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IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF COLUMBIA

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UNITED STATES OF AMERICA,

              Plaintiff,

     vs.

MICROSOFT CORPORATION,

              Defendant.

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Civil Action No. 94-1564 (SS) **MEMORANDUM OF AMICI CURIAE IN OPPOSITION TO**

PROPOSED FINAL JUDGMENT

The economic arguments in this Memorandum were prepared in extensive consultation with the following economists. However, because of the shortness of time, counsel retained complete responsibility for the contents of this document.

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The Department of Justice has determined that from 1988 through July 1994, a period during which the number of personal computers in the United States virtually exploded, Microsoft Corporation successfully used a variety of unlawful and "anticompetitive" practices to maintain its monopoly position in the market for "operating systems" for use with personal computers. As a result of these unlawful practices, Microsoft has been able to preclude any meaningful competition in the market while increasing the installed base of Microsoft operating systems from well under 20 million in 1988 to approximately <u>120 million</u> in 1994.

This memorandum[1] will show that under established economic theory, this now-massive installed base will enable Microsoft, if unchecked, both to maintain its monopoly in the operating systems market, and to leverage its installed base to dominate and monopolize the markets for applications and other software products. This brief also will show that the Department's proposed decree completely fails to address the consequences of the huge increase in installed base that Microsoft has procured through illegal practices. Instead, the Department simply proposes to shut the barn door now that the horse has already gone.

Under established economic theory, it is clear that the proposed decree will neither result in an increase in competition in the operating

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[1]This memorandum amici curiae is submitted by Wilson, Sonsini, Goodrich & Rosati on behalf of certain clients that prefer to retain their confidentiality. Hence, they are not identified in this submission.

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systems market, nor prevent Microsoft from monopolizing the remainder of the software industry. These amici accordingly urge the Court to require further submissions from the Department, both by way of expert affidavits and the production of documents, to explain how permitting Microsoft to profit from its illegal conduct not just by continuing, but by expanding, its monopolization of the software industry can be argued to be in the "public interest."

INTRODUCTION AND SUMMARY

This Court has been asked to endorse the proposed Consent Decree between the Department of Justice and Microsoft without being provided with any of the information upon which a meaningful determination under the Tunney Act could be based. Thus, for example, the Department's investigation ostensibly inquired regarding "alleged false product preannouncements" by Microsoft. 59 Fed. Reg. 59,426, 59,427 (Nov. 17, 1994). At the September 29, 1994 hearing on this matter, the Court referred to this issue, noting that in the book <u>Hard Drive</u>,[2] Microsoft was said "time after time" to predatorially preannounce products "with the intent [to] freeze other people from coming out with their product." Tr. of Status Call, Sept. 29, 1994, at 16:21-22. The following colloquy then took place between

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[2]James Wallace & Jim Erickson, <u>Hard Drive: Bill Gates and the Making of the Microsoft Empire</u> (1992).

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Microsoft's counsel and the Court:

> The Court: [H]ow do you answer those charges?
>
> Mr. Urowsky: Those charges we believe are entirely false.
>
> The Court: In other words, the vaporware charge is false?
>
> Mr. Urowsky: That's correct.

Id. at 15:7-12, 16:18-17:1.

Microsoft's representations, however, are belied by Microsoft's own documents, produced to the Government during the course of its investigation. (Examples of such documents are attached hereto at Appendix Exs. 21 and 22.)[3] Thus, for example, a Microsoft manager was involved in spearheading two product preannouncements during one six-month period. In one instance, the manager wrote that in response to "Borland's announce[ment of] TurboBASIC at the November Comdex," he simultaneously worked "to develop a [Microsoft] spec[ification] that could beat TurboB," while also formulating a promotional campaign "that could hold our position until [QB3, the Microsoft product] hit the market."[4] He stated that he "reviewed [this] promotion plan with Bill G. before implementation." Id. The Microsoft documents state that Steve Ballmer, one

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[3]Exhibit numbers refer to selected supporting documents which have been included in the Appendix to this Memorandum of Amici, filed herewith. For the Court's convenience, documents in the Appendix have been organized alphabetically by publication title.

[4]Microsoft Corp. Employee Performance Review, dated May 4, 1987, at 3 (Ex. 21). (Although this review has become a public document, these amici have redacted the review to safeguard the employee's privacy interests.)

of Microsoft's top executives, favorably commented on this strategy, saying

that the "best way to stick it" to Borland was such a "QB3 preannounce to

hold off Turbo buyers."[5]

In the same document, the Microsoft manager wrote that

Microsoft was "not as far along on the response to [Borland's] Turbo C," a

second product, because Microsoft was "further from product

announcement." According to the Microsoft document, the Microsoft

manager:

> developed a rollout plan for [Microsoft's products]
> QuickC and CS that focused on minimizing Borland's
> first mover advantage by preannouncing with an
> aggressive communication campaign.[6]

The manager was given the highest possible rating on his performance

review (a "5-") for his "public relations" handling of this "C

preannouncement."[7]

Perhaps even more striking than the incongruence between

Microsoft's representations and its own documents is the silence by the

Department, both in its written submissions and in its oral presentation to

the Court, regarding its findings on this and other matters. The Department

has not taken the position (nor, presumably, could it, without some

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[5]<u>Microsoft Corp. Employee Performance Review</u>, dated Nov. 2, 1987, at 8 (Ex. 21). (Although this review has become a public document, these amici have redacted the review to safeguard the employee's privacy interests.)
[6]<u>Id.</u> at 6.
[7]<u>Employee Performance Review for Nov. 1986-May 1987</u>, <u>supra</u>, at 3 (Ex. 21).

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explanation of the documents that have been submitted to it) that Microsoft

has not engaged in practices such as predatory preannouncements, or the

seeding of what are referred to as "undocumented calls" (secret elements in

an operating system that make a competitor's applications program operate

less well than a rival Microsoft program).[8] Instead, the Department simply

has asserted that it had determined that "no further action was warranted"

on these matters -- presumably a conclusion that it asks this Court to take

completely on faith, since it has provided the Court with literally no

explanation for its decision.

Most remarkable of all, however, is the absence of any

information in any of the Department's submissions regarding the adequacy

of its proposed remedy for Microsoft's illegal monopolistic conduct. Based on

the Department's own allegations, from 1988 to 1994 Microsoft used a

variety of illegal tactics to maintain its monopolistic share in the rapidly

growing operating systems market -- and thus increased the size of its

installed base through the use of illegal tactics from no more than 18 million[9]

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[8]Examples of such "undocumented calls" will be described in Section IV, <u>infra</u>.

[9]According to industry consultant Jerry Schneider, Microsoft's installed base in March 1988 was only nine to twelve million. <u>Dump DOS? No Way, Not Yet</u>, Computer Decisions, March 1988 at 50 ("between nine and twelve million DOS machines"). Indeed, according to Business Week, no more than twelve million PCs had been sold by April 1988. <u>Will Sun Melt the Software Barrier</u>, Business Week, April 18, 1988, at 72 ("Sun aims to coax a portion of the 12 million owners of PCs and clones into the UNIX camp.") The more expansive measure taken by industry analysts at International Data Corp. indicated there were "approximately 18 million IBM PCs and compatibles worldwide," in March 1988. Alan Radding, <u>IBM PC Orphans Hang On To A </u>

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to approximately 120 million users.[10] Having acknowledged that Microsoft

thus illegally acquired its massive installed base, the Department

nonetheless has failed to proffer any basis for concluding that simply

prohibiting these practices in the future will remedy the unassailable position

that Microsoft has gained as a result of its unfair and illegal practices.

Certainly no one in the industry believes that the Department's

proposed remedies will have the slightest effect in unseating Microsoft from

the position that it now illegally occupies. As one competitor observed after

the consent decree was announced, "[t]he consent decree seems to have set

[Microsoft] free. . . . Now, they are running rampant over everything."[11]

Microsoft entirely agrees. As Bill Gates observed in his response to the

proposed decree:

> None of the people who run [Microsoft's seven]
> divisions are going to change what they do or think
> or forecast. Nothing. There's one guy in charge of
> [hardware company] licenses. He'll read the
> agreement.

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Good Thing, Computerworld, March 7, 1988, at 81. Therefore, even under
the assumption that Microsoft's operating system software had been
installed in every IBM PC or compatible sold by 1988, Microsoft's installed
base at that time was no larger than eighteen million. Cf. Christopher
O'Malley, The New Operating Systems, Personal Computing, October 1986,
at 181 ("better than 95 percent [of then-existing] PC's and compatibles use]
Microsoft's disk operating system.").

[10]Amy Cortese, Next Stop, Chicago, Business Week, Aug. 1, 1994, at 24
("120 million MS-DOS customers (including 55 million Windows users)"). See
also OS Overview, Computer Reseller News, Aug. 22, 1994, at 223
(International Data Corporation table) (DOS and Windows installed base of
110.1 million).

[11]Amy Cortese, No Slack for Microsoft Rivals, Business Week, Dec. 19,
1994, at 35 (Ex. 5).

Elizabeth Corcoran, Microsoft Deal Came Down to a Phone Call, Washington

Post, July 18, 1994, at A1 (Ex. 42).

Nor have events since the decree was proposed provided the

slightest basis for believing that the Department's proposed remedy will

have any effect. In a nationally televised press conference on July 16, 1994,

Attorney General Janet Reno predicted that the Department's settlement with

Microsoft would have two results: it "will save consumers money [and]

enable them to have a choice when selecting operating systems."[12] In fact,

however, in the six months since the proposed settlement was announced,

press reports indicate that Microsoft has literally doubled the price of its

operating system to computer manufacturers.[13]

Moreover, far from the decree leading to an increase in

competition in the operating systems market, a key competitor in that

market, the maker of DR DOS, has subsequently withdrawn from the market.

The competitor observed in withdrawing from the market that "the battle for

the desktop is over and MS DOS and Windows have won."[14] The withdrawal

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[12]Attorney General Janet Reno, Dep't of Justice Press Conference
Transcript Regarding the Microsoft Settlement, July 16, 1994, at 2 (Ex. 12).
   [13]Amy Cortese, Business Week, Dec. 19, 1994, supra, at 35 (Ex. 5)
("Computer makers have been startled to learn that they will be asked to
swallow a huge price hike for their use of Windows 95 -- to as much as $70
per PC, vs. roughly $35 today.").
   [14]Larry Campbell, Novell to Introduce SuperNOS Strategy, South China
Morning Post, Sept. 20, 1994, at 1 (Ex. 37) (quoting Robert Frankenburg
speech to Networld + InterOp '94 conference). See also Bob Lewis, Ten
Troublesome Trends in Computing That Are Sure to Spook You, InfoWorld,
Oct. 31, 1994, at 82 ("Let's all admit that NextStep and QNX should have all

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of DR DOS from the market is of particular note since it was DR DOS that the authors of <u>Hard Drive</u> pointed to as providing the most likely source of meaningful competition to Microsoft in the operating systems market. <u>See Hard Drive</u>, <u>supra</u>, at 398.[15]

Having failed to explain how its proposal will remedy Microsoft's illegal acquisition of its massive installed base in the operating systems market, the Department's submission does not even <u>touch</u> on Microsoft's use of that illegally acquired installed base to leverage into -- and acquire market power in -- other software markets. In analyzing the strength of the Department's case against Microsoft, <u>Hard Drive</u> identified Microsoft's weakness in application programs as the principal reason (apart from the competition provided by products such as DR DOS) why Microsoft's dominant position arguably would not hurt consumers. With respect to application programs, the authors in 1992 argued that

> Microsoft does not come close to dominating the Big Three of applications--word processing, databases and spreadsheets. WordPerfect is far ahead of Microsoft Word, Lotus 1-2-3 is still ahead of Excel, and Microsoft has nothing to compete against

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of the market if there was any justice," but Microsoft's "Windows and DOS have more than 80 percent market share, so the war is over!").

[15]Nor has the irony of this withdrawal been lost on the computer industry. As one observer noted: "July [of 1994] saw Microsoft in full agreement with the Justice Department. Microsoft agreed to withdraw the `per processor' option that most PC suppliers found the cheapest way to buy DOS [in order to] encourage firms to offer alternatives to Microsoft's operating systems. Shortly afterward, Novell announced that it was stopping development of DR-DOS." Jack Schofield, <u>Computing 94: Processor Wars and Rumors of Delays</u>, Guardian, Dec. 29, 1994, at T14.

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Ashton-Tate's dBASE.

Hard Drive, supra, at 398.

What a difference three years can make -- at least when, like Microsoft, a company can leverage its installed base in operating systems, and finance early losses in applications with monopoly profits from operating systems. Under the headline "MICROSOFT'S DOMINATION," Dataquest Inc. has reported the 1994 market revenue and share figures for the applications market:

> "Lotus 1-2-3, WordPerfect, dBASE, Paradox and Harvard Graphics once dominated their respective categories," said Dataquest analyst Karl Wong. "Today, Microsoft products have replaced each of these one-time product category leaders."

Microsoft's Domination, San Jose Mercury News, December 21, 1994, at 1F (Ex. 35).[16]

Microsoft did not achieve its dominant position in operating systems and applications through free and open competition on a level playing field. Rather, it used the illegal tactics challenged in the Government's complaint to create a huge installed base in operating

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[16]Indeed, in 1990 Microsoft began to bundle its application products together into so-called "suites." These suites are the fastest growing segment of the applications market, and Microsoft commands more than 85% of the suite market. See Personal Computing Software Worldwide, Dataquest, June 27, 1994, at 20 (selected pages at Ex. 11) (unit shipments of suites grew more than 350% in 1993); id. at 27 (Microsoft's 1993 market share for suites is 85.4%); Doug VanKirk, Integrated Office Suites, InfoWorld, Feb. 7, 1994, at 51 ("Microsoft owns a 90 percent share of the suite market. . . .").

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systems. Then, it took unfair advantage of its installed base to give its own

applications group a head start and its programs a performance advantage

over applications competitors -- precisely the concern voiced in Hard Drive[17]

and echoed by this Court.[18] "Microsoft has never had a hit among its MS-DOS

applications programs."[19] Yet, in the past few years, Microsoft has come from

nowhere to provide the lion's share of business application programs.[20]

As explained in this brief, Microsoft achieved that result by the

illegal tactics charged by the Government, and by illegal tying techniques,

monopoly leveraging, and otherwise predatorially exploiting its monopoly

position in one market to achieve market power in other markets. Because

of the type of economic forces that prevail in these markets, rigorous

economic analysis predicts that, unless restrained by Government action,

Microsoft will succeed in using its dominance in operating systems to

monopolize all other aspects of transaction software, from desktop

applications to online systems. Microsoft's goal is to identify and control

every "strategic component," "choke point" or "leverage point" in the

information economy.[21] And Microsoft is already close to achieving a

complete lock-in in desktop applications.

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[17]Hard Drive, supra, at 398-99.
[18]Tr. of Status Call, Sept. 29, 1994, at 25-28.
[19]Ron White, Microsoft Gives the New Word, PC Week, Oct. 20, 1987, at
95.
[20]See, e.g., Brent Schlender, Bill Gates: What Doesn't He Want,
Fortune, Jan. 16, 1995, at 36.
[21]Id. at 47.

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This Memorandum of Amici argues that the Proposed Final Judgment is not in the public interest and should not be entered by this Court. Indeed, it is economically impossible to achieve the stated goals of greater choices and lower prices for operating systems without (1) addressing the increase in installed base that Microsoft has procured through illegal practices and (2) restraining Microsoft's use of that installed base to dominate the markets for applications and other software products.

This Memorandum of Amici is divided into seven sections. This first section provides a summary and overview of the brief. The second section addresses the scope of investigation and power of this Court under the Tunney Act. In particular, the second section argues that, under 15 U.S.C. § 16(e), the Court not only can but should consider the effect of the proposed decree beyond the operating systems market. The section further argues that the Department's submission falls far short of providing the Court with an adequate record upon which to act, and provides no factual predicate for concluding that the decree's remedy is even arguably within the "public interest" under Section 16(e).

The remainder of the brief explains that the Government cannot effectively restore and maintain competition -- even in the operating systems market -- without addressing both the consequences of the "installed base" that Microsoft increased through illegal means, and the use of Microsoft's resulting market power more broadly. Section III describes the markets and

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technologies in which Microsoft operates and lays a foundation for an understanding of Microsoft's conduct and strategic direction. The section begins by describing the interrelationships among complicated software technologies and demonstrates that the various markets in which Microsoft competes are parts of a large network that can be entered by a competitor's product through a few key gateways, the principal gateway being the desktop operating system. Using economic analysis, the section then argues that the economic characteristics of the technologies and markets at issue differ markedly from other, more conventional industries, in that these products (software products) and markets (networks) exhibit "increasing returns," also sometimes called "network effects." The section discusses the underlying characteristics of the technology that gave rise to these conditions and the likely consequences that these circumstances will produce.

Section IV of the brief explains Microsoft's strategy and evaluates Microsoft's prospects for complete domination of all of the interconnected software markets. The section begins by explaining that Microsoft increased its "installed base" in operating systems through the illegal practices charged in the Government's complaint. The section then explains and documents the fact that Microsoft pursues a strategy of leverage from "gateway" markets, like the desktop operating system in which it is dominant, to strategic markets in which its competitive position is weak (as was the case

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in applications). Microsoft targets such strategic markets, establishes marketing and technological links to those markets from established monopolies in gateway markets, and leverages its power to monopolize the target markets. In other words, it transfers the installed base of a gateway market it dominates to create an installed base in the strategic target market. The section focuses primarily on the desktop market, describing in some detail the method by which Microsoft (according to the Government's Tunney Act filing) used illegal activities to increase its installed base in operating systems and then leveraged its monopoly over the operating system to dominate applications. In particular, the section describes Microsoft's tactics of bundling and unbundling functions into and out of its operating system to disadvantage its competitors in the applications market.

Section V of the Memorandum of Amici applies "increasing returns" economics to suggest that Microsoft likely will achieve a monopoly position for its products throughout the entire personal computer network unless restrained by Government action. The section rejects various arguments that could be put forward to justify such monopolization, including the arguments (1) that alternative networks created by alliances of competitors will provide competition, and (2) that the benefits derived from integration of a single product line are worth the cost in loss of free competition throughout the network. The section concludes by suggesting that absent meaningful governmental intervention, the American software

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industry will be monopolized by Microsoft, with the only competition coming from protected markets and competition abroad.

Section VI evaluates the possibilities and prospects for governmental intervention from the legal perspective. The section begins with an evaluation of the proposed Final Judgment, observing that the Government's Tunney Act filing concedes that Microsoft, through the use of illegal practices, has acquired an enormous installed base that constitutes an overwhelming barrier to entry. The only sanction proposed by the Government, requiring Microsoft to cease the behavior that permitted it to acquire this entrenched installed base, will have no effect in diminishing the installed base, easing barriers to entry, or otherwise precluding Microsoft from using the illegally acquired installed base to monopolize the operating system market or other markets. The section considers specific strategies for relief adopted by previous Administrations in comparable situations and analyzes legal precedents supporting such strategies.

