

Uncertainty, prediction, and the unexpected

SHANE GREENSTEIN

s-greenstein1@nwu.edu

..... There is a common (and I think, accurate) perception that today's high-technology markets contain an irreducible amount of uncertainty. It's easy to explain part of this uncertainty. Few people are considered experts on many technologies. Thus, most high-tech watchers are frequently surprised, disappointed, and delighted by commercial developments in fields about which they know almost nothing. That said, more than just lack of expertise affects uncertainty.

Uncertainty has comprised the industry zeitgeist for decades. Many young programmers living on Internet time may not believe that, but it's no less true today than it was in the past. Only the sources of uncertainty change in each era—the presence of uncertainty does not.

Previously, observers associated disruption and instability with the introduction of, for example, notebook computers, PDAs, networked computers, laser printers, PCs, minicomputers, or a range of other technologies. If you need further evidence, consider this: Frank Fisher, the foremost market analyst of the commercial mainframe era, characterized the previous age as one of constant disequilibrium. Even the mainframe market was volatile!

If uncertainty is not associated with fleeting fads or with one wave of technological diffusion, where does it come from?

Competitive environments

Every reasonably knowledgeable engineer can describe the next five to ten

years of frontier technical developments in their own field of expertise. Most can do this without prior preparation for the question.

All experts understand the dimensions of frontier problems because they all refer to the same prototypes of new technology. Every expert knows about prototypes from reading trade publications and going to conferences. Those prototypes may be expensive, unwieldy, and unreliable, but their existence defines key issues in problem solving.

Having said that, opinions about details differ dramatically from this point forward.

Very few experts would dare to act so cocky outside of their own narrow field of expertise, nor would most technology experts pretend to know much about marketing a product. Put another way, in primitive prototype stages, a widespread disagreement usually appears detailing the appropriate mix of features, technologies, and prices that users want.

For related reasons, successfully translating a complex prototype into a product takes intelligent guesswork. It usually takes a well-functioning, cohesive enterprise, populated by experts in a variety of fields, who trust each other's judgement. It is not surprising that two different organizations and two different sets of experts translate in different ways.

The ultimate twist? These experiments are not conducted in laboratories. Performed in commercial markets, these differences among firms either multiply

during competitive interaction or ameliorate during imitation. There are several layers to this interaction and imitation.

For one, prediction and inevitability aren't the same thing. Have you ever sat through a cocktail party where an inebriated and lugubrious former Apple employee observes that the development of a Windows-based operating system on an IBM platform became possible only after Macintosh's introduction? So goes this argument, since a working prototype existed in 1985, it was just a matter of time and managerial attention before somebody introduced it to an IBM platform.

While sympathizing with any former Apple employee is essential—how the mighty have fallen—sympathy should not obscure how incomplete the argument is.

Predictable technological developments do not necessarily imply predictable winners. In other words, even if people foresee technical developments well in advance, they can't predict which firm or product will profit from commercialization, nor when success will occur.

More concretely, in 1985 the open question was who would make a Windows operating system for an IBM platform. It could have been Microsoft, IBM, Apple, or some team of frustrated undergraduates. Most bets in 1985 were on IBM.

As it turned out, only one person forecast IBM's vulnerability: Bill Gates. For his strategic foresight and perseverance, Gates deserves credit. Of course, he was

also lucky that his competitor at the time could not design and commercialize a reasonably competent operating system in a modest amount of time.

The next layer of complication arises when products work together and eventually form a system of interactive functions. To use another simple example, remember the early days of word processing on the PC? Several vendors other than word-processing firms marketed spell checkers, grammar checkers, thesauri, and all sorts of tools. Many of these tools were useful additions after several refinements, but foreseeing how all the refinements would work together proved difficult.

Imagine looking at a 1982 version of WordStar and trying to predict the design for a 1997 release of Word. The latter product borrows, copies, and steals ideas from all those tools invented over the years. Any prediction in 1982 would have been laughably wrong.

