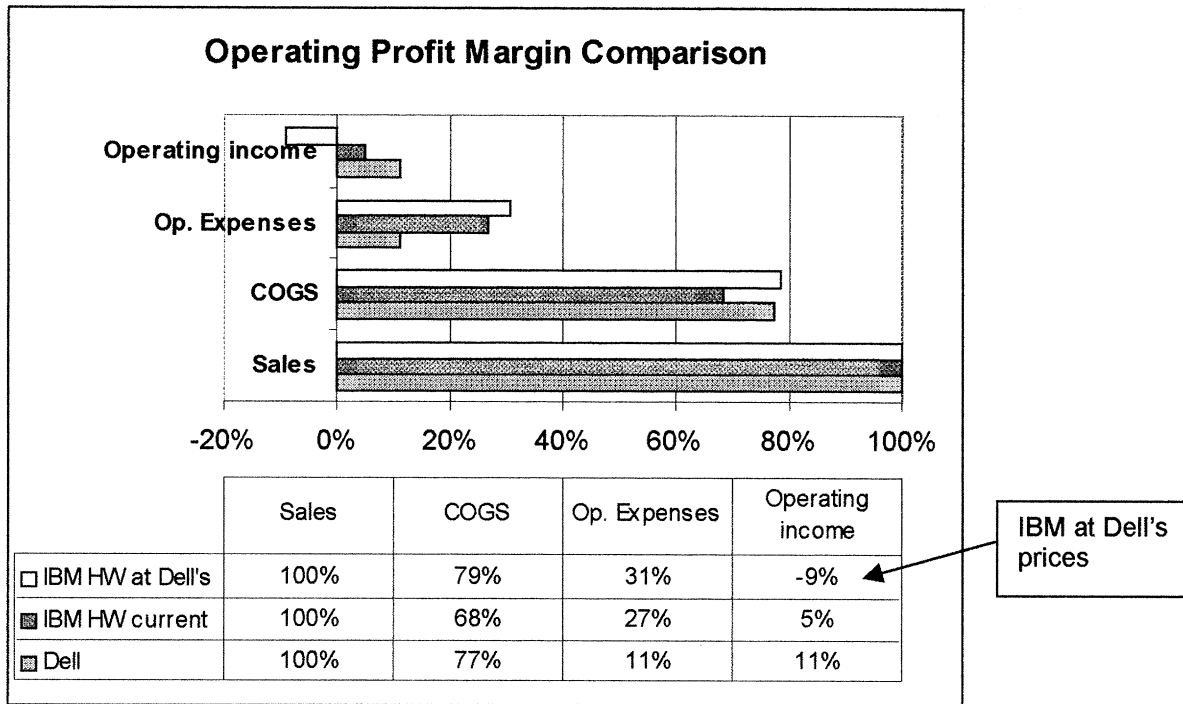
The direct model eliminates the need to support an extensive network of wholesale and retail dealers, thereby avoiding dealer markups. It also avoids the higher inventory costs associated with the wholesale/retail channel as well as the difficulties found due to the competition for

¹⁰ Magreta, Joan. *The Power of Virtual Integration: An Interview with Dell's Computers Michael Dell*. HBR, 1998

¹¹ Ibidem

retail shelf space¹². Thanks to the direct model, Dell is able to transfer the cost advantages earned through the direct model to its customers, thus being able to offer prices on average 10 to 15% below its competitors¹³. Should competitors like IBM attempt to match Dell's prices, they would end up with losses. Figure 2 shows a comparison between Dell's and IBM's hardware division current margin structure, and a simulation for IBM's P&L at 15% lower prices.

Figure 2. IBM and Dell. Price impact on Profit



Source: Merrill Lynch. IBM report for e-business analysis forum (Dec 1999). Dell 10K. Author's analysis.

Without any price reduction, Dell outperforms IBM's hardware division by six percentage points. Other variables held constant, a reduction on IBM prices of 15% would result in an operating loss of 9%.

In addition, the direct model allows the company to maintain, monitor, and update a customer database that can be used to shape future product and service offerings. The direct approach,

¹² Dell Computer Corp. Form 10K FYE 1/29/99

combined with the efficient procurement, manufacturing and distribution processes, allows Dell to bring technology to its customers faster and more competitively priced than many of its competitors¹⁴.

4.3. Dell's B2B strategy

In this section I describe Dell's B2B strategy as it was initially conceived and executed through the direct model and how it evolved to incorporate the Internet as a natural extension of the model. On explaining this strategy, I follow the framework for analysis as I described in chapter 2.

4.3.1. **Pillar: Inputs**

Dell's suppliers-procurement

Dell does not follow the policy of "we have to develop everything" that so describes IBM and Compaq historical attempt to build many components by themselves. These companies manufacture memory chips, disk drives and application software; and are to a large extent vertically integrated. On the contrary, Dell seeks for the best in class suppliers for these components and avoids the high fixed costs of the facilities and research and development that being best in class in any supporting technology entails. This has allowed Dell to grow at more than 50% per year without having to commit the amounts of capital required to build plants and laboratories to supply the components for this growth. In addition, building these plants and know how takes time that Dell could use to be faster at getting the products to the customer.

In order to address the above mentioned needs, Dell has built strong partnerships with suppliers. Dell's practice since the very beginning has been to have as few suppliers as possible (today, 40 suppliers provide 90% of Dell's material needs¹⁵) and keep them only for as long as they maintain the leadership in technology and quality. The partnerships are so solid and trustful that Dell's suppliers know exactly what are the daily production requirements. Information and plans are shared freely and openly with them. Dell's suppliers have access to information on the level of inventories and also incoming orders; they also ship to Dell every day or every hour, as the company requires. In addition, Dell's ability to operate in a just-in-

¹³ Harvard Business School. *Dell Online*. Case 9-598-116. Rev March 1999. P6

¹⁴ Dell Computer Corp. Form 10K FYE 1/29/99

¹⁵ Michael Dell and Catherine Fredman. *Direct From Dell*. Harper Business , 1999 p177.

time basis was facilitated by its suppliers, who have built warehouses for their components within 15 minutes from any Dell factory.

The information sharing has been possible thanks to Dell's management emphasis on building the IT capabilities required to do so, first with EDI and then with the Internet.

Dell's embrace of the Internet is a direct result of its superb capabilities in recognizing the limitations of the systems in place and the proactive search for the best technologies to enhance Dell's direct model. As an example in the supply side and before the coming of age of the Internet, Dell was using what at that time was the most effective collaborative tool to link with suppliers, the electronic data interchange or EDI. Some of EDI's limitations include its inflexibility, in the sense that it provides basic information about transactions but is unable to adapt to rapidly changing market conditions, its high implementation costs, and its undesirable locking in of suppliers and locking out of new customers, because it is based on proprietary technologies rather than open standards. In addition, EDI is a pure B2B tool and excludes the end user from the value chain.¹⁶ All these elements made of EDI a less than ideal solution for Dell. Two of Dell's key strategic advantages are its ability to connect all the members of the chain from point to point in such a way that information flows freely, and incorporate new customers or eliminate companies that become weak links in the chain. Dell's management quickly recognized that Internet based technologies would overcome many of the problems with EDI. The Internet is ubiquitous and open to everybody, is easy to use, is flexible enough to facilitate work inside an organization (Intranet), communication with outside world (the World Wide Web), and secure enough to work with privileged third parties (Extranets). Beyond this, the Internet is cheap and global in reach.

The Internet has enabled Dell to create an "information partnership" with its suppliers by treating them as collaborators who together find ways of improving efficiencies across the entire chain of supply and demand. Dell's strategy is to connect to its suppliers in the same way that it is connected to customers. By creating Web based links for each of Dell's suppliers, Dell facilitates the rapid exchange of information. As an example, Dell has built a Web based link for Intel that allows Dell to manage order flow more quickly and improve just-in-time delivery of parts.

¹⁶ The Economist. *You'll Never Walk Alone*. Survey. June 26, 1999

Finally, from the procurement side, the Internet has also brought Dell operational efficiencies such as paperless purchase orders, and better accounts payable control.

4.3.2. Pillar: Processes

Manufacturing, planning and forecasting

The company manufacturing built-to-order system is designed to allow quick production of customized computers. Manufacturing Includes assembly, functional testing and quality control. The main use of the Internet in manufacturing is the sharing of information in a real-time basis with its suppliers. The Internet has allowed Dell to transmit data on product quality to its suppliers who are then able to react quickly to solve any problem that might appear. This sharing of information and the partnerships built with suppliers also allow for better planning and forecasting. By having real-time information from the customer side and the market, suppliers as well as Dell can make strategic and tactical decisions in real-time too.

Product development

For product development, Dell has built cross-functional teams that involve not only Dell's personnel but also people from its partners. The company has partnerships and working relationships with many of the world's most advanced technology companies. Dell's engineers work together with technicians from these companies to manage quality, integrate technologies and design. The Dell venture program is allowing the company to be close to the hottest technologies. By investing in technology related companies, Dell gets access to the latest developments in its area of interest.

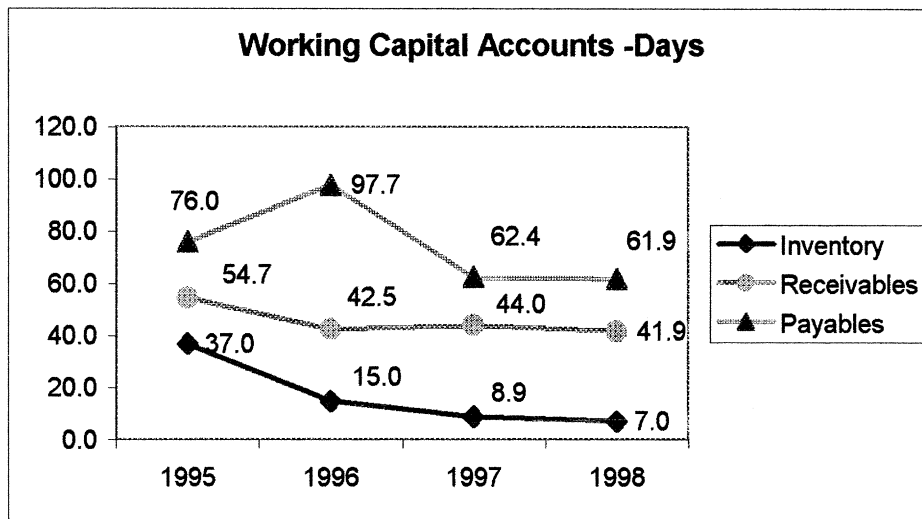
Dell has leveraged the Internet to do its product development through better and faster communications and flow of information between its partners, factors that are critical to reduce time to market. The close relationship and real-time information from customers allows Dell to continuously have the latest information on customer needs. As suppliers also have real-time information on Dell's customers, this information is processed and analyzed by the cross functional teams who in continuous contact with customers create better solutions for them.

Working capital management

Tight and on-line connections with customers and suppliers, paperless purchase orders and invoices, and sales-accounting-manufacturing-inventory–supply integration are characteristics

of Dell's model using the Internet. Reduced human interaction in accounting and control minimizes mistakes and makes it easier to manage accounts receivable, payables and inventory. Better working capital management and control allows the company to quickly react to any deviations from its working capital acceptable ranges, thus maintaining a healthy cash flow position. Figure 3 shows the working capital performance for Dell from 1995, the year in which the Web commercial applications were broadly adopted. Dell launched its Web site in July 1996, an event that resulted in an impressive improvement on inventory and payables. This increased inventory turns puts Dell in a better position against its competitors with regards to time to market since this implies faster and automatic action from suppliers to manufacture and deliver the parts to Dell, resulting in shorter manufacturing and delivery cycles for Dell. Dell's entire process from order receipt to product shipping requires only about 36 hours¹⁷.

Figure 3. Dell's working capital indicators



Source: Dell's 1998 annual report and 10k report.

Knowledge Management- customer intelligence

Since very early in its history, Dell has been able to track each unit sold, from the moment of the first sales contact, through the manufacturing process, to post-sale service and support. This has been streamlined by the use of the Internet, through Extranets and Intranets based tools. This platform has also improved the company's ability to track and study information about its customers. Using IP compatible databases to build customer intelligence, Dell is

¹⁷ Harvard Business School. *Dell Online*. Case 9-598-116. Rev March 1999. P3

able to track purchasing trends, advertising effectiveness, and thus target more efficiently its advertising and promotion programs. The database, allows Dell to gather information about customer satisfaction, and also provides the opportunity to test new propositions in the marketplace prior to conduct product or service introductions. Needless to say, this database is being up-dated on a real-time basis from the Web connections with customers.

Another function that has been moved to the on-line world partially is sales training. Through the use of Intranets, Dell is being able to communicate latest information on products and services to its representatives. Sales techniques that can be communicated on-line are being taught through the intranet portals, allowing representatives to spend much more time on productive selling and customer relations.

4.3.3. Pillar: Outputs

Dell's customer

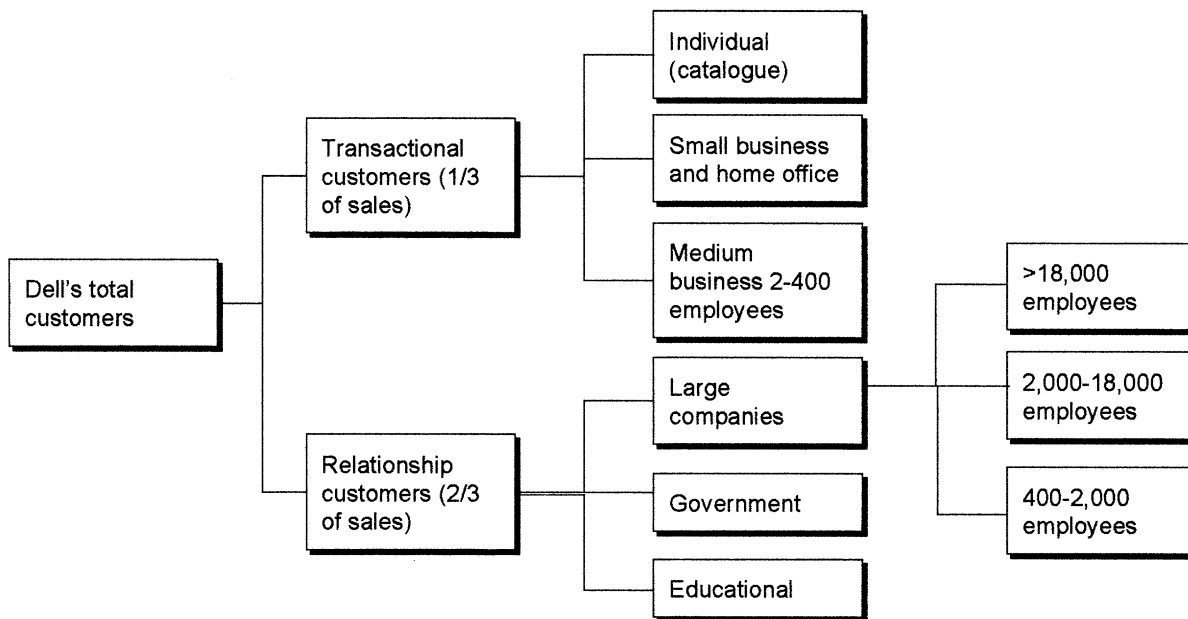
Dell initiated activities by focusing on business organizations and institutions. To approach these entities was a natural course of action given Michael Dell's goal to get rid of intermediaries. A retail oriented approach would have been almost impossible in pre-Internet days without massive support in traditional media due to the direct relationship sales and distribution objective. Today, approximately 90% of the company sales still go to institutions – business and government- and 70% to very large customers, those that buy more than \$1 million per year ¹⁸.

