

**NEW YORK UNIVERSITY
Leonard N. Stern School of Business**

**Business Strategy Analysis
B01.1101**

**Fall 2001
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Monday
6-8:50 p.m.**

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Course Description

This course provides students with the concepts and tools required to devise strategies that enable the business to create superior value for chosen customers and to capture a sufficient share of that value in order to create an economic profit on its investment. The course focuses on the gaining of competitive advantages at the product/market level.

The course builds a model of competitive advantage, applies it to the competitive marketplace, and identifies the key sources by which firms can gain competitive advantage. It provides the basic set of tools that enable students to analyze and define the competitive situation at the product/market level, to delineate the strategic options open to the firm to create or retain competitive advantage, and to evaluate those options in both their competitive and economic aspects.

This course is built on several key arguments:

1. The first argument is based on the understanding of competitive strategy in games in which the outcome is valued versus the play of the game. The main argument in this theory is that one does not play such a game 1) unless one has a competitive advantage which creates a positive probability of winning and 2) that the gains from winning versus the possible losses from losing are attractive.
2. The second argument says that marketplace exchange creates value. In this context, the objective of business strategy is to be able to create and capture value through exchange sufficient to earn an economic return on invested capital—the amount one bets on the game.
3. The third argument says that in competitive markets, firms compete to create superior value for customers as that value is defined and perceived by those customers.
4. The fourth argument says that competitive markets are efficient in the long run and that to create economic profits a firm must have an economic advantage versus competitors in

creating that value. Competitive advantage, whatever its source in the firm's value chain, must have its effect at the product/market level.

5. The fifth argument says that the firm has choices about 1) the exact value proposition to be offered, 2) the market segments and customer groupings it chooses to serve, 3) the position it will occupy in an industry value chain, 4) the way it configures its value chain, and 5) the ways in which it organizes its activities.
6. The sixth argument says that the argument outlined above is normative in nature: that successful strategies embody these ideas but the processes by which competitive advantage is achieved are varied and are more often opportunistic, serendipitous, and ill-defined than formal and planned because of the limits to human comprehension and the influences of competitive actions and shifts in the larger environment.
7. This course focuses on the above, prepares students with one set of tools to analyze strategic situations and make strategic recommendations, assumes that students learn the organizational issues within which such decisions are made in the Management of Organizations course, and lastly, assumes that the recommendations are executed as described.

Text and Other Class Materials

J. Czepiel, R. Garud, A. Ghosh, R. Lamb & J. Steckel, *Business Strategy Analysis*. Pearson Publishing Solutions Custom Edition, 2001.

P. Ghemawat, *Strategy and the Business Landscape*, Prentice Hall, 2001.

Topical Outline

<i>Session/Date</i>	<i>Topic</i>	<i>Readings</i>
1. 9/10	a) Course Introduction b) A Theory of Competitive Advantage	Competitive Marketing Strategy (CMS) Reading 1
2. 9/17	a) Competitive Advantage in Economic Competition b) Formulating Competitive Strategy	Ghemawat, Chapter Two Ghemawat, Chapter One; CMS Reading 2
3. 9/24	a) Creating Superior Value b) Superior Value through Operations and Cost Structure	Ghemawat, Chapter Three; CMS Reading 3 CMS Reading 4
4. 10/1	a) Defining the Competitive Situation b) Technology as a Source of Value	Case:INTEL/AMD (Discuss/Submitted) CMS Reading 5
5. 10/8	a) Superior Value through Operations and Cost Structure b) Strategy in a Dynamic Setting	INTEL/AMD Returned Case: WAL-MART (Discussed) Ghemawat, Chapter 4; CMS Reading 6
6. 10/15	a) Competing on Technology and Operations b) Strategic Competition and Cooperation	Case: Barco (Discuss/Submitted) Case: Browser Wars (Discussed)
7. 10/22	Wind-up	Case: Dell Online, HBR Interview with Michael Dell (Discussed); Barco returned
Final Exam TBA		

Grading Information

Grading will be based on the following:

1) Final Exam	50%
2) Intel/AMD Case (group)	20%
3) Barco Assignment (group)	<u>30%</u>
	100%

Session Objectives, Readings, & Assignments

Session 1b – A Theory of Competitive Advantage

In this session, you will learn:

1. How Hannibal used the laws of physics that govern battles as the basis for his victory
2. How to use the insights from military strategy as the basis to gain competitive advantage in competitions in which a successful outcome is the objective

Read: CMS Reading 1

Session 2a – Competitive Advantage in Economic Competition

In this session you will learn:

1. How superior value creation as the objective of marketplace exchange rules economic competition
2. How your business can create more value
3. How your business can capture its share of that value to create value for the firm
4. How to analyze an industry value chain and your firm's place in that chain
5. How to use the five forces model to analyze industries and markets for their profit potential
6. How to focus firm resources on attractive segments of an industry to gain competitive advantage
7. How to identify a firm's sources of competitive advantage

Read: Ghemawat, Chapter Two

Session 2b – Formulating Competitive Strategy

In this session you will learn:

1. How to use the strategy hierarchy as the basis for the strategy formulation process
2. How to formulate business strategy through a SWOT analysis
3. How to use the generic strategies matrix to determine the source of your firm's competitive advantage
4. How to use the competitive advantage, market attractiveness matrix to determine a firm's strategic choices
5. How decision trees can be used to delineate the specific choices a firm has to achieve its objectives

Read: Ghemawat, Chapter One; CMS Reading 2

Session 3a – Creating Superior Value

In this session you will learn:

1. How to use your firm's sources of advantage to create superior value
2. How to calculate the value of your firm's offering through a value-in-use analysis
3. How to use research techniques that measure consumers' perceived value to create their utility function as the basis for designing offerings that create superior value
4. How to use perceptual maps to assess customer-derived perceptions of competitive offerings
5. How to use the value map to define the value positions held by competitive offerings and to define your firm's strategic direction
6. How to evaluate the offerings in the market along the commodity-specialty continuum

Read: Ghemawat, Chapter Three; CMS Reading 3

Session 3b – Superior Value Through Operations and Cost Structure

In this session you will learn:

1. How to analyze the cost structure of your firm to determine its impact on the firm's strategy
2. How to define the elements of your firm's value chain
3. How to analyze the contribution that a firm's operations have on its ability to create superior value
4. How to identify a firm's cost drivers and their economic impact on its costs using the experience curve
5. How to use the relationships between a firm's operations, its competitive strategy, and its structures to define a future strategy

Read: CMS Reading 4

Session 4a – Defining the Competitive Situation

In this session you will learn:

1. How to define your firm's competitive situation
2. How to use a situation analysis to set the objectives your strategy must achieve
3. How to communicate your analysis to gain understanding and support for the development of your strategy

Prepare and Submit as a team: Intel vs. AMD Case Assignment

Session 4b – Technology as a Source of Value

In this session you will learn:

1. How to use technology as a competitive advantage in creating superior value
2. How to use an understanding of the theories of technology progress as the basis for assessing the competitive environment
3. How to use technological innovation to create competitive advantage
4. How to define your firm's technology strategy

Read: CMS Reading 5

Session 5a -- Superior Value Through Operations and Cost Structure

In this session you will learn:

1. The sources of Wal-Mart's competitive advantage in retailing
2. How sustainable their position in discount retailing will be in the future
3. How effective their diversification into the food industry will be

Prepare for Discussion: Wal-Mart Case

Session 5b – Strategy in a Dynamic Setting

In this session you will learn:

1. How to use an understanding of industry dynamics to create business strategy
2. How to use the product life cycle, the product evolution cycle, the population ecology model, and the competitive entry cycle to assess the future evolution of an industry and the strategy of the firm
3. How to identify the transition points in an industry's evolution to identify the strategic windows during which a firm can successfully change its strategy and the dynamics of an industry