Finally, Section VII of the brief proposes procedures this Court may wish to adopt in order to exercise its appropriate role in Tunney Act proceedings. The section urges the Court to order the production of key Microsoft documents and to require the Government to produce detailed and predictive economic models of the type previously employed to support consent decrees adopted through Tunney Act procedures.

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<u>THE PERMISSIBLE SCOPE OF THIS COURT'S REVIEW</u>

In 1974 Congress enacted the Antitrust Procedures and Penalties

Act ("APPA"), also known as the "Tunney Act," 15 U.S.C. §§ 16(b)-(h) (1994),

out of concern with "prior practice, which gave the [Justice] Department

almost total control of the consent decree process, with only minimal judicial

oversight." <u>United States v. American Tel. & Tel.</u>, 552 F.Supp. 131, 148

(D.D.C. 1982) ("<u>AT&T</u>"), <u>aff'd sub nom.</u> <u>Maryland v. United States</u>, 460 U.S.

1001 (1983). To remedy this practice, Congress sought to eliminate "judicial

rubber stamping" of such consent decrees,[22] providing that "[b]efore entering

any consent judgment ... the court shall determine that the entry of such

judgment is in the public interest." 15 U.S.C. § 16(e). Circuit Judge Aldrich,

sitting by designation in <u>United States v. Gillette Co.</u>, 406 F.Supp. 713 (D.

Mass. 1975) (cited by both the Department and Microsoft), observed upon

reviewing the legislative history of the Act:

> The legislative history shows clearly that Congress
> did not intend the court's action to be merely pro
> forma, or to be limited to what appears on the
> surface. Nor can one overlook the circumstances
> under which the act was passed, indicating Congress'
> desire to impose a check not only on the

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[22]As the sponsor of the Act, Senator Tunney, declared: "Specifically, our legislation will . . . make our courts an independent force rather than a rubber stamp in reviewing consent decrees, and it will assure that the courtroom rather than the backroom becomes the final arbiter in antitrust enforcement." <u>The Antitrust Procedures and Penalties Act: Hearings on S. 782 and S. 1088 before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary</u>, 93rd Cong., 1st Sess. (1973).

government's expertise -- or at the least, its exercise
of it -- but even on its good faith.

Id. at 715.[23]

Despite this clear statutory intent, the oral and written submissions in the present case have suggested that the Court's review should be circumscribed in ways not supported either by the statute or by existing case law.[24] First, the submissions may be taken as suggesting that the Court should look only to the impact of the proposed decree on the operating system market in determining whether the decree is in the public interest. See, e.g., 59 Fed. Reg., at 59,429. The law, however, plainly is otherwise. For example, in United States v. BNS Inc., 858 F.2d 456 (9th Cir. 1988), -- a case relied upon by the Department -- the Court observed that "the statute suggests that a court may, and perhaps should, look beyond the strict relationship between complaint and remedy in evaluating the public interest." 858 F.2d at 462 (quoting United States v. Bechtel Corp., 648 F.2d 660, 666 (9th Cir.), cert. denied, 454 U.S. 1083 (1981)). While the court's public interest determination may not be based on a different market from

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[23]Accord AT&T, 552 F. Supp. at 148 (Congress had "found that consent decrees often failed to provide appropriate relief, either because of miscalculations by the Justice Department or because of the `great influence and economic power' wielded by antitrust violators").

[24]Microsoft has argued at length in its submission that "the practices challenged in the complaint do not violate the antitrust laws." See Memorandum of Microsoft Corporation in Support of Proposed Final Judgment ("Microsoft Mem.") at 16-22. This argument is irrelevant, however, to the Court's assessment whether the settlement is in the public interest.
2 Phillip E. Areeda & Herbert Hovenkamp, Antitrust Law ¶ 348g (quoting United States v. Gillete Co., 406 F. Supp. 713, 716 (D. Mass. 1975)).

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the one identified in the complaint, the Ninth Circuit emphasized that this did

not mean that only effects on that market can or should be considered:

> [T]he statute clearly indicates that the court may
> consider the impact of the consent judgment on the
> public interest, <u>even though that effect may be on an
> unrelated sphere of economic activity</u>. For example,
> the government's complaint might allege a
> substantial lessening of competition in the marketing
> of grain in a specified area. It would be permissible
> for the court to consider the resulting increase in the
> price of bread in related areas.

<u>Id.</u> at 463 (emphasis added).

Under the Department's own authority, therefore, the Court's

inquiry is not limited to the effect of the proposed judgment on the operating

system market. To the contrary, the Court can (and, it is submitted, should)

determine the effect of the proposed judgment on other areas impacted by

Microsoft's monopolistic conduct. As will be discussed in more detail in

Section IV, <u>infra</u>, for example, Microsoft has used its illegally acquired market

position to leverage into and acquire a monopoly in other related markets.

The failure of the decree to "break up or render impotent [this] monopoly

power found to be in violation of the Act," <u>AT&T</u>, 552 F. Supp. at 150 --

indeed, its tacit decision to leave Microsoft free to profit from its unlawful

market power by leveraging into other software markets -- is something that

the Court should consider in evaluating the public interest served (or

disserved) by the proposed decree.

A second limitation implied in the submissions to the Court also

is without authority in the case law, namely, that the Court is limited to considering those matters that the Department has identified in its complaint. That is not the law. See, e.g., BNS, 858 F.2d at 462 ("a court may consider matters not discussed in the complaint"); Gillette, 406 F.Supp. at 715 ("Congress did not intend the court's action to be . . . limited to what appears on the surface"). Indeed, simply accepting at face value the Department's analysis -- and even its good faith -- amounts to precisely the kind of "rubber stamping" that the APPA expressly rejects. The Court is required, in evaluating the Department's proposed decree, to determine whether it "meets the requirements for an antitrust remedy -- that is, if it effectively opens the relevant markets to competition and prevents the recurrence of anticompetitive activity." AT&T, 552 F. Supp. at 153. If the Department has determined not to address a practice -- for example, Microsoft's "bundling" of operating and applications programs, discussed in more detail in Section IV, infra -- which forecloses any meaningful chance of competition in the operating systems market, that fact must be considered by the Court in assessing the adequacy of the decree as a remedy for the charged violations. That is so regardless of whether the Department has chosen to turn a blind eye to the consequences of such bundling on the effectiveness of its proposed decree.

Finally, prior submissions to the Court have emphasized that in assessing whether the decree is in the "public interest" under Section 16(e),

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the Court should not "determine whether the resulting array of rights and liabilities is the one that will <u>best</u> serve society, but only to confirm that the resulting settlement is within the <u>reaches</u> of the public interest." <u>United States v. Western Electric Co.</u>, 900 F.2d 283, 309 (D.C. Cir. 1990), <u>cert. denied</u>, 498 U.S. 911 (1990) (citations and quotations omitted; emphasis in original). This standard clearly is correct, but the parties' further assertion -- that the submissions already made by the Department are sufficient to satisfy this standard -- equally clearly is not.

A comparison of the information provided in those cases relied upon by the Department, with that provided here, highlights just how far short the Department has fallen in providing this Court with an adequate record upon which to act. For example, the Department relies heavily upon the Court of Appeals' decision affirming a modification of the consent decree in <u>United States v. Western Electric Co., Inc.</u>, 993 F.2d at 1572. <u>See</u> 59 Fed. Reg. at 59,429.[25] However, in finding that there was a sufficient "factual foundation for the judgment call made by the Department of Justice and to make its conclusion reasonable," 993 F.2d at 1582, the Court of Appeals in that case expressly pointed to the "array of prominent economists (including two Nobel laureates, Stigler and Arrow)," who had submitted affidavits in the record that supported the Department's position. These affidavits provided

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[25]An initial difference between that case and the present one, of course, is that the initial decree in that case was entered after the District Court had already heard approximately 11 months of trial testimony from roughly 350 witnesses. <u>See</u> <u>AT&T</u>, 552 F. Supp. at 140.

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detailed support for the factual predicates underlying the Department's proposal, including the view that the Bell operating companies would not be able to discriminate or engage in cross-subsidization; that government oversight would be effective in regulating their behavior; and that the proposal would enhance competition in the relevant markets. See id. at 1578-82.

This Court, by contrast, has not been provided with the affidavit of any economist, or for that matter of anyone else, that would provide a factual predicate for any of the matters that it must decide in reviewing the adequacy of the proposed decree. The Department has provided no factual basis (other than its say-so) for believing that the remedies proposed in the decree would be sufficient to "pry open to competition" the operating systems market, AT&T, 552 F. Supp. at 150; that Microsoft's other anticompetitive practices (undocumented calls, predatory preannouncements, anticompetitive bundling and unbundling, early disclosure to Microsoft applications programmers) will not undermine the effectiveness of the decree; and so forth. Although this case involves an industry of unquestioned significance to the future of the American economy -- one of comparable importance to AT&T itself -- the Department has in fact given this Court nothing to go on other than the purest ipse dixit. Indeed, it is hard to imagine how the Department could claim that its request for approval of the decree amounts to anything but a request for a "rubber

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stamp" when it has so notably failed to say anything other than "trust us."

Nor does the Department's submission compare favorably with the information available to other courts in cases cited by the Department. In Gillette, for example, which first formulated the "reaches of the public interest" standard, see 406 F. Supp. at 716, Judge Aldrich concluded that he was able to make an independent determination regarding the adequacy of the proposed decree because "the record [in the case] is both open and extensive." Id. at 715. Here, the record is neither. Indeed, the transcripts of the hearings on September 29, 1994 and November 2, 1994 are replete with inquiries by the Court regarding matters inextricably tied to the adequacy of the proposed remedy -- inquiries that repeatedly failed to yield any information at all, or (even worse) information that is at odds with the record.

The example of preannouncements already has been discussed above: despite Microsoft's unequivocal denial, and the Department's silence, the documentary record shows that such predatory preannouncements in fact are used by Microsoft. Nor is this the only example highlighted by the transcript. Equally striking is the Court's effort to ascertain whether the Department had concluded that a "Chinese Wall" exists between Microsoft's operating system and applications divisions. Noting the discussion of this point in Hard Drive, the Court may have been left with the impression during the hearing that such a "Chinese Wall" in fact exists. See Tr. of Status Call, Sept. 29, 1994, at 27:11-28:1. Certainly that is the impression that Microsoft

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previously has sought to convey, dating all the way back to 1983.[26] Indeed,

throughout the spring and summer of 1991, after the FTC announced its

investigation of Microsoft in March 1991, Microsoft persisted in its claim that

the company's applications and systems development groups were

separated.[27]

Now, however, at the end of a long footnote in its written

submission, Microsoft disavows that any such "Chinese Wall" exists -- and,

indeed, derides the idea as "irrational." See Microsoft Mem. at 7 n.12. The

Department, again, has been silent. Was its determination that "no further

action [is] warranted" on this issue, 59 Fed. Reg. at 59,427, based on

Microsoft's earlier representation that a "Chinese Wall" in fact exists? Was it

based on the conclusion that there is no "Chinese Wall," but it does not

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[26]See, e.g., A Fierce Battle Brews Over the Simplest Software Yet,
Business Week, November 21, 1983, at 114 (Ex. 2) (quoting Microsoft
executive Steve Ballmer) ("There is a very clean separation between our
operating system business and our applications business . . . It's like the
separation of church and state").
[27]See, e.g., Paul Andrews, Can Microsoft Just Do It?, Seattle Times,
March 18, 1991, at B1 (Microsoft "repeatedly" asserted "that a `Chinese Wall'
exists between its applications and systems divisions"); Microsoft and IBM
Under Investigation by FTC, Technical Computing, Apr. 1, 1991 ("Microsoft
maintains that it does not take unfair advantage of advance knowledge of
operating systems in designing its consumer products. It says there is a
`Chinese Wall' between systems and applications"); Michael Stroud, FTC
Widens Probe of Microsoft Dominence, Investor's Daily, Apr. 15, 1991, at 1
("Microsoft maintains that it keeps a `Chinese Wall' between its operating
system and applications divisions to prevent such an unfair advantage from
occurring"); Sean Silverthorne, AMD Files $2 Billion Antitrust Suit Against
Intel, Investor's Daily, August 30, 1991, at 1 (Microsoft responds to charges
that its application developers receive "inside knowledge" about the
company's operating systems by claiming that Microsoft "has erected a
`Chinese Wall' between the two operations.").

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matter? If not, why not?

The answers to these and other questions may remain unanswered because no satisfactory answer is available. As shown in Sections III through VI, <u>infra</u>, the Government cannot effectively restore competition in the operating systems market without addressing the consequences of Microsoft's illegally-acquired "installed base," and its broader use of its acquired market power. The Government's proposed consent decree, however, fails to do either.

THE ECONOMIC CHARACTERISTICS OF THE SOFTWARE INDUSTRY

Section III is divided into two parts. Subsection A provides background by describing the structure of the software industry and how it has changed over time in response to Microsoft's prior conduct in the market. Subsection B describes the economic characteristics of the technologies and markets at issue here.

Market And Technology Background

The relevance of much of the material in this section, particularly the schematic diagrams, is fleshed out and explained to a great extent in the subsequent sections. If the Court is unfamiliar with these markets, the Court may find it useful at this point to read <u>The Economist</u>[28] article, and the

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[28]<u>The Computer Industry Survey: Reboot System and Start Again</u>, The Economist, Feb. 27-Mar. 5, 1993, at 3 (Ex. 14).

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<u>Harvard Business Review</u>[29] article, both found in the Appendix.

At the outset, two characteristics of these markets and technologies should be emphasized. First, the products at issue are software products, composed almost entirely of intellectual property content. Because of the nature of software, there can be greater flexibility in the formation of vertical relationships than often is present with respect to more conventional products. Unlike a pipeline, for example, many competitors can vertically link their software, through software compatibility, to products in the markets above and below them. So, for example, a number of different companies can make word processing application programs that work equally well with Microsoft's operating system so long as they all have the same technical information on a timely basis. It is not necessary for Microsoft to bundle -- or literally tie together -- its operating system and word processing program in order to ensure that the two programs work well together. With software, the efficiency benefits of vertical integration can be achieved without foreclosing access to competitors.

Second, the Stipulated Complaint and Final Judgment in this case focus on the personal computer operating system and the applications that run on top of it. Together, the personal computer operating system and the applications that run on it are sometimes known as the "business desktop." But the desktop is really only an interrelated component of a network that

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[29]Charles R. Morris and Charles H. Ferguson, <u>How Architecture Wins Technology Wars</u>, Harv. Bus. Rev., Mar. 1993, at 86 (Ex. 16).

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contains desktops (or "clients") and "servers." These software networks bear

many of the characteristics that economists have associated with networks

in other industries, including "increasing returns" or "network effects," as

described in Subsection B. Indeed, software networks manifest increasing

returns, or demand-side economies of scale, more strongly than networks in

more conventional industries.

The network at issue here has four components, two on the

"business" side and two on the "home" side. On both the home and business

sides, there is a desktop, or "client," component, and a "server" component

that links the desktop into a broader network. The network as a whole can

be diagramed as follows:

BOX 1
HOME CLIENT

BOX 4
INTRABUSINESS CLIENT

Applications		Applications
Multiple Layers		5 Layers
Connected to Server by Windows 95		Connected to Server by Windows 95

Home-to-Business
("On Line Services")

Intrabusiness
(Enterprise Server)

	Home-to-Business Server		Intrabusiness Server	
	8 Layers		8 Layers	
	Connected to Home Client and		Connected to Intrabusiness	

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	Intrabusiness Server by Windows NT		Client and Home-to-Business Server by Windows NT	

HOME-TO-BUSINESS   ENTERPRISE SERVER
BOX 2   BOX 3

Figure 1

The following description attempts to provide some explanation

for each of these boxes: the intrabusiness client, which runs on the

"desktop"; the enterprise "server," meaning the hardware and software

applications that run on a more centralized computer and that link the clients

together; the home "client;" and the home-to-business server, that similarly

links home personal computers ("PCs") into a larger network. This brief then

discusses two particular technologies that play a critical role in

understanding Microsoft's strategy: OLE and Windows.

The Business Desktop

The personal computer or "PC" was initially devised as a stand-

alone device, but today it is usually used as part of a network. This is

certainly the case in business, and will increasingly be the case in the

home.[30]   The PC, both stand-alone and as part of a network, is often referred

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[30]See, e.g., All Things Considered (NPR broadcast, Nov. 17, 1994) ("if there's a sub-theme to this whole [Comdex] conference, it's networking, and Microsoft is the company that wants to connect all those different boxes that are going to be in your house."); Elizabeth Corcoran, Microsoft Heads Home: Software Giant Targets Huge Consumer Market With a Host of High-Tech Innovations, Washington Post, Nov. 13, 1994, at H1 (Ex. 44).

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to as "the desktop." The FTC Investigation and the DOJ investigation of Microsoft have focussed on the desktop.

Prior to Microsoft Windows, the intrabusiness "client side" or desktop could have been thought of as having four layers.

	Level	Name	Examples
	4	Applications	Lotus 1-2-3, dBASE, WordPerfect, Harvard Graphics
	3	Development Tools	Basic, Pascal, C
	2	OS	Apple, CPM, MS DOS, DR DOS
	1	Hardware	IBM, Apple, Kaypro

Figure 2

Today, the market looks more like Figure 3 below. It reflects two principal changes, each of which will be explained in Section IV, <u>infra</u>. First, Microsoft succeeded in forcing the market to migrate to a new operating system or "OS" (Windows), thereby inserting a new layer, the "graphical user interface" (GUI) layer (layer 3), between the operating system and the applications. Second, using its leverage in layers 2 and 3, it has become dominant as well in development tools (layer 4) and business applications (layer 5).[31]

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[31]Layer 5 has been broken out into two parts to reflect the development of what are known in the industry as "client-server" applications: applications that run partially on the desktop, and partially on server hardware connected to the desktop by a computer network.

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	Level	Name	Examples
	5	Applications	(a) Desktop applications (e.g., Lotus 1-2-3, dBASE, MS Word, MS Excel, WordPerfect) The Microsoft Office is a bundle of these applications made exclusively by Microsoft. (b) Client applications as part of a network (e.g., Oracle Financials, SAP, Peoplesoft, D&B Software, etc.)
	4	Development Tools	Basic, Pascal, C, Borland C++, Powersoft
	3	GUI and/or OS Services	MS Windows
	2	Operating System	DOS, Apple, OS2/WARP, UNIX
	1	Hardware	IBM, Apple, Compaq, Dell

Figure 3

The Justice Department investigation of Microsoft has focussed primarily on operating systems (Levels 2 and 3 in Figure 3), -- but the Government's Tunney Act submission also considers the applications layers (Levels 4 and 5) insofar as they impact competition in operating systems. In order to evaluate the proposed Final Judgment, a slightly more detailed understanding of the operating system layer is necessary.