Currently, Dell divides its customer in two groups: transactional and relationship customers (see figure 4). Transactional customers are individuals and small and medium business that think of each hardware purchase as an individual one. Dell sees these customers as more price sensitive, and therefore as those for whom the economics of the purchase decision is the key variable. Dell's main competitors in this segment are imitators, such as Gateway and the retail channel in general. The transactional segment has been the most affected by the market trends described in chapter 3. Price reductions caused by forces such as bundles of Internet services providers and low cost/quality producers are the main concerns for any company working to serve this segment.

¹⁸ Magreta, Joan. *The Power of Virtual Integration: An Interview with Dell's Computers Michael Dell*. HBR, 1998

Relationship customers are large corporations and institutions. They see computer hardware purchasing as a multi-dimensional process. These customers can be even more price sensitive than transactional ones, but once the price hurdle is reached, other attributes like performance, reliability, quality and service levels come into play. For the same price, these factors tip the balance of one vendor vs. another. Despite Dell's price advantage, if the company failed to deliver on these other attributes, it would be out of the race. Dell's main competitors in this segment are Compaq, IBM, HP and other brands sold through VARs and national resellers.

Figure 4. Dell's segmentation



The different dynamics of each segment has made Dell develop different strategies for marketing and sales to serve them.

Dell's marketing and sales strategy

Transactional customers-B2C approach

Dell markets its products and services to these customers by advertising in trade and general business publications and by mailing a broad range of direct marketing communications.

Some examples of the latter are customer newsletters, promotional handouts and catalogues.

For small to medium businesses and individuals, direct relationships are also established through account representatives, telephone sales representatives or passive Internet contact.

Relationship customers-B2B approach

Direct sales marketing programs and services are specifically developed for these relationship customers. Across the segments, strategies differ slightly based on whether the client is a large organization, an educational or a government institution. In general, prices and payment terms are established on a contract basis. Marketing activities targeted to relationship customers basically include direct marketing tactics such as sales and marketing calls, customized promotions and direct mailings to purchasing agents.

For large and institutional customers, the company works with the customer prior to the sale to plan a strategy to meet that customer's current and future technology needs. After the sale, the direct relationship is maintained by establishing dedicated account teams, consisting of people from sales, customer service, and technical personnel, dedicated to the firm's large corporate and institutional customers. In general, account teams provide each customer with a single point of assistance on several aspects such as technology needs assessment, system configuration, order placement, lifecycle cost management, and detailed product, service and financial reporting. Teams serving these clients are formed by outside and inside sales representatives. Outside sales representatives or people in the field (account executives) are in charge of a region and responsible for understanding customer's needs in products and services; they are also the single point of contact for business clients. They are paired with inside sales representatives and are dedicated to common relationship accounts. Inside sales representatives are the ones who take care of transactional customers and collaborate with outside sales representatives in activities such as order processing and handling incoming calls.

For global and multinational corporate clients, Dell has a global account specialist, again, a single point of contact. Special global pricing, and globally consistent service and support are part of the offerings. In addition, these customers are provided with access to central purchasing facilities.

For educational and health institutions as well as state, federal and local government agencies, Dell maintains account teams formed by specialized sales representatives, health care sales representatives and technical support people. As an example, Dell has a U.S. General Services Administration Schedule contract, through which it sells to U.S. federal governmental agencies.

As an effort to provide value added activities for its customers, and also because of the trends observed in the industry (chapter 3) towards service and total solutions, Dell is also providing on-site service. Important to mention, service representatives are mostly outsourced from well-known and respected service providers such as Digital Equipment Corporation and, most recently, IBM (the strategic implications of this agreement will be discussed in chapter 6). The customer relationship, however, is managed by Dell. Some examples of clients benefiting from these services are Boeing and Eastman Chemical. At Boeing, which has 100,000 Dell's PC's, Dell has about 30 people literally "living" at the client site and working together with the internal PC department¹⁹. For Eastman Chemical, who has a unique software mix, Dell provides the software loading. In order to do this, Dell had to create a massive network in one of its factories with high speed Ethernet accesses to a Dell server which stored and loaded Eastman Chemical's software to each machine as it came out from the assembly line. This is saving Eastman Chemical an average \$200 per machine, beyond the office space previously required to do manual loading at Eastman's IT department, and one to two hours of time per machine. Dell only charges a small amount for this service, making of this move more part of a strategy to build loyalty rather than of one which aims to increase revenues through services.

Leveraging the Internet for marketing and sales activities

From the description of the direct model, we can see that the Internet represents a natural extension and enhancement of the direct model. Dell's management is committed to refine and extend the advantages of this business model by moving larger volumes of sales, service and support to the Internet. As an example of this commitment, the company as of March 31, 1999 was receiving in excess of two million visits per week to its Web site www.Dell.com where it maintains 44 country specific sites. Company sales generated through the Internet achieved \$ 14 million per day by the end of the fourth quarter of fiscal year 1999 and

¹⁹ Magreta, Joan. *The Power of Virtual Integration: An Interview with Dell's Computers Michael Dell*. HBR, 1998

accounted for approximately 25% of that quarter's total²⁰. This figure is well below the figure for the third quarter of the same year, due to heavy expenditure on Q3 resulting from anticipating purchases for replacements and upgrades for the Y2K. By the end of Q3/99, Internet sales totaled \$ 35 million per day. At this running rate the Internet will account for annual total sales of 12 billion, and 50% of total 1999 revenue.²¹

Dell's Premier Pages

Customers and potential customers can have access to great deal of information through the Web site. Customers could get information about the company's offerings, can configure and purchase systems on-line and also can access support and technical information. For the corporate and institutional customers, Dell has developed its Premier pages, intranet Web pages customized to their needs. The Premier pages are password-protected, customer specific Web pages that allow customers to²²:

- Configure the systems
- Buy systems and services at approved, discounted prices (according to the configuration selected)
- Track orders and inventory
- Provide purchasing history
- Access contact information for Dell service and support team members

For small business customers, Dell offers an on-line virtual account executive. As explained before, Dell treats small business clients the same way as individuals. As such, no customization is provided yet. But unlike individuals, Dell's large and small businesses have access to both a spare-parts ordering systems and a "virtual" help-desk, which features natural language search capabilities and direct access to more than 50,000 pages of technical-support data.

Services

With regards to services, customers can access Dell via a toll free hardware support line that is accessible 24hours a day everyday. Technical specialists maintain close contact with Dell's

²⁰ Dell Computer Corp. *Form 10K FYE 1/29/99*

²¹ Morgan Stanley Dean Witter . *Report on Dell*, November 17, 1999. U.S. Investment Research.

²² HBS. *Dell On line*. Case # 598 116 p 17.

marketing, manufacturing and product design groups and have on-line access to each customer's original system configuration and service history. In addition to this, customers can receive automated and on-line technical support through the Internet Web site, e-mail, and on-line subscription services. Traditional media such as telephone and fax continue to be used. Recently an interactive Web-based tool was introduced to provide additional customer support.

Important to mention that many of company's systems include software that helps customers diagnose and communicate system problems. Today some of these software programs can be downloaded from the Web site. Several systems sold by Dell also include a built in diagnosis program that can provide on-line information about system malfunctions²³.

The Internet and Sales Productivity

The Internet has brought Dell dramatic efficiencies on the sales side. As an example, before the Internet, Dell's sales representatives used 45% of their time resolving operational issues, 15% doing active selling –building relationships, prospecting, consulting- and 30% travelling. With the use of the Web site, this allocation has shifted towards 45% on active selling, 15% on operational issues, while keeping traveling the same²⁴. The Internet is allowing the most valuable asset of a company, its people, to spend more time thinking and doing value added work instead of resolving operational issues. By using the Internet, Dell is getting the most from its salespeople. Initial fears regarding job losses in the sales teams, were rapidly eliminated when they were able to see the results of their increased productivity: higher sales.

Refined Segmentation

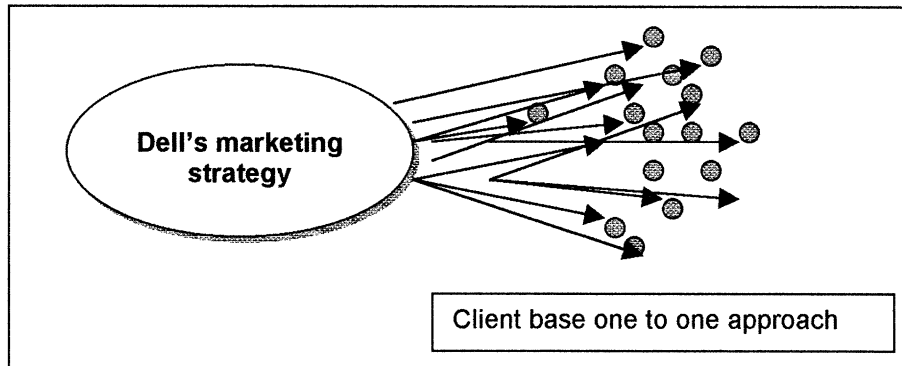
The Internet has also allowed Dell to push forward its traditional segmentation model. The company is cutting its existing segments into more and more smaller groups, getting up to the point of having segments of one (see figure 5). By creating highly customized Premier pages and fully exploiting the richness of having a complete customer database that can be accessed on real-time, Dell has been able to rapidly build a customer intelligence model that allows for totally customized products and services. Sales account executives are able to pull out relevant information from each of their customers to help them develop solutions to better

²³ Dell Computer Corp. *Form 10K FYE 1/29/99*

²⁴ HBS. *Dell On line*. Case # 598 116. P18

satisfy their needs. Obviously this has been possible due to the strengths of the direct model already presented.

Figure 5. The Internet. Allowing to move towards segments of one



B2C leveraging on B2B relationships

B2B is also providing Dell with a natural gateway into the B2C market. The B2B link through the Premier pages has also allowed Dell to create opportunities for cross selling. By offering the "employee purchase program", employees of the corporate customers are able to buy their personal computers through their corporate relationship/contact with Dell. Employees are given usernames and password to access Dell's Premier pages. They are also given (if their company allows for it) the opportunity of not paying for the computer right away but instead, having the cost of the computer deducted from their salary. This capability has given Dell access to millions of customers at a very low risk.

4.4. Opportunities for further growth

Although I will be addressing the future challenges for Dell in chapter 6, I would like to point out here what are the most natural things for Dell to continue doing. We have seen the hardware market stagnates and prices drop dramatically. We have also seen how the market has evolved towards demanding more complete solutions and services. Finally we have seen how important is to have real-time integration from end to end going from the supplier through the company, and all the way to the customer. These three facts are driving Dell's management to focus immediately on: 1. Moving even greater volumes of products sales service and support to the Internet , 2. Using the Internet to improve the efficiency of Dell's

procurement because currently some suppliers are still not streamlined and fully connected to Dell's business system and, 3. Further expanding its range of value-added services. Dell has established as a target to execute most of its operations through the Internet. Important progress has been made. As evidence of this intent, Dell has achieved:

- 50% of Web enabled sales
- 40% of Dell's technical support through the Internet
- nearly 70% of order status transactions checked on line²⁵

In order to achieve this goal of higher sales through the Internet, Dell is also aiming to reduce connectivity problems with current and potential customers. As a proof of this, Dell recently signed an agreement with Webmethods. The purpose of this agreement is to solve problems such as the ones experienced by some clients that had, after completing all the purchase, to re-key each order into their own Enterprise Resource Planning (ERP) systems, or their own procurement or purchasing system. This was pretty inefficient and resulted in increased operation costs, longer transactions time and overall decreased productivity. Statoil in Norway²⁶ currently faces this connectivity problem. Dell expects its customers to be able to link their applications directly with the company's to make their purchases in one easy step.

In order to address the second point, Dell is continuously acquiring top-notch applications to streamline its connectivity from end to end. As an example, Dell has recently bought i2's RHYTHM software on Supply Chain Management, to provide the comprehensive integration of processes that enable the exchange of information and the activities involved in their relationship with partners.

With regards to value added services, the idea is to take the current business model to a higher level and offer a bundle that involves services. Dell has shown capabilities in delegating service provision to third parties while at the same time controlling the customer relationship. This is a positive skill that allows Dell to have a robust position in the marketplace without building in house service capabilities. A good example is the deal with IBM global services described earlier and to which I will devote one part of chapter 6 to address its strategic implications. Another example of these service partnerships is the

²⁵ Dell Computer Corporation. Web site. Fact Pack. www.Dell.com.

agreement with Digital Equipment Corporation, now owned by Dell's main competitor, Compaq.

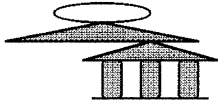
In addition, for its business customers, Dell has a disadvantage against other vendors such as IBM and VARs and resellers in general. These competitors are able to offer not only hardware but software, accessories, and even complete solutions. Dell's management has started to address this issue in two ways, directly and, indirectly by using third parties. On the direct side, some initiatives such as Dellplus have been put in place. Dellplus is a program by which the company offers specialized hardware and software integration services. Under this program, a customer's unique hardware and software integration requirements can be satisfied at the time the customer's systems are manufactured²⁷ at Dell's facilities. On the indirect side, for many integration services as well as for installation and support, the company partners with independent third party contractors or subcontractors to satisfy its customer needs.

4.5 Summary

This chapter presented the case of Dell, its unique business model and the Internet as a natural enabler to expand the power of that model. The Internet, combined with the direct model has brought Dell tremendous advantages over its competitors specially in velocity –time to market -and faster recognition of market changes. Dell's model flexibility has allowed the company to achieve good competitive positions in a relative short period of time. Several strategic issues however, need to be resolved.

²⁶ Frank Blaker. Statoil. Norway. February, 2000

²⁷ Dell Computer Corp. *Form 10K FYE 1/29/99*



Chapter 5

The Case of IBM

In this chapter I apply the framework proposed in chapter 2 to IBM Corporation. The analysis presents an overview of IBM's strategy, its B2B strategy and B2B e-commerce practices and focuses in particular on the hardware business in which IBM competes more directly with Dell. However, whenever warranted, I do not limit my analysis to that particular business unit since there are some synergies arising from the existence of other IBM businesses that provide the hardware operations with competitive advantages versus Dell. Following the structure of chapter 4, I start by describing briefly the history of the company and then enter into the B2B practice specifics, making special emphasis on indicating the impact on IBM's performance of the use of the Internet for the B2B part of the business. I end by showing a comparison of what have been the achievements of IBM and Dell with regards to market share in the corporate segment, as a proxy to assess the relative success of their strategies.