Read: Ghemawat, Chapter Four; CMS Reading 6

Session 6a – Competing on Technology and Operations

In this session you will learn:

1. How to assess the relative technology, operations, and cost positions of competitors to formulate competitive strategy
2. How the changing dynamics of competition in an industry redefine the strategic situation facing competitors
3. How to assess the importance of timing in executing strategy

Prepare & Submit: Barco Projection Systems (A) Case Assignment (group)

Session 6b – Strategic Competition and Cooperation

In this session you will learn:

1. How to use an understanding of the value net as the basis for interfirm cooperation in the creation of superior value
2. How to simultaneously compete and cooperate with others in an industry as the basis of a firm's strategy
3. How to analyze the impact that the development of industry standards affects the relative position of competitors in an industry
4. How to compete in industries in which the business model for value creation, the technology driving the industry, and player coalitions are constantly in a state of flux

Prepare for Discussion: The Browser Wars Case

Session 7 – Competition in Interactive Services

In this session you will learn:

1. How to use the evolution of electronic technology to create new competitive formats to create competitive advantage in existing industries
2. How to understand the bases of competition and the impact of the internet on the economics of an industry
3. How industries evolve as a function of a) new technology and b) the competition among firms for customers.

Prepare for Discussion: Dell Online Case and HBR Interview with Michael Dell

Case Preparation Note Assignments

Intel vs. AMD

The purpose of this assignment is:

- 1) to give you practice in applying the tools from the “Formulating Competitive Strategy” lecture and readings to a very “live” case with
- 2) the end result being a definition of the strategic situation in which AMD finds itself in the microprocessor industry.

Instructions

The case you have received in the case packet, *Intel Corp., 1968-97* tells primarily the Intel side of the case. To complete the case, you will need to research, in the popular business press, 1) the Advanced Micro Devices side and, also, 2) the actions that Intel has taken since 1997. To keep this assignment do-able, the course webpage contains a list of required and optional links. A must read is Jerry Sander's 1998 talk "Competing with an 800-Pound Gorilla."

Assignment

The case preparation note you are to submit, as a team, is to contain the following sections, in the order listed, and in no more than 3pp double-spaced, 12 pt. type with normal margins:

- The generic strategies being pursued by each competitor together with the reasoning you used to determine that conclusion,
- A SWOT analysis for AMD,
- Your definition of the strategic situation AMD faces (how would Hannibal have defined the situation?)

Wal-Mart

The purpose of this case is:

- 1) to allow you to identify and quantify the sources of Wal-Mart's competitive advantage in discount retailing,
- 2) to assess how sustainable their position in discount retailing will be in the future, and
- 3) to address the prospects for their diversification moves.

Discussion Questions

- 1) What are the key elements of Wal-Mart's competitive strategy? How has the firm differentiated itself?
- 2) Does Wal-Mart have a competitive advantage over its competitors?
- 3) Identify the sources of that advantage and quantify each in financial terms.
- 4) How well are the functions aligned with Wal-Mart's overall competitive strategy?
- 5) What criteria should be used to judge the different options for diversification? Which one(s) would you choose and why?

Barco Projection Systems (A)

The purpose of this assignment is:

1. To give you practice in comparing two different business strategies in the same marketplace,
2. To help you to understand how operations and technology contributes to creating superior value, and
3. To be able to define and evaluate a firm's strategic options in response to a competitor's action.

Assignment

The case preparation note you are to submit, as a team, is to contain the following sections, in the order listed, and in no more than one page double-spaced, 12 point type with normal margins plus a one page appendix as described below

- Describe the key elements that define the competitive strategies of both Sony and Barco in the projection systems market. How does each define creating superior value and how did they arrange their business functions to support that definition?
- Prepare, in an appendix, the value map of the offerings in the projection systems marketplace (including Barco's options).

The Browser Wars

The purpose of this assignment is to:

1. offer you an integrative case on the nature of competition in contemporary hi-tech markets
2. introduce you to the strategic importance of standards battles

Assignment

1. GO TO:

<http://www.stern.nyu.edu/~rgarud/browser.html>

2. YOU MAY LIKE TO BROWSE THE SITE—BUT, GO TO

- Competitive dynamics

3. WITHIN THIS, PLEASE READ:

- Technological Change in Web Browsers
- Competitive Dynamics in the Web Browser Market

Assignment:

As you read these pages, please address the following question in one page, 12 point type, normal margins plus a one-page graphic.

- Develop a model of competition in this field. How is it different from other models of competition that you know of? Draw a picture or diagram or your model on one page as an appendix.

Dell Online

The purpose of this assignment is:

1. To help you to learn how to evaluate the potential of an internet sales channel
2. How to structure the channel
3. How to measure the performance of the channel
4. Most broadly, to explore the impact of the internet on industry value chains and a firm's business strategy

Study Questions

- How would you judge Dell's online success?
- What advantage does Dell derive from its online success? Is it a big deal?
- How substantial and sustainable are those advantages in comparison to its competitors? Which of Dell's competitors should it worry about? Why?
- How should Dell go about conducting 50% of its business over the Internet by the year 2000?

**A TALE OF TWO BROWSERS:
Netscape and Microsoft in the Battle for the Internet¹**



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A TALE OF TWO BROWSERS

The Internet and the World Wide Web

While the origin of the Internet dates back to the U.S. Department of Defense-sponsored ARPANET project in the late 1960's, a key factor in its exponential growth was the advent of the World Wide Web (WWW). In March 1989, Tim Berners Lee, a researcher at the Center European pour la Recherche Nucleaire (CERN), outlined the concept of the WWW in an internal proposal in which he articulated the goal of making all information on a network accessible in a simple and consistent way using a concept known as Hypertext. The name "World Wide Web" was established in October 1990.

At its inception, the World Wide Web consisted of three new technologies: HyperText Markup Language (HTML), HyperText Transport Protocol (HTTP), and a Web client program. HTML is used to write web pages. It is a markup language in that text (and later graphics, video and audio) are literally marked up using control characters to inform the client program how these media should appear. HTTP is a TCP/IP protocol -- an Internet communications protocol that is used to transfer information (including HTML files) across the Web. HTTP is part of an application program that resides on a server (known as a Web server) that processes requests from a client program and responds by sending the requested documents to the client. The final component of the WWW developed at CERN was a Web client program that receives data from a server, interprets it, and displays the results. The first clients developed at CERN possessed two basic functions: navigation and browsing, which remain the core functions of browsers today (see figure 1).

Figure 1: How the Web Works

The next key breakthrough came in February 1993 when a software development group at the National Center for Supercomputing Applications (NCSA), located at the University of Illinois-Urbana Champaign, released its first web client, known as Mosaic. In keeping with a time-honored Internet tradition, NCSA distributed Mosaic for free over the Internet. This software was an intuitively easy-to-use navigational tool for "browsing" the WWW. As a result of these developments, the Internet, which had previously been an obscure public network used mainly by scientists, was transformed into the information superhighway. A linked collection of video images, graphics, audio and text, the WWW has transformed the Internet into a media-rich world of information accessible to anyone. The introduction of Mosaic, the first Windows-based web browser, is regarded as the "killer app" that started the stampede of individuals and organizations onto the Internet (Ayre & Reichard, 1995; Berghel, 1996). By mid-1994 nearly two million copies of Mosaic had been downloaded from various computers on the Internet (Elmer-DeWitt, 1994). NCSA also began licensing Mosaic in early 1994 to companies such as IBM and DEC who bundled the browser software with existing products such as operating systems. By late November of the same year, NCSA had licensed over 10 million copies of Mosaic (Computer Business Review, 1994). In assessing its significance, Andy Grove of Intel stated, "The Internet is like a 20-foot tidal wave coming, and we are in kayaks" (Schlender, 1996: 200).

