

Strategies for Sustaining a PC Market Recovery

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Giga Position

The movement away from PC technology is more than short term; it reflects dissatisfaction with the way the technology has developed and long-term dissociation between the needs of the buyer and the design of the related products. This disconnection between buyers and sellers transcends any one vendor and any one technology. If the buyers don't begin to see more of what they want in personal computing technology from existing vendors and products, they will, like they have in the past, move away from the current technology and related vendors, making a long-term market recovery unlikely.

The companies that provide personal technology products must ensure that their organizations map to their customers, the hardware they sell meets or exceeds market requirements, and that software better reflects how companies and individuals deploy and use it. Otherwise, they will experience an extended market downturn that will put jobs and job satisfaction at unacceptable risk.

Proof/Notes

In related research (see Planning Assumption, The Tactics of Starting a PC Market Recovery, Rob Enderle), we indicate that a sustained market recovery will require major changes to organizations, hardware and software so that the causes of the current slowdown are effectively addressed. This is much more than marketing, although marketing organizations should be once again staffed with experts in this craft, since it must move from hearing customers to actually listening and responding to what is heard. This means that the status quo is a quick path toward failure, and the excitement of a new market must be infused into the PC market to overcome the perception of PCs as legacy hardware and return the market growth that is so critical to sustaining the segment.

Strategic solutions are those that extend beyond 12 months and alter the physical structure of companies and products. These changes, to be effective, require hard decisions that may force companies to invest in other companies with different technologies and take some significant risks based on information that is anything but 100 percent accurate. Still, the vendors that do this right will likely own the recovery, and those that don't will become the next **Grid, Osborn, DEC and Commodore**.

The strategic changes we will look at come down to three broad categories: (1) organization, (2) hardware and (3) software.

Organization

While organizational changes can be made relatively quickly, the impact of those changes can take months, if not years, to materialize. Tactical decisions like layoffs have been identified as the reasons why some companies took so long to recover after the last market downturn during the late 1980s and early 1990s. Early retirement incentives drove off skills that were critical to the recovery, and poorly handled layoffs not only dumped key human assets, but they also destroyed the loyalty of many of the remaining employees who either left at inopportune times or semi-retired.

Recently, **IBM** provided a good example of what we mean by a strategic reorganization. By combining the mobile and desktop organizations, it is now better able to match the existing and emerging needs of its

buyers. It also addressed the tactical requirements to cut costs without having to execute broad layoffs. The remaining employees remain motivated and focused, and because IBM had a plan, the risk of losing unidentified critical human assets was significantly reduced.

We expect the market that will emerge in 18 to 24 months will be far more mobile than it is today and will be looking for flexibility as a defining trait. Security and personalization will be key values of any related offerings, and vendors that can provide a direct relationship will be favored over others. The software model will be moving strongly toward services, and sales plans, which look very much like the leasing programs that founded the mainframe era, will likely be favored over purchases. Flexibility coupled with mobility will be the core design trend, with size, efficiency and design being key elements of the dominant solutions.

This means that new organizations will need to map to the buyers they serve so that new products and services they will be rolling out also map to those same buyers. Organizations will also need to be flexible, since there is no sign that the technology segment is reaching an extended steady state yet. For instance, we are still monitoring a trend that could shift buying behavior away from PCs to more solid-state devices and this trend, as it develops, could change the buyer, the seller and the buying process for future desktop technology.

Hardware

PC hardware has fallen on hard times largely because **Intel**, the segment's current technology leader, has allowed the platform to languish while focusing on ever faster processors. As a result, the market appears to be looking for some dramatic improvements as a requirement to a significant increase in buying behavior. Based on conversations with IT managers and related surveys, we believe that the next generation of hardware will need the following attributes to be successful:

Modular: If buyers are going to accept the rapid technology stepping rates that Intel is driving, then hardware must become modular so that it can more easily be upgraded. A great deal of the cost of deploying new technology surrounds the physical upgrade of the hardware, if that hardware was more modular, users could simply install the new module themselves without disrupting the overall system or requiring substantive technical assistance.

