VIEWPOINT

Power Play: Year Two

PowerPC Blitz Continues, but Where Are the Compelling Products?

by Nick Tredennick

RISC should have been computer engineering's all-time winning PR blitz, but it's about to be overtaken by the PowerPC PR blitz. The RISC fad has been driven by universities and grass-roots folklore. The PowerPC PR blitz has real money and marketing savvy behind it from Apple, IBM, and Motorola. Based on popular press to date, it seems a foregone conclusion: Intel and the x86 are dead, PowerPC is the future. That may be so in Nerdville, but the personal computer market has four segments: large companies, small companies, normal people, and nerds. Large companies, small companies, and normal people (consumers) are all large segments of the personal computer market. Nerds are a miniature segment of that market.

It's obvious to us how the PR battle is going in Nerdville, since just about everyone who sees a copy of this article is likely to be a captive of Stalag Nerd. So how's it going on the outside? What will the software and hardware developers do? How will the battle be waged, and where is it likely to end?

A Computer My Brother Would Buy

I just got a fax from my brother Steve, who needs a new home computer. He had heard that I would be recommending a PC over a Macintosh and wanted to know why, since I am a long-time Mac user. I thought his fax helped answer his own question. "We felt we got left in the dust with our Apple IIgs (software-wise) and would like to try and avoid that this time." I may be off by a couple of years, but I think he has had the IIgs for seven years.

Sheesh! What a change in perspective. We here in Nerdville would be professionally embarrassed if we had to admit working with a computer that's more than a year old, and my brother's peeved that his investment didn't last ten years! That's the rest of the world for you.

He's asking me to forecast a ten-year investment for him. I can't talk to him about minutiae like instruction sets and RISC vs. CISC or MIPS, SPEC, and megahertz. He didn't think there was anything wrong with his IIgs—other than that Apple (and the software developers) stopped supporting it. He wants to know why he can't get software for the computer that's newer than the lawn mower he's still using. He can still get parts and service for a car that's ten years old, so can't responsible companies do the same for computers?

Cost and Price Fail to Converge

Price is a big deal to Steve. He is the best financial planner I know. He's starting with a fixed budget for the whole system, including printer, software, accessories, and taxes. And I know Steve won't go $1 over his planned budget. Steve isn't in love with computer systems (difficult to believe if you're from Nerdville), and he isn't buying it for the technology (ditto); he and the kids just need it to get some stuff done. He wants cheap, he wants good value for his money, and he wants it to last.

Perpetual flame wars on Internet argue whether the PC is cheaper than the Power Mac. Believe it or not, many of these arguments focus on the size of the CPU. "According to the *Microprocessor Report* Cost Model, chip A is this big, so it costs $50, and chip B is that big, so it costs $100. Because chip A is cheaper than chip B, systems using chip A will sell for less than systems using chip B." How am I going to get this idea across to Steve when I don't see the connection myself? Cost and price are only loosely related.

For positive cash flow, cost sets a lower bound on price, but we're not close to that situation here. Intel can sell all the high-end x86 chips it can manufacture for just about whatever it wants to charge. Since the PC system business operates on low margins, the price of PC systems will be strongly influenced by Intel's x86 pricing (but unaffected by how much it costs Intel to make the chips). Motorola and IBM, as the only manufacturers of PowerPC CPUs, set the price of the PowerPC chips, and Apple, as the only manufacturer of Power Macs, sets the price of the Power Macs. Apple, IBM, and Motorola can set their prices for high margins, or they can set their prices to capture market share (which may include pricing below cost).

Many Don't Need Better Performance

The Internet also carries vitriolic exchanges concerning which systems have the best absolute performance and which systems have the best price/performance. Advocates from Nerdville argue about the price/performance of the systems with the highest absolute performance. But for Steve, who wasn't complaining about the performance of his IIgs, there is a relatively low price point beyond which he won't pay more, no matter how much additional performance per dollar he gets for his money.

A recent Internet flame went something like this:

"You used an unfair comparison. You priced a no-name clone against the Power Mac. It's unfair, since there aren't any no-name Power Mac clones. You should have made the price comparison using a system from IBM or Compaq." This is another point I'm going to have difficulty explaining to Steve. He doesn't know Compaq from Zeos. How can I tell him it would be unfair to buy a system from Zeos because there are no comparable systems from Apple licensees?