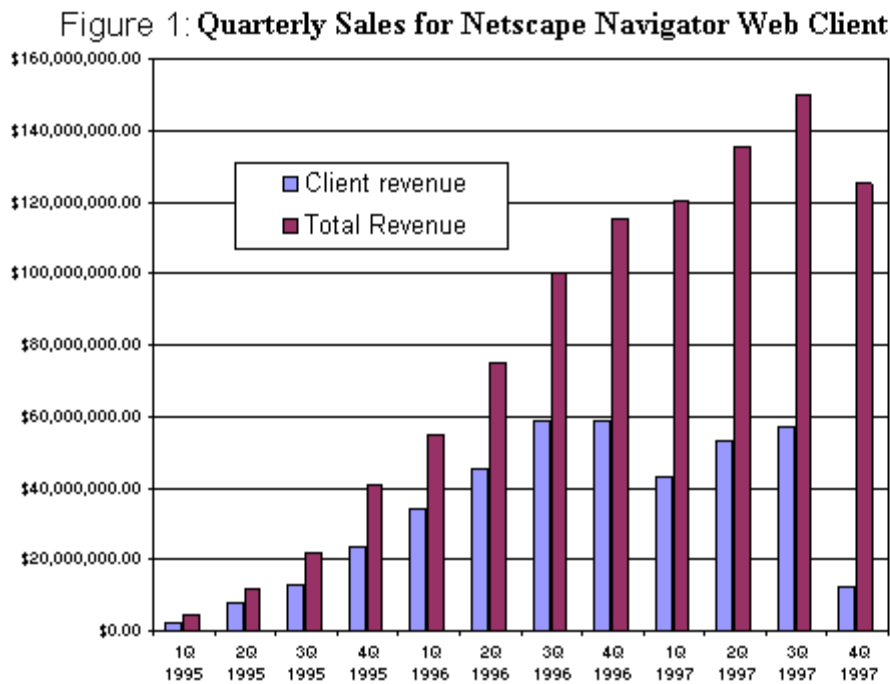
Netscape: The Early Years

Contrary to many media reports, Netscape did not pioneer the commercial market for web browsers. The genesis of commercial browser software can be traced to a small software company named Spy who in August 1994 released the very first commercial web client. One reason that Spy was first to market was that it licensed the software code for the Mosaic browser from NCSA and used this as the basis for its browser, rather than develop the code from scratch.

Although Spy was first, Netscape was not far behind. In April 1994 Marc Andreessen, a member of the NCSA Mosaic browser development team, joined Jim Clark, the founder of Silicon Graphics, to form a start-up company called Mosaic Communications (the name was later changed to Netscape Communications). The firm released a

beta version of its inaugural web browser, dubbed Navigator, in October 1994 and a finished version in December. In less than 6 months after its release, the Navigator browser became the industry standard, used (according to some estimates) by more than 70% of the WWW population. In doing so, it also became the world's most popular computer software application and transformed an obscure pastime -- seeking information and running applications on the Internet -- into a routine activity for tens of millions of people. More than 10 million copies of Navigator had been downloaded from Netscape's web site alone by the end of 1994 and 18 months after its initial release Navigator had an estimated installed base of more than 38 million users (Cusumano & Yoffie, 1999: 10). From no revenues in fiscal year 1994, Netscape generated \$85.4 million in sales in 1995, 61% of this coming from sales of Navigator (see Figure 2). The remaining revenues were primarily generated from the sale of Netscape's other core products -- server software. Netscape released its first server products, named Communications Server 1.0 and Commerce Server 1.0, in December, 1995.

Figure 2: Quarterly Sales for Netscape Navigator



Netscape's early success was not due to a lack of competition. Nine other web browsers were available by the end of 1994 and a total of 24 browsers were included in *Internet World's* review of this product category in April 1995. Towards the end of 1995, CNET, a popular on-line news service covering the information technology field, reviewed 28 different web browsers. Despite this increasing competition, Netscape and its Navigator browser experienced increasing success.

How was Netscape able to eke out such a dominant position? Being a pioneer in this nascent field certainly helped, though it should be noted that there were a number of other web browsers available in the marketplace even in 1994, including NCSA's Mosaic, Spry, Spyglass and others. Netscape, however, differentiated itself by building on the basic NCSA Mosaic platform and offering features in its products that made browsing the Internet a user-friendly experience. However, there is much more to how Netscape achieved its early dominance than just being a pioneer with a quality product.

Partnerships and the race for the installed base

Early on Netscape realized that it could not develop all the technologies, software components, and original content that would make the Internet an interesting and viable platform for entertainment and business, thus increasing demand for its core browser and server software products. Rather than attempt to go it alone, it developed a large number of strategic alliances and less formal partnerships with independent software vendors (ISVs), producers of original content for the web -- independent content

providers (ICPs), as well as numerous organizations that would help distribute Netscape's browser and server products (see Table 1) .

Netscape entered into many technological development arrangements that were aimed at embedding new technologies in the browser. For example, on January 9, 1995, Netscape announced an agreement with MasterCard to develop an interface for authorizing and clearing transactions on credit and debit cards in a secure environment on the Internet. Technological development partnerships were also aimed at extending the capabilities of the browser through the availability of complementary software components developed by independent software vendors. Netscape actively encouraged innovation on its browser platform by other companies. This involved providing technical support to the manufacturers of "plug-ins" -- software programs built by third-party developers that extended the capabilities of its browser. Plug-ins were made possible by Netscape's Client Application Interface (NCAPI). Through this initiative, Netscape created a network of developmental partners that eventually included companies such as Macromedia, Adobe and Real Networks.

Table 1: Netscape's Browser-related Linkage Announcements¹

Linkage Type	Definition	Example	Year					Total	% Total
			1994	1995	1996	1997			
<i>Technological Development</i>	Collaborative efforts between Netscape and one or more organizations to research, develop and commercialize products and/or technologies that extend the functional capabilities of the browser platform.	On January 9, 1995, Netscape announced an agreement with MasterCard to develop an interface for authorizing and clearing transactions on credit and debit cards in a secure environment on the Internet.	1	11	22	25	59	44.7	
<i>Marketing/Distribution</i>	Direct and indirect efforts to encourage adoption of the browser product. Direct efforts consist of agreements between Netscape and another firm to promote Netscape's browser to the firm's customers (includes OEM, VAR, co-branding, and bundling arrangements). Indirect efforts consist of agreements by content providers to provide exclusive or optimized content for Netscape Navigator users.	Direct: On January 24, 1995, Netscape announced that Silicon Graphics would bundle Netscape Navigator client software with all of its desktop systems. Indirect: On April 15, 1997, Netscape announced that over 400 firms would support its new Netcasting technology by providing content over Netcasted channels.	2	9	20	30	61	42.1	
<i>Standards Initiatives</i>	Participation in, and promotion of, standards committees or participation in, and promotion of, a coalition of firms that have adopted a technology as a standard.	On October 25, 1994, Netscape announced that it was a founding member of the World Wide Web Consortium and submitted its Secure Sockets Layer (SSL) technology for consideration as a technological standard for secure transactions over the Internet.	1	3	7	8	19	13.2	
Total^{2,3}			4	23	49	63	139		

¹ The values in this table reflect the number of *announcements* of interfirm linkages, rather than the actual number of linkages. Many announcements mention more than one linkage. Thus, these numbers represent a very conservative estimate of the number of linkages formed. Only linkage announcements directly related to the browser are reported.

² A linkage may have more than one purpose and would thus be counted in more than one category. For Netscape, this occurred a total of 7 times across the entire time period depicted.