Standards: Particularly with handheld computers, the lack of standards is causing a significant drag on some market segments. Anything that connects to something else or that requires core OS features should be standardized so that peripherals for one vendor can work with systems for another. Currently, notebook peripherals, USB/1394/USB2, legacy ports, system memory, flat-panel display interfaces and flash memory are broken, along with all of the handheld computers and smart phone classes. This appears to be getting worse and not better. Confusion over standards has historically been a very effective way to keep prospective buyers from buying.

Instant on/off plus power conservation: Power use is becoming increasingly important, since shortages are expected to propagate across an increasing area of the United States, and power costs continue to increase worldwide. Coupled with this, the inability to quickly power on and off has not only resulted in power waste, but also increased security exposures and reduced the reliability of the related systems. The next generation must easily drop in and out of low powered states, be more power efficient overall and power on and off instantly. Mobile devices continue to have this as a primary requirement, which has spawned devices that can boot into either Linux or Windows and **Transmeta**-based systems, along with their new Intel counterparts. The battle between these two vendors on power efficiency couldn't be better timed and should result in solutions that better meet laptop, desktop and even some server requirements.

Secure: Current widely deployed hardware security is inadequate for the Internet age. Unsecured systems can have password caches that effectively create an open door into personal account information and corporate assets. The opportunity for mischief is unprecedented, and vendors have not fully realized the potential

liability if there is a breach and they are found to share the responsibility for the damage. Advertisements that promote Internet use, remote use or any activity that could result in serious damage to the individual or the client could form the foundation for negligence and relatively large settlements and/or judgments. Vendors need to take this threat seriously and design much heavier, hardware-based, smart card/biometric security into their PC lines and/or provide it as an option. We believe that initiatives like **Microsoft's** HailStorm (see Planning Assumption, [Microsoft's Image the Major Hurdle for Its HailStorm Initiative](#), Rob Enderle) will need this enhanced security in place before they can be successful.

Desktop design: The need for security, the lack of desktop space and more rapid methods to address hardware failures should have resulted in new hardware designs years ago. A third-party company, **ClearCube Technology**, has come the closest to what we think is needed in the next generation of corporate desktop machines. Its design places the hardware components in a very small rack-mounted design that is connected to the desktop via a Cat5 cable. This allows for remote moves, adds and changes, rapid hardware replacement and real-time operating system upgrades.

In addition, power shortages are driving the move to LCD monitors, and the elimination of cables becomes a long-term goal for desktop designs. IBM appears to be leading the design effort and provides the best example of where hardware needs to go in the future.

Mobile: Laptop computers are migrating into two forms, largely represented by non-Intel hardware today. The desktop-replacement laptop's near-term future appears to be very close to the **Apple** Titanium notebook with a large, wide aspect ratio screen, a low carry weight and few compromises. The ultra-light class is dominated by Transmeta technology today, and future designs will combine the values of the professional class of CE devices with the capabilities of traditional laptops: long battery life, a very low carry weight and adequate performance. Strategically, we believe that as laptop component prices drop, particularly screen prices, as a result of new technology and more efficient manufacturing methods, a new modular portable form will emerge to bridge the high-performance needs of the desktop with the high portability needs of the mobile worker. Until then, a laptop/desktop bundle might find a willing audience during the time before the emergence of this new modular form factor. Interest for these new forms can be verified by some of the recent studies, which have shown a strong preference for **RIM** Blackberry devices that appear to be displacing notebook computers as they roll into that market.

Storage: With solid state (flash, DDR, SDRAM, etc.) memory prices dropping sharply and current system bottlenecks revolving around the current generation of magnetic and optical media, it is not hard to project that this next-generation system will need to use solid-state memory more effectively to overcome these bottlenecks. Test systems that booted from ROM-based operating systems or that used advanced types of nonvolatile solid-state memory were substantially faster than current-generation systems using even high-performance hard drives for these tasks. In addition, the most robust mobile personal computer ever created was the Study Pro, developed for K-12 education. This design clearly showed that by removing the rotating media, you could substantially increase the reliability of mobile PCs. Floppy drives and optical drives will be options, with the bulk of the market using a combination high-density rewritable optical drive and few, if any, using floppy drives.

