Consumers Will Be Slow to Adopt NCs

*NCs Will Succeed in Corporations First; Early Home Use Hampered by Barriers*

by Art Swift

Despite the hype that network computers (NCs) will see immediate widespread use among consumers and dramatically increase computer penetration into the home by enabling new computing price points and new compelling applications, it is unlikely that the NC market will actually develop in this fashion. A relatively weak value proposition versus a traditional PC, coupled with the significant barrier of low bandwidth to the home, will slow adoption even by the traditional early adopters of new home-computing technologies. Poor ease of use, a high price point, and a lack of compelling content will further delay adoption by the average consumer (affectionately known as "Joe Sixpack" to marketers).

Commercial markets, on the other hand, offer the potential for rapid acceptance of the NC. A significantly stronger value proposition makes early NCs much more attractive to corporations than to consumers. Many corporations today are aggressively seeking to reduce the overall cost of ownership of their desktop computing systems; it is in this regard that NCs may offer truly compelling value. The pre-existence of a relatively high-bandwidth environment in the typical corporation will reduce or eliminate one key barrier to usage. Other hurdles remain, but manufacturers of NC devices would do well to focus their marketing on early adopters in commercial markets.

Technology Adoption Cycles

As Geoff Moore noted in his popular *Crossing the Chasm,* new technologies tend to follow a predictable cycle of adoption by technology enthusiasts and early adopters before being purchased by more pragmatic buyers. Although who
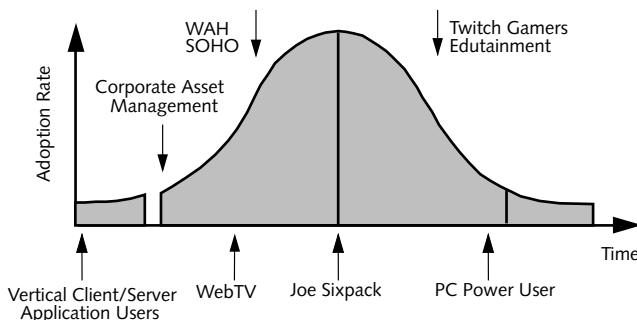
Figure 1. Technology adoption curve showing that those segments with the strongest value proposition and lowest barriers will tend to adopt the new NC technology more quickly.

these early buyers are varies by product (the early adopter of a new piece of stereo gear, for instance, may not be an early adopter of a new computing technology), this adoption cycle has been proved time and again in a variety of markets. The key to successful early NC business will thus be to identify and win the early adopters while positioning for future mainstream market entry.

Figure 1 shows one possible technology adoption scenario for NC devices. (The separation in the curve is Moore's "chasm," the difficult-to-cross breakpoint between early and mainstream markets.)

"IRKd" Network Chefs

Consider the dedicated NC appliances that Diba and others *(see **100804.PDF***) expect to take consumer markets by storm. The potential appeal of these devices is that their single- or limited-function design will dramatically simplify computer use and thus appeal to technology-averse consumers. Still, these devices face considerable barriers to widespread use. For example, the bandwidth bottlenecks to the middle-class American home today, coupled with ever-increasing demands on Internet infrastructure and Web servers, could make the time spent downloading a recipe and "how-to" images to the new Internet Recipe Kitchen device (IRKd) exceptionally frustrating to the newly connected network chef. The value delivered compared to looking up the recipe in a $10 cookbook may not be compelling.

Twitch gamers, edutainment-focused parents, and work-at-homers (WAH), who tend to be among the earliest adopters today, will not be likely near-term targets for NC appliances. The performance-hungry nature of their gaming applications sends twitch gamers rushing to the latest technology; the quest for more realism and a better adrenaline buzz will likely dampen their enthusiasm for a bandwidth-limited, low-horsepower machine. Edutainment-focused parents who want the latest multimedia applications for their kids will also be drawn to more powerful computing technologies. And finally, the NC will not run the legacy personal-productivity applications that the work-at-homers and small-office/home-office (SOHO) employees have come to know and love.