³ The values in this table include repeat linkages. Over time, Netscape expanded its relationship with some of its partners, either for the same purpose or a new one. Netscape announced 36 repeat linkages during this period.

Netscape's technological development partnerships also embodied initiatives aimed at exploring the WWW's technological potential in various areas, ranging from financial transactions to entertainment. These linkages were often highly speculative in nature. For example, Netscape was involved in a strategic partnership with @Home to define cable-based Internet services for the home. Similarly, Netscape formed Navio Communications, an independent software company in which it had a major equity position, to create a variety of consumer and non-PC products based on Internet technologies. Given the highly speculative nature of most Internet-based business opportunities, Netscape created a large number of partnerships to probe these possibilities, rather than go it alone.

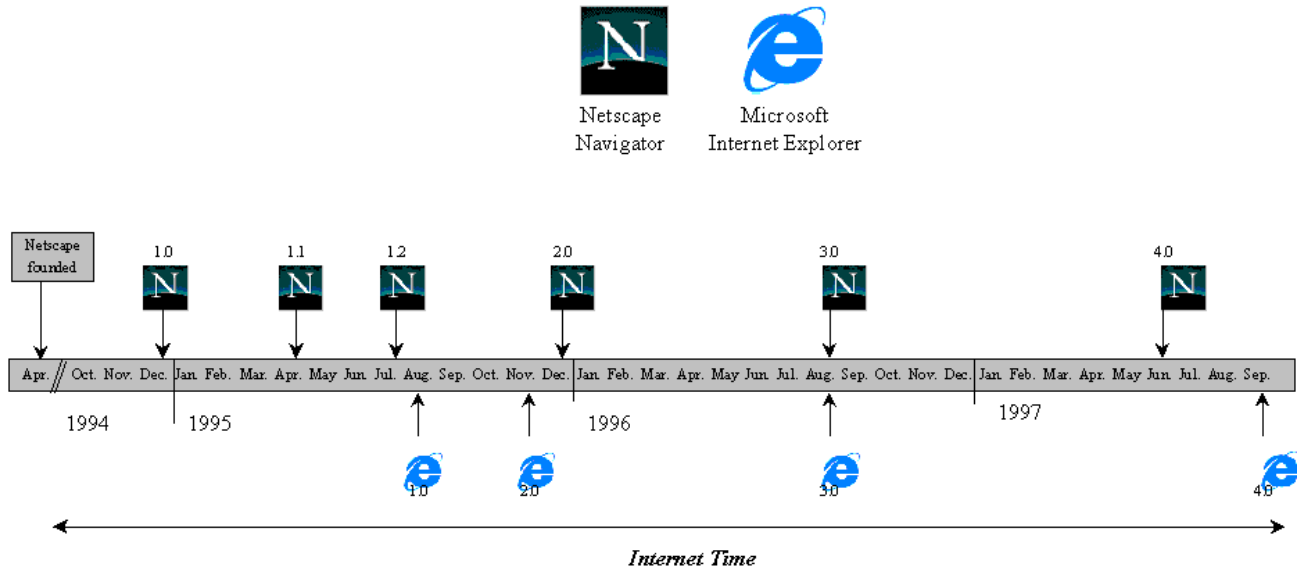
Netscape also entered into a number of different relationships, including OEM agreements, value-added resellers (VAR's), co-branding, and bundling arrangements, in order to expand the marketing and distribution of their products. As an example, Netscape engaged in tie-ins with a number of Internet service providers (ISP's), including MCI, Netcom, Portal and UUNet, in order to gain access to a wider number of end-users. In these arrangements, the ISPs co-branded Netscape's browser and provided it as the exclusive browser to the ISP's customers. Netscape also developed relationships with independent content providers (ICPs) to develop exclusive or "optimized" web content for Netscape browser users. For instance, in January 1997 the Wall Street Journal announced that they would provide a special "technology alert" directly to the email addresses of Netscape Navigator users. Perhaps the most well known of these efforts was to provide incentives to ICPs to optimize their content for Netscape's Navigator and display a button on their web site that stated "This site best viewed by Netscape Navigator."

Netscape also participated in initiatives to promote and establish technological standards. These standards act as institutionalized rules that serve to influence the evolution and adoption of technologies. From early on, Netscape was involved in identifying and nurturing the standards on which the Internet is built. These include support for such open standards as Hypertext transfer protocol (HTTP), Hypertext Markup Language (HTML) and Simple Mail Transport protocol (SMTP). To this end, Netscape actively participated in standard-setting efforts within the World Wide Web consortium (W3C) and the Internet Engineering Task Force (IETF), the premier forums for the advancement of Internet related technologies. Indeed, Netscape was a founding member of the W3C and was the first to submit a technology for consideration as a standard. Through its involvement in standard-setting activity, Netscape attempted to actively influence "the rules of the game" and define the direction in which Internet technology was evolving.

Innovation speed and unfinished products

In building its browser software, Netscape basically reinvented the rules of product development cycle times. To stay ahead, Andreesen insisted that the company release a new version of Navigator every three months, but he ultimately compromised on six months. When speaking about Netscape's strategic focus on speed in new product introduction, Eric Hahn, senior VP of Enterprise technology, explained, "The market obsoletes itself every few quarters. Today a product that takes two years to develop is probably irrelevant" (Markoff, 1996: D1).

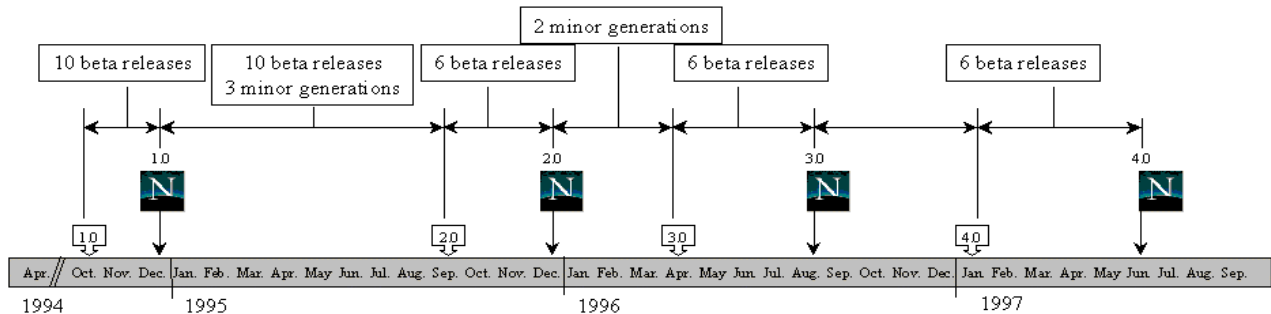
Figure 3: Release dates of major product generations of web browsers



The rate at which new generations of the browser product were introduced was unprecedented. Between its inception in April 1994 and June 1997, Netscape introduced four major generations of its web client and numerous minor generations (see Figure 3). This represents a major product introduction every 8.25 months. In terms of time of release, while the first version of its browser shipped eight months after Netscape's Navigator 1.0, the third generation of Microsoft's Internet Explorer was launched at the same time as Navigator 3.0, in August 1996 (see Figure 3). There has thus been a rapid shrinkage in the release time difference of the two browsers across the first three generations.

Netscape also achieved speed by reinventing a standard software industry practice. In an effort to enter the market as quickly as possible with its first edition of Navigator, Netscape released a "beta," or unfinished, version to the public on October 11, 1994. Numerous beta versions, each with incremental improvements and bug fixes, were released until Netscape released the finished commercial version of Navigator 1.0 on December 15, 1994 (see Figure 4).