Ideas from unexpected corners

Competitive processes are often open to a certain form of serendipity. A technology oriented for one set of uses may unexpectedly develop capabilities valued elsewhere. If the technology adapts well to new applications, all hell breaks loose.

The Internet's diffusion typifies a current example of serendipity. It may seem hard to believe, but this level of disruption was not foreseen even ten years ago. TCP/IP technology was widely diffused in research communities by the mid-1980s and even then most experts foresaw many commercial applications for TCP/IP. Yet, most experts projected applications in text-oriented services that resembled the bulletin board industry or something similar. It looked like an interesting future, but not anything too exciting.

A funny thing happened on the way to the market. Some physicists invented Web technology in the late 1980s, a bunch of undergraduates pushed the browser further in a shareware environment, and many firms tried to commercialize parts of the whole. TCP/IP hardware and software became increasingly devoted to sending pictures and icons. Now nobody

knows where this technology is going from a commercial standpoint.

Anyway, while it is true that Internet time seems faster, this is an artifact of its young age and the scope of the disruption associated with it. The big source of uncertainty right now is that most firms (with the notable exception of those who sell the equipment) have lost money on TCP/IP experiments—a certainly temporary uncertainty. I predict the industry will settle down into regular commercial patterns as soon as somebody figures out how to make money or gain a competitive advantage with online technology. Of course, everyone will then imitate this successful business model.

Survival and planning

Commercial survival depends on planning for the unexpected. Many well-known managerial techniques do this, though these techniques are not always easy to execute. The last source of uncertainty, therefore, is a plain old managerial mistake.

The most common mistake is made by inexperienced CEOs who introduce new products without making any plans to react to other firms. There are countless historical examples, but the saddest story belongs to Bob Frankston and Dan Bricklin, the inventors of VisiCalc, the first spreadsheet for a PC. These guys did not patent their invention (a challenging feat under the legal constraints of the time, but worth trying), made it for the Apple II, but did not make it fast enough for an IBM platform, and on and on. In the end, they became famous, but not rich.

A rarer mistake involves a major product launch without a reasonable prototype for the technology. For example, John Sculley committed this cardinal sin when he agreed to link key Apple Newton performance features to a breakthrough in frontier handwriting technology. All the experts at the time said that three generations of change could not produce a technology that could adapt to the idiosyncrasies of the average user, not to mention the typical physician. Normally these types of mistakes sink a product quickly without any

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fuss, but Apple had a high profile at the time and the company mounted an extraordinary marketing campaign. This induced a remarkable number of people to try Apple's PDA. Then users revolted against this high-priced toy because they wanted the technology to conform to them, not the other way around.

Of course, what is so maddening about the Newton episode, especially in retrospect, is that other companies stripped their PDAs of frontier handwriting technology or employed extremely primitive versions of it. Then the concept behind the PDA sold rather well, with many other firms benefiting from the hype surrounding Newton's launch.

The unexpected is a dependable part of the landscape. Good and inexperienced firms take chances with their investors' money. Stockbrokers and venture financiers put odds on new products and other uncertain events. Occasionally everyone makes a spectacularly wrong prediction about IBM, Intel, and, amazingly enough, Oracle.

..... Micro Law

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believes that the FTC's suit is based on a mistaken interpretation of the law. The FTC's suit signals that they want to change the existing laws.

(For an elaboration on this, see <http://www.intel.com/pressroom/archive/releases/>.)

Intel's contentions assume, without explanation, that Intel has intellectual property rights in the withheld information. The remainder of this column will proceed on that assumption too. However, it is not clear that Intel in fact has any intellectual property rights (under US law) in the technical information at stake. The information does not appear to be patented since Intel has not explicitly claimed that it is. Perhaps, trade secrets are involved, but that too is questionable.