The Government's complaint defines the market as operating systems that run on the Intel chip set (known as "X86" chips). 59 Fed. Reg.

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at 42,847 (Complaint ¶ 13). There were formerly three principal operating

system vendors for this market -- Microsoft (MS DOS and Windows), Novell

(DR DOS) and IBM (PC-DOS and OS/2). Novell, as indicated above, has

withdrawn from this market, and Microsoft is unquestionably a monopolist,

currently enjoying a greater than 90% market share.[32] Software written for

the current version of Windows (v. 3.1) and prior versions will also run on the

IBM OS/2 operating system. However, software written expressly for

Microsoft's next release of Windows (Windows 95), due out in August of

1995, will not run on the IBM OS/2 operating system. Don Clark and Laurie

Hays, Microsoft's New Marketing Tactics Draw Complaints, Wall St. J., Dec. 12,

1994, at B6 (Ex. 41).

There are a few other competing desktop operating systems that

run on different chip sets. For example, Apple's Macintosh operating system

runs on a Motorola chip set. And the UNIX operating system generally runs

on a specially designed chip, such as the "RISC" (reduced instruction set)

chip designed by Sun Microsystems.

Even including these other operating systems in the same

market as those that run on the Intel chip, Microsoft has an overwhelming

market share, with well over 85%. As the Government's Complaint correctly

points out, applications software written for an Intel chip operating system

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[32]PC Week, Feb. 21, 1994, at 39 (Paine Webber, Inc. Table) (excluding
sales of Macintosh -- which does not use X86 chips -- Microsoft's 1994 market
share was 92.4%). See also Computerworld, Dec. 6, 1993, at 99
(International Data Corp. Table) (Microsoft 1992 market share is 92.5%).

will not run on the Apple Macintosh or Sun RISC workstation without significant modification -- known as "porting." Frequently, porting application software to a new chip set and operating system entails a significant re-engineering of the software. Hence, the Government does not include operating systems for the different chip sets within the same antitrust market.

However, the Government fails to point out that the only companies in the market for developing business application software for the operating systems sold by Apple and Sun, for example, are also the business application vendors on the Windows platform -- e.g., Novell/WordPerfect, Lotus, Borland, etc., and Microsoft, itself, of course. The significance of this fact is discussed in greater detail infra. The point here, however, is that if Microsoft were able to monopolize the market for business applications software, it would severely inhibit competition from vendors of operating systems that run on other chips but nevertheless compete with the Microsoft operating system (e.g., Apple and Sun).[33]

Figure 4 shows what the intrabusiness client side probably will

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[33]The situation with respect to UNIX is slightly more complex, but in the final analysis, the situation is the same. UNIX has a strong following among technical engineering (as opposed to business) users of computers. There are companies that have written technical engineering application programs (such as "computer aided design" programs) to run on UNIX. But, as with Apple, the business applications vendors for the UNIX platform are the same companies that write applications for Windows. Hence, by controlling business desktop application programs, Microsoft can keep UNIX from penetrating the business desktop market.

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look like once Microsoft's strategy of vertical integration of markets within

the client is completely executed. It shows the completion of Microsoft's

leverage from layers 2 and 3 to further its domination of all aspects of layers

4 and 5.

	Level	Name	Examples
	5	Applications	Desktop Applications, e.g., Microsoft Word, Microsoft Excel, Microsoft Access, and Client Server Applications
	4	Development Tools	MS Basic, MS C, MS C++, Microsoft Visual Basic, Microsoft Visual C++, OLE
	3	Graphical User Interface	MS Windows
	2	Operating System	MS DOS
	1	Hardware	X86 PC Hardware and Other Hardware in Figure 3

Figure 4

The Intrabusiness Server

The "server" is the direct lineal descendant of the mainframe

computer. Prior to the advent of the personal computer, companies operated

using a mainframe, to which "dumb" terminals were connected. Personal

computer technologies now allow many computing functions to be performed

on the desktop by an individual worker, but workers within a business still

need to share information with each other and access a body of data

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simultaneously. The "server," a dedicated hardware platform with its own server operating system, allows this to happen. Indeed, increasingly, workers within a business will want simultaneous access to several bodies of data and several different application programs, so that, for example, textual documents containing spreadsheets can be prepared by a number of employees working at the same time.

There are two basic components of the server markets. The intrabusiness server is the backbone of business. Microsoft has projected that there will be 300 million servers in the business community, running everything from phone systems, to copying systems, to cash registers. J. William Semich, The Long View From Microsoft: Component DBMSs, Datamation, Aug. 1, 1994, at 40 (Ex. 10). If a single company controls all business server markets and applications, that company has far greater market power in various sections of the economy than, say, mere control of the desktop would bestow. The second server component, home-to-business, will be described in a subsequent section.

Today, the "server" side of the intrabusiness environment has approximately eight layers. It would unnecessarily complicate this brief of amici to describe the intrabusiness server markets in great detail. There are, however, three important points about the intrabusiness server markets that are relevant for this Court's consideration. First, the most important layer in the server market is the operating system level. The two leading

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competitors in this market at present are Novell's "Netware" product and Microsoft's NT product.[34] The operating system is important because the other products in the server market run on top of the server operating system in much the same way as desktop applications run on top of Windows. The operating system level is also important because it is the level through which the server is connected to the business desktop and (through on-line services) to the home client.

Second, as was the case on the desktop four years ago, competition is vigorous at all levels of the server market. At each of the eight levels, there are a number of competitors, each striving to make better products at cheaper prices. This condition represents a significant (and welcome) departure from the state of the computer industry prior to the advent of personal computer and server technology. In an earlier period, there were only a few vertically integrated companies in the computer industry, such as IBM, DEC and Wang. These companies attempted to supply all aspects of computer technology -- from the underlying chips and operating systems, to applications, to distribution, and even including service and support of previously sold computers. Generally speaking, consumers have benefitted enormously by the fragmentation of the industry into horizontal layers characterized by vigorous competition. Consumers have

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[34]Laura DiDio, <u>NetWare, NT Server to Divide Lion's Share</u>, Dec. 26, 1994, at 77 ("The network operating system arena looks like a two-horse race in 1995, with Novell, Inc.'s NetWare 4.1 and Microsoft Corp.'s Windows NT Server 3.5 locked in a battle for first place.").

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been able to choose the technologically superior and most cost effective product at each level and combine those products into a system that addresses the consumers' needs. The pro-competitive benefits of the industries' current horizontal alignment is discussed in some detail in the Economist article (Ex. 14).

Finally, Microsoft is pursuing a vertical integration strategy on the intrabusiness server side similar to that pursued on the business desktop side. This strategy is only briefly discussed elsewhere in this paper. The Court can get further information concerning Microsoft's strategy, goals and prospects for success from the following articles found in the Appendix: Stuart J. Johnston and Ed Scannell, Server Suite Could Squeeze Market, Computerworld, Oct. 10, 1994, at 4 (Ex. 7); How Microsoft's Server Strategy Will Change The Industry - Parts I & II, Report by Summit Strategies Inc.; J. William Semich, Datamation, Aug. 1, 1994, supra, at 40 (Ex. 10). Obviously, after complete execution of this strategy, Microsoft products would be dominant or exclusive on each of the server layers.

The Home-to-Business Server

The second aspect of server technology is the home-to-business server market, sometimes known as "online services." Today, most online services run off mainframe computers the way LEXIS and NEXIS do. Businesses will increasingly need to sell directly into the home through online services in order to remain competitive. Control by a single company

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of the home-to-business server market would have significant economic

ramifications.

Although there is a vigorous online services market in place, the

home-to-business server does not yet exist, except in Microsoft's plans. It

can be readily assumed that the home-to-business server would look much

like the intrabusiness server, with only Microsoft products being vertically

integrated.

	Level	Name	Examples
	8	Vertical Applications	Home banking, home shopping, news,
	7	Horizontal Applications	product support, portfolio management, plus other "Marvel" (the Microsoft online service) applications
	6	Development Tools	Same as Intrabusiness Server, plus Blackbird (OLE-based development tools; see InfoWorld 10/24/94)
	5	Server Applications	Microsoft EMS E-mail; Microsoft Tiger Video Distribution
	4	Database Services	Microsoft SQL Server (bundled with Marvel)
	3	OS Services	Windows NT (bundling MS Services)
	2	OS Networking	Windows NT (with Marvel Server Code)
	1	Hardware	Intel or Alpha (DEC) chip

Figure 5

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Home Computer Market

The home computer market is in its incipiency. The most important applications programs on the home client are "home banking" (also sometimes known as "personal finance") and tax preparation.[35] The most successful company in this market, Intuit, Inc., makes the largest selling home banking ("Quicken") and tax preparation ("TurboTax") programs. The only substantial competition to Intuit's products comes from Microsoft. Yet, despite a very substantial commitment in marketing staff and resources, Microsoft has gained only a 10% share. Microsoft has therefore elected to take over the home finance market by purchasing the leading software developer, Intuit, rather than by making better products to compete against it. The Microsoft acquisition of Intuit was announced on October 13, 1994 and is still under review by the Department of Justice. It is the largest acquisition in the history of the industry with Microsoft paying twice as much for Intuit as that company was worth in the stock market.[36]

The Microsoft acquisition of Intuit is highly strategic. It is a key element in Microsoft's plans to dominate all of information processing and will be discussed in a subsequent section. If the Microsoft-Intuit deal is

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[35]See, e.g., Michelle Flores, Probe of Microsoft is Extended -- Justice Dept. Asks For More Information, Seattle Times, Nov. 22, 1994, at B11 (electronic banking is the "killer app. of the '90s").

[36]Prior to rumors of the acquisition, Intuit's stock traded at 40 3/4. John Eckhouse, Giant Microsoft Buys Intuit for $1.5 Billion, San Francisco Chronicle, Oct. 14, 1994, at A1, A19. Each Intuit share is to receive 1.336 Microsoft shares at the closing. Id. Based on Microsoft's January 3, 1995 closing price of 60 3/16, each Intuit share receives over $80.

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consummated, it is not difficult to project what the home client will look like given Microsoft's recent announcement concerning "Marvel" (described in a subsequent section).

	Level	Name	Examples
	5	Applications	Microsoft Works, Quicken (Intuit), TurboTax, Encarta, etc.
	4	Development Tools	For example, language features of Microsoft Excel
	2-3	GUI/OS/Networking	Windows 95 with Marvel Client Code
	1	Hardware	PC Hardware

Figure 6

In summary, in each of the four components of the software industry, Microsoft's overall business approach and strategy is based on the creation of technological linkages between layers within the same market (e.g., DOS to Windows on the desktop) and between layers in one market and corresponding layers in another market (e.g., Windows NT to the Microsoft Network to Windows 95 on the home client). To fully understand Microsoft's strategy and its economic implications, however, it is necessary to understand two additional strategic Microsoft technologies: OLE and Windows. This Memorandum of Amici will address each in turn.

OLE

OLE (object linking and embedding) is a strategic technology for Microsoft on both the client and server side. It is the Microsoft-imposed

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standard for sharing information both among applications, and between

applications and the operating system. During the Justice Department

investigation, desktop application companies complained that Microsoft

seeded OLE to its own application developers before giving it to ISV's

(independent software vendors), thereby giving its own applications a

lengthy head start over the competition.[37] As set forth in a subsequent

section, these charges are supported by ample evidence and constitute the

clearest examples of Microsoft's use of operating system information and

specifications to achieve an unfair head start in the application markets.

This is precisely the issue raised by this Court.[38]

       Even more striking is the fact that Microsoft continues to exercise

the very same strategy on the server side. <u>See, e.g.</u>, J. William Semich,

Datamation, Aug. 1, 1994, <u>supra</u>, at 40, 41-44 (Ex. 10) ("If you think OLE is

everywhere in the future, the answer is yes"). Microsoft has made it clear

that OLE will be strategic technology for the home-to-business server

market, but Microsoft has not provided sufficient specifications to

independent database server providers to enable them to release equally

well-behaved products on the same time schedule as Microsoft's own

products.[39]

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[37]<u>See</u> Brian Livingston, <u>Undocumented Windows Calls</u>, InfoWorld, Nov. 16, 1992, at 98 (Ex. 19); Doug Barney and Ilan Greenberg, <u>ISVs Dampen Microsoft Furor for OLE</u>, InfoWorld, July 18, 1994, at 1.
[38]Tr. of Status Call, Sept. 29, 1994, at 25-28.
[39]Microsoft has made numerous presentations around the country that specifically make this point and written documentation from these

Windows

The business desktop connects to the server through the Windows operating system ("OS") and the home-to-business server ("online services") also connect to the home computer through the Windows operating system. Microsoft has several different Windows products that provide OS, GUI and networking capabilities. A brief (and superficial) description of these products is included at this point to avoid confusion.[40]

Desktop

Microsoft's first Windows products were targeted for the desktop and were built on top of Microsoft's dominant desktop operating system MS-DOS. Because of their DOS legacy, these products are unable to take full advantage of the capabilities of the 32-bit microprocessors they run on. Microsoft's current product in this area is Windows 3.1, which, due in part to the illegal per-processor licensing challenged by the Government, is pre-installed on most desktop systems presently sold.

Microsoft plans to proliferate Windows 95 (also known in the press as "Chicago" or "Windows 4.0") widely next year as the successor to Windows 3.1. Windows 95 is a true 32-bit operating system, but it is being targeted to the mainstream personal computer market. It also includes advanced networking features.

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presentations has been provided to the Justice Department.
   [40]For a more thorough discussion, see Miles B. Keyhoe, <u>The Winds of Change</u>, HP Professional, Aug. 1994, at 40 (Ex. 17). <u>See also</u> Microsoft Corporation, <u>Microsoft Windows NT and Client-Server Computing</u>, May 1993.

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Windows NT was Microsoft's first true operating system for 32-bit microprocessors. NT's principal use is in the server market (discussed below) but Microsoft has also targeted its NT marketing to power users running high-end personal computers or workstations.

Server

Windows NT can also be used as an operating system for a network server. Microsoft markets a version of NT with advanced server capabilities, called Windows NT Advanced Server, as an enterprise-wide computing solution. Microsoft offers a suite of applications for Advanced Server called "BackOffice" that includes database services, electronic mail, systems management, and connectivity to mainframe and minicomputers.

Microsoft's vision for enterprise computing is being marketed through its plans for a replacement for Windows NT currently code-named "Cairo." Cairo brings object-oriented technology into the file server and operating system. Microsoft already controls object standards through it OLE specification, discussed in the next subsection. <u>See</u> J. William Semich, Datamation, Aug. 1, 1994, <u>supra</u>, at 41-44 (Ex. 10).

Free Market Forces in Increasing Return Industries

In some industries, companies generally compete on a "level playing field." In such industries, diminishing returns to scale ensure that the forces of the free market will naturally gravitate toward an equilibrium point which maximizes the production of goods and services and results in the

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most efficient allocation of resources. Under such conditions, antitrust

enforcers as well as business executives can count on the fact that superior

products will necessarily prevail in free and open competition.[41]

Free market forces in other industries -- including those at issue

here -- do not exhibit such qualities. Rather, they exhibit "increasing

returns." In such industries, there is more than one equilibrium point and

there is no reason to expect the free market to reach equilibrium at a point

that most efficiently allocates resources.[42] The markets in such industries

can easily be manipulated by a company with a large "installed base,"[43] with

the result that superior products of competitors are not likely to prevail in the

free market.[44] Indeed, in "increasing returns" industries, there is every

reason to believe that consumers will get "locked into" the first product that

appears on a new platform, even if the product is technologically inferior.[45]

Similarly, a company with a large installed base in one market can give its

inferior product in a second market an insurmountable advantage over

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[41]W. Brian Arthur, <u>Positive Feedback in the Economy</u>, Scientific American, Feb. 1990, at 92, 93 (Ex. 36).

[42]<u>Id.</u> at 92 (Ex. 36).

[43]"Installed base" in the economic literature "means the number of owners of a good who may be dependent on the manufacturer of the good for the provision of complementary goods." Joseph Katten, <u>Market Power in the Presence of an Installed Base</u>, 62 Antitrust L.J. 1, 4 (1993).

[44]Joseph Farrell and Garth Saloner, <u>Installed Base and Compatibility: Innovation, Product Pre-Announcements, and Predation</u>, Amer. Econ. Rev., Dec. 1986, at 940; Janusz A. Ordover and Garth Saloner, <u>Predation, Monopolization, and Antitrust,</u> in <u>Handbook of Industrial Organization</u> 537, 565 (R. C. Schmalensee and R. Willis eds., 1989).

[45]W. Brian Arthur, Scientific American, Feb. 1990, <u>supra</u>, at 92-93 (Ex. 36).

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competitors in the second market by integrating the products from the two

markets together technologically.[46]

       Some of the early economic research in the area focused on

perceived anomalies -- particular standards that became locked in,

notwithstanding their obvious inferiority. Stanford economist Paul David

identified several such examples, the most famous of which is the layout of

the common typewriter keyboard, known as the "QWERTY" configuration

because of the order of the keys in the second row of the keyboard.[47]

Primitive typewriters were unreliable mechanical devices and the QWERTY

keyboard, at least according to the folklore, was therefore deliberately

designed to be dysfunctional so that typists would not strike the keys so

rapidly that the device would jam. Obviously, modern software and

computers can process keystrokes far more quickly, yet consumers are

locked into the QWERTY standard. There are even allegations "that the

combination of constant repetitive motion and inefficient finger movements

that QWERTY requires is the ticket to the most well-known [repetitive stress

injury] RSI, carpel tunnel syndrome," yet we go right on teaching it in

elementary schools.[48] Superior keyboard layouts were developed years ago

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[46]See, e.g., Garth Saloner, <u>Economic Issues in Computer Interface Standardization</u>, Econ. Innov. New Tech., 1990, at 140-142.

[47]See, e.g., Paul A. David, <u>Clio and the Economics of QWERTY</u>, Amer. Econ. Rev., May 1985, at 332; David A. Harvey, <u>Ergonomic Issues Have Taken a Backseat to Performance, Resulting in a Growing Tide of Computer-Related Injuries. Change is Needed - Now!</u>, Byte, Oct. 1, 1991, at 119.

[48]<u>See</u> David A. Harvey, Byte, Oct. 1, 1991, <u>supra</u>, at 120.