Figure 4: Netscape and betaware



Key

- = release of first beta version
- = release of finished version

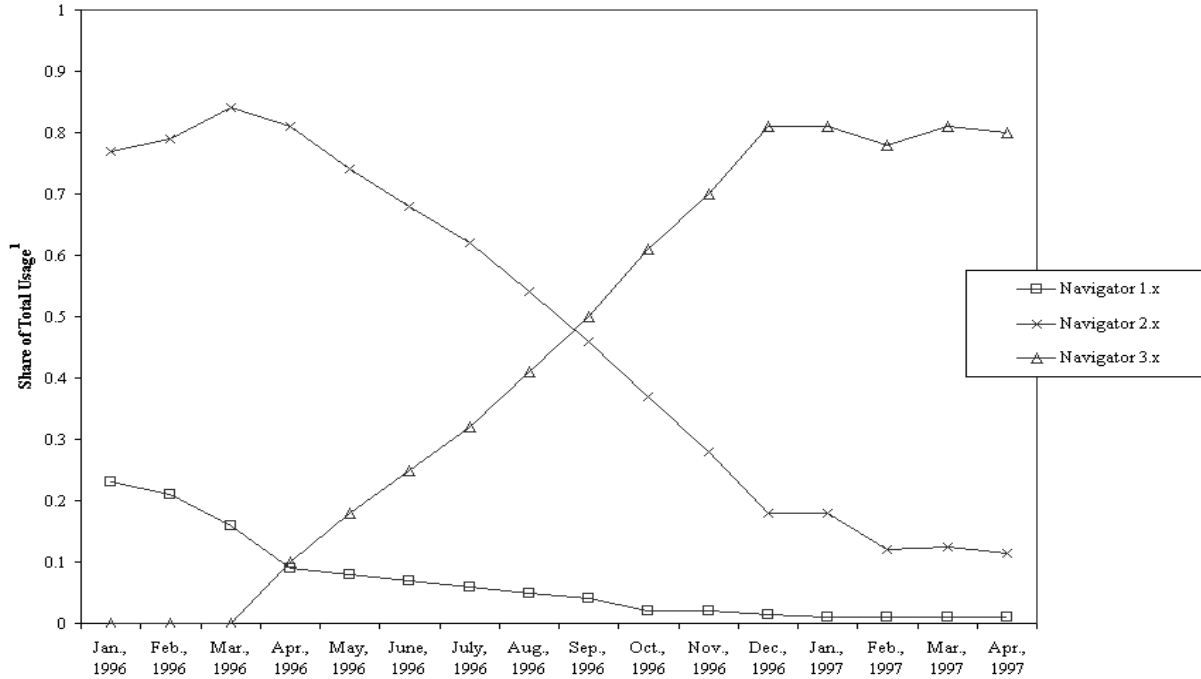
Beta versions, by themselves, were not new. A beta version of a computer software program, until then, referred to an unfinished edition that was selectively released to a limited number of test sites in order to identify "bugs" (i.e., problems with the computer code) and to solicit feedback on the features, functionalities and performance of the program. The rationale behind this practice was the betas were expensive. The unfinished software had to be documented, stored on diskettes or CD-ROMs, packaged and shipped. Therefore, betas were distributed to a select few only once or twice prior to the release of the finished version. However, the web enabled Netscape to change all that.

Netscape made beta versions of Navigator 1.0 available for free to anyone who wished to download them from its web site. This pioneering practice benefited Netscape in several ways. First, the distribution of free beta versions via the WWW allowed for rapid, large-scale trial by customers and provided Netscape with an army of unpaid quality-test engineers. Netscape encouraged such quality-testing efforts by providing an on-line "bug report form" on its website and by awarding customers cash and prizes for the quality of bugs they report as part of their "Bugs Bounty" program. Giving away the product in this manner eliminated the risk of trial and encouraged adoption. Netscape's development team utilized the information generated by beta users in order to gradually refine and add new features and functions to successive beta versions, all of which were then incorporated into the finished version of Navigator. The release of such intermediate products reduced Netscape's time to market. When speaking of the success of their innovative use of betas in their product development strategy, Netscape chairman Jim Clark stated, "There's no way we could have done this any other way" (Hof, 1997).

For each successive generation of browser Netscape increased the time between initial beta release and the release of the finished version. That is, Netscape has been introducing betas earlier and earlier. Netscape introduced its first beta version of Navigator 1.0 two months prior to the release of the finished

version. This lead-time increased to three months with version 2.0, four months with version 3.0 and five months for the latest generation of Navigator.

Figure 6: Product transience: Netscape Navigator share of total usage by product generation.

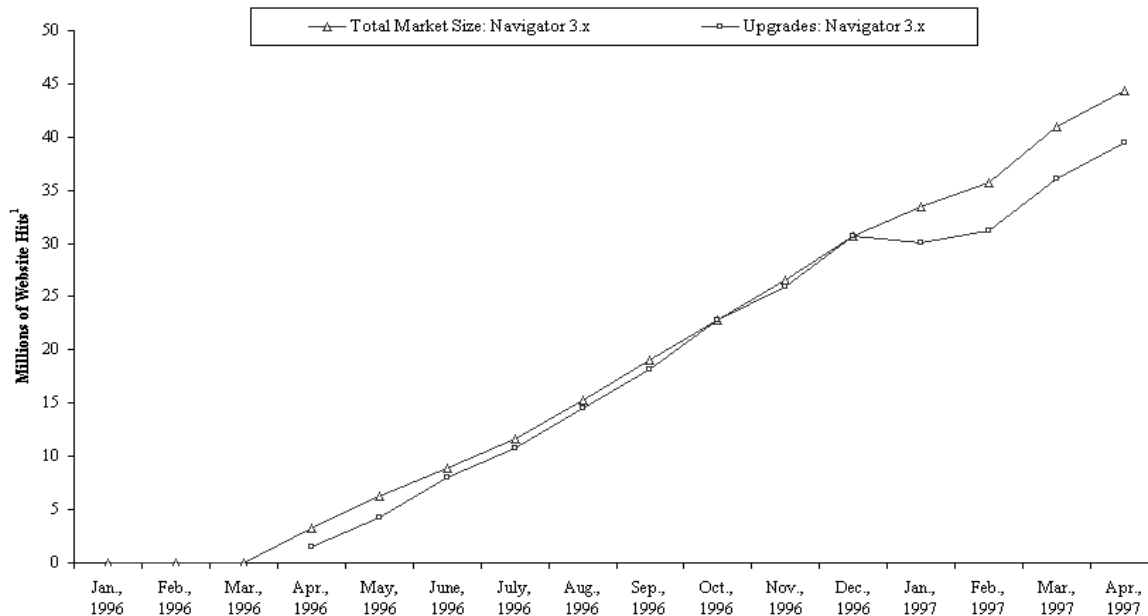


¹The vertical axis is standardized and represents the proportion of all Netscape Navigator users at each point in time. The distribution of all Navigator users across each product generation is represented by each of the designated lines. For example, in January 1996, 23% of all Navigator customers used 1.x, while 77% used the second generation.

By releasing unfinished and finished generations of Navigator so rapidly, Netscape aggressively cannibalized existing generations of its browser. Figure 6 depicts such a process of product cannibalization across three generations of Netscape Navigator. Of significance is the rate at which the adoption of Navigator 3.x grew at the expense of Navigator 2.x. Netscape released the initial beta of Navigator 3.x in early April 1996. By December of the same year this generation of browser had garnered 81% of all Netscape users. In contrast, usage of Navigator 2.x declined dramatically during this same period, from a peak of 84% to 18%.

While usage of Navigator 2.x was quickly replaced by Navigator 3.x, Navigator 2.x itself had earlier supplanted Navigator 1.x even more rapidly. Netscape released the initial beta of Navigator 2.x in early September 1995, when 1.x was the only generation available. While usage of Navigator 2.x rocketed to 84% by the end of March 1996, Navigator 1.x usage fell to 16% from 100% in the same period. It appears that users were quickly abandoning the older versions of Navigator in favor of the latest generation.