For example, how can a URL and information posted on the Web site with that URL be trade secrets? Indeed, it may be doubtful that any information about how users should properly use a microprocessor chip that Intel sells them can be a trade secret. Surely, the example of the withheld advice that a chip had a serious bug cannot be a legitimate trade secret. But at this stage of this case we ought to take Intel's word that it has intellectual property rights, and act on the assumption that the emperor has some clothes—unless and until someone shows that all the motherhood and apple pie talk about intellectual property is a sham. (But the truth is out there, Scully.)

Barrett, in a Tokyo speech in June, criticized the FTC case on a second ground, which doubtless will figure also in the appeal of the *Intergraph* case to the Federal Circuit. Barrett pointed out that the alleged victims of Intel's allegedly abusive conduct are Intel's customers, not its competitors. Intel has a negligible market share (less than 10%) in the relevant markets in which the alleged victims operate. Accordingly, it is unlikely that any adverse

effect on the vigor of competition in general will result from Intel's conduct. The harm is to competitors, Barrett says, not to competition itself: "I don't think this lawsuit has much to do with competition in the marketplace." Barrett also denied that there would be any impact on the health of the microprocessor market.

Has Intel an absolute right to refuse to deal?

The main legal issue is whether there is an absolute right to refuse to deal with others regarding one's intellectual property rights. In the case of unpatented goods and services that are an essential facility, the US courts have made considerable inroads on any absolute right to refuse to deal. They have found refusal to be an antitrust violation and have required the monopolist to allow access to the facility when these facts apply:

- a monopolist controls an essential facility (but what is an *essential* facility is controverted and murky),
- others cannot readily duplicate the facility for themselves,
- it is feasible to allow the desired access, and
- the monopolist denies access to its competitor.

It is much less clear that the same doctrine applies, however, when the essential facility is an intellectual property right and when the parties are not competitors in the same market. (Some decisions have applied the doctrine to downstream markets and customers, but typically there the "customer" has been a customer in one market and a competitor in another impacted market—a hybrid competitive situation. Most decisions refuse to apply the doctrine when the customer and seller do not compete at all—as in the case of an airport and an airline or a directory publisher and a listee.)

Still, as the Alabama judge pointed out in his opinion, the many statements in court decisions that Intel quoted about a patent owner's right to refuse to license a patent are usually qualified to some

extent. They are usually qualified by some remark to the effect that a patentee has an absolute right to refuse to license when the conduct is unilateral (is not done by agreement with others) and is not for an anticompetitive purpose.

In 1988, the patent laws were amended to add a specific provision (sec. 271(d)(4)) that it is not an "illegal extension of patent rights" to refuse to grant a license. However, this provision too is generally understood to mean that it is not an illegal extension when the refusal occurs unilaterally and not as an integral part of (or in furtherance of) a larger monopolistic scheme. The case law is murky, because courts have tended to conflate a variety of different fact patterns under one glittering generality. When the fact patterns are parsed, different rules for different situations may emerge.

Let's start with as close to a "plain vanilla" case as we can get, and then move to more complicated situations.

The simplest case would be this. Say Intel has a patent on some new central feature of microprocessors. Say it invents and patents pipelining. Say at this point Motorola wants a license. (Assume that there is no previous history of cross-licensing between the two companies.) Intel says no.

This is a pure vanilla case of refusing to share intellectual property rights—the kind that may well be per se lawful. Perhaps, without pipelining Motorola cannot market the next generation of microprocessors. But probably Motorola will have to take its lumps. To this extent, at least, intellectual property rights have a preferred position in our legal system. This is because federal policy promotes innovation by granting intellectual property rights to inventors of new technology.

Even this kind of case is not free from all doubt, though. Consider a subsidiary or external feature of the chip, such as an interface, as contrasted with an internal feature. Imagine that Intel replaced socket pinouts on chips with another, incompatible electrical interface means, say, a patented bus or slot interface. Imagine that PC OEMs considered it economical-

ly infeasible to build boxes with both interface means, and therefore all used only the higher-volume means, the bus.