Popular folklore in our business says clone makers have driven innovation from the PC: name-brand products have higher prices because the brand-name companies are paying the development and innovation costs. Nonsense. The clone makers and the huge volume market they have helped create have driven innovation from the system makers to the chip makers, where it is faster and more efficient. That's why we see rapid development in, for example, motherboard chip sets or graphics chips for the PC.

There are no Mac clones yet. Apple has maintained absolute control of the Mac hardware and OS since its introduction; its first foray into licensing has been limited to Unix platforms. I'm sure Apple maintains itself as the only Mac supplier because it wants to control the margins for its systems, especially after it saw what happened to IBM with the PC business. Apple controls the margins all right, but that means it also pays all the OS, firmware, system, and chip-set development costs. This is an enormous overhead not borne by the PC makers. PC makers buy their chip sets from competitive chip-set developers and they buy their firmware from competitive BIOS developers.

A Computer for the Next Decade

If Steve kept his IIgs for seven years and is peeved that it didn't last ten, what am I going to advise him to do? If he buys a 680x0-based Mac, he might get a decent price, but there's no ten-year future there. Apple has made arrangements to emulate the old 680x0 code on the new PowerPC-based Macs, but it hasn't made any arrangement for the installed base of 680x0-based Macs to run the new PowerPC programs. To run new PowerPC programs you can buy a new Power Mac system or, if your current system happens to be on Apple's list, you can buy a PowerPC-based upgrade board. (I have four Mac systems and not one is on the upgrade list.)

If you buy new Power Mac hardware, you can run your old programs, and you can run new programs. That's a backward-compatibility program for your old software. Will Apple have a forward-compatibility program for new software, so its installed base of 680x0-based hardware (old or new) will run any new PowerPC programs? That's what Steve would want. The 680x0-based Mac might give good value for the money and the forward-compatibility program would assure him that his system could still run the future software. (Remember, he wasn't complaining about the performance of his IIgs.) But Apple didn't have a forward-compatibility program for the IIgs, and Apple isn't going to have a forward-compatibility program to support its 680x0 installed base. (Apple wants Steve to buy new hardware—even if it's only an add-in board.)

Mac developers aren't going to support the 680x0-based Macs for the next ten years. I can't advise him to get a 680x0-based Mac, even though they are cheap now because I know Apple and the developers are going to be leaving that platform in the dust. So the 680x0-based Mac is out.

Power Macintosh Is a Dead End

Hey! How about a new Power Mac? Popular folklore says they're cheap and fast. Steve doesn't care about fast, so how about the cheap part? Hard to tell now. They don't look cheap to me relative to the x86 clones. Steve is looking for price and long-term value, he isn't looking for price/performance—I'm pretty sure family pastimes don't include sitting around the PC watching SPEC running on Unix.

Although Power Mac system prices may look good now, I think I see a problem in the future. Apple may be pricing its systems cheaply now just to capture market share, but what will be the case five years from now? Traditionally, Apple and IBM have made their money on high-margin sales. Apple has consistently had high margins relative to the x86-based PC market. I suspect the Apple-IBM-Motorola deal was born so Apple could gain credibility with corporate purchasers and IBM could regain a position from which it could control margins *(see the original Power Play:* ***070104.PDF****)*.

Once IBM and Apple capture a reasonable market share, their captives will pay plenty for upgrades and new systems. This is possible in the PowerPC world because it's "open" in the same way the Sun world is "open." That is: "You can have the specification for the architecture and you can build all the chips and systems you want as long as you don't compete with us."

Last year, Apple had something like 12–14% of the personal computer market, x86 systems had 86–88%, and all other systems shared the remaining 0%. This year, Apple will be splitting its market share. Some will remain 680x0-based Macs, some will go to Power Macs, and some will go to x86. If everything goes well for Apple, perhaps the Power Mac will end the year with a 1–2% market share and 680x0-based Macs will have 7–8%. The x86 will increase its market share this year.