Figure 7: Growth in adoption of Navigator 3.x adjusted for growth of WWW.



¹The vertical axis represents an estimate of the total number of users of Netscape browsers.

²The line labeled "Total market size for Navigator 3.x" represents all Netscape customers who were using the third generation of Navigator at a given point in time. The line labeled "Upgrades to Navigator 3.x" represents an estimate of existing Netscape customers upgrading to version 3.x. Thus, the difference between these two lines at a point in time represents the number of new users adopting Navigator 3.x.

Figure 7 graphically represents the growth in the adoption of Navigator 3.x, controlling for the influence of the growth of Netscape's absolute browser market size. As this figure demonstrates, even after controlling for adoption by new users, existing users are upgrading to Navigator 3.x rapidly, resulting in the aggressive cannibalization of Navigator 2.x. The graphic also shows that, in contrast to other markets where various product generations coexist with one another such as microprocessors, the browser market is one in which a new product generation tends to wholly replace an earlier one.

Underlying Netscape's obsession with speed was its belief that any new functionality that it introduced in its products could be easily imitated by other firms. This belief stemmed from an understanding that the WWW was based on the use of open technological standards such as HTML (Hypertext Markup Language) and HTTP (Hypertext Transfer Protocol). While such standards allowed for the rapid growth of the technological system by creating stable expectations for end-users, they also invited widespread use by competing firms. The "open" nature of the technological platform made it incumbent on Netscape to innovate rapidly and flood the market with new products on a continual basis. Reflecting upon the dynamics of this market, Netscape co-founder Mark Andreessen explained, "Proprietary technologies don't work on the Net, so we plan to stay ahead by innovating faster than our competitors, not locking users into standards we alone own" ("A new electronic messiah," 1995). Echoing this strategic focus, Netscape CEO James Clark told *Business Week* in March 1996 that his company needed to maintain a six-month lead over competitors in the release of new generations of its browser software "to stay safely ahead of the pack" (Hof & Cortese, 1996: 84). Peter Currie, Netscape's CFO, simply stated, "We'll sacrifice almost anything for speed" (Hof, 1997).

Entry of Microsoft

Netscape's strategy worked wonders during the first two years of its inception. From no revenues in fiscal year 1994, Netscape generated \$85.4 million in sales in 1995, 61% of this coming from sales of

Navigator. It also had gained a commanding share of the web browser market. However, the battle for the Web was just beginning.

Even as thousands of computer users began downloading Netscape's browser and exploring the WWW, Microsoft was preoccupied with other matters. For over two years Microsoft had been touting the release of its next generation Windows operating system -- Windows95. This product represented the single largest and most expensive development project in Microsoft's history. Related to this project, Microsoft had been developing a proprietary dial-up computer network for consumers that was code-named Marvel (and would later become known as the Microsoft Network, or MSN for short). MSN, which would be integrated into Windows95, was part of CEO Bill Gates's foray into what he believed to be the coming of the information superhighway -- the converging of television, cable, entertainment and computing. Indeed, around the same time Gates had invested in cable TV heavyweights TCI and ComCast. What Gates did not realize was that the information superhighway had already arrived -- in the form of the Internet. Gates and Microsoft were also having to contend with an intense investigation by the US Department of Justice of alleged anticompetitive practices, as well as a civil lawsuit filed by Stac Electronics accusing Microsoft of stealing Stac's data compression technology. Possibly symptomatic of all of these concerns, the Internet was not at all mentioned in the first edition of The Road Ahead, Bill Gates's book describing his vision of the future.

Although late to the game, Microsoft did make an initial attempt to respond to Netscape. In December 1994, it paid Spyglass \$ 2 million for a single snapshot of the Mosaic code that it would use to build a browser for Windows 95 and Windows NT. Internet Explorer 1.0 (IE 1.0) was launched on August 17, 1995, a week before the debut of Windows 95 and eight months after Netscape's release of Navigator 1.0. The introduction of IE 1.0 represented a rudimentary response by Microsoft. Versions of Internet Explorer for Windows 3.1 and Macintosh were still not available, and Microsoft watched helplessly as Netscape continued to grab a larger share of the browser market. Evidence that Gates and Microsoft finally realized the significance of the Internet and web browser was revealed in May of 1995 when Gates distributed his "Tidal Wave" memo to MS employees in which he likened the Internet to a tidal wave that could drown Microsoft if it did not respond quickly and appropriately. And it was on December 7, 1995 that Bill Gates made his famous "Pearl Harbor" speech, in which he outlined the comprehensive overhauling of Microsoft's strategy, which was now to be squarely focused on the Internet. Gates had, by now, recognized that the browser's potential value was less as a product in and of itself than as a vehicle -- a "platform," in industry parlance -- for high-dollar business applications software.

By early 1996 it became clear that Microsoft saw Netscape and its use of Sun's Java language as a threat to the Windows franchise. In February 1996, Microsoft group vice president Paul Maritz distributed a confidential strategic analysis of the web browser market. One of the slides contained within this document made the following points: "[Web] pages become applications. Netscape/Java is using the browser to create a 'virtual operating system'" and "Windows will become devalued, eventually replaceable?" (Lash, 1997). Understandably, the first item listed under the "product strategy" section of this report read, "Catch Netscape 2.0, neutralize Java" (Lash, 1997). The time had come for Microsoft to act.

Microsoft and its partnerships: Weaving a Different Web

In order to establish a presence for its browser platform, Microsoft realized that it too would have to rely significantly on external partners. For starters, Microsoft became involved in setting Internet-related standards. It announced in October 1996 that it was handing over the evolution of ActiveX technologies to the Open Group, thus placing its web application-creation standard in the public domain (see Table 2). In terms of marketing and distribution relationships, Microsoft struck deals with various Internet service providers (ISP's) to make it the preferred browsing software for ISP customers. Indeed the arrangement with Prodigy on October 8, 1996 completed a clean sweep of deals with the largest ISP's including AOL, CompuServe, AT&T Worldnet, Netcom and MCI, which, one-by-one abandoned Netscape's Navigator in favor of Microsoft. Scott Winkler of the Gartner Group stated, "Microsoft is buying the business. They've got the big pelts on their belts now" (Zuckerman, 1996: D1). Additionally, like Netscape, Microsoft also

established exclusive deals with content providers to encourage users to adopt Internet Explorer. For example, on August 13, 1996, Microsoft announced that seven firms, including ESPN and MTV, would offer free content to IE users.

Table 2: Microsoft's Browser-related Linkage Announcements¹

Linkage Type	Definition	Example	Year					Total	% Total
			1994	1995	1996	1997			
<i>Technological Development</i>	Collaborative efforts between Microsoft and one or more organizations to research, develop and commercialize products and/or technologies that extend the functional capabilities of the browser platform.	On March 11, 1996, Microsoft announced that it signed an agreement with Ncompass Labs to jointly develop Ncompass technology – software development tools that would enable plug-ins built for Netscape Navigator to run on Internet Explorer.	0	1	10	6	17	42.4	
<i>Marketing/Distribution</i>	Direct and indirect efforts to encourage adoption of the browser product. Direct efforts consist of agreements between Microsoft and another firm to promote Microsoft's browser to the firm's customers (includes OEM, VAR, co-branding, and bundling arrangements). Indirect efforts consist of agreements by content providers to provide exclusive or optimized content for Microsoft IE users.	Direct: On February 5, 1996, Microsoft announced that Network MCI (an Internet Service Provider) had chosen Internet Explorer as the default browser for its customers. Indirect: On August 13, 1996, Microsoft announced that seven firms would offer free content to IE 3.0 users.	0	1	8	7	16	43.9	
<i>Standards Initiatives</i>	Participation in, and promotion of, standards committees or participation in, and promotion of, a coalition of firms that have adopted a technology as a standard.	On October 6, 1996, Microsoft announced that it would give away control of its ActiveX technologies to The Open Group, a software industry standards body.	0	1	2	2	5	13.7	
		<i>Total²</i>	0	3	20	15	38		

Finally, Microsoft also established numerous technological development initiatives with other firms. Through partnerships with Visa International, American Express and a large number of banks, Microsoft took steps towards gaining a foothold in the emerging world of electronic commerce by developing security authentication technology. In this fashion, Microsoft also relied on various kinds of linkages in order to establish a presence for its Internet Explorer platform.