Would this drive AMD and all other X86 chip manufacturers out of business? Would this destroy the independent core-logic chipset manufacturers? Would it be an antitrust violation if Intel refused to share its patent with them? Would it make a difference if the new interface did not substantially improve microprocessor functional performance? Would it make a difference if Intel let box makers use the interface for a zero or low royalty, but charged chip competitors a very high or "prohibitive" royalty? Of course this is just a farfetched hypothetical case. Nothing like the real world. Anyway, we have it on the authority of microprocessor guru Michael Slater that "the government can't get involved in what bus interface is appropriate."

As soon as you deviate from the plain vanilla case (such as the pipelining example), the situation becomes unclear. A past history of cross-licensing may alter the picture. Outside the patent context, a past history of allowing cross-access to property has made refusal to deal illegal whenever the facility was essential, even though the case would likely have gone the other way without such a past history. (The Supreme Court so ruled in a case involving multiple-mountain ski lift ticket packages in Aspen.)

In the *Data General* case, the federal court of appeals in Boston refused to hold that a copyright owner had an absolute right to refuse a license on its computer program. It held instead that the copyright owner (*Data General*) was *presumptively* entitled to refuse to share its rights in its computer program. However, it also held that the other company (*Grumman*) could try to prove that the presumption of legitimacy was overcome by the particular fact pattern. In that case, *Grumman* could not show any likelihood of harm to the public as a result of *Data General's* refusal to license its software. The court therefore rejected *Grumman's* antitrust claim.

Grumman also argued that *Data General's* refusal to supply its computer equipment schematics was preventing

Grumman from developing technological advances in competing diagnostic software. The court rejected that claim. The court acknowledged that if *Grumman* could prove that *Data General* was preventing technological advances, that would overcome the presumption of legitimacy. The court said the evidence, however, simply showed no attempt by *Data General* to subvert the development of competing software. The court therefore ruled against *Grumman*.

That result may be prophetic of the ultimate outcome in the antitrust case against Intel. Unless *Intergraph* can show actual or likely harm to the competitive process, in microprocessors or in graphic subsystems, Intel's hard-ball tactics are likely to get a pass. The Alabama court noted that Intel had been supplying microprocessors and technical data to *Intergraph* and others in the past. It therefore concluded that there was no legitimate basis for Intel now to refuse to do so—simply because *Intergraph* sued it for infringing *Intergraph's* patents. The court said that Intel's claimed desire to protect its intellectual property rights was a pretext for trying to force *Intergraph* to submit (as *DEC* and *Compaq* apparently did) to Intel's confiscation of patent rights.

But it may well be that Intel does not have to show that it has a legitimate reason to refuse to deal. The Federal Circuit may hold that the shoe is on the other foot, as in the *Data General* case. *Intergraph* may prevail only if it establishes two crucial points. The first point is that Intel's hard-ball tactics are part of a deliberate program by Intel to acquire a monopoly of the graphics subsystem market. The second point is proving that the program may well succeed in the near future even if Intel now has only 10% or less of that market. If the Federal Circuit decides that the record does not show such a likelihood (Intel argues that it doesn't), the appeals court may grant Intel's appeal and vacate the preliminary injunction.

What's a mere pretext?

The Alabama court gave as one reason for rejecting Intel's attempted reliance on

Technology as a relevant market

There is another market in which Intel and *Intergraph* are arguably direct competitors: microprocessor technology. *Intergraph's* Clipper microprocessor technology is a competitive substitute for some of Intel's microprocessor technology (and perhaps a complement to other aspects of Intel's microprocessor technology). The Antitrust Division has recently argued that technology markets should be considered for purposes of antitrust analysis, just as product and service markets should. However, there is very little precedent thus far supporting competition in technology markets as a factor in antitrust analysis. In any event, no one involved in these cases has thus far contended that Intel's conduct should be evaluated in terms of its impact on a technology market as such.

its stated desire not to share intellectual property rights that this explanation was merely pretextual. It was pretextual because Intel had no problem with allowing *Intergraph* to use Intel's intellectual property until the patent infringement controversy arose. In this regard, the court echoed a recent California court of appeals opinion saying the same thing. *Kodak* attempted to rely on patent rights as a reason not to let a repair service competitor have access to *Kodak's* patented photocopier parts. The court said this was a pretext and *Kodak* just wanted to suppress its competition in the repair business.