The x86 PC has one major chip producer (Intel) and a hundred low-margin system companies. The Power Mac has two chip companies (IBM and Motorola) and one system company (Apple). I think the people who want to dethrone the x86 in favor of PowerPC are nuts.

Today, there's lots of whining about how to displace Intel from its near-monopoly position as the major x86 chip supplier. If Apple's Power Mac can get an 8–10% market share in the next few years, there'll be lots of whining about how to throw Apple over for a more competitive situation with several low-margin suppliers. Whining will include complaints about the near-monopoly position of the PowerPC chip suppliers. If you are into whining, you can look forward to a busy future.

Not only is there a problem with paying high margins for chips and systems in the Power Mac future, but there is also a looming software problem. I can't see why developers would even develop for the Power Mac, but for the moment, let's suppose they do. Their installed base will be small relative to the x86 installed base, so they will have to charge more per copy for their software to support the development. Fewer companies will choose to develop software for the Power Mac than for the x86, so there will be fewer applications, less price competition (implying higher prices for the consumer), and slower innovation.

I can't get Steve into this mess, so the Power Mac is out. Furthermore, the current Power Macs are NuBus-based, and that's another dead end, since Apple has already said its next-generation machines will use the PCI bus. Who will be developing cards for an orphan generation of NuBus Power Macs ten years from now?

The Reliable Alternative: x86

The x86 systems are cheap and definitely give good value for the money. The software is cheap and plentiful. I'm pretty sure x86 systems will still be around in ten years and so will the software support. I don't see the systems getting more expensive in the future, I see them getting cheaper. They will get cheaper as several major chip suppliers (at least several of: Intel, Cyrix, IBM, NexGen, AMD, UMC, SGS-Thomson, and TI) compete to supply x86 processors to a hundred low-margin system suppliers.

In 1993, Intel spent $1.8 billion on semiconductor capital equipment. That's about 150% of what Motorola and IBM together spent. This year, Intel plans to spend $2.4 billion on equipment (about the same as the 1993 total for the five leading Japanese manufacturers combined). If we add spending by other x86 manufacturers, it's obvious x86 development and production will run some time into the future.

With all the competition and standardization in x86 systems, it seems to me they will be supported by cheap software for the next ten years. If performance or features change enough to catch Steve's attention at some point in the future, I'm pretty sure whatever system he buys today will be cheap to upgrade. My advice to Steve: get an x86 system.

Steve's concerns in making his decision are probably similar to concerns of purchasers for the large-company and small-company market segments. In addition to Steve's concerns, many of these companies have an installed base of systems. If the installed base is x86 systems, there is little incentive to change. If the installed base is mixed, there is little incentive to make the situation worse by adding a third hardware platform to support. If the installed base is primarily 680x0-based Macs or if there is no installed base, the decision will be more difficult. My advice in all these situations would be the same: get x86 systems.

Software Developers Face Hard Choices

Apple developers can look forward to hard times from a difficult position. Developing for the 680x0-based Mac is a dead end, since the installed base will dwindle and the people who own these systems aren't likely to spend much on new software and upgrades. Developing for the Power Mac is risky, as there isn't an installed base. It is an uncertain proposition, but at best, it will be a very long time before the Power Mac installed base grows to the size of the installed base the developers will abandon in the 680x0-based Mac. That means it's going to be a long time before the developer can regain the position attained before Apple's transition.

With the 680x0-based Mac, at least the developers could make good use of previous generations of their own code development when producing new products and derivative products. And they had an installed base of users loyal to their software. Now there are two platforms: one a dead end and the other with no installed base. If they don't support the dead-end platform, they are sure to alienate some of their (formerly) loyal customers. If they don't support the new platform—and very soon—they are sure to alienate some of their (formerly) loyal customers. Supporting both requires adding resources in the face of declining revenues. I see no way to win in this situation.

Long-time Mac developers are likely to be in a worse position than newer Mac developers. The long-time Mac developers are more likely to have their code in assembler or Pascal or even Fortran, for which there is little PowerPC development support. Newer developers may have their code in C or C++, for which there is PowerPC development support.