There were differences, however, in the web of linkages that Microsoft and Netscape created for themselves. This is largely a reflection of both the prior history and the technical philosophy of the two companies. As a start-up company with limited resources, Netscape had to rely more heavily on external

partners in order to establish its presence. Its network includes some of the computer industry's most influential players: IBM, Sun Microsystems, Oracle, Hewlett Packard and Apple. This group of alliance partners has often been referred to as the "Everyone but Microsoft" crowd. Reflecting on the countervailing power that Netscape possessed because of its size and role, Henry Nothhaft of Concentric Networks stated, "Netscape has become the magnet of lots of other strong companies against Microsoft" (Hof, Rebello & Cortese, 1996: 35). Commenting on Netscape's strategy, Ann Winblad, partner in the venture capital firm Hummer Winblad, offered, "Its like the board game Risk. You cannot win alone. You've got to persuade someone else who's playing to be your partner" (James, 1996: 98).

Netscape was also strongly influenced by the prior experiences of its founding members. Historically, the Internet has encouraged diversity in usage of computing platforms, i.e., there has been a strong focus on getting computers running on different operating systems to interoperate with one another. Many members of Netscape's original software development group shared this multi-platform philosophy as a result of their involvement in the development of the original NCSA Mosaic browser. The Navigator browser reflected this vision in terms of the wide variety of platforms it operated on, including various versions of UNIX, Macintosh, and Windows 95 and NT. In essence, Netscape subscribed to a network-centric view of computing in which users are able to utilize the resources of the larger network of which they are part (Wallace, 1997). This view, in turn encouraged a highly decentralized organizational form. The large number of linkages that Netscape was involved in partly reflected its network-centric philosophy.

Microsoft, on the other hand, entered the browser marketplace with a commanding position in the personal computer software business. Given its already established installed base, it focused on integrating Internet-based applications with its existing Windows platform. John Rymer, VP of Giga Information Group, commented, "Essentially, what Microsoft is doing is making the browser a fundamental part of the operating system -- burying the functionality of the browser into Windows 95, and eventually, Windows NT" (Zuckerman, 1996: D1). This Windows-centric approach was also reflected in the number of linkages it formed. Microsoft was involved in substantially fewer interorganizational arrangements than Netscape, although the distribution of the type of linkages it formed was nearly identical to that of Netscape. Rather than build linkages with other firms, Microsoft often bought up firms that possessed competencies that it did not. Its dominant presence in the software industry was also reflected in the more centralized web of linkages that it created.

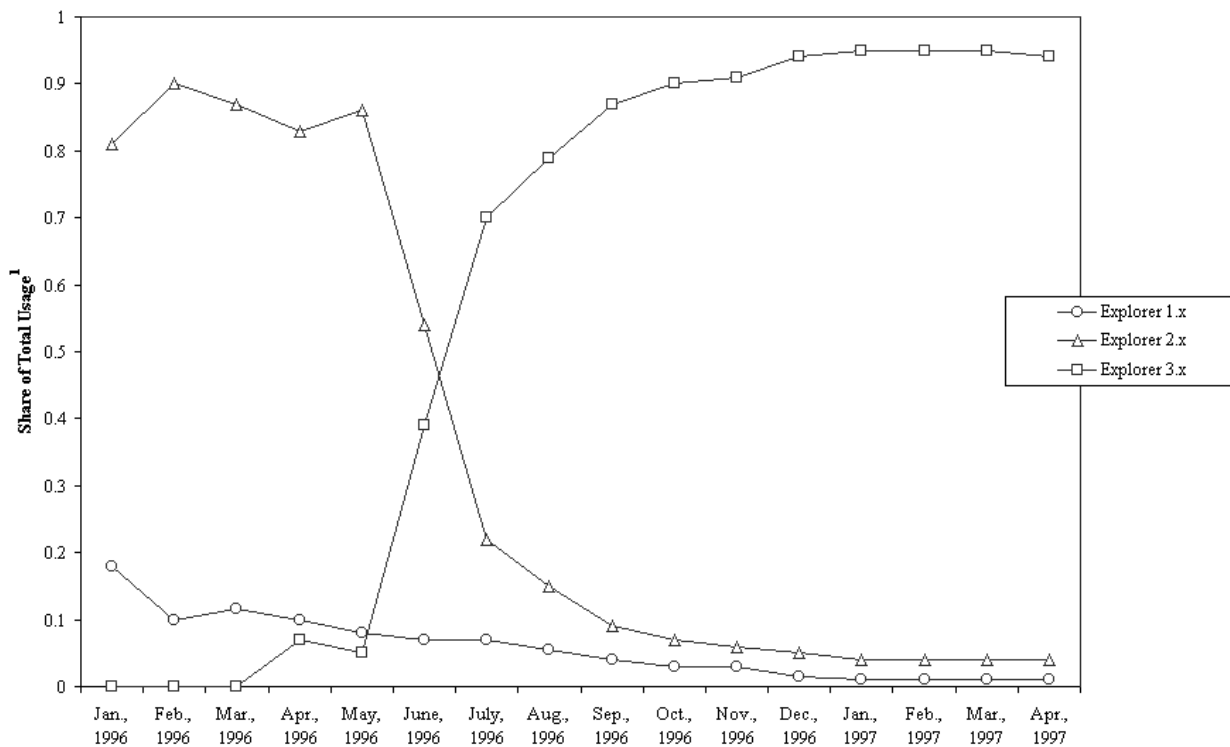
In addition to weaving a different web of linkages to build its own technological platform, Microsoft also had to contend with the rapid rate of product development taking place in this market. There was much ground to cover before it could catch up with Netscape.

Microsoft and Innovation Speed: Playing Catch-Up

While it was a relatively late entrant into the browser marketplace, Microsoft proved to be a quick learner. Initially, given Netscape's overwhelming market dominance, Microsoft had little choice but to clone many features of the Navigator platform. Beginning with IE 2.0 Microsoft also imitated Netscape's beta strategy by releasing numerous beta versions well in advance of the release of the final versions. With the release of IE 3.0, however, Microsoft had created a browser that not only achieved parity with Navigator in terms of its functionalities but also provided more than its own share of original technologies.

The entry of Microsoft into this market put additional pressures on the two firms to further accelerate their product development cycles. To illustrate this point, consider that Netscape released a total of 25 beta and finished versions of Navigator between the entry of Microsoft and the finished release of Communicator 4.0 in June 1997 (see Figure 3). This represents a release of some sort every 3.7 weeks. Indeed, the terms "Net Speed" and "Internet Time" have been coined to describe this rapidly evolving market.

Figure 8: Product transience: Microsoft Internet Explorer share of total usage by product generation.



¹The vertical axis is standardized and represents the proportion of all Microsoft IE users at each point in time. The distribution of all IE users across each product generation is represented by each of the designated lines.