But what does it mean to say that such a refusal to deal is pretextual? Apparently, it means that the court does not believe that the patentee is emotionally attached to its intellectual property rights, and *on that ground* refuses to share them, but rather simply doesn't want to face added competition. But isn't that always so, unless the patentee is a nut case? That is why people apply for patents. To keep out competition, not to facilitate it.

Does it make a difference whether the competition being kept out is competition

in the same market as the patent (diagnostic software in *Data General* and parts as such in *Kodak*)? Or instead it is competition in a different, vertically related market (repair services, in both of those cases)? Is one kind of refusal a pretext and the other not? In other words, must a patent in one market be used as a lever to keep out competition in another? Under this theory, Kodak might be justified in refusing to license a parts manufacturer competitor and Data General justified in refusing to license a diagnostic software seller competitor. However, neither might be justified in keeping out competitors in the repair service business.

What would give the concept of a pre-textual refusal a reasonable significance? One might argue that it should be limited to situations in which the motive is to compel the other party to yield to a demand that the patentee has no right to make. (But what's that?) Indeed, perhaps the term should be limited to situations in which the patentee seeks to coerce the other party to yield to an illegal demand. (Examples might be to fix prices or to join a boycott—in the case of a monopolist, a demand for exclusive dealing would be illegal.)

In any event, the concept of what is pre-textual needs more refinement than it has received so far in the *Intel* cases or in the *Kodak* case. The Federal Circuit may well have something to say about that when it decides Intel's appeal. (It may say that refusing to deal with a company that sues you for patent infringement or threatens to sue your customers is legitimate.)

What about the FTC case?

Does all of this apply equally to the FTC's case? No, for several reasons. The first reason is that the FTC may put together a fact record in its case that shows a risk that Intel will dominate the graphics subsystem market, in time. (Or the FTC might show that Intel is engaging in the challenged conduct to maintain a monopoly in the general microprocessor chip market or some subset of it.)

The second reason is that the FTC Act, unlike federal antitrust laws, is designed to reach incipient antitrust violations. The

incipiency doctrine is that the FTC is supposed to nip antitrust violations in the bud before they reach full bloom as antitrust violations or even get close to it. Less evidence will support an FTC case than is needed in a private antitrust action in district court (or an Antitrust Division case in district court). Accordingly, Intel's mere 10% market share may provide a potent defense argument in a monopolization law case in district court. However, Intel will have no defense under the FTC Act if the FTC finds an incipient tendency toward monopoly is budding here.

The third reason is a clincher. The Supreme Court has held that the FTC can enter a cease-and-desist order against a business practice simply because the practice is unfair. It is not clear what "unfair" means, but the Supreme Court says that the FTC is entitled to considerable leeway in defining that concept. Certainly, that a practice is unfair to the public in that it deprives the public of something it "ought" to have is one such concept. Immorality and oppressiveness are other possibilities. In any case, clearly, unfairness has an even lower evidentiary standard than anticompetitive incipiency does. The only requirement is that the FTC must give a well-reasoned explanation of why a challenged practice is unfair and will tend to harm the public or victims.

As an aside, I spent ten years on and off working on the only case of this type—the *S&H* case—that ever got to the Supreme Court on the merits of what "unfair" means under the FTC Act. That case involved whether a dominant trading-stamp company could refuse to let consumers swap different brands of trading stamps with one another and could refuse to let retailers redeem customers' trading stamps for the retailers' own merchandise. The Supreme Court held that the FTC had the power to find that conduct unfair, but the FTC's opinion did not adequately explain the FTC's reasoning. The Supreme Court therefore sent the case back to the FTC for it to write a more informative explanation of what it was up to. At that point the trading-stamp company decided to throw in the sponge and

move on to more rewarding endeavors.