5.1. IBM- International Business Machines Corporation- Brief History

IBM's history can be divided into six eras (1) :

- the early years(1890-1938),
- the era of innovation (1939-1963),
- a new family (1964-1980),
- the PC era (1981-1992)
- a new IBM (1993-present)

The early years

Although the company was incorporated in 1911 as a Computing-Tabulating-Recording Company, its history goes back to 1891 when the US Census Bureau sponsored a contest to find an efficient means of tabulating census data to have a better count of the population. The winner, a German immigrant –Hollerit- capitalized on the success of his punch card tabulating machine and founded the Tabulating Machine Co, in 1896. Later in 1911 a merger between this company and two others, Computer Scale Co of America and International Time Recording Co, was orchestrated by a trust organizer. The result was a company called C-T-R or Computer-Tabulating- Recording Co, a diversified company that became difficult to

manage. In 1914 Thomas Watson, former executive at NCR, became CEO. It was he who put the seeds for making of IBM the customer driven company it is still today. Under Watson's management the company grew through the focus on large scale, custom-built, tabulating solutions for businesses and expansion in both the United States and overseas markets. Because of this worldwide presence, the name was changed to International Business Machines in 1924. Watson was so successful that he managed to keep the company producing and growing even during the Great Depression.

The Era of Innovation (1939-1963)

Despite having to put the company's facilities at the service of the government for war purposes, IBM continued R&D efforts to create an automatic calculation machine. Finally, in 1944 and after 6 years of development with Harvard University, IBM fully entered the computing world as we know it today by developing the automatic sequence controlled calculator, the first machine that did calculations automatically. From then onwards, IBM would lead the computer world through a series of innovations, from the IBM 701, a large computer based on the vacuum tube, to fully transistorized mainframes. IBM's lead in computing forced the company to verticalize into other areas to allow it to fully exploit the power of its innovations. For instance, in 1957, IBM launched the first computer disk storage system and also introduced FORTRAN, the computer language.

In 1952 Thomas Watson delegated the presidency of the company to his son, Thomas Watson Jr., who foresaw the role that computers would play in the world and pushed IBM towards this goal. Under his leadership, IBM's revenue grew from a \$900 million to \$ 8 billion and from 72,500 to 270,000 employees ¹.

1964-1980 A New Family

On April 1964, IBM introduced the system 360, the first family of computers to use interchangeable software and peripheral equipment. This also led to innovations in the way the company was selling technology, as IBM decided to unbundle the components, a seminal event that gave birth to a multibillion dollar software and services businesses. Today IBM is the leader in these two industries. In 1971 Vincent Learson and then Frank Cary in 1973 took over the presidency of the company.

¹ <http://www.ibm.com/IBM/history/story/text.html> p3

1981-1992 The PC era

In 1981 John Opel was appointed CEO. This coincided with the beginning of a new era of computing. The birth of the IBM personal computer put the IBM brand in the hands of individuals, small businesses and homes. With the PC, IBM started its relationships with Intel and Microsoft by buying from them the processors and operating systems, respectively. In 1985 John Aker became CEO.

With the further development of the computer, IBM laid a foundation for many other applications, including network computing. Computers were placed in hands of millions of people and the client/server revolution took over. Yet, the company was not always ready to capitalize on its own revolutionary actions. IBM's lack of commitment to take advantage of the client/server architecture and the losses in the PC sector it had basically created led to reported net losses of US \$ 8 billion in 1993.

The New IBM: 1993-present

In April of 1993, Louis Gerstner was appointed chairman and CEO. His focus was to rebuild the product line, shrink the workforce and capture cost reductions in general. He decided to keep IBM together, despite pressure to split it into separate businesses, by recognizing that the company's most prominent strength was the ability to provide integrated solutions for its customers.

The Internet and network computing are currently the marking trends in the industry. IBM has recognized this and has invested heavily in R&D to provide integrated business solutions that leverage on both. Louis Gerstner continues as CEO and under his leadership IBM has recovered from the lackluster performance of early last decade.

5.2. IBM's strategy

Contrary to Dell, IBM's strategy has been from the very beginning to offer best customer solutions, as defined in chapter 4.

Two evidences of IBM's strategic focus towards customer solutions are presented by its communicated mission and product and services offerings.

The company mission specifically states that:

“At IBM, we strive to lead in the creation, development and manufacture of the industry’s most advanced information technologies, including computer systems, software, networking systems, storage devices and microelectronics. We translate these advanced technologies into value for our customers through our professional solutions and services businesses worldwide”²

IBM offers a wide variety of products and services aiming towards providing an integrated solution for customers, from hardware to software, consulting, finance and services in general. IBM’s has executed its strategy by building capabilities in the areas in which it is committed to provide solutions to customers. IBM is flexible on how to acquire these capabilities, going from internal development, to acquisition and partnering with someone that has already built them. Differently from Dell however, IBM will first aim to develop these skills organically, and only then go to the outside world to acquire and build the required skills.

All this diversity at IBM begs the question of what business is the company really in. The answer, as stated in its mission, is broad: hardware, software, technology integration services and consulting, whatever is needed to provide the full solution the customer requires. Table 1 provides more details.

Table 1. IBM’s current offerings

Business Segment	Examples & comments
Hardware	IBM’s hardware segment is composed of servers, personal systems and technology (storage, hard drives and semiconductors, printers and networking products). Servers are sold directly by IBM or through business partner relationships; personal systems are mostly sold through resellers and the retail channel; the technology segment sells internally to IBM or to OEM’s..
Software	IBM’s most profitable segment. Includes open and Host- based systems. Examples: s/390 middleware, OS 400, Tivoli .
Global Services	The most promising and highest growing segment Professional services such as system integration, consulting and education and training. E- business services. Product support & services: maintenance and network services
Global Financing	Includes used equipment sales, software and services financing, working capital finance and general interest income.
Enterprise Investments/ other	Venture Capital business unit. Investments in a wide spectrum of initiatives in information technology solutions supporting the hardware, software and services segments of the company

² IBM, 1998 annual report

IBM competes more directly with Dell in its hardware segment. However, we have seen that the areas of competition are expanding since Dell is increasingly recognizing that the best opportunities for growth are not restricted to hardware. Dell has perceived that an imperative for surviving in the new economy is to offer integrated customer solutions, and in order to achieve this, Dell needs to build capabilities in services, consulting, and software.

As a source of competitive advantage, IBM has a particularly strong position in its service segment. Total sales for this segment have grown at a rate of 14% over the past 3 years and are gaining share of the total revenue mix (see table 2). The Global Services business alone is almost twice as big in revenues as Dell's total business (see figure 1).

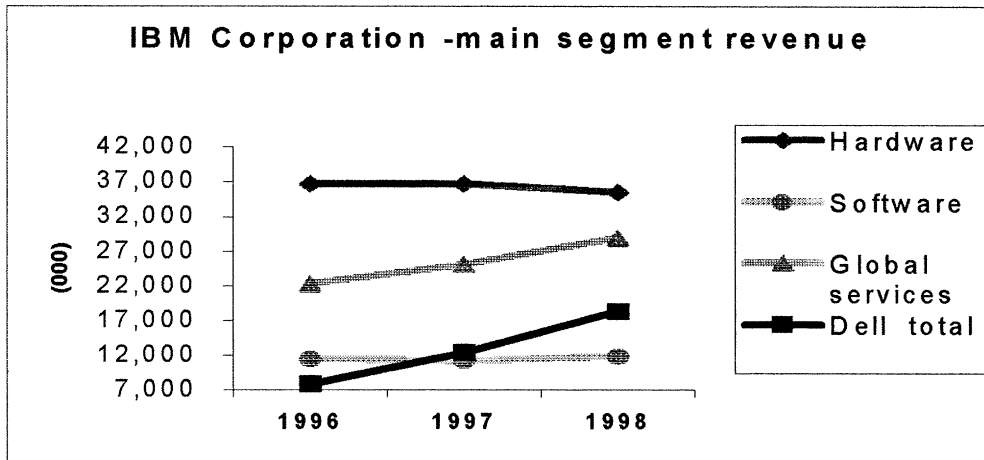
Table 2. IBM revenue mix (%)

Segment	1996	1997	1998
Hardware	48.2	46.7	43.4
Global Services	29.4	32.3	35.4
Software	15.0	14.2	14.5
Global financing & enterprise investments & other	7.4	7.0	6.7
Total	100.0	100.0	100.0

Source: IBM 1998 annual report

In addition, the profitability of these segments has been also changing. Software has been the most profitable, with gross margin increasing from 74% in 1996 to 80% in 1998. On the contrary, the hardware margins have decreased from 38% to 32% in the same period. Global Services has stayed stable at 27%. The intense price competition as well as limited opportunities for growth in the hardware segment are making natural the shift in emphasis of IBM, both in human and financial resources, towards those segments that offer more opportunities for profitable growth, Global Services and Software (see chapter 2).

Figure 1. IBM total revenue for main segments vs. Dell total revenue



Source: IBM and Dell's 1998 annual reports

IBM has proactively recognized the trends in the industry and as such, the company is putting a specially focused effort towards building a stronger Global Services division. With the current boom in e-commerce and e-business, Global Services will play a key role in IBM's future growth. In particular, IBM expects the e-business sub-segment to be the main driver of this growth through the offering of solutions such as IT consulting, e-business strategy and planning, e-commerce service for Web selling, e-payments and e-procurement, security and privacy services, e-business enablement services involving applications and, information uses and messaging. IBM projects that this segment will grow at an average rate of 12% for the next two years. As per IBM's forecast, Global Services will come to represent 38% of total 1999 revenues compared to 41% for hardware³.

IBM's new powerful embrace of the Internet is clearly communicated in the media, with the December 13, 1999 Business Week cover claiming the IBM is "the biggest dot.com of them all".

5.3. IBM's B2B strategy

In this section I describe IBM's strategy execution and how the company is leveraging the Internet to gain and sustain its competitive advantage. I also explain the areas in which IBM's

³ IBM. 1998 annual report

implementation of its strategy differs from Dell's, as well as the reasons why one of these companies could be in a better position than the other. The analysis is presented by following the framework described in chapter 2.

IBM started its commitment to the Internet in October of 1995, as a result of the work of a task force commissioned by Louis Gerstner with the charter of addressing the meaning of "exploiting network-centric computing". With this, IBM reprioritized its budgets and created the Internet division. IBM concluded that the Internet represented more than simple search or access to information; it recognized that additionally, it was more the business of doing business, executing transactions, but rather, it was the catalyst to re-invent the way business used to be done.

5.3.1. Pillar: outputs. Marketing and Sales Strategy

5.3.1.1. IBM's clients

IBM segments its customers into individuals, and small, medium and large enterprises. Differently from Dell, IBM also distinguishes large businesses by specific industry; e.g., Retail Banking, Financial Markets, Insurance and Retail. In general, IBM's clients are divided into 5 groups depending on their size:

1. SOHO – small office home office
2. Small businesses with less than 50 people
3. Medium size companies with 51-250 employees
4. Medium/large companies with 250- 999
5. Large enterprise with 1000 employees or more

Small and Medium Size Business

Before the Internet, small businesses were served via national resellers and VARs, which supplied both products and services. The channel had total control of the sale, from the first contact and the closing of an order up to the delivery and after sales service. The channel maintained inventory of products which were ordered from the vendor/manufacture based on demand projections and forecasts. Usually these projections were done jointly by both the manufacturer and the channel. With the Internet, several VARs and resellers established Web sites to sell IBM products. Web resellers now act as front-end sales vehicles that handle

accounts receivable and returns but do not actually touch the product. Customers buy the products through these Web sites; but the systems, in the majority of the cases, are shipped directly from the distributors or the manufacturer as a way to reduce handling and shipping costs. This added a complexity that did not exist before and made the initial experiences of IBM with the Internet damaging to its reputation as the channel lost great part of control over shipping and after sales service. Dell does not have problems like the one just described. Through its direct model, Dell has been able to fully control the operation from the moment the product is ordered through manufacturing, shipping and after sales service.

IBM also offers its products via the Web site. However, as an effort to avoid channel conflict, IBM customers who access the site are also given the option of buying from VARs and resellers. Furthermore, IBM recommends through the site the specific VARs and resellers that best fit the customer location and systems preferences.

In order to address the control issue, IBM started to develop a new e-business program, called VentureTech, that focuses particularly on the resellers which have already shown capabilities to provide good customer service and leverage the Web, such as Value America Inc. Currently IBM deals with about 30,000 to 40,000⁴ VARs. With VentureTech IBM pretends to aggregate and reduce the number of these service providers by profiling and certifying them. VARs will have to demonstrate that they can have total control over the sale and after sale service. As per IBM conceptualization, VARs will be the service backbone. The VentureTech program is being managed by IBM's Advanced Fulfillment Initiative, and currently has about 500 VARs involved⁵.

Simple services that do not require on-site visits are being moved on-line. Through the Web page, customers could receive support, access to technical information, manuals, and expert advice. As a result, a large part of the back-office operational work is no longer done by support personnel. In 1998, IBM performed 14 million electronic customer service transactions, pure Web transactions with no human intervention, and saved \$ 300 million⁶.

⁴ Zarley and Campbell. *New service channel takes shaped around the Internet*. Computer Reseller News. (861), 5, 14 Sep 1999

⁵ Ibidem

⁶ Gillooly, Caryn. *Tech Companies Want Everything On The Web*. Informationweek. Sep 27/1999

IBM expects to save \$750 million this year by putting customer support on-line and handling 35 million online service requests.

Small businesses, individuals and SOHO clients could buy directly from IBM's Web page or other remote channels such as fax, phone, e-mail and mail. On-line customers will be able to obtain products, services and advice. In addition, customers will have access to on-line leasing and financing for their purchases. The site for these businesses is open, as it is the one for individuals: with no personalization offered. Beyond the Web page linked to a Var or a reseller, IBM also offers two other options for the small business: to buy directly from IBM, as an effort to explore the direct channel and improve profitability in its PC line or, as mentioned before, to go to a dealer which the site will also recommend based on the client's location or system support needed. After the sale and regardless of the chosen channel, the client receives a follow-up phone call from an IBM sales representative.

This approach to serve small customers is very close to Dell's in several aspects. The main one is the use of a non-customized, open site with business customers targeted as if they were individuals. This clearly shows that IBM is not working towards building a long-term relationship in this segment. This apparent lack of interest in serving small businesses is further reinforced by the use of the channel to deliver the product, something Dell would never do. The current efforts of IBM to start approaching these customers directly could cause channel conflict and probably lost sales, whose negative impact might not be compensated by the higher profit the direct channel brings.

IBM's wider portfolio of products and services gives the company a stronger position than Dell's when it comes to offering integrated solutions to these small clients. As an example, IBM offers Web-connections to companies of up to 100 employees. This connection is a set or bundle of Internet services, such as a server with built in firewall security, shared Internet access, e-mail, domain names, 24 hour access to a help desk, and support for e-commerce functions such as hosting of an on-line catalog and credit card processing. Users pay a one time starting fee plus a monthly fee that varies, depending on the services, from \$ 99 to \$499. For those small clients that need to be active in the on-line world and have cash flow limitations, this is a very good option that avoids up-front capital expenditures.

