

## The New Platform – The Network Palette

Net Forecasts – Peter J. Sevcik

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The folks who are busy trying to identify the 'Net's next "killer app," are looking for the wrong thing. There aren't killer applications, but new killer application *platforms* will spawn tremendous innovation, change and economic growth. I've given the primary platform a name—the Network Palette; consider this column the starting gun in a race to build the platform that will power the Internet to its full potential.

### Platforms Are Sneaky

Platforms sneak up on you. They arrive to solve existing problems, but then someone realizes that the technology can be flipped—i.e., put to other purposes, some of which the platform's designers may consider to be heretical. The repercussions can be profound.

Platforms are sneaky in another respect: While a new platform will be hampered by inappropriate underlying technology, ironically, the initial terminals or devices users require to access the platform are often already in their hands. For example, when the Web arrived, many PCs had to be upgraded but the fundamental technology was already there.

But new platforms also often must overcome technical obstacles with some key inventions. In networks, these are often new protocols, or new ways to organize machines or information. Then, once a platform becomes successful, it becomes an underlying element of the next-generation infrastructure.

Successful platforms also kindle the formation of a community that applies its collective creative talents to bring new capabilities to an open platform. This creativity not only develops new applications, but is essential to enable "legacy" operations to continue working on the new platform.

However, inevitably, there will be competing objectives within the community. Since it costs money to develop new platforms, there is a tendency to make them proprietary; however, without open standards and cooperation, it's

unlikely that any platform can attract a critical mass of customers, developers, etc. How well a new technology balances proprietary vs. open interests determines whether it evolves from a "one-off" application or product into a true platform.

Successful new platforms run much faster than the platforms they replace, as measured by the total user experience or by a change in how the user lives or works—e.g., how fast and conveniently I can buy a book on line, rather than how fast a picture of the book downloads to my viewer. Finding current information about a specific distant topic on the Web is much faster than slogging through many phone calls. In this context, faster is almost always better.

So, what are some examples of platforms? Well, cell phones are *not* a platform. Their fundamental purpose is to duplicate wireline phone service using traditional phone numbers, touch pads, along with access to well known features like voice mail. Putting text and Web access into a cell phone's small screen is the start of something different. Having a PDA use the cellular phone network to retrieve and access images and data with no voice component will be a flip that ushers in a new platform, just as putting voice on the Internet is a flip.

### Key Technologies For The New Platform

Clearly something big could happen if we leverage the Internet, cellular phone network and the ubiquitous devices already attached to them. Researchers are doing some crazy things to leverage these ingredients with the existing infrastructure.

**Shifting Data Coherency:** All information applications have an application topology structure, based on a hub-and-spoke model of information flow. Data users connect to servers, which connect to additional back servers. Telephone users connect to big switches that control all features. Efforts to change the hub-and-spoke into a distributed topology have failed because of the seemingly unsolvable problem of trying to maintain complete data coherency among all sites. It's been impossible

to do over a large geographic area like North America due to the long and variable delays among the sites, and it requires a ton of bandwidth to keep all the databases in synch.

The breakthrough idea is *changeable* application topologies—i.e., topologies that are appropriate to each instance of the application and what the users are doing at that time. For example, users on Amazon that are browsing, looking for a specific title, purchasing at the check-out or checking on an order are all interacting with the service in fundamentally different modes that can each be supported by a different application topology. Users looking over an item on eBay are vastly different than the bidding "bots" that come into play in the last 15 minutes of the auction.

In short, data coherency in a distributed model does not have to be completely synchronized in all locations. It does not matter if each user sees the eBay item in slightly different times. It only matters that the "bots" bidding on a specific item see the same information at the same time. As for the bandwidth requirements, they are being addressed by the gigantic strides in higher capacity and reduced costs of optical bandwidth.

**Self-Propagating Applications:** Applications and content will "atomize" into small, self-contained chunks of useful stuff. Several companies are working on automated ways to decompose an application into sections that change as the user moves into various phases of work. XML will be the *lingua franca*—applets will use it to communicate with the platform for support, to get work done and to deliver the product. XML will produce more traffic than HTML, and anything that is bigger than the Web needs to be taken seriously.

When the attributes of an applet can be exchanged with other applets using XML, we can envision self-organizing services. Applets will discover value in other applets—"If you do that for me, I will supply this in exchange." The applets will operate very close to the user where his/her attributes and desires are known.

**Virtual Voice:** Vint Cerf envisions the merging of telephones and the Internet unleashing new ways to interact with both the 'Net and devices on the 'Net. The most important aspect of this integration will

be the ability to, finally, untether ourselves from the slow and cumbersome keyboard. People will talk to the 'Net to get things done.

However, Cerf sees an enormous challenge when the need arises to handle specific situations; for example, when someone on the 'Net is speaking a particular dialect of Russian. One way to get around this is to "home" all users to a personal voice processing agent. The agent will spin into action near the user where it knows a lot about the local conditions like dialect, access method, currency and time, and it will go into use on all calls.

We have put machines between people who are communicating for a long time. The telephone was the first step, and much later we added voice mail to "time-shift" the conversation. We will add more time-shifting aids to human communications; real-time, recent time, recorded time, indexed time and out-of-sequence time will all merge into "virtual" time. We will juggle multiple sessions of multiple media.

#### **The New Network Palette**

Today's smart edge services and technologies are the vanguard of the new Network Palette. But they will flip—they'll evolve from serving as an intermediary that reduces response time across the 'Net and saves upstream bandwidth to providing real-time termination of the connection and become the location where content, voice processing and support aids reside for each local user.

Application developers and users will create totally new ways of communicating using the Network Palette. The days of separate media and one-size-fits-all solutions will be gone.

But many hurdles must be overcome before today's edge infrastructure can emerge as the new Network Palette. First and foremost, a change in attitude is needed: We are in a unique moment in the evolution of networking; bandwidth is a commodity, not a precious resource, and we have to start acting accordingly.

The recent overbuilding of capacity relative to demand is an opportunity (see "Internet Bandwidth: It's Time For Accountability," in the January 2001 issue of *BCR*). Thousands of edge servers are ready

to consume all excess bandwidth overnight. Machines will drive traffic as they communicate among themselves refreshing data, passing user information and announcing new users or new locations of old users. Most of these machine-to-machine bits will never be seen or heard by human beings.

We also need new ways of writing applications that take advantage of the creative abilities within the Network Palette. Developers have to go beyond providing access to old applications on the 'Net, and beyond merely decomposing old applications into their component parts.

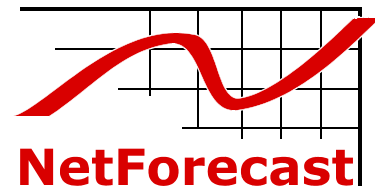
People on the 'Net will be time-shifting between live and virtual connections. Each user will have one—and only one—name by which they get everything. No more separate phone numbers for phone, fax, cell phone, etc. This has long been proposed with solutions that integrate all data about the user in a single, integrated place. That's not the right model—it will happen at many locations on the edge of the network. So, blow up your PBX and your website. You're going to need to get back to

"home base" very infrequently. Service will be local.

The Network Palette is one of the concepts we'll be discussing at the upcoming eBiz Networks Conference in June. The fundamental idea behind the conference is to examine how today's Internet and the emerging networking technologies can evolve into a new platform for global ebusiness communications. Join us for what promises to be an exciting and important industry event.

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