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but were unsuccessful in dislodging the clearly inferior design that established itself as an early standard.[49]

By the late 1980's, economic analysis was finally able to explain such situations more clearly. Economists at Stanford and the University of California at Berkeley published leading articles demonstrating that market characteristics long viewed as anomalous were, in fact, widespread in high technology industries.[50] By the mid-1990's, increasing returns economics has become widely accepted as mainstream economic analysis.[51] There is now extensive theoretical literature with direct empirical application to many leading industries, including telecommunications, broadcasting, computers, and ATMs.[52]

Increasing returns are present in industries throughout the

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[49]Joseph Farrell & Garth Saloner, Amer. Econ. Rev., Dec. 1986, supra, at 942; Jean Tirole, The Theory of Industrial Organization at 405, n.40 (1988)

[50]W. Brian Arthur, Scientific American, Feb. 1990, supra, at 93.

[51]See W. Brian Arthur, Increasing Returns & Path Dependence in the Economy, 1994, at ix (forward Kenneth J. Arrow).

[52]For the theoretical literature see, for example, the recent Symposium on Network Externalities in the Journal of Economic Perspectives, Spring 1994, the Symposium on Compatibility, edited by Richard Gilbert in the Journal of Industrial Economics, March 1992, and the survey by Paul David and Shane Greenstein in the Economics of Innovation and New Technology, 1990. For an application to telecommunications, see Stanley Besen and Garth Saloner, The Economics of Telecommunications Standards, in Changing the Rules: Technological Change, International Competition, and Regulation in Communications 177 (1989); for applications to broadcasting, see Stanley Besen and Leland Johnson, Compatibility Standards, Competition, and Innovation in the Broadcasting Industry (1986); for applications to ATMs, see Garth Saloner and Andrea Shepard, forthcoming in the Rand Journal of Economics, and Steven Salop, Deregulating Self-Regulated Shared ATM Networks, Econ. of Innov. and New Tech., 1990; and for computers, see Garth Saloner, Econ. Innov. New Tech., 1990, supra.

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economy, but two high technology market situations, in particular, give rise

to increasing returns. First, users of high technology products are frequently

electronically connected in a network. Networks exhibit and produce certain

important economic results. Because the purpose of a network is to enable

communication with others, the value of the network increases with the total

number of users who join the network.[53] Consequently, once a network such

as a telephone network is in place, a competing network would have to enter

the market with at least as large a number of nodes in order to displace (or

even compete meaningfully with) the first network.[54]

A second factor that gives rise to increasing returns is referred to

as "compatibility" in the economic literature. Unlike more conventional

industries, the value of the technology to end users in increasing returns

industries increases with the number of users who use compatible

technology. While the "network" feature draws its force from physical

interconnection, the "compatibility" factor arises from a dependency of

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[53]This "network effect" has been described by numerous authors. In a recent Symposium in the Journal of Economic Perspectives, Michael Katz and Carl Shapiro write, "Consequently, as has long been recognized, the demand for a network good is a function of both its price, and the expected size of the network." See also Jeffrey Rohlfs, A Theory of Interdependent Demand for a Communications Service, Bell J. of Econ., Spring 1974, for an early reference, as well as Michael Katz and Carl Shapiro, Network Externalities, Competition, and Compatibility, Amer. Econ. Rev., June 1985; Joseph Farrell and Garth Saloner, Amer. Econ. Rev., Dec. 1986, supra; and other papers cited in M. Katz and C. Shapiro, Systems Competition and Network Effects, J. of Econ. Perspectives, Spring 1994.

[54]See Julio J. Rotemberg and Garth Saloner, Interfirm Competition and Collaboration, Strategic Options, 1991, for an example of the power of network size.

mutual use by consumers without regard to actual physical interconnection.[55]
For example, although manual typewriters were not connected in a physical
network, new users adopted the QWERTY keyboard because it was in wide
use by others.[56]

Economic analysis demonstrates that superior products do not
necessarily prevail in markets and technologies that exhibit increasing
returns. Rather, these markets are easily susceptible to "tipping" -- once
moved off of equilibrium by an event, the market tends quickly toward a
single standard that dominates the market:

> [N]etwork markets are `tippy': the coexistence of
> incompatible products may be unstable, with a single
> winning standard dominating the market. The
> dominance of the VHS videocassette recorder
> technology and the virtual elimination of its Betamax
> rival is a classic case.

See Stanley M. Besen and Joseph Farrell, Choosing How to Compete, J. of
Econ. Perspectives, Spring 1994, at 118; see also Michael Katz and Carl
Shapiro, J. of Econ. Perspectives, Spring 1994, supra, at 106. Once a market
is "tipped" in favor of a particular competitor, it would take truly massive
forces to return the market to a state of equilibrium (i.e., competition). See,
e.g., W. Brian Arthur, Increasing Returns and Path Dependence in the
Economy, supra, at 2, 10-11.

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[55]For early examples in the economics literature, see Joseph Farrell and
Garth Saloner, Standardization, Compatibility, and Innovation, Rand J. of
Economics, Spring 1985 and Michael Katz and Carl Shapiro, Amer. Econ. Rev.,
supra; Jean Tirole, supra, at 405.
[56]Jean Tirole, supra, at 404-406.

Creating a large installed base is the key to dominating such an increasing returns market.

> Because of the compatibility and network benefits, all else equal, a new user prefers a vendor with a larger total installed base of users. Thus installed bases have a tendency to be self-perpetuating: they provide the incentive for the provision of products (software and hardware) that is compatible with the installed base which in turn attracts new users to the installed base further swelling its ranks. . . .

Garth Saloner, Econ. Innov. New Tech., 1990, <u>supra</u>, at 140. Indeed, "<u>de novo</u> entry into a market occupied by vendors with large installed bases is exceedingly difficult." <u>Id.</u> at 140.

The self-perpetuating nature of an installed base in an increasing returns industry causes particular products to become "locked-in." W. Brian Arthur, Scientific American, Feb. 1990, <u>supra</u>, at 99 (Ex. 36). The costs to a consumer of using or switching to a different system are so high that the vendor with the installed base has a substantial advantage over competitors and can, once the base is established, charge consumers supracompetitive prices.[57]

Because increasing returns markets are particularly susceptible to "tipping," a company with a monopoly in one market that faces competition in a second market can use the locked-in installed base of the first market to wipe out competition in the second market by "tipping" the

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[57]Garth Saloner, Econ. Innov. New Tech., 1990, <u>supra</u>, at 137-138; Joseph Farrell and Carl Shapiro, <u>Dynamic Competition with Switching Costs</u>, Rand J. of Econ., Spring 1988, at 123-137.

second market. The monopolist might achieve this result by releasing a

"predatory preannouncement" with regard to a product in the second

market. In markets that feature increasing returns, users will want to be on

the same standard as other users, so expectations (what users <u>believe</u> will

happen) dominate user choice in the second market -- as opposed, for

example, to the inherent technological quality of competing product

offerings.[58]

> [A] preannouncement can sometimes secure the
> success of a new technology that is socially not
> worth adopting, and that would not have been
> adopted absent the preannouncement.

Joseph Farrell and Garth Saloner, Amer. Econ. Rev., Dec. 1986, <u>supra</u>, at 942.

Similarly, a monopolist that is cash rich from monopoly profits in

the first market might also "buy off" early adopters to create a "band wagon

effect" in favor of its product in the second competitive market.[59] This

technique of predation is known in the economic literature as "penetration

pricing."

> An installed base advantage might also be achieved
> by "penetration pricing," the technique of offering
> low prices to early customers so as to build up an
> installed base and influence the choice of later
> adopters. Penetration pricing seems a natural
> strategy in network industries, and appears
> prominently in the theory.

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[58]Stanley M. Besen and Joseph Farrell, J. of Econ. Perspectives, Spring 1994, <u>supra</u>, at 118; Joseph Farrell and Garth Saloner, Amer. Econ. Rev., Dec. 1986, <u>supra</u>, at 946.

[59]Joseph Farrell and Garth Saloner, Rand J. of Econ., Spring 1985, <u>supra</u>; Joseph Farrell and Garth Saloner, Amer. Econ. Rev., Dec. 1986, <u>supra</u>.

<u>See</u> Stanley M. Besen and Joseph Farrell, J. of Econ. Perspectives, Spring

1994, <u>supra</u>, at 122; <u>see</u> <u>also</u> Janusz A. Ordover and Garth Saloner, <u>Predation,</u>

<u>Monopolization, and Antitrust</u>, <u>supra</u>.

Finally, a monopolist with a large installed base in one market

might "tip" a second competitive market in favor of his product in that

market by technologically linking the two products, or by outright bundling of

the functionality of the second product into the first product, thereby

eliminating the need for the competitor's product in the second market. For

example, by subtly altering the tying product so that rival products in the

tied market become incompatible with the monopolist's "standard," the

monopolist can quickly dominate the second market.[60]

The Justice Department's complaint in this case recognizes the

critical importance of an "installed base." The complaint alleges that the

"lack of a sizable installed base of users" constitutes a "substantial barrier to

entry" for Microsoft's operating system competitors. 59 Fed Reg. at 42,847

(Complaint ¶ 15). The complaint also alleges that Microsoft used

"anticompetitive contracting practices" including "per processor licenses"

starting as early as 1988 to "significantly increase the already high barriers

to entry." <u>Id.</u> at 42,847, 42,848 (Complaint ¶¶ 18, 20, 26). The complaint

appears to assume that Microsoft's monopoly was lawfully acquired. <u>Id.</u> at

42,847 (Complaint ¶ 19). But since Microsoft's installed base of operating

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[60]<u>See</u> Garth Saloner, Econ. Innov. New Tech., 1990, <u>supra</u>, at 141-142.

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system users has increased six-fold since 1988, it must follow that the

"anticompetitive licensing practices" with which Microsoft is charged had the

result of increasing its own installed base at the same time it impeded the

development of competitors' installed bases. As set forth in the next section,

Microsoft has used its installed base both to preclude competitive entry into

the operating system market, and to stifle competition in related markets.

MICROSOFT'S TACTICS AND PROSPECTS FOR SUCCESS

This section of the Memorandum of Amici will examine

Microsoft's overall strategy, the tactics that Microsoft has used in pursuing

that strategy, and the likelihood that Microsoft will accomplish its aims.

Microsoft, by the admission of its own Chief Executive Officer, intends to

dominate all of data and information processing.

> There's no level of performance or specific
> application of corporate information systems that we
> don't intend to go after . . . [and] there won't be
> anything we won't say to people to try and convince
> them that our way is the way to go. That's because
> this new, electronic world of the information highway
> will generate a higher volume of transactions than
> anything to date, and we're proposing that Windows
> be at the center, servicing those transactions.

Brent Schlender, Fortune, Jan. 16, 1995, supra, at 40 (emphasis in original).

To accomplish these aims, Microsoft has pursued licensing

practices that the Government has denominated as "anticompetitive," and

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has engaged in classic predatory behavior by using its monopoly in one market to achieve monopolies in other markets. This section applies increasing returns economic analyses to Microsoft's behavior and concludes that, unless restrained by Governmental intervention, it is highly likely that Microsoft will achieve its goal of dominating the entire national information infrastructure.

Microsoft's Strategy

Even if Microsoft's initial monopoly was lawfully obtained, its enormous market power (and particularly the power to leverage into related markets) comes from its installed base in operating systems. That installed base, according to the Complaint, was procured as a result of anticompetitive practices. Indeed, Microsoft's installed base of operating system users has increased more than six-fold (from 18 to 120 million) since 1988, when the company began its anticompetitive practices. Microsoft has used its monopoly and its installed base in a classically predatory manner. It has used its monopoly revenues in one market to drive competitors out of other markets. It has also used its operating system installed base in a predatory manner to "tip" adjacent competitive markets in the direction of its own product in those markets, to the detriment of competitors.

Microsoft's strategy at any particular point on the network (for example, at the home client or at the business desktop) can only be understood and evaluated in the context of Microsoft's overall strategy.

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Microsoft pursues a strategy of leverage from product markets in which it is dominant, to markets in which its competitive position is weak. It targets particular markets, establishes marketing and, in particular, technological links to those markets from established monopolies, and then leverages its power to monopolize the target markets.

As used in this brief, "leverage" means that Microsoft uses the installed base in a market it dominates (for example, the operating system) to create an installed base in a new market (for example, desktop applications). It uses predatory subsidization, and both marketing and technological linkages, to accomplish leverage, as explained in greater detail in the succeeding pages. For the sake of easy example, Microsoft's horizontal tie-ins <u>within</u> a single layer represent the most trivial example of its marketing strategy. Thus, Microsoft has bundled for sale a number of desktop applications (under the name, the "Microsoft Office"), putting companies like Lotus, WordPerfect and Borland at a competitive disadvantage. Carole Patton, <u>Bundles Are Bad News</u>, Computerworld, Nov. 14, 1994, at 57 (Ex. 8). Microsoft is executing the same tactic on the server side by bundling its "BackOffice" products to foreclose meaningful competition at the "server applications" layer. <u>See</u> Stuart J. Johnston and Ed Scannell, Computerworld, Oct. 10, 1994, <u>supra</u>, at 4 (Ex. 7).

Microsoft also pursues other tactics. In particular, Microsoft derives leverage from its control of Windows products and logo; from its use

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of a consistent graphical user interface; and from its tight technical

integration between interconnected machines through the control of

standards such as OLE. After establishing market power on one level,

Microsoft will target an adjacent layer, subsidize the creation and sale of

products at that layer from the monopoly it derived on the first level,

establish proprietary technological linkages to the target layer, and then

leverage its market power to establish market power in the next layer. Two

examples of this within the desktop side are DOS to Windows, and Windows

to desktop applications. In addition, Microsoft uses its market power from

one side of the network (server or client) to leverage to the other side, again

by establishing linkages. Microsoft is already attempting to leverage its

control of the desktop into a control of servers. It will also use its market

power in the PC-based financial and text software market, through the

acquisition of Intuit, to leverage into the server.[61]

Obviously, control of certain layers in the various markets of the

network create greater potential for leverage than control of other layers. In

particular, there are a few "gateway" layers into the network. Control of

these layers represents the most effective platform for leverage (i.e., moving

the installed base). Generally speaking, the operating system layers in each

box represent the most powerful platforms for both horizontal and vertical

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[61]For a detailed review of Microsoft's server strategy, see How
Microsoft's Server Strategy Will Change The Industry, supra, (Ex. 38).

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leverage.[62] For example, Microsoft has already leveraged control of operating systems to desktop applications. It can also leverage control of the desktop operating system (Windows 95) to the server operating system (Windows NT).

Control of the "gateway" layers provides greater possibilities for leverage because control of the architecture at those levels effectively controls all higher vertical levels, and also provides significant power at the horizontal interface between the client operating system and the server operating system. This brief uses the term "architecture" in the same way as that term is used in the Morris and Ferguson Harvard Business Review article -- namely, the complex of standards and rules that define how programs and commands will work and how data will move around the system. Charles R. Morris and Charles H. Ferguson, Harv. Bus. Rev., Mar. 1993, supra, at 88 (Ex. 16).

By owning the installed base at a gateway, Microsoft can control not only the architecture at that level but also at all higher vertical levels. For example, by controlling the desktop operating system architecture, Microsoft can easily obsolete or render inoperable Lotus 1-2-3, merely by making a minor change to the architecture. Microsoft can pretextually or

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[62]There was clearly the potential for at least some leverage from the chip or hardware level, when the OS level was more fragmented. This possibility is not treated in this brief for a number of reasons, including the widely publicized alliance between Microsoft and Intel that makes separate treatment of the hardware layer irrelevant.

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otherwise claim the change to be an "upgrade" or a "bug fix," but it is the effect of the power to control architecture that is more important than Microsoft's subjective intent.

If Microsoft controls the architecture at a "gateway," it can loudly proclaim its system to be "open" while in truth its architecture remains closed. Thus, for example, Microsoft can claim that its desktop operating system will continue to work with Lotus 1-2-3 or that its server operating system will continue to work with the database products offered by Microsoft competitors (and, to that extent, its system is "open"). Because Microsoft can easily obtain competitive advantage over (or outright displacement of) vertically related competitors by upgrades to the architecture, however, its nominally "open" system does not provide for effective competition on higher vertically related levels.[63]

All companies try to use leverage to some extent,[64] but Microsoft has a powerful advantage over its competitors. It has used "anticompetitive"

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[63]The operating system gateways are the most effective layers for leverage. But the system can also be leveraged from other access points as to which strong network externalities attach. For example, on the home client, Intuit has leverageable power from the strong network externalities that have attached to that product at the computer-human interface. (This is described in greater detail elsewhere in this brief.)

[64]In many respects Microsoft's strategy of targeting, linking and leverage is little different from that employed by MITI and Japanese keiretsus to target and capture American markets. Microsoft's leverage comes from technical ties in markets it dominates, while Japanese companies' leverage comes from the installed base of buyers it creates in Japan. In both cases, the leverage can be applied by forward-pricing into the target market to damage competition in that market. Cf., L. D. Tyson, Who's Bashing Whom? Trade Conflict in High-Technology Industries, at 55-57, 99-101 (1992).

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licensing practices to acquire a huge installed base and it uses the power of this installed base against competitors in adjacent markets. Microsoft employs multiple linkages and leverage from the different markets (and, in particular, from the gateways) it controls into a single target market, so as to completely outflank and overrun existing competitors in that market.

In the beginning (for our purposes), IBM had a monopoly in computers and the market for computer products was, generally speaking, vertically integrated. (This necessary background is explained in The Economist, supra, at 3-18 (Ex. 14).) How IBM got this monopoly was the subject of much conjecture and years of litigation, but is irrelevant for our purposes. What is relevant is the fact that IBM, in its rush to get out a personal computer, did not leverage its own power from mainframes. Rather, it procured chips from Intel and an operating system from Microsoft ("DOS"), thereby transferring its market power to them as the market for personal computers expanded to displace mainframes and IBM's imprimatur established a standard. In short, IBM empowered Microsoft and Intel to control the architecture for the next generation of computers, and has been playing catch-up ever since. See Charles R. Morris and Charles H. Ferguson, Harv. Bus. Rev., Mar. 1993, supra, at 86, 92 (Ex. 16). See also Elizabeth Corcoran, Washington Post, Nov. 13, 1994, supra, at H6 (Ex. 44).

Bill Gates, the founder of Microsoft, secured control of the personal computer market by riding IBM's coattails. The success of the IBM

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PC opened a lucrative market for compatible computers, or "clones." At the time, Microsoft was the sole source for a compatible operating system. Accordingly, Microsoft was able to license the operating system ("DOS") to compatible makers at significantly higher rates than those charged to IBM. Hence, as the Government's Complaint (¶ 19) explains, "Microsoft quickly dominated and gained a monopoly in the market for PC operating systems." 59 Fed. Reg. at 42,847. More precisely,

> DOS would have been worth relatively little had Gates not retained the right to license its use to IBM's rivals. This arrangement -- the source of Gates' wealth and power -- became clearer as IBM set the standard for the burgeoning PC market. By the mid 1980's every rival except Apple computer felt that the only way to compete against IBM was to sell a clone of IBM's PC. Making a clone required, among other things, licensing DOS from Microsoft. Over time DOS became a kind of annuity for Microsoft: buying DOS was the price of admission for entering the PC business.