IBM recognizes that most small and medium sized companies cannot afford to pay for personalized consulting to help them in their e-business efforts. In order to satisfy this need, IBM is using the Internet and providing as a solution the IBM e-Business Accelerator, a venture that is part of IBM Global Services. This is an on-line consulting tool designed to help customers to make timely, well-informed, critical business decisions about harnessing the Web to get a business advantage.⁷ The service provides reading materials, business analysis applications and an on-line access to IBM e-business consultants. Although this is not the same as face-to-face consultancy, it has proven to work for cash constrained customers given its very low cost: for less than the cost of a secretary, clients have access to a group of consultants to answer their specific questions.

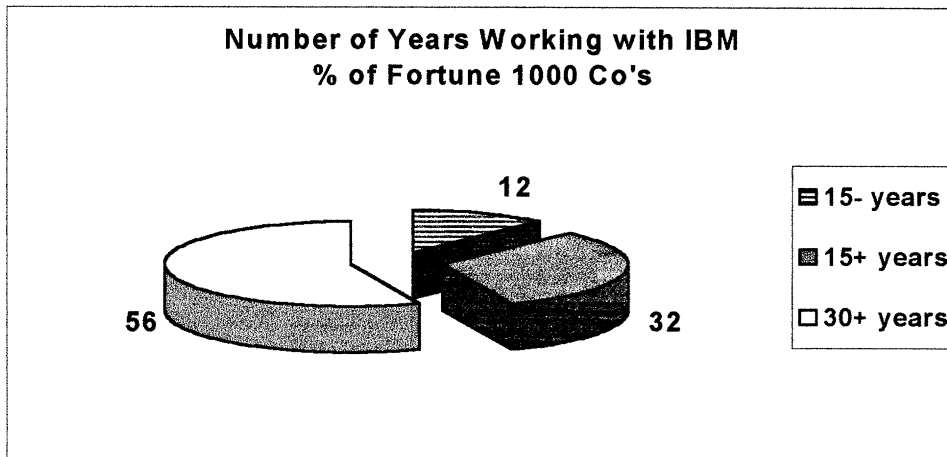
Large Customers

For IBM a large customer is the one who has 1000 or more employees. As mentioned earlier, IBM also classifies them by industries such as Retail Banking, Financial Markets, Insurance, and Retail. With this, IBM is aiming to build industry specific knowledge to provide better tailored solutions.

Large corporations have historically seen IBM as a business partner and strategic vendor. Many of these large clients have been doing business with IBM for more than 30 years, as shown in figure 2. This represents both a challenge and an opportunity for IBM. The challenge arises because the company should concentrate its efforts on retaining these relationships and avoid the incursions of other vendors in their turf. The opportunity appears in the sense that once the company has already captured these clients, it can cross-sell more easily to them a wide range of products and services, that in many cases build into a locked position, as is the case of mainframes used as servers. Customers entering into e-commerce can benefit from IBM's e-commerce linkage capabilities to streamline the flow of information and goods and services, and its own vast past experience. In addition, since these customers have been long standing IBM clients, standardization and connectivity, particularly with legacy systems, cease to be obstacles.

⁷ Miller, Julie. *IBM delivers e-business consulting for small and medium companies*. Midrange systems. Sep 30, 1999 12 (14), 22

Figure 2. % of Companies that have been working with IBM for long periods



Source: *Forrester Report. IBM's Internet Opportunity. 1998*

With the Internet, IBM has been able to develop audience-oriented Web sites and offerings. Password protected sites for corporate users also allow for cross-selling to employees, as Dell has done. This is an experience about which I will give more details later on this chapter.

IBM sells to its large business accounts through account management teams. Each team has a leader who is the executive in charge of several corporate customers. Prices are negotiated on a client by client basis, under long-term contract agreements. Due to the importance of these clients, IBM serves them directly, with no intervention of third parties or resellers. The Internet has increased the effectiveness of these account management teams by allowing sales people to dedicate more time to thinking about sales strategy than to solving operational issues. IBM is moving towards avoiding the silo effect by using the Internet to provide account executives with complete knowledge of all IBMs products and services and truly make of them the single point of contact with the client. How to provide this kind of support internationally is still an open issue of the utmost importance for IBM given the global presence of many of the company's key clients.

Large customers and international expansion

For those customers that are global, IBM offers a specific program that simplifies international IT procurement by centralizing or regionalizing, depending on the customers' needs, the purchasing and procurement functions. Customized Web sites are internationalized with few local/country specific adaptations.

In general, IBM applies in every country the same US model. As an example, IBM India announced in Nov 1999 the launch of the e-channel, a Web-based B2B channel. With this, customers can transact IBM's offerings through the Web. By an Extranet Web site dedicated to each customer, it can order and get on-line information on products, services and support. For those corporate customers that have decentralized their IT buying process, the e-channel will help reducing the internal lead-time.

Another example of international replication of the model is the direct sales effort started by IBM in the UK to sell hardware to customers via the phone and the Internet. If this pilot project is successful, it will be replicated in other parts of Europe. The initiative in the UK is basically aimed at the small business market. Prices for products delivered through the direct channel are very close, if not equal, to resellers' prices. This experiment is clearly an attempt by IBM to understand how the direct channel works, and learn how to avoid the channel conflict the company can ill afford.

IBM Business Partners

Older initiatives, such as the IBM Business Partners, tighten the company's relationships with its clients. By working with partners, and helping them improve their business through the transfer of knowledge and skills, IBM also profits. These partners could be either Software developers, Web developers, independent software vendors, custom development integrators, systems integrators, solution integrators, service providers, education providers and resellers. The idea is to leverage and increase IBM's product and service penetration. In order to do this, IBM helps its partners by educating and supporting them with marketing campaigns, sales leads, technical knowledge, co-marketing and other marketing and sales skills.

For business partners, IBM is also leveraging the use of the Internet to promote loyalty and growth through Web-based programs. An example is IBM's PartnerInfo, which allows the company's more than 45,000 business partners worldwide to access product and marketing information in 10 languages. With a new commerce capability, PartnerCommerce, IBM's partners could check supply status, purchase products and track orders on the Web. It is estimated that in 1999 IBM business partners purchased almost \$ 4 billion on the Web from IBM⁸.

⁸ Danielle Mattia. E-mail introducing Anderson Richard. IBM . E-commerce class speech. April 7, 1999

5.3.1.2. Marketing Communication Strategy- Public relations

The Internet, when building awareness, is not very effective because it implies that users or potential users must be on-line and browsing in sites related to the product or service the company is trying to target. IBM has clearly understood this. As a proof of that, it has begun an on-going public relations campaign through providing expansive services for key voices in the industry, viewing them as both business partners and customers. This is what they have called "influencing the influencers"⁹. One example is the 1000 member Independent Computer Consultants Association – ICCA- and also some trade organizations.

For these influencers, IBM is also using the Internet as a complementor to help build and maintain these strategic relationships. IBM has put in place a program, the Consultant Relations which provides these influencers with specific and focused technical materials and marketing support. This is done through a Web site www.ibm.com/consultantrelations dedicated to the effort.

Tailored Web sites are provided to IBM's key influencers including the press, IT consultants, financial analysts and shareholders, and prospective employees. These sites provide easy and worldwide access to information. IBM currently holds quarterly earnings calls with security analysts on the Web. IBM also allows shareholders to vote their proxy online. In addition, IBM's Press Room for the media gives access to company press releases, high-resolution photography, a worldwide database of press representatives, biographies of IBM's executives and speeches. The site gets more than 40,000 page views per week¹⁰.

Dell has yet to develop a similar program. Other than having a great deal of information available for everybody on the site, Dell does not seem to have a specific initiative to develop sites for influencers. This is a problem specially if word of mouth is not always positive to both its reputation and revenues. For instance, some small customers are manifesting their dissatisfaction with Dell's poor level of service and attention, a reputation that could have a negative impact on Dell's growth.

⁹ Albert, Sam. *Midrange Sytems. Influencing the influencers.* 12 (18): 54 Dec 13, 1999

5.3.1.3. Some other benefits from leveraging the Internet

In addition to the economic and operational benefits brought about by the Web based initiatives mentioned throughout this section, the use of the Internet to capture better segmentation and cross-selling opportunities is also a source of advantage.

The Internet has brought both IBM and Dell a new way of segmenting their clients. Through its IBM customer relationship management services CRM, the company has made official its intent to segment its clients into groups of one. IBM is doing this with its clients, as well as offering these CRM capabilities as part of its Global Services. Enabled by e-business technology, IBM's approach focuses on managing the customer "holistically" to deal with each customer as an individual, recall and reference all previous interactions, and better accommodate each customer's needs and preferences¹¹. One- to-one segmentation is one of the best ways to achieve customer loyalty and retention through building higher customer satisfaction and switching costs.

Another opportunity brought about by the Internet is cross selling. Both Dell and IBM have taken advantage of this through their B2B company specific Web portals, which give access to the large market comprised by the employees of their B2B customers. Examples of this are: Dell with Ford, IBM with Toyota. For instance, Ford's employees (more than 100,000) and retirees can order from the Dell's company site, and receive a password for this purpose. This practice benefits not only the PC vendor but the partner company as a whole in the sense that employees perceive this as an additional benefit provided by their employer. This is in my view also another way of creatively building new distribution channels. At the end, Ford and Toyota are selling Dell and IBM's products.

5.3.1.4. IBM –Going direct?

The IBM PC unit has recently announced that it would sell directly through Web-based solutions. IBM expects this action to make the PC line profitable again by cutting 5 to 10% from its personal systems group of 10,000 employees¹². This is a clear response to competitors such as Dell and Gateway which are being able to provide systems at lower prices and also through this managed to gain a considerable share of the market in a relatively short

¹⁰ Anderson Richard. IBM . E-commerce class video. April 7, 1999

¹¹ <http://www.ibm.com/services/crm/overview.html>

¹² Copeland, Lee. *IBM To Focus on Selling PC's direct*. Computerworld. 33 (42) Oct 18, 1999

period of time, as shown in chapter 3. The question about how is IBM going to deal with the channel conflict that this decision generates still remains unanswered.

5.3.1.5. IBM -Thinking future, fueling growth

Some initiatives taken by IBM such as investing and partnering with companies and technologies are clearly compatible with their Internet strategy.

IBM established in January 1999 a \$ 500 million fund aimed at companies that just passed their first round of venture capital funding in order to get access to new technologies and capture as customers dot.coms and other start-ups as they are born so that they grow up locked in with IBM. IBM has invested already more than \$ 1 billion in VC funds¹³, in specific start-ups that could help IBM's business, in the development of a six-month incubator program and in developing a lease program to support all the companies that grow out of this action.

An example of these initiatives is also provided by the recently signed agreement between IBM and Sprint. They have agreed to jointly develop services that would enable large customers to access the Internet and corporate Intranets via wireless phones so that users can get real-time access to the data using their mobile phones. IBM will provide the software for the service that will run on Sprint's national digital network.¹⁴

Some Key numbers

In addition to all the strategic benefits IBM can claim of its rallying into the Internet world, the company has gained also from the output side¹⁵:

- ✓ For 1999, IBM's e-commerce revenue is estimated to be between \$ 10 and \$ 15 billion. This includes sales of everything from PCs to mainframe software.
- ✓ IBM is also estimating that 25% of its total revenue (about \$ 20 billion) is driven by e-business demand.

¹³ Richardson, Vanessa. *Big Blue Pumps Big Bucks into e-commerce*. Red Herring, Jan 19/00

¹⁴ The Wall Street Journal. *Sprint, IBM Set Up Venture for Wireless Access*. Technology Journal page B4.

¹⁵ Business Week Online. *E-Biz cover story- IBM's e-Business Strategy* December 13, 1999

5.3.2. Pillar: Processes

Manufacturing, Forecasting and Working Capital management

Relative to Dell's model, IBM has a very complex process environment. IBM has 27 manufacturing facilities, versus 6 for Dell. The age of these facilities varies and the main company's suppliers are spread all over the country and the world. In other words, there is not a direct model at IBM as it is conceived by Dell. As such, the built to order manufacturing process is applied only for those high tier machines whose high costs do not let the company build them to stock. This complexity impacts IBM's flexibility to react fast enough to changes in the market place.

On the other hand, the fact of being also a software company has helped IBM. IBM uses its enterprise resource planning (ERP) software package internally to allow data flow beyond department walls. Applications such as this, when connected to the customer database and the incoming on-line information are allowing companies like IBM to improve their planning and forecasting.

Due to IBM's size and complexity, the full integration from end-to-end (customers-company-suppliers) observed at Dell is not yet a reality and will take some time. In the meantime, IBM is doing its best at trying to use its close relationships with customers and business partners jointly with the use of databases and IT capabilities to have precise information from the market place in order to develop better forecasts and thus reduce working capital in inventories.

Working capital management in particular has improved through the use of the Internet. Through Web connections with customers and suppliers, paperless purchase orders and invoices, and fully integrated general accounts receivable and payable systems, IBM has achieved operational efficiencies that have reduced the number and cost of transactions (I provide details of this in the supplier section). Better controls and management of the working capital accounts have resulted in maintaining working capital at levels of 31% of revenue for the last 3 years¹⁶. Hence, improvements should be expected from the three working capital fronts (impact on accounts receivable-clients, payable-suppliers and inventory) when the

¹⁶ Author's estimates. IBM 1998 annual report.

suppliers e-procurement system as well as the customer e-sites and all supporting systems get fully implemented.

Product Development

IBM has eight (8) R&D labs. Product development is basically done by cross -functional teams incorporating people from several areas such as Engineering, Research, Marketing and Manufacturing. By being in close contact with customers, IBM develops products aiming at satisfying specific needs. If an idea or a need is manifested by a customer, the account executive and the account team make sure that the lab gets the required information.

With the Internet, the flow of information from customers to development teams will be more fluid. In addition, internal information will revamp the process of product development. Corporate intranets as well as the possibility of sharing and transferring knowledge and software from one place in the world to another in matters of seconds are expediting the development process. These practices are observed in both IBM and Dell. Dell however, because of the end-to-end integration, could have an advantage since the company's suppliers have greater involvement by virtue of these being more closely connected with the manufacturer and having real-time information from the market.

From a more general view, IBM also shows its commitment with e-business through the sheer size of its R&D budget. IBM is putting half of its R&D (\$ 5 billion) budget into Internet related-areas. In addition, IBM has created the Institute of Advanced Commerce, a team that includes outside consultants and academics as well as 50 IBM scientists, all working on electronic commerce. Needless to say these initiatives would not only benefit IBM's clients but also IBM's operations and processes.

Knowledge management

The Internet brings IBM enormous benefits when we talk about knowledge sharing and training. This is done not only by using intranets to provide employees with wide access to product and service information but also by providing them with the skills to become better salespeople, engineers, or managers. Results for IBM have been very satisfactory. In 1998, 15% of IBM's internal education and training was done through Web-based distance learning. IBM estimates that for every 1,000 classroom days converted to distance learning, it can save

\$500K. For 1999, it is estimated that internal training delivered via distance learning, resulted in savings of \$100 million¹⁷.