Mac developers are faced with decreasing market prospects at the same time that they must increase their development efforts. I say increase because I presume they had already amortized major development costs for the 680x0-based Mac products and were supplying enhancements and support. Now they have to begin development for a new platform at the same time that they can look forward to reduced revenue. At the very least, they will have to port existing code to a new platform. And they will have to provide support for the old plat-

form, the new platform, and the transition.

If I were an Apple developer, I' d consider moving to x86. At least for the x86, there is a gigantic and growing installed base. Investments I make in committing to the x86 won't be lost in a sudden architecture transition. Development support for the x86 is plentiful and cheap. Development support for the PowerPC is sparse and expensive. (Apple seems to treat its developers program as a profit center rather than as a loss-leader or an at-cost service.) I would wait a few years to see if the Power Mac attains an installed base large enough to support profitable products.

The Battle for Market Share

The x86 has a commanding lead in the race for personal computer market share. Apple changed CPUs, which puts its 680x0-based market share up for grabs. Let's assume Apple and Motorola would like to retain the 680x0-based market share and capture a large share of the x86 market. What would I do if I were Apple and Motorola in this situation? I would do just what they are doing. Define the battle in narrow technical terms, where they have a perceived advantage, and press it for all it's worth. Ride the RISC fad. Play to the folklore by reinforcing popular beliefs.

The PowerPC is winning in areas where RISC has traditionally been strong: press coverage and reported performance (not to be confused with actual performance). Combine massive advertising and press coverage with aggressive pricing to grow an installed base. Promote the PowerPC advantage in smaller die size. Advertise low chip prices.

If I were Intel, I'd stop being defensive about reported performance. Intel has a right to be miffed about unbalanced press coverage, but that's the price of being an outsider in the midst of Nerdville's raging RISC fad. What's in print is created by businesses to make money. The nerd press is printing what Nerdville wants to read.

If I were Intel, I would ignore the SPEC battle, since it's irrelevant to the vast majority of its target audience. I would press my major advantages in volume production, applications, installed base, system price, cost of accessories, availability of peripherals, and especially cost of ownership.

I'd buy gigantic ads and plot the historic cost of upgrades for PCs and Macs. I'd plot the availability of software packages and average costs of packages for Mac and PC. Plot the number of CDs available for PC versus Mac and their average prices. Plot the execution time of some programs over time as the systems improve (think how this would look as the plot for the Mac software drops for a while and then increases).

The Likely Result

So where's it all going in the battle for market share? I think the Power Macs will find a place. If Apple does everything right, I think it will get a 7–8% market share for the Power Macintosh. I don't think it will get back to the 14% share it had with the 680x0-based Mac. If Apple was successful in changing from the Apple II to the Mac in 1984, you ask, why can't it do the same thing again in 1994?

In the early '60s, high-end stereo equipment was substantially ahead of consumer stereo equipment; the stereo market was still developing. Stereo fanatics of the era probably compared and contrasted stereo components at the same fever pitch computer "scientists" today devote to comparing architectures and systems. If you wanted to buy good stereo equipment, you had to buy the same things the stereo nerds were buying. That meant the design of high-end stereo equipment in the '60s was strongly influenced by stereo nerds.

If you want good stereo equipment today, you can buy just about anything. Stereo nerds don't drive the design of stereo equipment because, compared with the past, there is very little difference in quality between the high end of the stereo market and ordinary consumer products.

When Apple first introduced the Mac, the market was still developing, so systems were sold to computer nerds who cared about user interfaces, performance, and features. It was possible for Apple evangelists to convince developers to build applications and extend market share for the new architecture. Apple's market for the first Mac was much like the early market for stereo equipment. Development of the personal computer market was strongly influenced by computer nerds.

Today, the market for personal computers is more like the modern stereo market: personal computer quality, features, and performance may be sufficient to sustain a consumer market. The personal computer has become an appliance. Nerds will still demand increased performance and features but will cease to drive most of the market.

This situation will make it more difficult for Apple to repeat the success of the first Mac introduction with its second Mac introduction. The firestorm of positive PowerPC press coverage is ample evidence that Apple has captured a sizable segment of nerd mindshare. The difficulty will be translating that to success in a consumer market. There was a time in the development of the PC market when compatibility wasn't absolutely necessary. That time may be past. ♦