See G. Pasquel Zachary, Showstopper: Breakneck Race To Create Windows NT and the Next Generation at Microsoft, 27 (1994).

As new technologies overcame the old mainframe market, the market for computer products formed into a number of horizontal markets that are vertically related to each other. Charles R. Morris and Charles H. Ferguson, Harv. Bus. Rev., Mar. 1993, supra, at 8 (Ex. 16). There are many competitors at each level that aggressively compete with each other to develop more powerful products at lower prices. Generally speaking, consumers have benefitted from the formation of horizontal markets.

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Consumers can put a system together using the best and most cost effective products at each level, even if the products are made by different manufacturers. But by using its installed base in operating systems to "tip" each of these markets in favor of its own products, Microsoft undermines the competitive process. From the initial monopoly bestowed on it by IBM and the huge installed base secured by anticompetitive practices, Microsoft has leveraged and linked a series of powerful monopolies with the intent of forming a new verticality on the market. After establishing several monopolies with enormous leverage potential, the positive feedback from the verticality imposed by Microsoft will in short order eliminate competition on all horizontal layers within the server and online markets, just as it is eliminating competition in the horizontal layers on the desktop.

The Business Desktop

The Justice Department's Tunney Act filing alleges that Microsoft has monopolized "the market for PC operating systems worldwide" for "almost a decade." 59 Fed. Reg. at 42,850. As noted previously, in 1988 Microsoft had an installed base of approximately 18 million operating system users.[65] In 1988, Novell (formerly Digital Research, Inc.) entered the X86 operating system market with a competitive product, DR DOS, and it was in response that Microsoft began the "anticompetitive licensing practices" identified by the Government. Microsoft continued these practices through

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[65]See supra note 9.

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mid-1994, and, as noted previously, it was during this period that Microsoft was able to increase its installed base by more than 100 million users.[66] As the preceding section explains, it is the size of Microsoft's installed base, rather than merely its market share, that determines the company's true market power. Accordingly, through practices that the Government has identified as "anticompetitive," Microsoft has increased its market power many fold.

Having gained this market power, Microsoft has used it both to maintain its monopoly in operating systems (described in subsection (a) immediately below) and to obtain a monopoly in desktop applications (subsection (b)). The remainder of this section (subsections (c) through (f)) describe how Microsoft has used its market power to engage in other predatory conduct in the desktop markets.

Effect of the Monopoly on Operating Systems

Microsoft's strategy, which was based at the outset on an installed base created in part through anticompetitive licensing practices, succeeded in monopolizing the desktop OS and threatening desktop applications. Once Microsoft had control of the operating system, which is the key architectural technology for desktop computing, it was able to maintain its share, even with an inferior product. The introduction of DR DOS

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[66]Amy Cortese, <u>Next Stop, Chicago</u>, Business Week, Aug. 1, 1994, at 24 ("120 million MS-DOS customers (including 55 million Windows users)"). <u>See also</u> <u>OS Overview</u>, Computer Reseller News, at 223 (DOS installed base of 110.1 million).

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from Novell showed that Microsoft had failed to keep MS DOS abreast of leading technology.[67] Yet Novell's compatible offering in the DOS market (DR DOS) stopped selling when Microsoft made it clear that Microsoft would create versions of Windows that were incompatible with DR DOS. It is common for "better" products to fail if a competitor controls the architecture in which the product operates. See Charles R. Morris and Charles H. Ferguson, Harv. Bus. Rev., Mar. 1993, supra, at 89-91 (Ex. 16).

Microsoft was also able to raise prices for its operating system, as its monopoly position continued to solidify and its installed base increased. In the early 1980's, Microsoft licensed MS DOS for $2 - $5 per copy. By 1988, the price was up to $25 to $28. Once Microsoft drove DR DOS out of the operating system market, it was able to double the price it charged, with recent press reports indicating that it is demanding as much as $70 per copy of the forthcoming version of its operating system.[68]

Overall, Microsoft's strategy has been enormously successful in maintaining its monopoly in operating systems while expanding its installed base. Microsoft's share of all desktop operating systems is a staggering 85%. See supra note 32. Microsoft's share of the operating system market that runs on X86 chips is even larger -- more than 90%. See id.

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[67]See Stan Miastkowski, Digital Research Creates a Better DOS, Byte, Nov. 1991, supra, at 68.

[68]See Amy Cortese, Business Week, Dec. 19, 1994, supra, at 35 (Ex. __) ("Computer makers . . . have been startled to learn that they will be asked to swallow a huge price hike for their use of Windows 95 -- to as much as $70 per PC vs. roughly $35 today.").

Effect of the Monopoly on Applications

Having entrenched its operating systems monopoly, Microsoft has aggressively leveraged this monopoly to gain a monopoly in business applications. In 1991, Microsoft's senior vice-president Mike Maples expressly stated the company's intention to monopolize the software applications market:

> If someone thinks we're not after Lotus, and after WordPerfect and after Borland, they're confused... My job is to get a fair share of the software applications market, and to me that's 100 percent.

See Jane Morrissey, Microsoft's Application Unit Seeks Market Dominance, PC Week, Nov. 18, 1991, at 1.

Microsoft used the monopoly revenues from licensing the operating system to fund the development of applications to run on DOS, in competition with software vendors which had no operating system control (for example, Lotus, Borland, and WordPerfect). But because of the relatively open nature of DOS, competitors like Novell could make "compatible" operating systems -- operating systems that would run applications written for Microsoft's MS DOS without modification. Therefore, Microsoft could not exercise sufficient control to give its own applications a strong competitive advantage over the application programs of competitors. The competitors' products were the first developed on DOS and had therefore acquired significant installed bases, as to which powerful network externalities had attached. In order to displace these competitors, Microsoft needed to create

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a new operating system platform so that its own applications would reach

the market on the new platform before its competitors' products.

Microsoft "solved" this problem by (1) developing a new

operating environment (Windows) that it totally controlled, (2) targeting a

function performed in the application layer that it could either embed in the

operating system (for example, the "graphical user interface" or "GUI"

feature) or link with the operating system, and (3) using its power over DOS

to migrate users to Windows. Microsoft thereby got more control over the

OS, added value to the OS it controlled, and forced independent application

publishers to rewrite all of their applications twice (once for Windows and a

second time for OLE, as described below). The forced migration that

Microsoft effected with the GUI and Windows may be depicted as follows:

BEFORE (See Figure 2)				AFTER (See Figure 3)		
		GUI/ Applications				Applications
DOS		GUI/ Applications		DOS/Windows GUI		Applications
		GUI/ Applications				Applications

Figure 7

Microsoft, in effect, added a new layer to the architecture of the desktop,

moving the industry from Figure 2 to Figure 3 above. Controlling

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architectures is the key to dominating competition. <u>See</u> Charles R. Morris

and Charles H. Ferguson, Harv. Bus. Rev., Mar. 1993, <u>supra</u> (Ex. 16).

Microsoft leveraged its control over the operating system to

control desktop applications, following a carefully crafted plan that utilized

the market power of its installed base. First, Microsoft emulated the

application program of the market leader in that application (<u>e.g.</u>, Lotus,

WordPerfect or Borland), breaking the network externality of the installed

base by providing file and keystroke compatibility. Microsoft funded the

development, marketing, and below-market pricing of its applications from

the profits it reaped on the six-fold increase in the installed base of its

operating system. Microsoft's

> stronghold in operating system software . . . financed
> Microsoft's push into applications software.

Victor F. Zonana, <u>$14-Million Deal Microsoft Buys Software Competitor</u>, L.A.

Times, July 31, 1987, at 4.[69] For years, Microsoft funded "many versions" of

applications programs before they "were good enough to grab substantial

market share."[70] But

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[69]<u>See also</u> O. Casey Corr, <u>IBM vs. Microsoft -- Software Superbowl -- IBM to Kick Off New Version of OS/2, but will Microsoft Make Winning Goal</u>, Seattle Times, March 29, 1992, at C1 (system sales are "the cash cow that has fueled Microsoft's aggressive entry into nearly every field of personal computing"); <u>id.</u> ("DOS, which comes installed on computers at the factory, has provided profits to finance Microsoft's development of applications such as the Excel spreadsheet and Word, a writing program."); Laurie Flynn & Rachel Parker, <u>Extending its Reach</u>, InfoWorld, August 7, 1989, at 43 ("the Microsoft strategy has been to fund expensive applications development and marketing with its profits from the recurring DOS royalties it receives.").

[70]Kathy Rebello, et al., <u>Is Microsoft Too Powerful</u>, Business Week,

> [b]ecause Windows gives Microsoft a "pervasive
> presence on any desktop that matters, Microsoft can
> subsidize its loss leaders [in applications] and
> leverage its desktop heritage".

Barbara Darrow, Developers Brace for Shakeout, Computer Reseller News,

Feb. 1, 1993 at 28 (quoting Don DePalma, senior industry analyst for

Forrester Research). ACCESS, Microsoft's database program, is a case in

point. It

> cost a staggering $60 million to develop . . . . By
> contrast, the [entire 1992 development] budget at
> Borland was $50 million. At Lotus, it was $35 million.
> That's not all. Microsoft also had the money to offer
> an introductory price of $99 for ACCESS -- less than
> one-third the retail price for similar packages.
> Result: Microsoft sold 700,000 copies in just three
> months. The entire market in 1992 was only 1.2
> million units.

Kathy Rebello, et al., Business Week, March 1, 1993, supra, at 88.

Unfair Early Access

Moreover, because of Microsoft's installed base in operating

systems, it was able to provide an unfair advantage to its applications in a

variety of other ways, as well. For example, Microsoft based its own

application programs on components in the operating system that it had

unique or early access to. Microsoft claimed it was "open," but actually used

hidden features and functions to gain a competitive advantage. Brian

Livingston, InfoWorld, Nov. 16, 1992, supra, at 98 (Ex. 19). That is, Microsoft

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March 1, 1993 at 88 (Ex. 4).

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provided a proprietary architecture with a supposedly "open" system. See

Charles R. Morris and Charles H. Ferguson, Harv. Bus. Rev., Mar. 1993, <u>supra</u>.

The most well-known such example involves Microsoft's "OLE" (object linking

and embedding) standard.

　　　　Microsoft created interoperability among its own applications,

and between its applications and its operating system, by creating a new

standard, OLE, which copied functionality from Hewlett-Packard's product

New Wave. Stuart J. Johnston, <u>Dangerous Liasons</u>, InfoWorld, April 8, 1991,

at 44. With market power on both sides of the interface (<u>i.e.,</u> in both the

applications and the operating system), Microsoft easily displaced the

existing standard in favor of OLE. It embedded OLE functionality into both its

operating system and applications, and it heavily marketed this new

functionality using profits from its market position in operating systems.[71]

　　　　During the very same time period that the Government contends

Microsoft was using "anticompetitive licensing tactics" to harm OS

competitors, applications competitors repeatedly complained that Microsoft

was using its knowledge of new operating system features to give its own

applications programs a head start and performance advantage over

applications competitors. As stated in Section II of this memorandum,

throughout the 1980's and early 1990's Microsoft responded to this criticism

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[71]<u>See</u> Cara A. Cunningham, <u>IBM and Microsoft Wage Open Doc vs. OLE Find</u>, InfoWorld, Aug. 15, 1994, at 25 (Microsoft has an "army of evangelists . . . that goes out and sells the [OLE] technology and swarms over developers").

by asserting that it had erected a "Chinese Wall" between its operating system developers and applications developers. According to Steve Ballmer, the senior vice-president for Microsoft's system divisions:

> [T]here is a very clean separation between our operating system business and our applications business . . .. It's like the separation of church and state.

Business Week, Nov. 21, 1983, supra, at 114 (Ex. 2).

In the face of mounting criticism, Microsoft executives adhered to the party line. For example, in 1989, Steve Ballmer again disputed "the charge that his people gave their counterparts in applications previews of their upcoming systems products."[72] Microsoft executives repeatedly told the press that a "Chinese Wall" was in place. See, e.g., Laurie Flynn and Rachel Parker, Infoworld, Aug. 7, 1989, supra, at 43. Indeed,

> Gates insisted that Microsoft kept the playing field level by erecting an imaginary barrier between the company's operating systems group and its applications division.

Hard Drive, supra, at 308. Even into early 1991, Microsoft executives were claiming that the company had an "ISV-independent program" that treated Microsoft applications "the same as any other ISV [independent software vendor]."[73] Although the FTC began investigating Microsoft in 1990, Microsoft continued to maintain that it had a "Chinese Wall" well into 1991.[74]

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[72]Richard Brandt, Microsoft Is Like an Elephant Rolling Around, Squashing Ants, Business Week, Oct. 30, 1989, at 148 (Ex. 3).

[73]Ray Weiss, Windows Stars at SD 91, Electronic Engineering Times, Feb. 18, 1991 (Ex. 15).

[74]See supra note 27.

But Microsoft's head start in using OLE in 1991 to the detriment of applications competitors put the lie to such claims. Microsoft incorporated OLE into its Windows operating system and shipped its first completed application incorporating OLE, Excel 3.0, in February of 1991, at the very same time it was releasing a "beta version" of OLE -- not suitable for commercial distribution -- to ISV's. Indeed, the February 1, 1991, issue of Byte Magazine reports the two events in the same issue.[75] Microsoft's applications competitors suffered delays of many months as they were forced to rewrite their own applications to make them perform under Windows as well as Microsoft's Excel, which had a head start in using OLE. It was not until many months later that the first third-party implementation of OLE appeared on the market.[76]

Microsoft's unfair advantage obtained from prior knowledge of operating system functionality created a significant head start for its own applications on the new Windows platform. As the prior economic analysis demonstrates, the advantage of being first to market in an "increasing returns industry" is enormous -- it permits a competitor to begin to generate an installed base, reap the benefits of "positive feedback," and otherwise drive its own products to "lock in" before competitors even reach the market. Microsoft used its operating systems information to secure these unfair

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[75]Compare Andrew Reinhardt, First Impressions: New Extras for Excel, Byte, Feb. 1, 1991, at 136 with Microbytes, Byte, Feb. 1, 1991, at 20.
[76]See, e.g., Stan Levine, Lotus Embraces 'Competition As It Aims for Identity, LAN Times, June 17, 1991.

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benefits for its applications.

Confronted with their obvious untruths, Microsoft executives did an abrupt corporate-wide about-face at the end of 1991. Microsoft senior executive Mike Maples stated in December of 1991:

> There is no Chinese Wall. We don't want there to be
>
> a Chinese Wall, and I don't think we've ever claimed
>
> that there is a Chinese Wall. Microsoft is a single
>
> company. . . . We don't try to pretend that there is a
>
> Chinese Wall. . . .

Stuart J. Johnston, `No Chinese Wall' at Microsoft, Infoworld, Dec. 30, 1991, at 107 (Ex. 18). And since early 1992, Microsoft has freely and openly given its applications developers an advantage over ISVs. In November of 1992:

> at least half a dozen cases in which Microsoft
> allegedly withheld information on its DOS or Windows
> functions from outside developers, for periods
> ranging from six months to several years. During
> these periods, Microsoft's own developers appear to
> have used these functions in applications or utilities
> that competed with those eventually developed by
> independent software vendors, according to
> programmers who have examined the code.

<p align="center">* * *</p>

> [I]n each case, the lack of documentation of
> the functions may have given Microsoft applications
> a time-to-market lead of six months or more before
> similar features could be incorporated into competing
> developers' applications . . . .

Brian Livingston, InfoWorld, Nov. 16, 1992, supra, at 98 (Ex. 19).

Predatory Bundling

<p align="center">--</p>

Since dropping all pretense of a "level playing field," Microsoft has increasingly used the power of its operating system installed base to gain advantages over applications competitors. It has attempted to monopolize the market for the development tools (also known as programming languages) used to create applications by predatorially preannouncing its products (as documented in the introduction to this brief) and by bundling versions of its own programming language products into its operating systems so that users will have a powerful disincentive to purchase a competitor's programming language separately.[77]

Microsoft has also conducted a lengthy "campaign" to bundle business software applications into the operating system so that it can "mop up competitors that sell stand-alone applications, resulting in more limited user choice down the road."[78] Microsoft has steadily increased the price of its operating system to cover its own loss of revenue from the diminished sales of free-standing applications that it bundles into the operating system. Although free-standing applications generally cost more than Microsoft's increases in operating system licensing fees, the unit sales of each

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[77]Ethan Winer, <u>BASIC, Yes; Feeble, No</u>, PC Magazine, Oct. 30, 1989, at 187 (Because "the BASIC [programming language] interpreter [is] bundled with DOS . . . at no extra cost, [it] is known and used by more people than any other programming language for personal computers.").

[78]Michael Csenger & Adam Griffin, <u>Microsoft Free At Last?, Ruling Still Lets Firm Incorporate Apps Into Its OS'es</u>, Network World, July 25, 1994, at 4 (Ex. 23); <u>see also</u> John Markoff, <u>Microsoft's Future Barely Limited</u>, N.Y. Times, July 18, 1994, at D1 (Ex. 24) (describing Microsoft's 14 year "campaign[] to expand the definition of what computing functions belong inside the computer operating system.").

application are far fewer than the number of users that upgrade to each new release of the OS -- because of the huge installed base that Microsoft has procured by "anticompetitive practices." Hence, even a modest increase in operating system fees more than offsets Microsoft's loss of revenue from diminished applications sales.

Applications competitors, of course, do not fare as well -- when Microsoft bundles the functionality of their products into the operating system, they lose their only source of revenue. After the competitors go out of business, Microsoft is free to unbundle the applications from the operating system and charge, in the absence of competition, whatever price the market will bear. Microsoft initiated this strategy with the introduction of Windows, by bundling word processing, calculations, communications and "paint" business applications software directly into the operating system.[79]

Microsoft has even bundled technology into its operating system that it <u>misappropriated</u> from its competitors. When Microsoft wanted to add data compression capabilities to DOS, for example, it approached Stac Electronics, developer of the industry's leading data compression software. Microsoft demanded a worldwide license to use Stac's software as part of DOS, but "steadfastly refused . . . to pay Stac any royalty for [its] patented

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[79]Paul Andrews, <u>Windows Is No JFK, But Its Visual Appeal Is Outstanding</u>, Seattle Times, May 22, 1990, at C2 ("Windows 3.0 comes with a suite of mini-applications including Write, Paintbrush, Clock, Recorder (a macro utility), and Terminal (telecommunications).").

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data-compression technology."[80]   When Stac refused Microsoft's demand,

Microsoft simply incorporated Stac's intellectual property directly into DOS.