A good example is provided by IBM's award-winning Intellectual Capital Management AssetWeb technology, which is being used by tens of thousands of IBM employees and customers, particularly in IBM Global Services (IGS), to create, share and reuse IBM's intellectual capital more productively and profitably¹⁸.

5.3.3. Pillar: inputs

IBM has made several efforts to improve its communications and flow of information with suppliers. Before using the Web, IBM implemented an Electronic Data Interchange (EDI) system to establish electronic links with its suppliers, eliminate operational work, and obtain efficiencies across the supply chain. But EDI, as was mentioned in the previous chapter, is not an optimal system (see chapter 4). IBM has acknowledged this and decided to move to a Web environment. This initiative is part of a broader effort to develop e-procurement. The idea is to build and maintain existing relationships with suppliers for the long term. Such view allows suppliers and IBM sign a master agreement to invest in building standards to enhance both groups performance.

E-procurement brings a speed advantage to IBM, a "must" in the current information economy. Paperless purchases, better control over accounts payable, and real-time supply information, are becoming more important by the day as they help to gain such speed. But the transition from previous systems to EDI and then to Web based processes has taken time and required that players coordinate and standardize their systems.

IBM started its efforts on the supply side integration back in 1988. The main objectives were to reduce cost, improve customer satisfaction, reduce cycle time and improve ease of doing business.

The evolution of this process could be divided into four phases:

1. 1988-1992 Decentralized business,
2. 1993-1996 System consolidation,

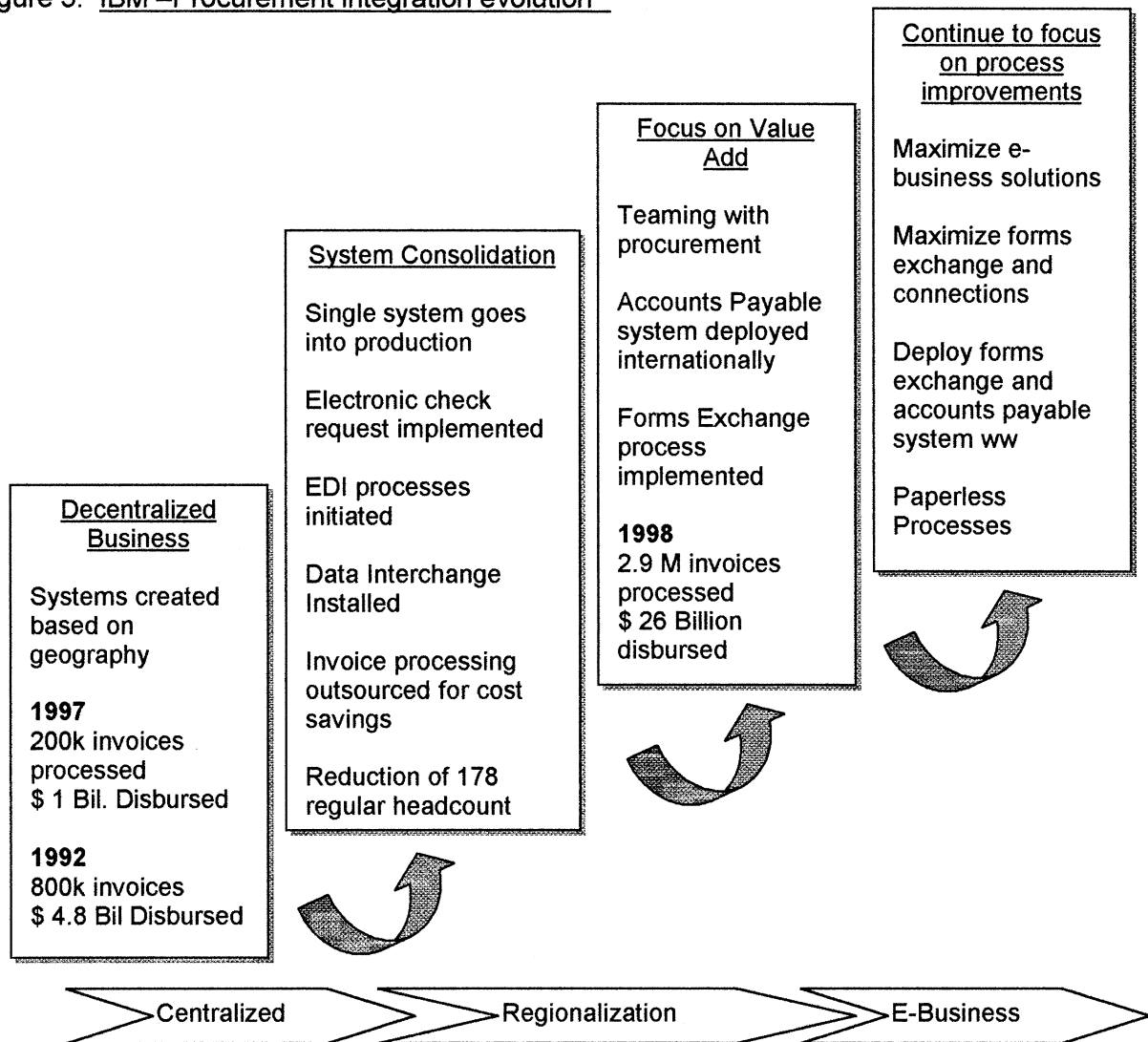
¹⁷ Anderson Richard. IBM . E-commerce class video. April 7, 1999

¹⁸ Danielle Mattia. E-mail introducing Anderson Richard. IBM . E-commerce class speech. April 7, 1999

3. 1997-1998 Focus on value added and
4. 1999-2000+ Continue to focus on process improvement

Figure 2 shows a detailed description of this evolution towards Web connections. Over the past 24 months, results have been impressive: 50% productivity improvements achieved, a reduction of data-centers from 67 to 7, a decrease in the financial cost of transactions as percentage of revenue from 2.9% to 1.2%, and a reduction of transaction applications from 108 to 20.¹⁹

Figure 3. IBM –Procurement integration evolution²⁰



¹⁹ Hughes Robert. IBM National Accounts Payable. Web-EDI-to Reach Your E-com goals.1999
²⁰ ibidem

By moving purchasing onto the Web, IBM estimates it has saved \$ 240 million on the \$ 11 billion in goods and services it bought in 1998.²¹ In 1999 IBM has established Internet links with more than 6700 suppliers.

5.3.4. Culture

IBM underwent enormous challenges in the early 90's. Jobs for life, insular organizations even within Business Units, a very professional yet stilted professional "IBM man" were all changed radically with the arrival of the current CEO. In a way, these changes were a preamble and facilitator for the changes that the Internet has caused within the company. Interconnectedness is "de-rigueur". Although there are still separate sales-forces by business units, the use of multifunctional teams to find the best solution for the client is more and more common, in line with the vision to provide total solutions for them. As boundaries between enterprises have fallen, it was only natural to have such behaviors occur within the companies' themselves, and even mighty IBM could not fall behind this without falling behind in the marketplace.

IBM has evolved slowly into the new Internet paradigm. The purchase of Lotus in 1995 was a watershed in this case. In order not to lose the talented entrepreneurial spirit on which this company depended, Lotus was maintained independent. In the age of the Internet this is even more important. Speed is of the essence, smallness brings speed. IBM is using its successful Lotus experience to "contaminate" its more established divisions. Young, hype, informal is becoming the rule; quite a revolution considering the mature, risk-averse, and formal environment of the IBM of old.

This interconnectedness and speed is also allowing flexibility to flourish. Work at home, more elastic working hours are facilitated by the virtual reality of the Internet. Physical presence is not so necessary now within the company. IBM however still has the challenge of dealing with the old. It cannot change as much as to alienate its clients, companies that as we saw have come to see IBM as reliable, as one of their own. This flexibility must thus accommodate a creative tension between the old, chummy contact with clients with the need to keep IBM abreast of the market. The remote worker will not be able to be an IBM employee, at least not

²¹ Business Week Online. *E-Biz cover story- IBM's e-Business Strategy* December 13, 1999.

in areas that require at least a modicum of customer physical interface, a fact that increases with the size of the order and importance of the client.

In that sense IBM's pedigree is both a curse and a blessing. Dell, young and upwardly mobile, dependent on its remote Dell Direct service can easily sell the commodity, the good computer for the lower price. Here face to face contact is less important, it is all a game of speed. Selling services is another story. People have to interact, during the decision making process, undoubtedly after that. In that sense, IBM has an advantage here. It will be comfortable in such an environment. Selling was one of the key distinctive skills of the old IBM. In a service world, it will continue to be so. The challenge for the company will be to keep its excellence in this physical contact game incorporating the power of Internet interconnectedness, speed, and immediacy. For Dell, the challenge is to use its process on the remote game, on managing third parties from afar, on serving the client well on the standard product to grow into the human rich world of services and the skills that it entails; skills, it must be said that few companies manage to acquire.

The future is, at least from an organizational and cultural point of view, for those that take the best of the old and leverage the new to get the most of it. In that sense, IBM's success into becoming "the largest dot.com of them all" seems to point to a capability to do this that nobody would have expected of the company even 5 years ago.

5.4. Summary

Results –competitive position

We have seen how companies like IBM and Dell use the Internet to enhance their relationships with their business clients. We also have seen how by using the Internet these two companies have improved their positioning in the market and their profitability. Dell has won a superior position against IBM in the B2B market, specially within the large organizations segment (see table 3). At the moment this thesis is being written, it seems that it is still unclear for Dell's management what the strategy for small businesses should be. On the other hand, IBM has shown to take better care of the smaller segments. However, we know that great part of this job is being done by the channel (resellers and VARs). Although IBM has clearly stated that they will pursue the direct channel also, I will devote a piece of the next

chapter to analyze the future challenges and, in particular, what I see as the trend with regards to the issue of channel management.

Table 3. **B2B** computer hardware market – Revenue share- 1999

	Compaq	Apple	Dell	IBM	HP	Others
Education	15	15	9	8	4	49
Government	16	0	13	10	7	54
Large Business	23	0	16	13	10	38
Medium Business	19	0	15	11	9	46
Small Business	16	4	10	11	6	53
Small Office	13	4	9	8	5	61

Source: IDC

Chapter 6

Conclusions, Recommendations and Future Challenges

In this chapter I present the general conclusions on what under the current dynamics of the computer hardware industry seem to be the more reasonable ways to gain competitive advantage. I also provide specific recommendations to both, IBM and Dell. Finally, I provide an outlook for the future and what I see as the main sources of sustainable advantage under different scenarios.

6.1. Analysis of the immediate trends in the industry- Proposed ways of action

We have seen from chapters 3, 4 and 6, that the hardware industry is going through dramatic changes. PC prices are dropping and business customers are asking for more services and integrated solutions. This evolution is summarized in figure 1.

Figure 1. Computer Hardware. The Next Era. ¹

	ERA Before 1985	ERA Before 2000	ERA After 2000
Target Platform	Mainframe	PC's	Network –Internet connected devices
Audience	Management	Employees	Customers, partners, employees
Platform Optimization	Storage	Flexibility	Manageability
Important Standards	COBOL	Windows APIs	XML, Java, CORBA, DCOM, etc
Principal Client Function	Reporting	Computing	Integration and communication
Buying criteria	Standard brand	Standard brand	Integrated/full solutions

The PC revolution moved the power of information from centrally managed data, that was stored in mainframes and providing users with low flexibility on how it was presented and handled, to data that was at the fingertips of employees at all levels. Everybody in a company could now access and manage information at an individual level. This was possible by the use of an emerging standard, Windows, that allowed to create applications that gave easy-to-use functionality to the new PC platform. But the move from the inflexible tyranny of the mainframe to the no-man land of every PC as an isolated entity was unable to capture the full potential of the use of information to provide outstanding customer service. The de-integration brought about by giving a stand-alone PC to every employee, that allowed for having multiple standards even within each department in a company, was weakened first by the use of WAN's. The birth of the Internet made of this a revolution, as the full power of communication and computing came together to allow for integration within and without the company.

This in turn has forced companies to manage multiple systems and interfaces as a seamless whole and made imperative the use of system integrators that provide not only a good branded product but also a full range of services. Those integrators will ensure that their clients can connect to the world, yet maintain the integrity of their own internal systems while managing all this complexity. It is important to mention that the impact of these changes have been more felt by large companies since they were the first that had to come to terms with the changes entailed by going from mainframes to PC's, a change that basically resulted in a move from the power of one big voice to the power of many voices acting alone to, finally, many voices acting as one. This evolution was only made possible by the arrival of networks and the Internet.

As we put this new perspective together, this thesis has surfaced three key general strategic issues, issues that go beyond yet involve this work's attention on B2B e-commerce, as the immediate focus of management at Dell and IBM: an emphasis on value added services, a necessity for channel re-engineering and an imperative to clearly define how to serve the different business segments by size. With regards to the B2B e-business specifics, the main challenges lie on designing customized user-friendly portals and integrating the external and internal enterprise information systems both backwards with suppliers, and forwards with

¹ Author's analysis and adapted from Forrester Report. PC Industry Roller Coaster. Vol 15, number 11.

customers. Resolving these issues will provide the blueprint to build and maintain long-term relationships with all customers at large.

In the following two sections I explain how the two sets of issues, the general strategic and the B2B e-business specifics impose challenges to IBM and Dell and how these companies could surmount these challenges to maintain and strengthen their competitive advantage.

6.1.1. General Strategic Issues

Emphasis on value added services

Companies playing in the computer hardware market will have to emphasize the provision of full services. Customer service is now not at the end of the supply chain. As Internet commerce and Internet business advance, virtual relationships will force partners to collaborate and share leads, pass inventory data and support customers across the value chain.

Computer hardware vendors that do not offer services themselves will have to create alliances with service companies, like the VAR's Vanstar and Entex, or they will be made increasingly irrelevant providers of hardware and eventually even be left out of new hardware purchases.

The irony is that the very same revolution that forces companies to provide full service solutions also makes doing this easier. Partnerships are easier to implement in today's world thanks to the communication and information sharing capabilities offered by the Internet. As continuous innovation in the hardware industry is fundamental and technology cycles become shorter and shorter, the Internet has emerged as an effective and cheap means to move quickly and keep internal and external parties synchronized as products and business relationships change.

As was mentioned in Dell's chapter, this company should emphasize more and more the provision of the services required by its customers. Dell has demonstrated excellence in building partnerships to outsource some parts of its business model value chain. Dell has provided services to its customers through those alliances with third parties such as Digital

Equipment Corporation. The recently signed agreement with IBM's Global Services, to which I will devote part of this chapter, will definitely bring Dell with the capability to extend its services to a large number of customers. As such, this will eliminate any obstacle for growth that the non provision of services could generate. In this regard, IBM is very well positioned through its Global Services Business unit. As the company's CEO has manifested, this unit will be the main driver of the company's future growth, specially through the consulting unit that will provide a full range of consulting services for companies engaging in e-businesses.