Services: Part of the hardware experience will be a set of connected services that work in the background to help identify and resolve problems automatically. An extension of the Windows Update service used by each hardware manufacturer to both differentiate the branded companies from the white box vendors and to create a greater loyalty with customers, these services, when connected to competent service organizations, will be the cornerstone of sustaining the consumer/small business installed base, as well as providing for an advocacy for growing that base. Corporations will likely want to host their own services, and this trend will likely force an even greater coupling between desktop and server sales going forward. At the end of the decade, we expect that the remaining hardware OEMs will look more like service organizations that provide hardware than they do today.

Software

Windows XP, the latest generation of Windows NT, is an improvement that is more evolutionary than revolutionary. It makes a number of critical changes, particularly for the Windows 9x base, that the market should find both interesting and compelling. However, it doesn't go nearly far enough. Migration costs, particularly when moving to new hardware, are excessive, and the tight relationship with hardware makes it far too difficult to consistently image large numbers of systems or reliably upgrade the operating system and some applications. The market is currently looking to products, like Linux, that are changing rapidly to address this need, or simply holding on to now obsolete Windows offerings until they see something that better maps to their expectations and needs.

We believe the need is for an operating system that is configured closer to the Connectex Windows emulator on the MAC platform to create a better match to current requirements. The emulator creates a static Intel hardware layer and allows for a Windows 95/98/ME/2000 load that can remain static for extended periods of time because of this static hardware emulation layer. While this would lower performance somewhat, currently, companies feel they have more performance than they need and are demanding more stability. Trading off something that customers don't need for something they do is just good business. This solution could be created by either Intel or Microsoft today, but regardless of which company creates it, the requirement for stability must be addressed.

These requirements are based around the need to be able to support a large number of users easily, either as a support service to consumers or a support organization to corporate employees. To do that, there needs to be a much higher level of standardization with regard to the common interfaces between the application layer and the hardware layer to allow the applications to remain untouched while the hardware goes through its ever more rapid changes. This allows the drivers to change along with the related hardware and should largely mitigate the problems that companies that locked into Windows 95 or any OS version enjoyed as a result of their need for long-term standards.

In effect, the new break between hardware and user interface/software should be above the kernel, and the related interfaces should remain static for a period of no less than three years. Below this layer, there will be changes; we can't seem to stop those, and these changes, like the related hardware, will likely become the responsibility of the hardware vendor over time. Above this layer, there would be changes as well, but these changes would be under the near absolute control of the customer. Certainly, imaging would only occur above this new hardware/kernel combination, and hardware vendors could extend the life of the kernel/hardware core as needed. This should vastly simplify the problems of dealing with the lack of synchronization between hardware components and operating systems and put consumers/IT managers back in control. It should also allow hardware vendors to focus on hardware core values and compete on those values and allow Microsoft to better consider benefits to new software offerings and avoid the kind of problems that are currently forcing customers to other solutions or away from the market entirely.

A dual-mode implementation for mobile is becoming an increasing possibility as well. With the advent of the **Casio/Transmeta** laptop computer that boots into Linux for an appliance experience and into Windows for full capability, the opportunity to allow the mobile device to boot into a much lower powered state for basic tasks, like e-mail, telecommunications, calendaring or contact management, becomes more of a possibility. Battery technology is not advancing as quickly as other components and, as a result, a more creative way to deal with that shortcoming is needed in both hardware and software.

One clear addition to the feature set supplied as part of the core software is virus checking. Because virus checkers remain intimate with hardware to work properly, it should be part of any evaluation or production beta test and, as such, should be a feature of the OS. Certainly, it could represent basic protection, with advanced protection coming as part of an enhanced offering, but in today's world, virus protection is as important as encryption, virtual private network (VPN) support and basic system security, which are all included in a full-feature Windows platform today.

Finally, the current price increase when moving from Windows 9x to XP for corporations is not value based and seems like a tax. Either the perception or the price needs to be changed so that corporations do not feel penalized for moving to new platforms. Since these new platforms are generally critical to the sales of related desktop and back-end solutions, we continue to believe that Microsoft's current pricing practice in this regard is counter-strategic and needs to be rethought going forward.