Id. Stac brought suit and a federal jury found Microsoft guilty of infringing

Stac's data compression patents and awarded Stac $120 million in

damages.[81] Microsoft thereafter settled the case by acquiring a 15% interest

in Stac, and obtained a license to Stac's vital data compression technology

for a fraction of the jury's verdict.[82] Because Microsoft's conduct in the Stac

case "underscore[s] the sort of allegations that have kept the [Government's

antitrust investigation] alive for years," some observers have suggested that

the timing of Microsoft's settlement with Stac in late June 1994 was

calculated to "remove [Stac president Gary] Clow as a hostile witness in the

Justice investigation."[83]

Predatory Unbundling

Microsoft has also unbundled technology from its operating

system in order to render other companies' products uncompetitive. For

example, the DOS operating system contained, in version after version, a

portion of code known as the "debug kernel." Both Microsoft and

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[80]O. Casey Corr, A Look Behind Stac Deal, Seattle Times, June 26, 1994, at F1 (quoting Stac's complaint).

[81]Id.; Charles McCoy, Microsoft to Pay Stac Judgment of $120 Million, Wall St. J., Feb. 24, 1994, at A4.

[82]Stuart J. Johnston, Microsoft Settles for Piece of Stac, Computerworld, June 27, 1994, at 30 (Microsoft paid $39.9 million for 15% of Stac, and an additional $43 million over 43 months for a license to Stac's data compression technology); Doug Barney, Microsoft, Stac Resolve Dispute; Microsoft Finally Pays Up, InfoWorld, June 27, 1994, at 14.

[83]O. Casey Corr, A Look Behind Stac Deal, supra, at F1.

competitors like Borland created development tools that used the functionality of the debug kernel in order to run.

With the introduction of Windows 3.1 in April, 1992, Microsoft removed the debug kernel from the operating system and bundled it with its own language application program. If a user wanted to run the competitive Borland program, it had to buy the debug kernel separately from Microsoft, at a price Microsoft set to make the Borland product less competitive. Microsoft even conspicuously advertised the fact that its own product was cheaper than the Borland product because the user had to buy the debug kernel separately from Microsoft. Byte, May 1992, at 159 (Ex. 6). Whatever pro-competitive benefits Microsoft might advance to justify its bundling of new functionality into the operating system, it is difficult to imagine any justification for unbundling operating system technology, other than harming competition.

Other Uses of Leverage

Microsoft further exploited its leverage, both vertically and horizontally. Horizontally, within the desktop applications layer, Microsoft introduced additional applications, touting and exploiting the benefits and advantages of its vertical linkage (to the operating system): for example, word processing ("Word"), database ("Fox Pro" and "Access"), and presentations ("Power Point"). Microsoft also employed horizontal leverage in the applications layer through its marketing practice of bundling a group of

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applications into a "suite," which is sold at low price points. And, all the

while, Microsoft used its profits from its monopoly position in OS for (1)

massive marketing to promote the linkage features of the OS, and (2)

sustaining a protracted battle with independent applications vendors in a

new market that, without the profits from the leveraged market, could not be

sustained.[84]

As noted in the introduction to this brief, Microsoft has been

spectacularly successful in leveraging its installed base in the operating

system market to dominate the business applications market. In four years,

Microsoft "went from an also ran in the business applications market to the

industry leader." Inside Telecom, Sept. 26, 1994. Although Microsoft has not

yet fulfilled Mike Maples' goal of "100 percent" market share, it is by far the

leading supplier in each individual applications product category. Microsoft

Domination, San Jose Mercury News, Dec. 21, 1994, supra, at 1F (Ex. 35).

Moreover, suites are the fastest growing category of business applications

software and Microsoft accounts for an astounding 85% of all suites sold.

See supra note 16.

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Microsoft's success in monopolizing business applications is,

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[84]As explained in Section V.C., infra, the superficially irrational behavior
of undermining the application vendors that produce programs that run on
Microsoft's operating system is logical specifically because Microsoft has an
independent economic incentive to monopolize the market for business
application programs.

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absent effective Government intervention, only a taste of things to come. Having succeeded in dominating the desktop operating system and applications markets, Microsoft has begun to leverage its installed base to monopolize both the intrabusiness server and on-line systems, as set forth in subsequent sections.

The Intrabusiness Server

Microsoft intends to displace all of the competition on the enterprise server, just as it did on the desktop, by employing multiple linkages and leverage. Its leverage will come from the large installed base of the PC operating system monopoly. Using this base, Microsoft will employ three strategies: (a) vertical linkages similar to those that worked in the desktop markets, (b) horizontal linkages from desktop to intrabusiness server, and (c) horizontal linkages from home-to-business server to intrabusiness server.

Microsoft began the implementation of its strategy by creating a new server OS ("Windows NT") that horizontally leverages from the monopoly position of DOS/Windows in the client market. Microsoft has increasingly placed server functionality into Windows and Windows applications (for example, with the Microsoft products, Access, Fox Pro, and Excel).

> With NT, Gates seeks to extend his software
> dominion from desktop software, which he
> monopolizes, to the network. In the 1980's,
> Microsoft's DOS and Windows systems software

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> defined the way most people worked with computers. In the 1990's, the company aims to define the software that electronically ties together workers and businesses, customers and homes.

Zachary, Showstopper, supra, at 3.

In addition, Microsoft is nakedly leveraging its market power in the desktop operating system market to the enterprise server by requiring software developers who want to use the logo for "Windows 95," the forthcoming version of Microsoft's desktop operating system, to make their desktop application products also run on "Windows NT" (Microsoft's server operating system). See William Brandel, Developing for Next Generation of Windows May Mean Running on NT, Computerworld, November 18, 1994, at 4. There is no technical reason to require an application to run on both Microsoft's desktop and server: indeed, a user would not even expect (nor perhaps even want) a "Windows 95" application program to run on the server. Microsoft's requirement is simply another way of leveraging:

> The NT requirement seems like nothing more than an attempt to leverage Microsoft's control over the upcoming Windows 95 market to assist its lackluster Windows NT product.

Brian Livingston, Will 'Windows' Compatible Really Mean What It Says?, InfoWorld, November 14, 1994, at 40 (Ex. 20) (quoting Andrew Schulman, Unauthorized Windows 95). Microsoft is using its operating system power to force independent application vendors to establish the linkage between the desktop and the server that Microsoft has been trying to establish through its

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own products. In affect, Microsoft is using independent software vendors to establish Microsoft's power in servers.

Microsoft also enhances its power in the server applications layer by horizontally bundling these products into a suite (the "BackOffice") in the same way Microsoft bundled desktop applications into a suite. Just as with the desktop applications, there is also vertical leverage to enforce the horizontal bundle by making all server applications OLE-enabled. See Stuart J. Johnston and Ed Scannell, Computerworld, supra, Oct. 10, 1994, at 4 (Ex. 7); J. William Semich, Datamation, Aug. 1, 1994, supra, at 41-44 (Ex. 10).

The Home-to-Business Market (Server and Client)

Increasingly, business will need to communicate with personal computers in homes in order to sell products or services and in order to provide information, for work or other purposes. Obviously, businesses that exploit this channel will have a strong advantage over competitors that do not, with the result that all businesses will seek entry. This market is currently known as "online services." There are three principal competitors in this market -- America Online, CompuServe and Prodigy.

Control of the home-to-business market by a single company would produce an enormous windfall. First, of course, the monopoly would be able to extract a toll for a large percentage of consumer financial and product transactions. More strategically, a company that controlled the home-to-business market could leverage that control back to the

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intrabusiness, or enterprise, server market. Control of both sides of the server market, intrabusiness (enterprise) and home-to-business, would place enormous power (financial services, information, education, etc.) in the hands of a single company. Microsoft has this power within its grasp. Microsoft is pursuing its policy of targeting, linking and leverage from the operating system installed base to seize control of the architecture of the home-to-business market, just as Microsoft gained domination of the desktop.

On November 14, 1994, Microsoft announced its own online service known as "Marvel" or the "Microsoft Network." Microsoft will use Windows NT as the home-to-business server for the Network. Adam Gaffin & Peggy Watt, <u>Microsoft, Lotus Battle Shifting to On-Line Services</u>, Network World, Nov. 21, 1994, at 1. More importantly, Microsoft will use the market power from its installed base in operating systems in a number of ways to displace existing on-line competitors and dominate the home-to-business market.

Predatory Bundling

First, Microsoft intends to leverage its installed base in operating systems to give its own on-line service an unfair advantage over existing competitors. Microsoft has already announced that the next upgrade of its PC operating system, Windows 95 (due out later this year), will have a connection to the Microsoft Network already bundled in. According to Bill

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Gates, "We'll give you access to [the Microsoft Network] with Windows 95... If (the software notices you have a modem, it will ask you if you want to register."[85]

This tactic will instantly displace existing on-line competition. Windows 95 will be pre-installed on virtually every PC sold in the United States in the coming year[86] and approximately 20 million copies will be in use within a year of its release. Amy Bernstein, <u>Microsoft Goes Online</u>, U.S. News & World Report, Nov. 21, 1994, at 84. This "potent plan for spreading Marvel" will dwarf the competition. <u>Id.</u> America On-Line, by comparison, has an installed base of 1.25 million subscribers. Elizabeth Corcoran, Washington Post, Nov. 12, 1994, <u>supra</u>, at H6 .

Industry analysts and commentators have repeatedly raised concerns that Microsoft's bundling of its own on-line service "tilts the playing field in its direction," likening Microsoft's bundling practice to the utility company selling appliances or the local phone company automatically connecting the user up with AT&T's long distance services[87]:

> In essence, OEMs will be forced to distribute MSN
> [The Microsoft Network] if they want to access
> Windows 95 -- even if that distribution is to the OEM's
> detriment.

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[85]Elizabeth Corcoran, Washington Post, Nov. 12, 1994, <u>supra</u>, at H6.
[86]Amy Cortese, Business Week, Dec. 19, 1994, <u>supra</u>, at 35 (HP, Compaq and other big U.S. PC makers plan to bundle Windows 95 into their machines).
[87]   <u>See</u> Lawrence J. Magid, <u>Microsoft: Not So Marvelous</u>, Bay Area Computer Currents, Dec. 1, 1994, at 98, 101 (Ex. 1); Carole Patton, Computerworld, Nov. 14, 1994, <u>supra</u>, at 57 (Ex. 8).

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Jesse Berst, <u>Microsoft's On-Line Rivals Could End Up In `Cyberia'</u>, PC Week, Dec. 12, 1994, at 120 (Ex. 30). Microsoft's conduct is a textbook example of an attempt to use market power in one market (operating systems) to "tip" a competitive adjacent market (online systems).

Unfair Use of Information

Microsoft is also using its power over the operating system installed base to dominate the content of the home market -- CD ROMs -- the same way it used leverage from the operating system installed base to dominate business applications. For example, as a condition to obtaining information about how to run on the multimedia portions of Microsoft's operating system, independent CD ROM developers were required to fill out a form, designated "Microsoft Confidential." In other words, in order to obtain necessary operating system information, the form required Microsoft's CD ROM competitors to disclose to Microsoft confidential business information necessary to make successful CD ROM products. This form is a remarkably glaring example of the open exercise of market power. It required, <u>inter alia</u>, the following disclosures:

> Please describe your company's important business relationships (distribution, venture capitalists, etc.)
>
> Provide proposed product areas.
>
> Current key software products (in order of market share and importance to your company).
>
> Who is the target audience for your products?

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What is the price of your products?

What is your supply date for retail distribution?
What competition do you perceive for this product?

How will you differentiate this product from its competition?

How is this project funded?

(The "Microsoft Confidential" form is found in the Appendix as Ex. 22.)

Armed with all of this confidential information about its competitors plans

and products, Microsoft has successfully entered the CD ROM business itself,

and is "churning out about one new CD ROM title per week." <u>Washington</u>

<u>Post</u>, Nov. 13, 1994, <u>supra</u>, at H6 (Ex. 44).

<u>Unfair Head Start</u>

Microsoft will also ensure domination of the content of on-line

services by using OLE-based tools as the standard for business developers

and users to create object-oriented documents that can be transmitted over

the Microsoft Network. Mary Jo Foley, <u>Microsoft Lays Foundation For On-Line</u>

<u>Network</u>, PC Week, Nov. 14, 1994, at 1; Doug Barney, <u>Microsoft to Announce</u>

<u>New On-Line Service at Comdex</u>, InfoWorld, Oct. 24, 1994, at 1,140.

According to a <u>PC Week</u> article, the Microsoft network employs OLE

technology and uses the "standard Microsoft Exchange E-mail client included

with Windows 95 . . . ." In short, "Microsoft Network's on-line services are

well-integrated into the Windows 95 user interface." Eamonn Sullivan & Matt

Kramer, Microsoft Marvel Beta Leverages WIN 95 Desktop, PC Week, Nov. 7, 1994, at 169 (Ex. 28).

And, as if Microsoft's use of leverage to dominate the home and on-line markets is not sufficient, Microsoft announced on October 13, 1994[88] its intention to buy Intuit, Inc., paying a 100% premium to market. See supra note 36. Intuit publishes the personal finance and tax planning software programs that dominate their respective markets. Intuit's product controls 80-85% of the personal finance markets.[89]

Personal financial software is generally regarded as the "killer app[lication] of the 90's" for the home computing market.[90] Personal financial software has broad consumer appeal in that everyone has a bank account. It requires the integration of several sources of data including bank accounts, brokerage accounts, and credit information. Because of Intuit's commercial success, there is a strong network externality ("lock in") attached to a user's viewing his personal financial information through the Intuit user interface. Accordingly, Intuit provides tremendous leverage into the home banking market.

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[88]Lee Gomes, Microsoft to Acquire Intuit, San Jose Mercury News, Oct. 14, 1994, at 1D.

[89]Don Clark, Microsoft to Buy Intuit In Stock Pact, Wall St. J., Oct. 14, 1994, at A3 (86% of retail store sales); Karen Epper, Software Deal Shakes Up Home Banking, Amer. Banker, Oct. 17, 1994, at 1, 25 (80-85%).

[90]Michelle Flores, Probe of Microsoft is Extended - Justice Dept. Asks For More Information, Seattle Times, Nov. 22, 1994, at B11; Michael Schrage, Microsoft Can Make Lots of Money; Can It Shape the Management of It?, Washington Post, Oct. 21, 1994, at B3; Brent Schlender, Fortune, Jan. 16, 1995, supra, at 36.

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The Intuit acquisition is currently under Justice Department scrutiny. If the deal is consummated, Microsoft can be expected to leverage Intuit's installed base to further lock in its own products. For example, Microsoft will bundle Intuit's products with its next release of the operating system to increase the number of users who will upgrade to Windows 95.[91] Microsoft can also provide an enormous market edge to its own on-line service by making Intuit available exclusively (as among on-line services) on the Microsoft Network. <u>See</u> Michael J. Miller, <u>The World According to Microsoft</u>, PC Magazine, Jan. 24, 1995, at 80 (Ex. 25).

Domination of home banking and personal finance provides the optimum platform from which to dominate other on-line services, including, for example, shop-at-home. Businesses that want to provide financial information to Intuit users, or who want to provide other on-line services, will want to choose server software for interacting with the Microsoft Network. Microsoft will be able to use all of its vertical integration skills developed in the desktop and enterprise server marketplace to ensure that businesses choose Microsoft home-to-business server software.

Based on the leverage potential from its operating system installed base, Microsoft has been able to consummate deals that will ensure that Microsoft Network dominates the market. For example, on November 8, 1994, Microsoft and VISA (the credit card company) announced the provision

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[91]Gina Smith, <u>Merger Misgivings: Will Intuit Go `Soft?</u>, S.F. Chronicle, Dec. 4, 1994, at B5, B14.

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of a standard and secure method "for executing electronic bankcard transactions across global public and private networks." Visa News Release, Nov. 8, 1994 (Ex. 39). In the question and answer session following the press release, the VISA spokesperson said that the driving force in VISA's decision to do the deal with Microsoft was the fact that Microsoft had an installed base of 60 million copies of Windows. The significance of Visa's agreement with Microsoft is not lost on industry observers. See, e.g., Elizabeth Corcoran, Washington Post, Nov. 12, 1994, supra, at H6. Nor is it likely to be the last such agreement: the Post reported, for example, that "four telecommunications companies are expected to announce on Monday [November 14, 1994] that they are working with Microsoft to make dialing into Marvel a local call for many subscribers." Id. And, on December 21, 1994, Microsoft announced that Tele-Communications, Inc. purchased a 20% stake in the Microsoft Network for $125 million. The deal "implies a value of $625 million for an on-line service that doesn't exist yet . . .." Jim Carlton & G. Pascal Zachary, Microsoft Sells A 20% Interest In Planned Unit, Wall St. J., Dec. 22, 1994. Once again, Microsoft is controlling the architecture and using a nominally open standard.

If Microsoft is successful in establishing the standard for the home-to-business market, it will be able to leverage into the enterprise server market both from the desktop, which it already controls, and the home market. Once a business decides that it should use the Microsoft

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server to communicate with customers, there is no point in having a different, probably incompatible, server for intrabusiness needs. After all, the operating system for the server side of Microsoft's home-to-business server is Windows NT. Why have a different business server operating system? This connection between the home server and the business server is clearly in Microsoft's contemplation because Microsoft has already announced that Marvel (the Microsoft network) will connect directly to a company's server. Doug Barney, <u>Microsoft to Announce New On-Line Service at Comdex</u>, InfoWorld, Oct.24, 1994, <u>supra</u>,at 1.

The inevitable result of Microsoft's monopoly leverage will be to transform Microsoft into a "middleman" or rent collector for every transaction processed in an all-encompassing information economy. Whether writing a letter, placing an order, or paying a bill, every consumer and business connected to the information highway will pay Microsoft's toll. As noted in Fortune, "[t]his isn't just a gleam in Bill Gates' eye -- [by purchasing Intuit, entering a joint venture with Visa, and bundling the Microsoft Network] -- its already starting to come together, and in Microsoft's typically orchestrated fashion.[92]

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[92]Brent Schendler, Fortune, Jan. 16, 1995, <u>supra</u>, at 47-48; <u>see also</u>, Michael J. Miller, PC Magazine, Jan. 24, 1995, <u>supra</u>, at 80 (Ex. 25) ("Microsoft could require just a small service charge on each transaction. Or it could make money on the float -- the interest in the few seconds it takes to move money from one place to another. Or both.").

<u>MICROSOFT'S NETWORK-WIDE MONOPOLY</u>

It is readily apparent that Microsoft's strategy of targeting, linking and leveraging from the desktop operating system has been successful in seizing control of the business desktop. It is also apparent that Microsoft is leveraging from the business desktop to the business server and is vertically integrating within the business server so as to seize control of the critical server operating system gateway. The Intuit acquisition is intended to control the gateway on the home computer and leverage toward the home-to-business market.