One of the main questions that arise from the analysis is whether service provides the full answer. Service is defined here as the entire range of value added services, not only customer service and repairs, and embrace at least all the activities that are being performed by IBM's Global Service Unit. We need to explore how companies like IBM and Dell will be able to compete in this service market where a trend for consolidation has been observed and where well established service companies, such as EDS and Andersen Consulting, have strong competitive positions through their capabilities in consulting and overall IT solutions.

In this scenario, IBM's business model seems more robust. IBM has built "full customer solutions" capabilities inside its Global Services business unit. IBM has developed the competencies to be an important player in this arena. As a result the Global Business Unit performance over the past 3 years has been outstanding; recall from chapter 5 that IBM has managed to maintain its Global Services gross margin at 27% while at the same time investing on building the knowledge to deliver better solutions. In addition this segment has gained an important share of the total IBM business: from 29% in 1996 to 35% in 1998 of total sales of US\$76 and \$82 billion respectively, an average annual growth rate of 14%. From a more strategic view, this focus on services also demonstrates IBM's capabilities making the right choices about entering or increasing a focus on a business.

Dell has yet to develop this ability. In this sense, the company has since its very beginning, been more a follower than an innovator; Dell lets others first experiment and try new venues before committing to them. Undoubtedly a smart approach if the company avoids the risk of not being able to expand its focus or lose track. Dell's approaches to value added services have been relatively timid, particularly as a result of delegating the provision of such service to small and medium companies to service providers. Moreover, we could even say that Dell

only provides basic after sales services such as repair and maintenance. Despite such reduced scope, Dell's image as a provider on these basics is not positive. Before trying to expand into a greater array of up-graded services and full customer solutions, the company needs to fix its image. I will propose some alternative ways to solve this issue in a future section of this chapter.

Channel re-engineering and trends

Manufacturers will have to reengineer and reallocate responsibilities among themselves and the intermediaries between them and the end customers. Direct models such as Dell's and Gateway's are leveraging the Internet to outflank those middlemen and thus gain market share by passing the savings to their customers (see chapters 2 and the end of chapter 5). This is forcing intermediaries to either invest to gain scale or to focus on niches. Furthermore, these industry changes mean that companies playing in this arena should re-think their channel strategy.

Hardware manufacturers that rely on indirect vendors face the challenging task of competing with the direct channel's economics. The only way to stay afloat and thrive will be to go into related products or services that allow the manufacturer to become more than that and differentiate itself, particularly as Dell and others offer more truly full enterprise solutions.

Two main courses of action are recommendable: 1) indirect OEMs (e.g., Compaq) will transition gradually to the direct model to avoid alienation of the channel partner; or 2) manufacturers will engage in mixed manufacturing/distribution practices such as transferring assembly to channel business partners. Thus distributors could be in charge of assembling built-to-order systems. This will eliminate the alienation that small businesses feel by not being allowed to have configuration flexibility when buying products from most OEM's.

Currently IBM is following the two approaches mentioned above. Forced by the economics of the indirect channel, IBM announced in 1999 that PC's sales will be concentrated on the direct channel. With such transition occurring gradually, their target is to transfer 100% of small business sales to the direct channel up from 50% today, in no longer than 3 years.

IBM has already implemented a third-party assembly program, the Authorized Assembly Program AAP. With this, IBM is transferring the assembly of systems to partners that are working on a built-to-order basis. This will give IBM a competitive advantage against other indirect vendors because it will be able to reduce inventory levels and working capital.

Moreover, the program will put IBM in a better position in terms of costs (opportunity costs of high inventories) and prices (IBM could negotiate third party margins down by giving them a larger piece of the business) to compete against the direct model. Under this program, IBM began shipping "bare bones"² systems to the channel for order assembly and configuration. Loyalty all across the value chain will be achieved because re-sellers will have a closer relationship with vendors.

The Internet will tremendously help the third party assembly program implementation. By allowing for increasingly fast and streamlined flow of information at low cost, both parties will be able to have real-time information and thus be able to react quickly enough to changes in the market. Overall, the benefits of this practice will be an increased responsiveness to demand, better inventory management, lower risk of product obsolescence, and reduced manufacturing costs.

This mixed model could be further expanded by making distributors be in charge not only of assembly but also of the provision of value added services, if the vendor sees it fit. This is a natural evolution for the channels, specially for the small business segment in which the current players have not been very efficient. Branding will still be a task of the manufacturer, as this is the only way to ensure the development of a unified message at the lowest possible cost.

Channel- Other challenges

An important additional challenge is presented by the Application Service Providers (ASPs). These companies provide on a rental basis the servers required by companies to interconnect. Hence, ASP's have the potential to become one of the largest and most strategic markets for systems vendors. In other words, a lot of the influence and responsibility for buying servers

² HBS. Dell Online . Case # 598-116 . page 9

will shift from IT departments to ASPs³. Since these ASPs are less likely than corporations to have existing investments in certain operating systems and/or computers, switching costs are reduced, and therefore, hardware manufacturers face difficulties locking in these customers.

The alternative of leasing and renting hardware and IT services offered by ASP's seems to be a very plausible one for corporations. Small business will benefit from the emergence of ASP's by not having to invest up-front in IT assets. In addition, not having to hire the IT people also releases the company from a fixed cost burden. With this, customer retention and loyalty have to be built on a relationship basis. Competition here will force vendors to improve their offerings and be ahead in technologies to better serve their client base. Both Dell and IBM could offer the servers to these ASPs. However, Dell is in a worse position than IBM. This company is better prepared to participate in this business by also becoming a player in the ASP market, given its Global Services skills and capabilities. IBM however needs to ponder such a move carefully since entering the ASP market would put the company into direct conflict with its current clients there.

Imperative to clearly define how to serve the different business segments by size

The direct channel is not very effective at reaching all customers and providing good service. We know that even Dell has experienced some problems with its small business segment, the only one in which the company has not yet gained a better position versus IBM. This could be signaling that small businesses are more loyal to the channel than to brands. Note that both Compaq and IBM, mostly indirect channel players, have won leadership positions in this segment (see table 3 in chapter 5). These facts reinforce the proposed idea of using third parties to provide better after sale service. IBM could do this through its current channel, focusing on certified VARs and resellers. Dell could move even faster in this direction through its current strategy of partnering with top-notch service providers, such as DEC and IBM, and also by leveraging on the capabilities it has already built on outsourcing through several other service providers. Clearly this will imply for Dell the internal redesign of its approach to the small business segment. In other words, Dell will have to implement some internal organizational changes in order to build mixed internal/external teams that will take care of the needs of this specific segment. The challenge will be to learn how to manage the relationship

³ Mc Williams Gary. *First Software, Then...* The Wall Street Journal. Technology Report. Nov 15/99

with the third party service providers while gaining and keeping control of the relationship with the client.

Managing such relationship with third parties might be difficult because of one of Dell's strengths, its very dynamic product line. Dell is constantly up-dating product specifications along all dimensions from graphic capabilities to processors and hard-drive memory. This continuous improvement represents both an opportunity and a challenge for Dell. On the one hand, Dell is able to introduce new products and models faster than anyone in the industry, just at "the speed of thought". Dell's product modularity allows the company to react faster to any changes on demand and also to be less dependent on forecasts.

But on the other, this represents a challenge for the company since their older product line becomes obsolete faster, a fact which makes more difficult to provide good service and part replacement if models and parts become quickly outdated. As we know from chapter 4, Dell has a built-to-order manufacturing model that allowed the company to operate with very low inventory levels. Also, this built-to-order model is possible thanks to the partnerships Dell has built with its suppliers, who also are benefiting from the model by reducing their inventories. The issue then becomes the provision of replacements and repairs if the company does not have the parts in stock to supply. Service partners might refuse to stay as such if product changes and lack of parts prevent them from giving their client the level of support they require.

The above mentioned problem is more evident and severe for small and medium businesses than for large ones. In large corporations, as we saw in chapter 4, Dell has an "in site" organization taking care of customer needs. They literally become part of the corporation's IT department and as such, solutions to the problems are developed almost without the client noticing it. In medium and small businesses, which apparently already complain at Dell's support, service is provided through third parties such as DEC.

An additional reason for Dell's wanting service for small and medium businesses is the apparent weakness of the third party organizations that provide said service. These partner companies seem to be having problems at the diagnostic stage, when responding to a small Dell client asking for support. To compensate for the lack of necessary capabilities to detect

the real problem, react quickly to client requests, and avoid further problems that might weaken its brand, Dell seemingly has instructed to replace all "suspect" parts, even if not necessarily damaged. Building the skills in the service partners is greatly complicated by Dell's very changing product line, which makes difficult for these companies stay updated on all Dell products, new and old, that might be present at the client's site. This is a vicious cycle that makes difficult for Dell to improve service levels, thus improving its brand equity in this segment, and has a negative economic impact arising from overstocking and overdelivery in spare parts to meet Dell's policies, without saying anything of how such overhang goes against the very heart of Dell's just-in-time, made-to-order direct model.

I can think of several options to solve this issue. However, these solutions will require further in depth analysis and viability studies from Dell's management. An alternative could be to sell a "replacement order, no questions asked" option to the small and medium business at the moment of the sale. For an additional amount of money, Dell will guarantee that no matter the problem that appears in the computer, it will be replaced for a new one immediately. By replacing the whole system, no parts will then be needed to be kept in stock from the company's side, thus stopping modularity from being an inhibitor of basic service and parts provision. Obviously Dell should conduct some economic studies to ensure that this is an economically viable option.

Another alternative that mostly addresses the issue of over-diagnosing is presented by the revolutionary trends observed in the Internet world. We are seeing convergence of voice, data and video via the net. Dell should consider to pioneer the latest customer interaction tools such as Telewebing and Webrides. Telewebing combines telephony and Web-page viewing, so Dell customer support people (or assigned third party) can point and surf through a webspace while the customer talks and watches. This experience is more efficient for support providers and also is educational for users⁴. Customers will be provided with the option of receiving live assistance from a Web site and engaging in rich voice-and-visual interactions with the company representative best able to address their questions or problems. In addition, by using Webrides Dell could also delegate a great part of the diagnosis to its customers in an easy/user friendly way and thus obtain better information from the customer side. Webrides are prepared guides or canned demos of a website by expert webguides/webpeople.

⁴ Examples could be seen at <http://www.webline.com/solutions/online.htm>

Webrides let users watch experts surf through a site and demonstrate how to use it thus reducing the live interaction required and allowing for better information on the problem. In the case of Dell, sites that could be “Web-ridden” might be a help-desk software or, even more broadly the Premier pages. An example is <http://www.datango.de>. With these two applications, Dell could combine the personal value of human interaction with the information value of the Web site while maximizing the benefits for both the customer and the company, with the latter avoiding unsuccessful repeated service visits and improving customer satisfaction.

In a more ideal world, Dell could implement a system for diagnosis and service similar to the one that Carrier Corporation has. Equipment at the customer site is hooked up and connected via the Web to Carrier’s service center. Computers will detect and diagnose problems on the client’s equipment even before the users notice it. When Carrier service people appear at the customer site, usually clients get surprised because they did not even know they were having a technical problem⁵.

In summary, what we are seeing through these alternatives is that great part of the basic customer service is being transferred to the higher sophistication and interconnectivity of the Web. This is a great opportunity for both Dell and IBM not only to improve their service levels but also, if these multimedia applications take off, to create an even larger market for Web servers.

With regards to large corporations, they will continue to buy directly from the vendor not only hardware but also software and services as they search for complete solutions. Large companies will increasingly require one-stop shopping with a full long term commitment from the manufacturer. Better positioned companies like IBM, which have created capabilities in several fronts (software, consulting, services, systems integration) will be preferred. Top tier vendors will fight for the acquisition of these customers. Once the customer is acquired, maintaining loyalty becomes a little easier because of the high switching costs implied by the purchase of complete solutions.

⁵ Jonathan Ayers. President Carrier Corporation. UTC company. April 10, 2000. *SMAC Seminar at Sloan School of Management*.

In the case of Dell, some large corporations currently prefer to request the products from Dell but ask for resellers' services. This is a risky situation that needs to be resolved urgently. Dell must avoid that resellers enter into the client relationship. A suggested immediate action in this case is to try to transfer these clients from those resellers to Dell's preferred service partners (currently DEC and IBM). Obviously this will imply first an identification of these clients and then the establishment of personal contacts in order to understand better these customers' needs as well as the reasons why they prefer resellers' services. Dell should pay special attention to the first experience that these customers have when transferred to the new service providers since this initial impressions will determine their willingness to continue buying from Dell in the future. This alternative has the advantage of leveraging on the already established relationship between Dell and its service partners and also of allowing Dell both to serve its large corporate clients and, as the company learns from this experience, to provide better service to its medium and small business segments.

Dell and IBM the Global Services Deal

Within the line of service partnerships, Dell and IBM have recently signed an agreement for service providing. This agreement benefits both parties. By using IBM, Dell will be able to provide the required best in class service and high-end support that the company has not yet developed to support its expanding server business. For IBM, the agreement is a major source of growth for one of the segments that is the immediate focus of the corporation.

The agreement was signed in September 1999, was worth US \$ 6 billion, and would last for a period of 7 years. Specifically, the Global Services Business unit of IBM will provide Dell's designated customers with installation, basic-extended warranty, and high availability of services for desktop, notebook, server, and storage customers. This is a worldwide pact and involves all of IBM's 22,000 field technicians. Such global reach will enormously help Dell's international expansion plans, which have recently gained renewed momentum with the opening of a factory in Brazil, from where it intends to serve South America.

It is important to mention that with the agreement, Dell is not transferring the customer relationship to IBM. The intention is that Dell will maintain the relationship intimacy as it has been the case with other Dell's service partners such as Digital Equipment Corporation, Getronics, Wang, and Unysis. Dell has proven to have good capabilities at outsourcing and

partnering. This agreement is no more than another case of the company outsourcing services but in a wider scale than ever before.

The new relationship between Dell and IBM will likely evolve even further with IBM providing more value added services, such as consulting and integration, and Dell assembling IBM's personal computers and lower-end hardware. The move would allow both companies to focus on their current comparative strengths, IBM in value added services and Dell in built-to-order and outsourcing. Additional evidence for such a trend is the March 1999 agreement in which IBM commits to supply Dell with \$ 16 billion worth of components.

6.1.2. B2B e-commerce Issues

As mentioned above, two main sets of challenges are to be faced by companies playing in the computer hardware industry. These two groups are the general strategic issues, as were described in the previous section and, the specific issues related to the B2B e-commerce practice.

The main issues that companies need to tackle to achieve superb execution in B2B e-commerce are hygiene factors such as portal design, Web page customization, user friendliness or easiness to use, feedback systems to continuous improvement, and connectivity/standardization/dynamic integration. These factors are determinants for integrating the external and internal information system both backwards and forwards, a prerequisite in the e-business world.

Both Dell and IBM have achieved superb results in managing key hygiene factors such portal design, Web page customization and, user friendliness or easiness to use. In August of 1999 Business Marketing, a business magazine for B2B companies, published its NetMarketing 200, an issue in which they ranked the top B2B Web sites. The Netmarketing 200 ranked these sites cutting across 24 general industry categories. Both Dell and IBM were ranked between the top 30. See table 1.