The WebTV Incarnation

Consumer-focused NC adherents are thus in a bind: the traditional early adopters of home-computing technologies won't want an NC, and mainstream markets are not ready for these devices. Perhaps the WebTVs being launched by Philips,

Sony, and others *(see* **1011VP.PDF***)* will ultimately provide the way out of the consumer-market dilemma: at least the limited NC functionality is embedded in a device that already has a perceived value. Of course, overcoming bandwidth and Internet infrastructure limitations will still be necessary before this incarnation of the NC takes off. Providing enough interesting content to justify the incremental cost of the embedded NC will be another prerequisite for success in the mainstream consumer market.

Compelling Value to the Corporation

On the other hand, the NC can immediately offer a strong value proposition to certain corporate users, not only because they already have a relatively high-bandwidth infrastructure, but also because they have a strong need to reduce the overall cost of ownership of their networked desktop systems. The NC will still follow an adoption cycle, but the more compelling value and reduced barriers imply that the NC will move through the early phases of the cycle more quickly in business applications.

It has been widely observed by corporate MIS managers that the purchase price of a commercial desktop is dwarfed by the costs of administering the machine: setup, network administration, maintenance, software upgrades, backups, recoveries, and so on. This litany of costs, which often can amount to 5–10 times the original purchase price over the life of the machine, doesn't even include the hidden costs of corporate end users doing their own backup, software installation, or hardware upgrade.

It is in reducing the overall cost of ownership that the NC may truly shine, coming close to the MIS director's dream of the zero-administration client. New software revisions or new applets will be downloaded as needed from the server, backup will be automated, and system administration greatly simplified. Potential savings are large, even with the increases in network and server capabilities that will be required to support the new paradigm.

Don't Target Horizontal Applications

Even with an attractive value proposition, the NC still faces many obstacles that will limit its initial deployment to focused user groups within the corporation. Once again, the inability to run legacy applications, especially the Microsoft Office suite, will discourage deployment by users who have a personal-productivity or horizontal-application focus. Ongoing improvements in remote administration capabilities for networked PCs will also erode the value of the NC over time, making it easier for horizontal-application users to justify staying on the Wintel PC bandwagon.

Other impossible targets include performance-hungry PC or workstation applications that require a sophisticated desktop operating system and the highest-performance processors. Finally, the typical conservatism of corporate-asset managers will play against immediate corporation-wide deployment of the NC. Companies that aggressively

manage their desktop assets to extend machine life not only are budget conscious, but also tend to be late adopters of new technologies.

Target Vertically Focused Applications

Vertically focused client/server applications offer the most attractive near-term target for the NC. In customer service, retail point of purchase, or inventory-tracking applications, for example, availability of traditional personal-productivity tools is not a primary concern. Rather, rapid access to key customer or company information in an easy-to-use form is of critical importance.

Desktop performance is not usually a huge barrier in these applications; software architecture, server loading, and network infrastructure generally affect performance as much or more than client-side processing power. Given the breadth of custom client/server applications deployed on intranets, the reduced administration costs of the NC could offer a truly compelling value proposition to large corporations.

The NC paradigm might save corporations money in other ways, as well. If new NC client/server applications are written in Java, they could be deployed on the NC and, theoretically, also on all other corporate desktops. Legacy client/server applications need not be completely rewritten to capitalize on the lower costs of ownership of the NC; instead, corporate software teams could rewrite the client-side GUIs and menus in Java, minimizing effort and again ensuring cross-platform operation. Leveraging software-development costs across multiple deployment platforms is one of the more compelling arguments for Java-based NCs.

Challenges Remain

These vertically focused client/server applications are often mission-critical functions within a company. The robustness, reliability, and security of the new NCs must at least be on par with previous solutions, or the MIS community will not risk deployment.

Security advantages are claimed as one of Java's key selling points, but any benefit must be proved to this risk-averse community. Network reliability is also of paramount importance in an NC-based department or site: the user is dead in the water if the network goes down. Finally, a shortage of trained Java programmers may limit the deployment of vertically focused applications on the new NCs.

From a marketer's perspective, one of the most significant challenges for the manufacturers of NCs is to set expectations properly, to "define the category" in marketing speak. Claiming the NC as the ultimate PC replacement does nothing but force all the requirements of the mainstream PC community onto the fledgling device, a burden likely to break the backs of early innovators. Ⓜ

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