But what would it mean in this case to say that Intel's conduct is unfair, even if not an incipient antitrust violation? Can unfairness have any sensible content in a commercial setting of this kind? Perhaps it can.

Intergraph and the other companies that Intel beat up all owned patent rights that Intel was apparently misappropriating. Patent rights exist to promote the progress of science and useful arts. Intergraph and the other victims (and Intel, too) participated in the US patent system by creating and disclosing their technological innovations in return for a patent grant. Without the fuel of such incentive, the fire of invention would burn slower. The public could see a slower pace of innovation. In sum, public policy favors the victims' being "incentivized" by the patent system and disfavors a thuggish patent infringer beating them up so badly that they opt out of it. Why spend on R&D if Intel will confiscate the results?

What Intel is doing is at least arguably contrary to the public interest and contrary to public policy. Its long-run effect is to discourage what the patent system tries to encourage. Stealing other people's patent rights is therefore unfair to the public and competitors, within the meaning of the FTC Act. By the same token, using coercive refusals to deal in accomplishing theft of other people's patent rights is unfair. (Perhaps the words "stealing" and "theft"—common parlance in intellectual property litigation!—are too highly colored for your taste. Then, substitute "patent infringement followed by a demand for royalty-free licensing of the infringed patents.")

There is considerable force to the argument, and at least a hint of it in the FTC's complaint against Intel. Thus, the FTC states:

A natural and probable effect of Intel's conduct is to diminish the incentives of firms that are Intel customers or otherwise commercially dependent upon Intel—to develop new innovations relating to microprocessor tech-

nology. Intel's coercive business tactics effectively undermine the patent rights of such firms and reduce their incentives to develop new technologies relating to microprocessors. The nature and effects of Intel's conduct are illustrated [by the DEC, Compaq, and Intergraph incidents].

Because patent rights are an important means of promoting innovation, Intel's coercive tactics to force customers to license away such rights diminishes the incentives of any firm dependent on Intel to develop microprocessor-related technologies. Because most firms who own or are developing such technologies are vulnerable to retaliation from Intel, the natural and probable effect of Intel's conduct is to diminish the incentives of the industry to develop new and improved microprocessor and related technologies. Consequently, Intel's conduct entrenches its monopoly power in the current generation of general-purpose microprocessors and reduces competition to develop new microprocessor technology and future generations of microprocessor products.

Arguably, the FTC is setting itself up as a defender of patent rights when it attacks Intel's refusal to license its intellectual property. The patent rights that the FTC is championing, however, are those of Intel's alleged victims as contrasted with those of Intel itself. Or perhaps it would be better to say that the FTC is defending the patent system as a whole (and its policy goals) against one abusive patentee.

Intel's CEO is right in saying this attempt to vindicate the patent system by means of antitrust enforcement is unprecedented. There are some steps in this direction in the past, however. In the late 1940s, the Antitrust Division challenged GE's licensing practices by which GE entrenched two different GE monopolies—one in electric lamps and the other

in carbonyl abrasives. In each of these cases, GE had required its licensees, as a condition of patent licenses, to agree to grant back to GE licenses on their own future technological innovations.

The result was to discourage further technological innovation by the licensees, who testified in court that they decreased their R&D efforts and expenditures. They said it was not economically worthwhile for them to spend money on innovation if they had to let GE have the benefit of any innovations they developed. GE's "grant back" practices were therefore enjoined in both cases.

In the 1970s, the Antitrust Division challenged several industrywide patent pools that required all members to share any inventions at zero or very low royalty rates. Again, the claim was that the patent-sharing requirement discouraged innovation in the industries. The industry pools were broken up by consent orders.

But the FTC's challenge against Intel goes well beyond these cases. It is apparently the first antitrust challenge against what amounts to predatory patent infringement, backed up by coercive refusals to license industry-dominating intellectual property. It is far too soon to tell how these cases will develop. It would not be surprising, however, if the FTC's greater powers under the more flexible FTC Act will make it more successful than Intergraph litigating under the more circumscribed antitrust laws.