Alternative View

Making change at this level is nearly impossible for companies unless they are threatened with near-term mortality, and by then, it generally is too late to make the changes. Making this happen would require the industry players cooperate to some degree on new standards, act in concert to get Intel and Microsoft back on track, and even move to other vendors if the two core players did not, or could not, respond timely. This is a fight for survival, and the decision-makers in large hardware/software companies generally put internal conflicts, competitive posturing and short-term tactics in front of decisions that are critical to the long-term health of the market and their own businesses.

Certainly, the announcement that there is only one declining manufacturer of mainframe technology should remind the current vendors of the risks in not addressing these problems timely. Still, the fact is that markets do not typically respond properly to this kind of a threat, and many of the people that created the current market opportunities have retired. Microsoft still seems very focused and may be able to once again turn the market. Its recent financial performance makes this outlook more promising. Unfortunately, the odds continue to be against long-term market recovery, and it may be prudent for firms to begin to focus on the next technology and leave this one to join the mainframe in history books.

Findings & Recommendations

The current market downturn is the result of a growing disconnection between the wants, needs and expectations of corporate buyers and consumers and the companies that provide personal computing technology today. To address this exposure requires both tactical (short term) and strategic changes in the way technology suppliers market, design, build and deliver products.

Strategic activities extend beyond a 12-month planning cycle and are far more difficult to execute than their tactical, largely marketing/positioning counterparts. These recommendations focus on how PC companies are structured, how hardware evolves and the design and implementation of the operating software.

Organizations need to map closely to their customers who, on the corporate side, buy both mobile and desktop solutions today, mapping well to IBM's current organizational structure. However, consumers' and corporations' buying needs and methods are dramatically different, suggesting that **Compaq's** move to merge consumer and corporate businesses is ill advised.

Hardware will need improvements in the following areas:

- **Modular:** This will better allow component upgrades and ensure that the flexibility of the platform maps to the growing flexibility of the buyer.
- **Standards:** This ensures that peripherals work across manufacturers and that buyers are not penalized for moving to a new technology quickly.
- **Instant on/off plus power conservation:** This maps to energy needs growing sharply on the West Coast and expected to expand worldwide.
- **Secure:** The increasing use of the Internet and the exposure of intellectual property, increase of viruses/breaking and initiatives like Microsoft's HailStorm require a much higher level of standard security.

- Desktop design: This is smaller, more secure, less expensive to upgrade and less intrusive.
- Mobile design: This is a more effective use of current technology (Apple), or smaller, lighter and more power efficient (Transmeta).
- Storage: This is faster and solid state. Hard-drive bottlenecks and failures remain an industry problem today.
- Services: Creating a stronger relationship between the vendor and the customer is better for all parties.

Software will need improvements in the following areas:

While Windows XP is a strong improvement, particularly for the Windows 9x base, future versions of the standard OS need to reflect the changed needs of the corporate and consumer customer base. They need to appear more stable in the face of hardware changes, need to be vastly more reliable and secure, and they need to better address the usage needs that exist in the market today. These needs expand on the hardware requirements above and help enable them; however, related solutions must also address the following needs:

- Imaging: The ability to apply rapidly a standard software load without penalty to large numbers of systems.
- Zero migration cost: The elimination of the hardware/OS migration penalty.
- Virus free: Like other security solutions in the OS, virus checking needs to be standard.
- Mobile: Mobile users have unique requirements that must be more effectively addressed.
- Pricing: Pricing should have a better relationship to user value and not be perceived as a tax.

Currently, the PC market is in sharp decline — fortunately or unfortunately, depending on whether you are a seller or buyer of this technology — there is no truly adequate replacement yet. However, this is changing rapidly, suggesting that large deployments of new PC technology should be, and likely will be, increasingly less of a priority until the platform is significantly improved.

Once a market turns against a product category, it becomes increasingly difficult to get the buyer back; the longer it takes to develop systems people want to buy, the less likely it is that these changes will have the desired effect. For many, it may already be too late — if the industry does not act quickly, the history of the mainframe will repeat itself with the WinTel personal computer.

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