Table 1. The NetMarketing 200: Top 50 Web sites⁶

Rank & Company	Age yrs ⁷	Product order & payment	Order & no payment	News & Information	e-mail notices /news	Host online ads	Online help
1. Cisco	6	✓		✓	✓	✓	
2. Boeing	4					✓	
3. Orderzone	0.3	✓	✓	✓	✓	✓	✓
4. Plasticsnet	4	✓		✓	✓	✓	✓
5. UPS	5		✓	✓	✓		✓
6. Apple	N/A	✓		✓	✓	✓	
7. Compaq	6+	✓		✓	✓		✓
18. Dell	5	✓			✓	✓	✓
24. IBM	5	✓		✓	✓	✓	✓

Dell and IBM should leverage the Internet to also implement a continuous feedback program on their Web sites. This feedback should be formally requested from users and should cover specific aspects of the site such as content, ease to find, ease to search, reliability and speed amongst others. By doing this, both companies will ensure that they reduce the risk of having unsatisfied customers.

Another B2B specific challenge is connectivity. In the electronic business world, standardization of systems and sharing data will be an imperative. Data and code that were only months ago deemed proprietary, and therefore a source of competitive advantage, now become a barrier to achieve the open standards that ensure the interconnectedness that truly create competitiveness in the new Internet world. As an example Rosettanet is an organization that began in 1998, formed by manufacturers, distributors and resellers, to oversee development of open standards for e-commerce transactions involving computer products.

The necessity for standardization is extremely evident from the IT and business process point of views. Many companies are not taking full advantage of the e-commerce practice due to lack of connectivity. Dell was one example. As I have mentioned in chapter 4, Dell was having difficulties to demonstrate the advantages of ordering directly through the Web site to

⁶ Note: a blank space means that the company does not use the site that way. In other words, the company probably provides the service by using other means such as e-mail, etc.

Source: *Business Marketing. NetMarketing 2000. August 1999*

⁷ Age of Web-site

some clients. Statoil was a case in point. Due to the lack of integration between the company's enterprise resources systems and Dell's Web Premier pages, Statoil personnel had to re-enter manually some purchase information that could be pulled automatically from the system.

In order to address this lack of full connectivity, Dell signed agreements with providers such as WebMethods to streamline and integrate several business processes along the value chain. However, in the marketplace there are many companies, mainly small businesses, that have problems on their end to get to the level of connectivity that would lead to the "total" integration required to be a proactive player in the e-business world. IBM, by virtue of being also a software developer that could offer a "bundle" that solves several customer needs, is nowadays in a better position than Dell to take advantage of the new paradigm.

Rosettanet is only an example of how most companies have recognized the need for standardization. Today, all enterprise resource planning systems are designed to be fully EDI compliant and XML capable. This is allowing manufacturers who had already committed to expensive EDI networks to connect with those suppliers who previously could not afford EDI.

In summary we are moving towards total customer experience and dynamic integration. Businesses are not longer engaging in B2B e-commerce practices to cut costs or simplify processes. They are doing so in order to strengthen customer relationships and as a result dominate markets. E-commerce is no longer an operational issue but a strategic one.

6.2. Looking longer term

In a longer term, we should expect several challenges for companies engaging in e-business. These challenges will be imposed by the new advances in PC substitutes, PDA's and wireless applications and hardware, and the appearance of e-marketplaces that give birth to dynamic pricing.

Companies engaging in e-business will witness the appearance and consolidation of several advances in communications and interconnections. These advances will have implications in their day to day business as well as in the longer term. We have already started to witness

these advances; devices such as mobile phones, personal digital assistants, pagers, and so forth are already playing an important role in business and non business communications.

Additionally, new electronic business models such as exchanges, auctions and aggregators will impose several challenges for companies engaging in e-business.

New advances and possible PC substitutes: A switch to the new while saving the best of the old

We have so far examined IBM and Dell within the boundaries of the computer hardware industry. However, market trends are also showing the emergence of several devices as substitutes for laptops or notebooks for some of their uses. Devices such as the digital personal organizers are being widely adopted. The most important new trend in the personal digital assistants (PDAs) market is wireless Web access. As an example the popular Palm series from 3Com, Palm VII, has a built-in antenna and communications capability for wireless access to specially formatted Web pages⁸. Another company founded by former Palm's founders, Handspring, has launched Palm –compatible PDAs called Visors that will also include Web-surfing capabilities.

These examples clearly show that PC's are no longer going to be the main means to interconnect inside and outside companies. We should expect that in the future, the physical space where businesses were conducted moves into the virtual realm as these PC substitutes take over the functions of Web connections, e-mails, intranet access, and even voice communication.

In addition, cellular phones are moving in the same direction. The cell phone is becoming a versatile information appliance. Although the current small screens prevent from using them to present fancy Web pages and lots of data, existing mobiles allow users to check the Internet and the Web anytime to get their e-mails, stock quotes, and even vital information available in specific pages in companies' intranets.

IBM is also heavily involved in the development of technologies in all these areas. As an example, the Bluetooth project, the work of more than 500 firms, led by Ericsson, Nokia,

⁸ Fortune Magazine Special, *Designer Tech Now that Computer Prices are Rock-bottom*. Dec, 1999

Toshiba Intel and IBM, aims to create a replacement for the wires that connect devices to one another through a single short radio link.⁹ A simple chip worth only \$5 will be installed in mobile phones and allows to connect mobile phones to notebooks, computers, printers and literally any other digital device within ten meters. Bluetooth also will tie into existing data networks, including the Internet.

In summary, alternative ways to reach the Web and to communicate and transfer information will proliferate. As this happens the PC will start losing its ubiquity and playing a rapidly diminishing role in the networked economy. PC's will not longer be necessary as "holders" of software. The Internet could literally be the software holder and will allow users to require no more than "dumb" PC's with reduced functionality. PCs will basically become enhanced monitors and "windows" for access.

Such panorama will not look very appealing to computer hardware vendors, specially if these vendors are heavily dependent on PC sales. Companies playing in the computer hardware market will be better off by focusing on storage systems and Web based servers that would facilitate their becoming the repositories and conduits for information and connectedness. Although current security issues will prevent companies from relying on the Web to storage sensitive data, there is no reason to believe this will not change. Longer term, the expected evolution of security systems and the increased acceptance by the management of the such remote data storage in the Internet will make of servers the main source of growth amongst hardware products.

The combination of these trends, the forces at work within the PC industry examined before and the current strengths, capabilities and product portfolios of the two companies examined point towards the following offering by each company:

- IBM –Continue to focus on complete solutions with an emphasis on providing services and integration. For hardware, move to components, servers and storage systems, while exploring mobile connectivity.
- Dell – Continue the model as it is with specific emphasis on Internet related technologies in servers and storage systems. Improve services through outsourcing to

⁹ The Economist, Special. *The Future: Tomorrow's Internet*. November 13, 1999

provide full solutions and integration capabilities. Fully extend the model internationally.

In this sense, the IBM model seems more robust. However, Dell already has shown that it can get the leading edge in more established technologies by the sheer excellence of its outsourcing capabilities. In that sense IBM could benefit on developing leading edge design on quickly commoditized products, which will be produced by Dell, or even simply incorporate into its full service offering hardware manufactured by its competitor. IBM wins by reducing its asset intensity and capturing some of the value created by Dell's management processes; Dell wins by increasing even more its scale, thus reducing its costs and probably increasing its price advantage versus other players, with the resulting share growth this might mean. In addition, Dell could benefit from IBM's R&D process, by being able to be second to incorporate any IBM invention or product extension in its own product line. Both players would still be well placed to win the hardware game in an Internet world by building on their own independent talent to reach users and convince them that their own brand and product array is best. Here the best will win.

For Further Thinking

Although this goes beyond the scope of this thesis, I suggest that the companies object of this study do further thinking and analysis with regards to the following proposition. In a more dramatic scenario of increasing change requiring developing very focused capabilities to compete against new specialized entrants, these two companies might need to decide in which business to stay and which to abandon. As I mentioned before, in this regard, IBM has shown better at deciding where to focus its efforts.

In the new world depicted, a de-integration and then re-integration of the value chain in the computer hardware industry with companies specializing in what they are best at, seem plausible. Three functions appear to be the result of a possible de-integration: developer, assembler, and value added services provider. In this new scenario, IBM will play the first and third roles to be the developer and provider of software, components and value added services or full customer solutions. This will give to the company all the benefits mentioned in the previous section while also liberate resources that IBM could use in order to develop best-in-class capabilities and skills required to compete in the new service business. IBM has

somehow recognized that it has limitations as a PC manufacturer and started to outsource assembling to third parties, basically its channel, resellers and distributors via the Authorized Assembly Program (AAP).

On the other side, Dell will be the assembler, and will not play any role in the service arena. Dell could either assemble under its own brand but using IBM's technology, or it could assemble all the hardware for IBM. Dell will benefit by specializing on its built-to-order efficient assembly system while at the same time having access to best-in-class product development and components. In addition, Dell will be liberated from the service part of the business, by transferring all that part of its value chain to IBM. Note that this is a relationship that has already started with the recently Dell-IBM agreement in which IBM's Global Services Unit will provide services on behalf of Dell. Moreover, the fact that Dell does not have to build reputation on e-business consulting¹⁰, makes it easier for Dell to leave this business and concentrate on assembly under its already proven successful built-to-order system. However, a detailed assessment of this proposition is required, specially given that IBM just recently signed a new agreement with Acer, which could preempt Dell from fully playing the assembler role with IBM. This agreement is a 7-year technology alliance by which Acer will buy hard-disk drives, processors, networking, and display technology from IBM for use in its servers, desktops, and laptops. IBM will have a reciprocal agreement with Acer to purchase PCs, notebook computers and thin clients in an extension of the complex, long-standing outsourcing arrangement between the two companies¹¹.

Additionally, IBM or Dell could also look for additional sources of technology innovation and product development by engaging in strategic alliances, or even acquisitions with top-notch innovators. A good candidate could be Sony. Currently Sony has a leadership position in the consumer electronics area. In the computer hardware industry a trend towards convergence of consumer electronics and computing seems evident. DVD's embedded in personal computers are an example. Sony has pioneered several innovations in this arena, an example is the video audio integrated operation (VAIO) in which convergence of several multimedia such as TV and PC is implemented. Sony has achieved excellence in product

¹⁰ McWilliams, Gary. *Dell Shifts Strategy to Make Servers Its No. 1 Priority*. The Wall Street Journal. April 6, 2000, Page B6.

¹¹ Moltzen, Edward F. Raum, Andreas. *IBM partners with Acer in another major OEM pact*. Computer Reseller News. (845): 1,6. 1999 Jun 7.

innovation through its line of portable computers. In the worldwide market the company has the number 7 position. Both companies, IBM and Sony will benefit by joining efforts and resources towards product innovation. IBM will have access to the newest technologies in consumer electronics that could be used for computing enhancement, while Sony will be both released from having to compete on the price sensitive PC market and able to concentrate resources in its most important core competencies. Furthermore, all these alliances and partnerships become more feasible to implement in the networked world due to the communication and information sharing capabilities brought about by the Internet.

The proposition/alliance with Sony could also work for Dell in similar conditions to those that were proposed for the IBM case. In the past, Sony has developed new technologies for Dell; an example is the Li-On battery, with which Dell achieved to regain its almost lost battle in the portable computer market, by introducing a light computer with enhanced performance and long lasting (relatively to the market offerings) batteries at the end of 1993.

Despite all the above advantages, Sony could be reluctant to engage in such an alliance, because it just passed through an organizational re-structuring in which it went from a multiple product unit focus to a concentration on three subsidiaries, one of which deliberately emphasizes Sony's PC business. A refusal by Sony however would still leave open a partnership with other Japanese companies active in the PC business, such as Hitachi, Matsushita (Panasonic), and Toshiba.

Lastly, the economics of the direct channel dictate that companies will be forced to adopt it. The question that arises from this is what will happen to intermediaries. In the B2B area, dramatic changes should be expected from their side. They will be forced to quit or to develop alternative businesses such as becoming assemblers or retailers of products different from computer hardware or even transforming themselves into ASPs. This is a segment in which probably they will have to make heavy investments in order to build the required capabilities. In the B2C market, they could probably become showrooms for computer and computer accessories and hardware as buyers on the consumer side are less computer savvy and have many times the need to see, touch and feel the product they are about to purchase.

Summarizing, this scenario shows a market of highly specialized players, in which the best will win and innovation will continue to play a key role as a source of competitive advantage.

E-marketplaces -Dynamic pricing.

One of the challenges brought about by the Internet is that it enables companies to move away from fixed pricing models. An example is a B2B exchange. This dynamic pricing allows companies to significantly reduce their purchasing costs, reduce their inventory levels and ensure better on-time delivery of their products. Prices for certain products will be more flexible. Goods in oversupply could be sold efficiently at market clearing prices instead of either clogging channels or being dumped.¹²

With the Internet several business models for marketplaces (e-market places) have emerged. They could take basically three forms: auctions, exchanges and aggregators. Initially e-marketplaces were used to match buyers and sellers. However they are evolving to involve a wider range of other business processes. As an illustration, a manufacturer could tie together all the suppliers and shippers with which the company deals through the Internet.

Exchanges are centralized markets for standardized products. There, competitive bidding occurs between buyers and sellers, and orders are matched automatically, creating a very efficient price-setting mechanism on-line. Multiple buyers and sellers are brought together in a virtual, central marketplace that enables them to buy and sell from each other at a dynamic price that is determined in accordance with the pre-set rules of the exchange.¹³ A good example of an exchange is the stock exchange. But in the e-world there is not physical space where the transactions are made. Everything is done on-line.

An auction market is a special type of exchange in which either multiple sellers or buyers bid competitively on a contract. It is preferred by companies liquidating excess inventories at best possible prices because it enables a wide range of potential buyers to bid competitively for the products at below market prices¹⁴. An example of this e-marketplace is e-bay and e-steel.

¹² The Economist. Survey. *You'll Never Walk Alone: Above All, e-business is about sharing.* June 1999.

¹³ Ibidem

¹⁴ Sculley and Woods. *B2B exchanges.* ISI publications, 1999. P 35.

Finally, aggregators, are the “virtual” agents that aggregate the product catalogs of several suppliers. They put all this information in only one place and one format. They are a kind of “one-stop-shopping” for companies. Aggregators do not allow for flexible pricing since the model is not based on real time bid-ask. They are basically consolidators in a fragmented market where the information from all possible suppliers is not easily available and several inefficiencies are created because of that.

Of these forms, exchanges (auctions included) are the most suitable for B2B application since they put together buyers and sellers of standardized products. Enterprise procurement is basically a task of purchasing standardized products since raw materials or parts must comply with several specifications.

In short, table 2 presents the main key advantages of B2B exchanges as well as the reasons why the Internet is enabling these exchanges to develop.