Application of "increasing returns" economic analysis would reasonably predict that, given the present situation, Microsoft will succeed in monopolizing the entire information infrastructure (just as it has monopolized the desktop) and that the monopoly will remain in place for a very long period of time.[93] Indeed, the monopoly on the enterprise and home-to-business server markets is likely to be so vast that Microsoft will be able to extract monopoly rents on not only financial transactions, but also the transmission of information and data.

> Some fear that as the digital future of the information superhighway emerges, an unchallenged Microsoft

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[93]For example, leading industry analyst Rick Sherlund of Goldman Sachs predicted that with the settlement, Microsoft "should dominate the market for desktop software for the next 10 years." And another leading analyst, Richard Shaffer concluded that "[t]he operating system wars are over -- Microsoft is the winner . . . . Microsoft is the Standard Oil of its day." Andrew Schulman, <u>Microsoft's Grip On Software Tightened By Antitrust Deal</u>, Dr. Dobb's Journal of Software Tools, Oct. 1994, at 143 (Ex. 13).

and Intel will wind up in total, undisputed control of
the technology upon which the country's citizens and
economy will depend . . . "Increasingly, I'm believing
it's all over, and we're going to be locked into
Microsoft and Intel forever," said Dataquest analyst
Kimball Brown.

Rory J. O'Connor, <u>Microsoft, Intel Set to Define Technology</u>, San Jose Mercury
News, Nov. 13, 1994, at 1-A. (Ex. 34).

Notwithstanding the Government's conclusion that Microsoft has
increased its installed base in operating systems six-fold using
"anticompetitive practices," and ample evidence that Microsoft has
leveraged that installed base to attempt to monopolize business applications
(as well as other markets), the Government's Tunney Act filing does not
require divestiture of any part of its operating system installed base, nor
does it prevent Microsoft from using that installed base to monopolize other
markets, including business applications. The Government has articulated
no economic rationale to justify its failure to act in the face of such clear
evidence of anti-competitive intent and effect. These Amici can identify four
possible economic justifications for the Government's inaction, but none of
the four is persuasive.

Leverage of the Installed Base by Competitors

Although the Government has not articulated an economic
rationale for its position, the Justice Department may have concluded that a
monopoly of the X86 operating system market by Microsoft is inevitable --
either because MS DOS is already locked-in or because an "increasing

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returns" market will cohere around a standard in any case. Following this approach, the Government may have concluded that the best hope for competition in the operating system market is through an operating system program compatible with MS DOS, but made by a Microsoft competitor. Arguably, a vendor of such a program could tap into Microsoft's huge installed base and attempt to displace Microsoft by "migrating" users to subsequent versions of the competitor's operating system.

   If such was ever in the Government's contemplation, events since the announcement of the settlement between the Justice Department and Microsoft have shown that such a scenario is unrealistic. Novell has withdrawn its MS DOS compatible operating system from the market entirely. See, supra note 14. And Microsoft's market is so strong that IBM selected Microsoft's MS DOS program for pre-installation on a new line of IBM personal computers, instead of IBM's own PC-DOS (compatible) program -- notwithstanding the fact that IBM's product is technologically superior to MS DOS and is less expensive.[94]

   IBM's technologically advanced OS/2 is faring no better. OS/2 is capable of executing both DOS and Windows 3.1 applications, and according

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   [94]See John M. Goodman, The DOS Heavyweights Go Another Round, InfoWorld, Aug. 29, 1994, at 87 (rating PC-DOS version 6.3 above MS-DOS version 6.22) and Earle Robinson, DOS-version Madness? Integration Coping with DOS, Windows Sources, Oct. 1994, at 163 ("my choice would be the IBM . . . it's cheaper") and Yael Li-Ron, PC DOS 6.3: DOS and DOS: Separated At Birth, PC-Computing, July 1994, at 94 (IBM's Ambra computers ship with MS-DOS).

to Microsoft executive Steve Ballmer, IBM is "offering computer makers OS/2 for free and may be even paying some to take it."[95] However, Microsoft's market power has resulted in IBM getting few if any takers, even on these terms. As one potential customer, a computer manufacturer, stated:

> Microsoft can kill us, ... I worry more about my dealings with Microsoft than I do about my competitors.[96]

Alliances

Alternatively, the Government may have concluded that other operating system competitors might combine with application developers in alliance-type combinations to prevent Microsoft from extracting monopoly rents from the business desktop. But alliances among companies rarely work in the best of circumstances -- i.e., in more conventional markets. Here, the alliances would have to produce or blend complex software technologies in order to make a competitive offering equally useful and reliable to that marketed by a single vertically integrated competitor, which is better able to guarantee seamless integration.[97] Similarly, from the economic perspective, the possibilities of real competition from an alliance-based product line are highly remote, at best. Microsoft's installed base and share of the applications market is so large that its products are "locked-in" and true

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[95]Don Clark & Laurie Hays, Microsoft's New Marketing Tactics Draw Complaints, Wall St. J., Dec. 12, 1994, at B6 (Ex. 41).
[96]Id.
[97]All of these problems are discussed in Rory O'Connor, San Jose Mercury News, Nov. 13, 1994, supra, at 1A, 28A (Ex. 34).

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competition can be restored only through truly massive forces or structural relief. See, e.g., W. Brian Arthur, Increasing Returns and Path Dependence in the Economy 2, 10-11 (1994).

Most importantly, although there are companies that make operating systems that run on different chips, no Microsoft competitor or group of competitors controls the operating system gateway to the network in the way that Microsoft does. Control of the "human interface" gateway on the home computer through the acquisition of Intuit will only heighten Microsoft's control throughout the market. In short, the prospects of an alliance to compete effectively with Microsoft, in the current market where the gateways are controlled by Microsoft, are extremely remote. Competitors would have to produce a competing information infrastructure through a different paradigm (e.g., cable television), something that is years, if not decades, away. Microsoft is, moreover, already committing substantial resources -- reportedly 500 employees by next June -- in anticipation of this paradigm shift. See Elizabeth Corcoran, Washington Post, Nov. 13, 1994, supra, at H6 (Ex. 44). It therefore is clearly preparing now to be in a position to control this new paradigm as well.

"Tiered" Monopoly

Third, the Justice Department might have concluded that, although Microsoft has achieved a monopoly in the operating system market, there is no need for governmental intervention because Microsoft would

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prefer competition in business and home applications software. In other

words, the Government might argue that Microsoft has no economic

incentive to monopolize the applications market intentionally and has

acquired its dominant position in the market only because of superior

products. According to this approach, although Microsoft has a monopoly on

X86 operating systems, it would actually prefer that the applications (and

development tools) market be fully competitive in order to maximize

monopoly profits from the operating system market. A schematic

representative of the "desktop," Figure 3, is reproduced below for reference:

	Level	Name	Examples
	5	Applications	(a) Desktop applications (e.g., Lotus 1-2-3, dBASE, MS Word, MS Excel, WordPerfect) The Microsoft Office is a bundle of these applications. (b) Client applications as part of a network (e.g., Oracle Financials, SAP, Peoplesoft, D&B Software, etc.)
	4	Development Tools	Basic, Pascal, C, Borland C++, Powersoft
	3	GUI and/or OS Services	MS Windows
	2	OS	Apple, DOS
	1	Hardware	IBM, Apple, Compaq, Dell

Figure 8

This type of economic thinking would suggest that if Microsoft

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truly had a monopoly at the second level (operating systems), it would prefer

competition at all higher levels so as to maximize its ability to extract

monopoly profits through the operating system level. And, according to this

economic argument, there would be no point in Microsoft expending the

resources to monopolize applications (level 5), since it would derive the

same benefit by monopolizing the operating system (level 2).

Indeed, according to this approach, because of the presence of

demand side economies of scale, there would be a need for Microsoft to

control the X86 operating system (level 2). There is a network externality

that must be solved by a single firm with control of both level 2 and all of the

levels above it (3-5). All other factors being equal, according to this

argument, consumers would be better off with the greatest possible variety

of level 5 competition and the greatest possible adoption of one operating

system standard.[98] Hence, if Microsoft controls the operating system, it

would have an incentive to price it low because it could extract the profits

through the applications (level 5). (Or, alternatively, Microsoft might price

the applications low and take the profits out through the operating system.)

Indeed, Microsoft might be willing to price below cost.

On the other hand, according to this economic approach, if a

Microsoft competitor gained control of applications, Microsoft and the

competitor would fight over the division of profits. This would be wasteful,

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[98]See Michael Katz and Carl Shapiro, Systems Competition, supra.

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would lead to higher total costs for the system because of "double marginalization" and would not lead to as great adoption of the overall system. Given that Microsoft controls the X86 operating system, so the argument would go, its profits would be maximized if the market for applications were made as large as possible. Hence, it would follow that Microsoft would want to control applications to make this market as large as possible and would do this by pricing applications at a low level, and by making the inter-connection between its applications and operating system as efficient as possible.

This economic approach is unpersuasive for three reasons. First, although Microsoft monopolizes the market for operating systems that run on the X86 chip, there are competitive operating systems that run on other chips -- Apple and UNIX, for example. These competitive operating systems, like the Microsoft operating system, run business applications. Hence, so long as these competitive operating systems exist, Microsoft can extract "monopoly rents" by monopolizing a layer above operating systems -- business applications.

Second, as the Government's complaint in this case points out, there must be "a variety of high quality applications" that run on an operating system if that operating system is to be successful. 59 Fed. Reg. at 42,847 (Complaint ¶¶ 16-18). Accordingly, control of applications enables Microsoft to maintain and increase barriers to entry in the operating system

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market, thereby solidifying and maintaining Microsoft's operating system monopoly.

Finally, control of the application layer enables Microsoft to price discriminate more effectively, thereby maximizing its monopoly returns. For example, because Microsoft also monopolizes business applications, it has the ability to selectively bundle some word processing functionality into operating systems, while at the same time offering a higher priced, more fully functional word processing program to users who need greater functionality. This enables Microsoft to extract greater revenues than would be possible merely by uniform operating system prices -- i.e., if Microsoft only monopolized operating systems, but not applications.

In short, Microsoft has ample economic incentive to monopolize business applications. To the extent Microsoft is concerned at all about actual or potential competition for operating systems, gaining control of applications will ensure overall control of the desktop, regardless of what might transpire in the future with respect to operating systems.

A complete comparison of consumer welfare in a world with uniform dominant-firm pricing in operating systems and competition in applications on the one hand, with monopoly price discrimination on the desktop (operating system and application together), on the other hand, is beyond the scope of this Memorandum. However, economic theory would strongly suggest that with respect to pricing, competition in applications,

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coupled with imperfect competition in operating systems -- or at least the presence of potential competition in operating systems -- is preferable to monopoly of the entire desktop. Moreover, in terms of technology, it is considerably more likely that the best technology will emerge in applications if there is open competition for the technology, rather than if it is dominated by the firm that monopolizes operating systems. That is especially true if the reason that Microsoft is able to monopolize applications is because it can leverage its operating systems monopoly and not because of any superiority of its technology.

Efficiencies of Integration

Finally, the Government might justify its failure to act on the belief that the benefits Microsoft is providing by vertical and horizontal integration outweigh any anti-competitive effects. Microsoft will point out that it seamlessly integrates new technologies into new markets, and it will argue that unless it is permitted to link and leverage, these markets will not be opened in a way meaningful for consumers. It will further argue that if markets are opened by less efficient alliances, the services are bound to cost more because Microsoft competitors will not enjoy the efficiency benefits of integration. Indeed, according to this argument, allowing Microsoft to leverage Windows from one market to the other amortizes the research and development costs over a broader base of potential customers, with the result that Microsoft can charge less for the product in the first instance.

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Furthermore, Microsoft presumably will argue that because these markets and technologies exhibit increasing returns, they will gravitate toward a standard (i.e., a monopoly) anyway. According to this argument, it would be economically wasteful to require two networks that do the same thing. And, if there is only going to be one standard, that standard should be chosen by the market, as opposed to by Government intervention.

There are two important responses to this argument. First, software is not similar to many conventional products in an important way. With software it is possible to achieve virtually all of the benefits of integration without excluding competitors. There is no reason why an application developed by an ISV cannot work just as well with the operating system as a Microsoft application, provided Microsoft provides necessary information to application competitors on a timely and complete basis.

Second, while there are benefits to vertical and horizontal integration that Microsoft will point out, there are also very substantial costs. The enterprise server market, for example, is currently organized into a number of horizontal layers, each of which is characterized by strong competition. Generally speaking, consumers prefer this horizontal competition. See, e.g., The Economist, Feb. 27-Mar. 5, 1993, supra, at 11 (Ex. 14). Microsoft is attempting to impose a verticality on the enterprise market so that it can extract monopoly rents.

Benefits of vertical integration, as opposed to horizontal

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competition at each layer, both on the desktop and the server, should be

evaluated on the basis of product quality and incentive to innovate, as well

as product cost. It is clear that vertical integration will allow Microsoft to

displace even superior technologies. As PC Magazine recently observed:

> Since Microsoft is in a position where its operating
> system is dominant . . . [i]n order to be successful,
> Microsoft Network doesn't even have to be the best
> on-line service; it just needs to be good enough and
> the most convenient.

Michael J. Miller, PC Magazine, Jan. 24, 1995, supra, at 79-80 (Ex. 25).

Similarly, if Microsoft controls the operating system gateway layer, its

vertical integration will permit the displacement of superior products at the

applications (and development tools) layer merely because of the vertical

integration. The displacement of superior products is clearly a cost that

should be evaluated, offsetting Microsoft's claim that its products would be

lower-priced to the consumer.[99]

Moreover, once Microsoft achieves dominance in a market, it has

little incentive to innovate.[100] So the negative effects of vertical integration

include both the displacement of superior products, as well as the diminution

of the incentive to advance technology that has become a standard. The

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[99]Joseph Farrell and Garth Saloner, Installed Base, supra; Paul David, Amer. Econ. Rev., May 1985, supra.

[100]Indeed, Microsoft's operating system "lock-in" has permitted it to bring demonstrably inferior products to market (products that did not enjoy any appreciable consumer acceptance) without negative consequences to the company. See Michael Morris, Microsoft Deal: Too Little, Too Late, S.F. Examiner, July 24, 1994, at C-5. (Ex. 33)

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latter cost should be evaluated as well.

Nor is it altogether clear that vertical integration will necessarily produce efficiencies (that translate into lower prices) over, say, horizontal competition at each layer. There is not yet empirical research on point, but there is certainly theoretical research suggesting that there are benefits to horizontal competition in the vertical layers.[101] Hence, while there is theoretical literature that documents the efficiency of the horizontal competition model, the real challenge is maintaining the horizontal model in the world. Increasing return economics indicates that there is no reason to believe that the market, as currently structured, will choose the "best" product at a particular level. Rather, there is every reason to believe that Microsoft, through leverage from control of the operating system, will be able to impose verticality, with its associated costs -- notwithstanding the fact that users appear to desire the benefits of horizontal competition. <u>See, e.g.</u>, The Economist, Feb. 27-Mar. 5, 1993, <u>supra</u> (Ex. 14). In short, Government intervention is necessary merely to provide a sufficiently level playing field for the horizontal model to have a reasonable chance of succeeding.

ANTITRUST ENFORCEMENT

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[101]Joseph Farrell, Hunter K. Monroe and Garth Saloner, <u>The Vertical Organization of Industry and Systems Competition Versus Component Competition</u>, October 1994 (working paper).

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This section of the brief identifies the deficiencies of the proposed Final Judgment and compares the relief sought by the Government in this case to the relief sought by the Government in comparable situations involving pharmaceutical, computer and telecommunications monopolies. Finally, the section analyzes the relevant case law that would support similar relief in this case, particularly a preclusion on the use of leverage from an installed base that was procured by "anticompetitive practices."

Deficiencies of the Proposed Judgment

Manifestly, the proposed judgment has failed to achieve its stated purposes. Instead of saving consumers money and providing them with greater operating system choices as the Attorney General promised, the settlement has permitted Microsoft to run yet another competitor out of the operating systems market (Novell) and raise its own prices to resellers. From an economic perspective, this was to be expected. The relief proposed by the Government will neither maintain nor restore competition in the operating systems market. More ominously, the settlement clears the way for Microsoft to use its unfairly acquired installed base to run competitors out of other software and networking markets, as well.

According to the Government's complaint, Microsoft used anticompetitive licensing practices from at least 1988 to 1994. As noted earlier, during that period, Microsoft maintained its greater than 90% share

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of the X86 operating system market,[102] thereby increasing its installed base

six-fold.[103] Contrary to the assertions of the Assistant Attorney General, the

relief proposed by the Government, a cessation of further anticompetitive

practices, will not restore competition to the X86 operating system market

because of the "network effects" present in the market.

Because Microsoft now has a huge installed base and an

overwhelming market share of X86 chip operating systems, thousands of

applications have been written for the Microsoft operating system. Microsoft

products, in economic jargon, are "locked in." New purchasers of computers

with X86 chips have every incentive to demand Microsoft operating systems

-- and no incentive to demand the operating systems of its competitors.

Given the huge installed base, OEM's will therefore preinstall the Microsoft

operating system in order to meet consumer demand -- whether Microsoft

continues to pursue "per processor" licenses or not.

This conclusion is demonstrable from the economic literature

cited in earlier sections. It is also obvious to the journalists, analysts and

commentators who follow the computer industry. For example, following

announcement of the settlement, PC Week wrote:

According to computer manufacturers, industry

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[102]See, e.g., supra, note 32. (Microsoft presently holds greater than 90% of the X86 operating system market share); Christopher O'Malley, Personal Computing, October 1986, supra, at 181, 183 ("Microsoft's operating system" has "better than 95 percent" share of the X86 systems.)

[103]Department of Justice Press Conference (July 16, 1994), at 3-11 (by Asst. Attorney General Anne Bingaman).

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analysts and end users, the outlook is grim for Novell's DOS and IBM's PC-DOS and OS/2. They say there is not much motivation for PC manufacturers to pre-install a competing product, since Windows has millions of users and thousands of software applications.