Like Netscape, Microsoft also employed a strategy of product cannibalism in the web browser market. Figure 8 portrays this form of product transience across three generations of Internet Explorer. The figure shows that the second and third generations of Internet Explorer exhibit a pattern of growth and decline similar to that of the same generations of Netscape Navigator. The initial beta of IE 2.x was released in September 1995. By February of the following year this generation had attracted 90% of all Microsoft browser users; an average monthly increase of 15%. Inversely, usage of IE 1.x had declined to 10% in the same period; an average monthly decrease of 15% since the release of IE 2.x. The comparable growth and decline rate for the same generations of Netscape Navigator was only 13.2%. Subsequent to its rise in popularity, IE 2.x was replaced even more rapidly by IE 3.x. From its introduction in beta form in April 1996, usage of IE 3.x rose to account for 90% of all Microsoft browser users by October of the same year; representing an average monthly increase of 16.2%. During this same period, usage of IE 2.x fell from 83% to 7%; an average monthly decrease of 15%. By comparison, relative growth and decline rates for Navigator 3.x and 2.x were 8.3% and 7.2%, respectively. As figure 8 demonstrate, product cannibalism across the first three generations of Microsoft's browser is more pronounced than that exhibited by the same versions of Netscape's browser. We attribute this intense transience to Microsoft's strategy of giving away its browser and to product quality competition from Netscape. By providing its browser for free to all customers, Microsoft greatly reduced any disincentive, such as a sunk cost effect, for quickly upgrading to the latest generation. In contrast, Netscape only provided its browser for free to a subset of customers, charging between \$39 and \$79 for commercial and retail editions. Second, Microsoft entered the browser market nine months after Netscape and had to quickly develop generations of IE that soon matched or exceeded the functional capabilities of

Navigator. These steeper jumps in quality, in turn, led to greater numbers of users switching to the latest version of Internet Explorer. Moreover, they ensured that Microsoft would not be locked out of controlling the potentially lucrative portal to cyberspace.

Contours of the Battle through 1997

The battle of the browsers continued to unfold. Many analysts believed that the true significance of this battle was about establishing the software infrastructure (i.e., the "bricks and mortar") for commercializing the Internet and thereby defining a new model of computing. As Bill Gates proclaimed, "The computer industry has now entered the second PC revolution -- this one to be fought over the Internet" (Wallace, 1997).

Netscape and Microsoft: Generation 4.0

Netscape released its fourth generation browser in June 1997 and Microsoft followed a few months later with the release of Internet Explorer 4.0 in September. In each successive generation of browser, both Netscape and Microsoft have significantly enhanced the functionalities of their respective browsers. In doing so, both companies have begun to transform the browser into a full-fledged application platform, or, in industry parlance, into "Internet-enabled groupware."

In pursuit of building such platforms, both firms have adopted a component software strategy whereby the browser is actually an integrated suite of various applications. These applications, or "components," represent the browser's major functionalities. Indeed, much had been written in the computer press about the increasing role of the browser as a "component container" and application platform (Kay, 1997). The increasing modularity of this technological system has been referred to as the "componentizing" of the browser (Smith, 1996). Such componentizing provides for the mass customization of each company's browser by enabling users to mix and match components and plug-ins to suit their specific needs (Pine, 1993). Additionally, the programming languages used to develop each browser are "object oriented" languages. A key feature of such software languages is their ability to use modules of prewritten code that can then be used as components in larger programs.

The modularity of both the browsers and their underlying code is a sharp break from conventional monolithic programs and programming techniques, and promises to lead to even faster innovation in the already hectic Internet software market. The terrain of the contest is thus moving to the creation of more complex software for the Intranet market. According to Jim Barksdale, CEO of Netscape, the real war is being fought over the \$10 billion he expects corporations to spend on Intranet software by the year 2000. And Marc Andreessen, co-founder and senior VP for technology adds, "The big war in 1997 is going to be over groupware and e-mail." (Lohr, 1996: D2).

The building of a more complex technological platform that can support business critical applications has required both Netscape and Microsoft to rely on relationships with external partners who bring distinct and complementary sets of skills to the table. A recent example of this is reflected in the rush by both companies to provide "push" technology in their latest browser versions. Netscape joined forces with Marimba while Microsoft has an arrangement with Pointcast to provide such technology in their browsers. Likewise, both companies have tie-ups with a number of banks, financial institutions and security authentication companies in their attempt to create and expand the market for electronic commerce on the WWW. As both companies continue to beef up their browsers and convert them into full-line Internet application suites, their reliance on external linkages continues to grow.

These linkages, in turn, impact the technological platform that is being built by the two firms. The components that comprise the latest versions of both Navigator and Internet Explorer are a direct consequence of the interorganizational linkages that Netscape and Microsoft created in the past. For example, the inclusion of the Collabra component in Navigator 4.0 (that provides the group collaboration function to this platform) can be clearly attributed to Netscape's acquisition of Collabra Software in September 1995.

DOJ vs. Microsoft and Netscape's Giveaway

Recently, several significant events have occurred that may have a tremendous impact on the future success of both these firms. First, on October 20, 1997, the U.S. Department of Justice (DOJ) filed a petition seeking to hold Microsoft in civil contempt for violating the consent decree that Microsoft had

signed with the DOJ in 1995. Second, on January 22, 1998, Netscape announced that it would freely license the source code of its browser software to any vendor. On the same day, Netscape also announced that it would make available its browser free of charge to its customers. Although each of these events is worthy of a detailed analysis, we will only provide a broad discussion of how these issues may be important in the browser wars.

In its petition, the DOJ alleged that Microsoft was attempting to extend its monopoly of the operating systems market to the market for Internet browsers. Microsoft, the DOJ stated, was violating an earlier consent decree by requiring computer manufacturers to install Internet Explorer if they installed Windows95. The DOJ's case was based on two premises: (1) the web browser was a distinctly different product from the operating system, and (2) computer manufacturers had no way of installing Windows without the Internet Explorer, effectively forcing them to distribute this second product.

After initial reluctance to unbundle the browser from the operating system, Microsoft relented and agreed to provide OEMs with a functional version of its Windows operating system without Internet Explorer. What is yet to be decided is Microsoft's right to integrate Internet Explorer into the next version of their Windows operating system. Microsoft is arguing that the ability to enhance the features of the operating system is a fundamental facet of innovation in this industry, whereas the DOJ is arguing that such "bundling" tactics are anti-competitive. Microsoft argues that the consent decree explicitly recognized Microsoft's right to add new capabilities to its Windows operating system and to create "integrated" products.

Even as the Justice department was attempting to limit Microsoft's monopoly control, Netscape felt that the only way to compete with Microsoft was to adopt an "open-systems" strategy. On January 22, 1998, Netscape took the technology world by surprise with an announcement that it would make both its browser and the browser source code freely available to anyone. Providing the browser free to users was an attempt by Netscape to match Microsoft's free give-away of browsers. With the loss of significant browser revenue, Netscape's Andreessen stated that his company planned to generate revenues from enterprise software and from its Web site business (Brandt, 1998).

The source code give away, Netscape suggested, would ensure that others in the field could innovate on an open platform. However, this was a tremendous departure from the standard strategy in commercial software of aggressively shielding what is often considered a software company's most valuable property – its source code. Rather than develop various isolating mechanisms to protect the value of its browser source code, Netscape opted to place it in the public domain. Netscape also announced a process of how the best of the distributed initiatives would be incorporated into the ever evolving architecture that it hoped to control because of its position at the hub of the network. Specifically, Netscape's source code deal required anyone who modified the browser to send changes back to Netscape for possible inclusion into an official release. In this way, Netscape was hoping to foster distributed innovation among its network members. Andreessen summed up their source code strategy this way: "Microsoft has a ton more developers and programmers. Source code is the only way we could tap the energy of all the people who wanted us to modify it or port to other computers or create new features" (Caruso, 1998).