Table 2. B2B Exchanges¹⁵

Advantages	The Internet as enabler of B2B Exchanges
<ul style="list-style-type: none"> ▪ Standardized products, contracts and documents ▪ Confidentiality ▪ Neutral place ▪ Users need to be pre-qualified and are regulated ▪ Centralized market place ▪ Information availability on real-time price quotes, post trade information and history ▪ Transparency ▪ Rules maintain the integrity of the market ▪ Regulated market, regulated pricing mechanism ▪ Clearing and settlement ▪ It builds a community , that allows also for service providers to participate ▪ Future :24 X 7 trading allowed 	<ul style="list-style-type: none"> ▪ Automated trading could eliminate market inefficiencies ▪ Price setting mechanisms will improve pricing efficiency ▪ Higher volumes traded ▪ Higher volume of information that did not exist before ▪ Low connectivity costs – geography is not an obstacle ▪ Allows for easier finding of fragmented buyers and sellers ▪ Costs are substantially low relatively to the physical world

¹⁵ Source: Sculley and Woods. *B2B Exchanges. The killer Application in the B2B Internet Revolution.* ISI Publications,. 1999 USA

Before entering into the implications of B2B exchanges for the hardware business, it is important to differentiate between seller driven, buyer driven and two way auctions.

Seller Driven auctions are the ones in which the seller lists the items it wants to sell and several buyers bid at upward prices to acquire the good or service. This is the model used by e-bay. Here the seller benefits the most. Buyers have to offer higher and higher prices in order to be able to purchase. In other words this could be seen as a competition between multiple buyers. This model is preferred by companies that have obsolete materials or goods and want to sell them fast enough.

Buyer Driven auctions are also known as reverse auctions. In this case, buyers specify what they want to buy and several sellers participating in the auction will compete to gain the buyer's business but in this case in a downward price dynamic. Contrary to the seller driven auction, this kind benefits the buyer who would be able to acquire the goods or services needed at the best possible price. An example of this is Freemarkets.

Two way auctions are basically another name for an exchange, a model where the seller offers to sell (ask) and the buyer to buy (bid).¹⁶ This works perfectly in an electronic environment since several automated mechanisms could be put in place to allow for null human intervention. Two ways of closing a negotiation in this market place are pricing at market prices or limit orders. Market prices mean that the purchase is settled at the best price offered on the other side of the market at a precise moment of time. Limit prices work as follows: the buyer puts a maximum price to buy, when the market price reaches this "limit", the order is settled. The system checks incoming orders and looks for an equivalent (in the opposite side buyer/seller seller/buyer) order that matches the price conditions. If the order cannot be matched, it is kept in the system waiting for incoming orders until an equal and opposite order arrives.

From the above descriptions we can see that these new developments will have several implications on the way companies sell their products and services as well as in the way they

¹⁶ Sculley and Woods. *B2B Exchanges. The killer Application in the B2B Internet Revolution*. ISI Publications,. 1999 USA

manage their procurement activities. The main implication is basically a requirement for IT capabilities that allow for full, end-to-end integration. These requirements follow¹⁷.

- Without any human intervention systems will have to find one another and connect in seconds sometimes for a single transaction.
- Corporate information systems will need to make proposals and counterproposals in terms and conditions over the net to arrive at agreement in seconds. This implies that corporations have to clearly establish a policy for purchasing that can be translated into specific conditions and could be executable over the Net. Large and bureaucratic corporations will not be early participants in these markets given that they would probably have to “re-engineer” their purchasing function.
- Enterprise applications will have to automatically coordinate projects, plans, logistics, and execute purchases as soon as they officially enter the market (or even before that). In order to do this, protocols, data and others must be completely integrated.
- Another requirement is for companies to share their data about factors like production capacity, scheduling, assembly, transportation and warehousing. E-marketplaces will evolve to add support for communicating this information and for monitoring shared processes. Again large and/or bureaucratic corporations will not probably be so willing to accept this condition as they could see it as a way of releasing confidential information.

As we can see, e-marketplaces create a collaborative environment. Companies will begin to rely on e-marketplaces for managing and evaluating their supply chains. By this I mean that many companies could decide to keep in house some core processes and/or activities and outsource others in which they are not as competitive. This could only be possible thanks to the transparency of these marketplaces. To take the best advantage of partnering relationships, a company must review its own internal departments to assess core and non-core activities and so decide which activities to keep or to outsource. As an example, companies can plan to fragment IT and enter into marketplaces to build partnerships with IT outsourcers.

¹⁷ The Forrester Report. *Brokered Partner Integration*. January 2000.

We can expect these marketplaces to proliferate as economic benefits become widely obvious and expedite their adoption. Companies not participating in these markets will lose by having reduced access to goods and services and paying premium, non-optimal prices for their purchases.

But systems integration and IT capabilities are a must in this relatively new environment. We know that best in class systems are expensive and have to be renovated frequently. Companies not willing to invest in systems and systems integration will not survive as players for long.

Dell and IBM are, from different starting points, in a good position with regards to dynamic pricing. We have seen that both IBM and Dell are moving towards complete integration. Dell first by virtue of its overall model, is in a better position to deal with the dynamic pricing challenge. The company has already developed close relationships with players at both ends of its value chain, customers and suppliers. Transparency in communications and free access to information play a key role in Dell's model and will enable the company to be in an advantageous position to take advantage of dynamic pricing.

IBM is also moving towards this direction. On the one hand, IBM is probably better off than Dell because of IBM's capability to develop the software required to create marketplaces in-house. On the other hand, IBM's larger size and complex process environment could require more time versus Dell to be able to play in the dynamic pricing arena. However, this should not stop the company of eventually catching up and becoming a relevant player since IBM has already demonstrated that, despite its size and complexity, proactively managed to implement its e-business initiative in record time.

In addition to help on pricing, and related to the issues we touched upon in previous sections when discussing how to serve different market segments, the use of e-marketplaces might potentially help Dell more than other players in the PC hardware market. Dell has recently signed an agreement with Ariba for the development of an on-line marketplace that will allow Dell's small and medium business customers to post requests for goods, list products or parts

for sale or conduct on-line auctions¹⁸. This “alternative” market will indirectly work for Dell in the sense that will help reducing the low satisfaction of those clients that are not eager to engage into the proposed “replacement order-no questions asked” program by providing them with an option to get access to the parts they need.

6.3. Summary

In this chapter and also based on the analyses presented across the whole document, I have proposed several courses of action for these two companies. A collaborative approach seems to be the most likely in the current and future scenarios. Partnerships to acquire capabilities are a way to gain and sustain competitive advantage. The relationship with customers becomes the key thrust; the company that manages to acquire and retain the customer relationship will be in better positioning. Once the relationship is held, the manufacturer should look for ways to improve its offerings to this customer and provide better solutions to customer needs. How to do this varies, depending on the company capabilities and skills. Dell could better serve its customers by outsourcing the service provision to partner service providers or to IBM. IBM will be better served by building and improving service offerings through in-house development. Internally, and focusing mainly on hardware manufacturing and distribution, specialization will play an important role in determining which company does what. Under the premises of this work, Dell could probably be the manufacturer of lower end hardware for IBM while the latter focuses on building, if it must do so, the higher end products and providing the highly profitable software and service solutions.

New product introductions such as PDAs and wireless expanded capabilities will dictate the future in personal computing. The next two years will be key for all players in the computer hardware industry including IBM and Dell. Alliances with wireless hardware and service providers seem recommendable if not absolutely necessary.

¹⁸ Technology Supplement. The Wall Street Journal. *Dell Will Develop on-line Marketplace in Venture with Ariba*. March 14, 2000

Bibliography

- Forrester Research. Lief , Dolberg and Lanpher. **Anatomy for New Market Models-** Report. February 1999
- Timmers Paul. **Business Models For Electronic Markets.** European Commission, April 1998
- The Economist- Survey. **Business and the Internet.** June 26th, 1999
- Reinhardt Andy. **Log In, Link up, save big.** www.businessweek.com 1998
- Forrester Research. Bell, Schadler, Dolberg and Sharrad. **Building and Extranet Strategy.** March 1999, report.
- Hof, Robert. **The Click Here Economy.** www.businessweek.com. 1998
- Forrester Research. Walker, Brown, Smith, Ciardelli and Worthen. **Pumping Up Intranet Portals.** September 1999, report.
- Forrester Research. Erwin, Modahl, Johnson. **Sizing Intercompany Commerce.** July 1998, report- volume one number one.
- Forrester Research. Dolberg, Cheema and Sharrard. **Resizing On-line Business Trade.** November 1998.
- Manson, W.B. **It's Not easy Being B2B.** Cio Magazine, October 1, 1999
- Forrester Research. Dolberg, Boehm, Chatham and Ritter. **The Commerce Integration Imperative.** July 1998. Volume 1 number 3.
- Forrester Research. Dolberg, Temkim and Lanpher. **Best of The Business Web.** August 1998. Volume 2 number 2.
- Kelly, Kevin. **New Rules fro the New Economy.** Wired Magazine. September 1997. Archive 5.09
- Forrester Research. Oltsik, Howe and Deutsch. **IBM's Internet Opportunity.** July 1998. Volume 15 number 9
- The Economist. **Big, Boring, Booming.** 10th May , 1997
- CommerceNet. **World Wide Statistics.** www.commerce.net/research/stats/wwstats. 1999
- Internet Society. **All about the Internet.** 1999. <http://info.isoc.org/internet/>
- Mendelson, Haim. **A Note on Internet Technology.** Stanford University-Graduate School of Business. S-OIT-15. Rev July 1999

- [http:// www.w3.org/people/Berners-Lee/FAQ](http://www.w3.org/people/Berners-Lee/FAQ)
- Morgan Stanley Dean Witter. **The Internet Data Services Report**. August 11, 1999
- Financial Times Survey. **Electronic Business**. Wed, October 20, 1999
- Business Marketing. **The Net Marketing 200: Top 50**. August 1999 issue. P 27,38.
- Dell, Michael with Catherine Fredman. **Direct From Dell**. Harper Business Publishers, First Edition 1998.
- Hagel and Singer. **Net Worth**. Harvard Business School Press.1999
- Papows, Jeff. **Enterprise.com**. Perseus Books. 1998
- Hanson, Ward. **Principles of Internet Marketing**. South eastern College Publishing. 1999
- Ravi Kalakota, et al **E-Business : Roadmap for Success** (Addison-Wesley Information Technology Series)"
- Jonathan Rosenoer, et al **The Clickable Corporation** : Successful Strategies for Capturing the Internet Advantage
- Christina Ford Haylock, et al; **Net Success** : 24 Leaders in Web Commerce Show You How to Put theWeb to Work for Your Business"
- W, William Woods, Arthur, B Sculley; **B2B Exchanges: The Killer Application in the Business-to-Business Internet Revolution**
- Oster, Sharon M. **Modern Competitive Analysis**. Third edition. Oxford University Press. 1999
- Porter, Michael E. **Towards a Dynamic Theory of Strategy**. Strategic Management Journal, 12, 95-117. 1991. John Wiley and Sons Ltd
- The Cambridge Technology Partners. **Competition's Battleground: The Integrated Value Chain**. 1999
- Grant. Robert. **The Resource Based Theory of Competitive advantage**. California Management Review. 33 # 3. 1991
- Douglas Dave and Papadopolous Greg. **How to .com Your Business**. Sun Microsystems 1999
- The Forrester Report. **Reining In Online Suppliers**. January 2000.
- <http://www.IBM.com/IBM/history/story/text.html>
- IBM, 1998 Annual Report

- Zarley and Campbell. ***New service channel takes shaped around the Internet.*** Computer Reseller News. (861), 5, 14 Sep 1999
- Gillooly, Caryn. ***Tech Companies Want Everything On The Web.*** Informationweek. Sep 27/1999
- Miller, Julie. ***IBM delivers e-business consulting for small and medium companies.*** Midrange systems. Sep 30, 1999 12 (14), 22
- Albert, Sam. ***Midrange Sytems. Influencing the influencers.*** 12 (18): 54 Dec 13, 1999
- Anderson Richard. IBM . E-commerce class video. April 7, 1999
- Copeland, Lee. ***IBM To Focus on Selling PC's direct.*** Computerworld. 33 (42) Oct 18, 1999
- The Wall Street Journal. ***Sprint, IBM Set Up Venture for Wireless Access.*** Technology Journal.
- Business Week Online. ***E-Biz cover story- IBM's e-Business Strategy*** December 13, 1999
- Hughes Robert. ***IBM National Accounts Payable. Web-EDI-to Reach Your E-com goals.*** 1999
- Harvard Business School. ***Product Development at Dell Computer Corporation.*** Case 9-699-010. Rev Feb 1999.
- Harvard Business School. ***Dell Online.*** Case 9-598-116. Rev March 1999
- Hax Arnoldo and Wilde Dean. ***The Delta Model: Adaptive Management for Changing World.*** Sloan Management Review, Winter 1999.
- Dell Computer Corp. ***Form 10K*** FYE 1/29/99
- Magreta, Joan. ***The Power of Virtual Integration: An Interview with Dell's Computers Michael Dell.*** HBR, 1998
- Merrill Lynch. ***IBM report for e-business analysis forum*** (Dec 1999).
- Morgan Stanley Dean Witter . ***Report on Dell,*** November 17, 1999. U.S. Investment Research.
- Dell Computer Corporation. ***Web site. Fact Pack.*** www.Dell.com.
- Forrester Report. ***PC Industry Roller Coaster.*** Vol 15, number 11. September 1998
- Mc Williams Gary. ***First Software, Then...*** The Wall Street Journal. Technology Report. Nov 15/99

- Business Marketing. NetMarketing 2000. *The NetMarketing 200: Top 50 Web sites*. August 1999
- Fortune Magazine Special, *Designer Tech Now that Computer Prices are Rock-bottom*. Dec, 1999
- The Economist, Special. *The Future: Tomorrow's Internet*. November 13, 1999
- The Economist. Survey. *You'll Never Walk Alone: Above All, e-business is about sharing*. June 1999
- The Forrester Report. *Brokered Partner Integration*. January 2000
- IDC , *The Direct Channel Ships More PCs than the Commercial Channel for The First Time in 3Q99*. Jan 12, 2000
- IDC. *IDC Expects Shipments Through Direct Channels to Surpass Those Through Commercial Channels by 2001*. August 1999.
- IDC and Dataquest 1999.
- Leonard- Barton Dorothy. *Core Capabilities and Core Rigidities: A Paradox In Managing New Product Development*. Strategic Management Journal. Vol 13, 111-125 (1992).
- Investext. *Mergent Fis Company report*. Dell Computer Corp. # 3573577
- Moltzen, Edward F. Raum, Andreas. *IBM partners with Acer in another major OEM pact*. Computer Reseller News. (845): 1,6. 1999 Jun 7.
- James, Geoffrey. *Baby Godzilla*. Mc Technology marketing Intelligence. 19(7): 32-38 1999 July.
- McWilliams Gary. *Dell Shifts Strategy to Make Servers Its No. 1 Priority*. The Wall Street Journal. Technology Journal. April 6, 2000
- Lindquist, Christopher. *Superslim PCs: Lean and Costly*. Computerworld. 33(38):84. Sep 20, 1999.
- Technology Journal. *Dell Will Develop Online Marketplace In Venture With Ariba*. The wall Street Journal. March 14, 2000
- Fulford, Benjamin. *A Digital Counterattack*. Forbes Magazine. 164(10): 154-156. Oct 18, 1999.