See Jeff Bertolucci, Microsoft Settles: Business As Usual, PC World, Oct. 1994,

at 72 (Ex. 31).[104] Furthermore, Microsoft has adopted new marketing

incentives that violate the spirit if not the letter of the consent decree by

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[104]See also Stuart J. Johnston, Decree: Deal or Dodge?, Computerworld, July 25, 1994 ("Interviews with PC hardware vendors last week indicated few are likely to switch to a competing system any time soon. `Customers have already voted with their dollars in a very strong way for DOS and Windows.  I don't see that changing,' said Howard Elias, a vice president at AST Research, [a leading OEM].")  Jane Morrissey, DOJ Accord Fosters `Too Little, Too Late' Perception, PC Week, July 25, 1994, at 1 ("[O]bservers doubt the consent decree agreed on will have much effect on the company or its competitors," because it is "too little, too late."); Jesse Berst, Behind The Smoke: Microsoft Wins Again, PC Week, July 25, 1994, at 106 ("Does the agreement really change anything? No. . . . If the decree had come five years ago, when there were viable MS-DOS clones, it might have had some immediate impact. Now, in a world where MS-DOS is on the way out and Windows has no real clones, it will have no short-term impact") (Ex. 27); Andrew Schulman, Dr. Dobb's Journal of Software Tools, Oct. 1994, supra, at 143 ("the change from per-processor to per-copy licensing probably comes about four years too late"); Claudia Maclachlan, Software Makers Mull Over Microsoft Legal Challenge, National Law Journal, Aug. 1, 1994, at B1 ("They can't do [original equipment manufacturer] pricing, but they don't need it anymore.")

Indeed, even Microsoft's supporters concede that, "[a] year from now, [the proposed decree] will be" no more than "a blip on the radar screen of computing history." William Casey, Let's Stop Beating On Microsoft, Washington Post, July 25, 1994, at F15. "Issued five years ago, the ruling would have had an effect . . . users were open to alternative environments, even if it meant migrating from [Microsoft's products]." Id. "Those choices, and the years in which they could have been made freely, are ancient history. . . . It's a fact that [today] the operating environment of choice on Intel-based processors is DOS and Windows." Id.

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rewarding OEMs for activities designed to prevent them from doing business with competing operating system vendors. Don Clark & Laurie Hays, Wall St. J., Dec. 12, 1994, supra, at B6. In short, Microsoft's new practices achieve substantially the same effect as those banned by the Judgment.

More importantly, Microsoft remains free to leverage its installed base -- apparently with the Government's blessing -- to put competition out of business in scores of new markets: business applications, entertainment software, personal finance software, on-line systems, server technologies, etc. This key issue is simply not mentioned in the Government's Tunney Act filings, but, as with "lock-in," the significance of the issue is not lost on the industry:

> The settlement did not specifically address what many competing companies consider the antitrust issue. Microsoft, they say, has used its control of DOS and Windows to extend its hold on the software sector.

See David Einstein, Microsoft Unscathed by Settlement, S.F. Chronicle, July 18, 1994, at A1 (Ex. 32).[105] As explained in Section V.C., supra, Microsoft's

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[105]See also John Markoff, N.Y. Times, July 18, 1994, supra, at D1 (Ex. 24) ("The agreement leaves untouched what many computer industry executives say is Microsoft's principal advantage -- that it develops both the basic operating system software that makes personal computers run . . . and applications software . . . that performs specific tasks."); id. ("The other important issue not specifically addressed in the consent decree is whether Microsoft has been able to leverage its virtual monopoly in operating systems into domination of applications software -- a far bigger and more lucrative market"); Claudia Maclachlan, National Law Journal, Aug. 1, 1994, supra, at B1 ("As long as [Microsoft has] a dominant position in operating systems . . . it allows them to leverage that into applications. This agreement does nothing to the status quo.") (internal quotation omitted).

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use of leverage against application competitors damages competition in the operating systems market, the very market the Government purports to address.

The pernicious use of leverage is well known to the Justice Department. Decrees sought by the Antitrust Division in comparable circumstances over the past forty years have prohibited leveraging of monopoly power to dominate related markets.

Comparable Consent Decrees

It is hardly aberrational for the Department of Justice to settle monopolization cases in high technology industries by securing consent judgments that prohibit the use of leverage from a monopolized market to a market in which competition is present. Some of the largest monopolization cases in history were settled on such a basis.

Parke, Davis Decree (Pharmaceuticals)

The decree entered in <u>United States v. Parke, Davis and Co. and Eli Lilly and Co.</u>, 1951 Trade Cas. (CCH) ¶ 62,914 (E.D. Mich. 1951), prevented Parke, Davis and Eli Lilly from using their market power in the primary market for pharmaceuticals to exert leverage into the secondary market for gelatin capsules (used to contain individual doses of particular drugs). The decree did not foreclose the defendants from competing in the capsule market, but it imposed severe restrictions designed to ensure competition:

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<u>No Acquisitions of Stock in Companies in the Secondary Market</u>: Defendants were prohibited for ten years from acquiring any interest in any business engaging in the manufacture or sale of capsules, capsule manufacturing equipment, or capsule filling equipment unless they applied to the court and made an affirmative showing that such acquisition would not substantially reduce competition. (An equivalent Microsoft decree would prohibit Microsoft from acquiring any interest in any company making or selling application programs (<u>e.g.</u>, Intuit).)

<u>Mandatory Licensing of Patents Pertaining to Secondary Market</u>: Defendants were required to grant to "any applicant" (except the other defendant) royalty-free, unrestricted licenses under all Defendants' existing capsule-related patents. Defendants also were required to grant licenses to all of their future capsule-related patents in return for a "reasonable and non-discriminatory royalty." (An equivalent Microsoft decree would require, at minimum, that Microsoft grant royalty-free licenses on all its existing application and server software patents.)

<u>Publication of Documentation to Enable Competition in Secondary Market</u>: Defendants were required for five years to provide to all applicants "a written manual . . . describing the methods, processes, materials and equipment used by [Defendants]" in the commercial manufacture of capsules. (A provision that would have the same effect in the Microsoft decree would require, at minimum, that Microsoft immediately provide all competitors or potential competitors all operating systems documentation and specifications necessary to create a well-behaved application program. Going forward, Microsoft would have to provide the information necessary to place each of its competitors in the applications program market on an equal footing with Microsoft itself.)

This decree remained in effect until 1987. <u>See</u> <u>United States v. Parke, Davis</u>

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<u>and Co. and Eli Lilly and Co.</u>, 1987-2 Trade Cas. (CCH) ¶ 67,834 (E.D. Mich. 1987).

<u>International Business Machines Corp. (Computers)</u>

In 1956, the Justice Department settled its monopolization case against IBM with the entry of a comprehensive decree, <u>United States v. International Business Machines Corp.</u>, 1956 Trade Cas. (CCH) ¶ 68,245 (S.D.N.Y. 1956). That decree <u>still</u> remains in effect.

The IBM decree prevents IBM from utilizing its power in a primary market (the market for "tabulating systems" and "electronic data processing systems") to create a monopoly in secondary markets (the markets for service on IBM machines). Unlike the Microsoft settlement, however, the IBM decree makes a <u>comprehensive</u> effort to prevent leveraging of the primary market monopoly. Rather than prohibiting a small number of specific practices (<u>e.g.</u>, per-processor licensing), the IBM decree fundamentally restructured IBM's method of operation in the primary market to eliminate leverage opportunities.

A similar decree against Microsoft would have included (at minimum) provisions requiring that Microsoft: (1) train its customers and competitors in the use and structure of Windows, (2) disclose to all developers, customers and competitors the same details about Windows that it discloses to its own employees and at the same time, (3) make public Microsoft technical documentation and tools used in Windows development,

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and (4) create a separate corporation for developing application programs,

with a true "Chinese Wall" between the applications and operating system

development personnel.

American Telephone and Telegraph (Telecommunications)

In January of 1982, the Department of Justice filed a Final

Judgment breaking up the AT&T monopoly. In its response to comments on

the proposed final judgment, the Government explained that it sought broad

relief to prevent the type of leverage that Microsoft is currently employing:

> The theory of both the Western Electric and AT&T
> cases was that, as a rate base/rate of return
> regulated monopolist, AT&T has had both the
> incentive and the ability, through cross-subsidization
> and discriminatory actions, to leverage the power it
> enjoys in its regulated monopoly markets to foreclose
> or impede competition in related, potentially
> competitive markets.

47 Fed. Reg. 23,320, 23,335 (1982). Microsoft is not a regulated monopolist,

but its monopoly in operating systems is no less thorough and its use of

leverage to dominate related markets no less pervasive. Yet according to

newspaper interviews given by the Assistant Attorney General following

announcement of the settlement with Microsoft, the Justice Department

"never considered" breaking up Microsoft. Viveca Novak, Antitrust's

Bingaman Talks Tough in Microsoft Case, Wall St. J., July 19, 1994, at B5.

Case Law

Had the Justice Department sought to prevent Microsoft from

leveraging its installed base of "locked-in" operating system users, its

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position would have found support in the case law. Cases in which

leveraging claims have been denied involve factual situations in which the

plaintiff conceded that monopolization of the target market was impossible,

even with the leveraging. <u>See, e.g.</u>, <u>Alaska Airlines, Inc. v. United Airlines,</u>

<u>Inc.</u>, 948 F.2d 536, 546 (9th Cir. 1991), <u>cert.</u> <u>denied</u>, 112 S. Ct. 1603 (1992).

This is not such a case. Here, both Microsoft and the

Government concede that Microsoft has a monopoly in the operating system

market and that Microsoft used "anticompetitive practices" to increase its

installed base in operating systems six-fold. Microsoft then clearly expressed

its intention to monopolize the business application market and thereafter

succeeded by leveraging. Now, Microsoft's executives have clearly

expressed their intention to monopolize every "specific application of

corporate information systems."   Brent Schendler, Fortune, Jan. 16, 1995,

<u>supra</u>, at 40. Microsoft's tactics, coupled with the economics of the markets

at issue, would lead inexorably to the conclusion that Microsoft will succeed.

A number of courts, including the Supreme Court, have

evaluated conduct in one market based upon conditions in an adjacent,

related market. Relevant decisions have reflected increasing returns-type

analyses. For example, in <u>Eastman Kodak Co. v. Image Technical Services,</u>

<u>Inc.</u>, 112 S. Ct. 2072 (1992), the Supreme Court held that factual issues

regarding consumer "lock-in" in the after-market for replacement parts

constituted a proper basis on which to deny motions for summary judgment

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in a tie-in case. Similarly, a plaintiff's use of leverage in lock-in situations has

frequently been cited in the lower courts as a principal basis for the denial of

summary judgment motions in both tie-in and monopolization situations.[106]

One good example of such thinking is <u>Grappone, Inc. v. Subaru of

New England, Inc.</u>, 858 F.2d 792 (1st Cir. 1988). There the First Circuit

(Breyer, C. J.) provided what it referred to as a more "refined analysis" for tie-

in situations. This analysis begins to consider the anti-competitive

consequences of actions that require competitors to enter the market on two

levels (rather than a single level) of business. <u>Id.</u> at 795-96.

PROPOSED PROCEDURES UNDER SECTION 16(f)

Reflecting its emphasis on the importance of court review of

decrees agreed to by the Justice Department, Congress in 15 U.S.C. § 16(f)

has expressly authorized a wide variety of procedures that the Court may

use in making its determination regarding the public interest. These

procedures include, <u>inter</u> <u>alia</u>, taking the testimony of Government officials or

experts, or other expert witnesses (§ 16(f)(1)); appointing a special master or

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[106]<u>See, e.g.</u>, <u>Digidyne Corp. v. Data General Corp.</u>, 734 F.2d 1336, 1340-
43 (9th Cir. 1984), <u>cert</u>. <u>denied</u>, 473 U.S. 908 (1985); (software); <u>Ortho
Diagnostic Systems, Inc. v. Abbott Laboratories, Inc.</u>, 822 F. Supp. 145, 155-
56 (S.D.N.Y. 1993) (blood screening technology); <u>Viacom International, Inc. v.
Time Inc.</u>, 785 F. Supp. 371, 377 (S.D.N.Y 1992). <u>See</u> <u>also</u> <u>Lee v. Life Ins. Co.</u>,
829 F. Supp. 529, 537-39 (D.R.I. 1993), <u>aff'd</u>, 23 F.3d 14 (1st Cir.), <u>cert.
denied</u>, 1994 U.S. LEXIS 7596 (1994).

court expert (§ 16(f)(2)); examining documentary materials (§ 16(f)(3)); or

"taking such other action in the public interest as the court may deem

appropriate" (§ 16(f)(5)).

In this action, some information is relatively well-documented in

the public record, and hence is less pressing significance to the Court's

ability to engage in a meaningful public interest analysis. By way of

comparison, in <u>United States v. Yoder</u>, 1989-2 Trade Cas. (CCH) ¶ 68,723, at

61,797 (N.D. Ohio 1986), the Department provided the court with an affidavit

identifying the number of competitors, distributors and customers in the

industry whom it had contacted about a proposed modification to a consent

decree, and described the responses and concerns of those contacted. <u>See</u>

<u>id.</u> at 61,797 n.10. Here, the Department has simply asserted orally that "by

and large I think we got positive feedback" from competitors and customers,

then adding (in response to a comment by the Court) "there were clearly

some people who wished that we had done more." Tr. of Status Call, Sept.

29, 1994, at 13:16-22. These observations certainly do not give the Court

the full flavor of industry concerns, but critical reports in the media amply

document the true reaction in the industry to the proposed decree.[107] It is,

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[107]<u>See, e.g.</u>, David Einstein, S.F. Chronicle, July 18, 1994, <u>supra</u>, at A1
(Ex. 32) (Ernie Simpson, president of a software company which develops
programs for use with Windows, called the decree "a waste of time"); <u>Quote
of the Week</u>, InformationWeek, Aug. 1, 1994, at 10 (Reacting to the proposed
decree, Gordon Eubanks, CEO of software firm Symantec Corp., said simply,
"That's it?"); John Markoff, N.Y. Times, July 18, 1994, <u>supra</u>, at D1 (Ex. 24)
(quoting Martin Goetz, cofounder of Applied Data Research, the nation's first
software company, as saying of the decree, "The Justice Department hasn't

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therefore unnecessary to further burden the Court with affidavits or the
testimony from those in the industry regarding these concerns.

Similarly, the nature of the allegations regarding Microsoft's
conduct are well-established. Media reports, publications such as <u>Hard
Drive</u>, this brief, and the Government's own submissions all document what
the alleged illegal conduct is claimed to be: undocumented calls; early
disclosure of operating systems information to Microsoft's own applications
engineers; predatory preannouncements; predatory bundling and unbundling
of operations and applications functionality; restrictive licensing practices;
and the use of subsidized pricing to leverage into the applications market
using monopoly profits from operating systems. <u>See</u> <u>supra</u> text at notes 69-
70. It would therefore appear unnecessary to hold hearings in which various
independent software vendors, OEM manufacturers, and other industry
participants recount particular instances of such alleged conduct.

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listened to the cries of the software companies"); Jane Morrissey, PC Week,
July 25, 1994, <u>supra</u>, at 1 (Ex. 26) (quoting Mitchell Kertzman, chairman of
Powersoft Corp., as saying the proposed decree will have "close to zero
impact," and that "to the extent that Microsoft's behavior prevented other
operating systems from succeeding, the war is over . . . DOS is it and
Windows is it"); Andrew Schulman, Dr. Dobb's Journal of Software Tools, Oct.
1994, <u>supra</u>, at 143 (Ex. 13) (quoting spokesman for Compaq as saying
"Windows is the standard--not much will change"). <u>See also</u> David Einstein,
S.F. Chronicle, July 18, 1994, <u>supra</u>, at A1 (Ex. 32) (quoting a leading industry
analyst as concluding that "[t]he operating system wars are over -- Microsoft
is the winner . . . Microsoft is the Standard Oil of its day"); Claudia
Maclachlan, National Law Journal, Aug. 1, 1994, <u>supra</u>, at B1 ("As long as
[Microsoft has] a dominant position in operating systems . . . it allows them
to leverage that into applications. This agreement does nothing to the status
quo") (internal quotations omitted).

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Instead, these amici submit that what is missing from the record before the Court are two categories of information, neither of which should require unduly protracted hearings, but which together should provide the Court with a sufficient record to make a determination under Section 16(e). First, in the course of its investigation, the Government has reviewed large quantities of documents from Microsoft, and these amici believe that a very small group of these documents have been identified by the Government as "key" documents. These documents largely should answer questions regarding Microsoft's intent and use of various illegal practices. They should be turned over to the Court for its review.

Second, the Government should be required to submit affidavits from its economic experts that set forth in detail what those experts anticipate the operating systems and applications software markets will look like in five years, assuming that the present proposed decree were implemented. Such a submission should indicate whether, under the present decree, the Government's experts anticipate that competition will have been restored in the operating systems market by that time. If the Government's experts believe that competition is not likely to have returned to the market by that time, they should be required to indicate what effect different alternative proposals might have on restoring competition to the market. And, if they believe under "increasing returns" theory that it is simply too late to restore competition -- that the operating systems market "runs to

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scale," and having been permitted to establish dominance through its illegal practices, that Microsoft cannot now practically be unseated -- the Government should be required to indicate what alternatives it has considered to minimize adverse consumer consequences resulting from this monopoly.

These amici submit that the affidavits from the Government's economists also should address the extent to which they anticipate that Microsoft will have been able to leverage its operating systems monopoly into secondary software markets. Because Microsoft's installed base monopoly (and the resulting monopoly profits) were illegally acquired, the Government's economists should explain why it is unnecessary from an economic point of view to implement provisions such as those present in the IBM and Eli Lilly consent decrees. This analysis would include, for example, the effect of alternatives such as prohibiting Microsoft from acquiring stock in companies that make or sell application programs (Eli Lilly); spinning off its applications division into a separate subsidiary, and enjoining it from giving any benefit to the subsidiary that is not also provided to third-party applications providers (IBM); and making public Windows technical documentation and tools used in Windows development (IBM). In the event that such alternatives were not viewed as sufficient to ensure a "level playing field" in the applications markets, given Microsoft's now-dominant installed base, the economists should address whether divestiture (such as in

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AT&T) is the appropriate remedy.

Based upon the information made available to the Court as a result of this analysis, these amici believe that the Court would be in a position to accept or reject the Government's current proposed decree, or to identify those modifications that would be necessary to bring the decree within the public interest standard. Cf. AT&T, 552 F. Supp. at 153 & n.95, 212-13. At a minimum, such submissions would provide a factual record which the Court's own economist expert could review in considering the economic issues raised by the proposed decree, or to which economists could respond on behalf of other interested parties.

Given the extreme importance of these proceedings to the future of the American software industry, and hence to the economy as a whole, the Government should be permitted to do no less. As documented in previous Sections, economic theory predicts that, even without resort to its ongoing (and unchecked) illegal practices, Microsoft would very likely be able to leverage its unlawfully acquired installed base in operating systems to monopolize the entire business and home software network in the United States. The Government's decision to do nothing to restrain Microsoft's ability to engage in such monopoly leveraging, or even to curtail Microsoft's use of blatantly predatory and unlawful practices in furtherance of that end, requires explanation. Absent such explanation, these amici submit that the Court has no choice but to reject the proposed consent decree as plainly

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outside the bounds of the public interest.

Dated: January 10, 1995   Respectfully submitted,

                                            WILSON, SONSINI, GOODRICH & ROSATI

                                            By_____
                                                    Gary L. Reback

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