

## A Sea Change in Network Technology Planning

Net Forecasts – Peter J. Sevcik

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Once upon a time, every enterprise had a nice, simple proprietary network, defined and supplied by a single computer vendor. Once you selected from one of the few mainframe or minicomputer players, everything kind of fell in place.

Then came PCs and departmental LANs, and, suddenly, the operative term for the IT infrastructure was: Choices. Although the freedom to choose sounded appealing, it also created enormous chaos, because the fact of the matter was that virtually no enterprise had a single, simple architecture, and virtually no network manager had a comprehensive picture of everything attached to or part of the network infrastructure.

This situation produced boom times for consultants, because there were so many things enterprise managers had to decide: bridging vs. routing, address management, topology discovery, routing algorithms, DHCP, DNS, LAN-WAN interconnection and firewalls. And, as one generation of technologies gave way to the next, the options changed as well: X.25 packet switches, bridges, routers, ATM, back to routers with MPLS.

Today, the network infrastructure scene has calmed down. Technology keeps evolving, but generational "leaps" are few and far between, a point made clear at the November 03 Next Generation Networks Conference in Boston ([www.bcr.com/ngn](http://www.bcr.com/ngn)). Most of the sessions focused on incremental improvements to existing technology; words like "new," "next generation" or "paradigm shift" were rarely heard.

Instead, two of the highest attendee-rated sessions (non-plenary) were "Web Services Security: Protecting Next-Generation Applications" and "Saving Money: New Techniques for Improved Bandwidth Utilization and Performance." In talking about BGP, John Stewart from Juniper Networks summed up this mood during the highest-rated session, "Internet Routing Grows Up: BGP Challenges and Developments" by saying, "The challenge is how to make BGP more robust in an evolutionary, not revolutionary, way."

### New Enterprise Planning Skills Needed

Innovation, of course, will continue. But the notion of wholesale technology replacements is giving way to more measured technology improvements.

Ironically, this makes life even more complex for network planners, because many if not most of the obvious problems are already fixed. The big, simple choices have all been made, as have the big investments. Today's problems are much more subtle and their fixes require careful adjustments rather than big changes to the architecture.

In today's environment, decision-making must follow detailed analysis, a skill sadly lacking in many enterprises. Capabilities for measurement and analysis must be improved, and this also changes how network architects relate to the rest of the organization. Instead of the top-down model, the architects are going to need much more input from more organizations. The architects will have to reach out and learn more about how applications operate, the users' perceptions and business impacts of change. On the one hand, of course, it's not news to declare that "new technology has to help the business," but the goal has become more important than ever. And, truth be told, we're better at declaring allegiance to that goal than achieving it.

### Lessons from Moneyball

So, let me suggest an unconventional source of help: Baseball. The author Michael Lewis shed great insight into how big money operates in his book *Liar's Poker*, and his latest work is called *Moneyball*, a fascinating chronicle of winning strategy is developed under an unfair set of conditions.

Lewis tells the story of Billy Beane, GM of the Oakland Athletics, who decided the "old-fashioned" way of building a team -- sending out scouts who would watch players once or twice and then recommend who be hired -- was a waste of time and money. Beane believed that gut instinct and great plays couldn't match the insight provided by lots of data on the small things a player does -- for example how many times does a player draw a walk? So, Beane brought in statisticians to find

"undiscovered" players who had promise but could be hired on the cheap.

Beane's quest for players who delivered consistent but modest performance rather than out-of-the-park hitters worked. In 2002 the Oakland A's won 103 games with a payroll of \$41.9 million. That same year, the Texas Rangers won 72 games, 31 fewer than the A's, while spending \$106.9 million. I checked the figures again for the 2003 regular season. Oakland spent \$513,409 per game won, fourth from the bottom of major league baseball, but they again made it to the play-offs. My beloved Boston Red Sox also made the playoffs, but it cost them \$1,059,486 per game won. And the Yankees really know how to spend big money, paying \$1,553,945 per win!

A more conventional and comprehensive study of major league baseball salaries was carried out by two economists at Northeastern University, "Team Payroll and Team Performance In Major League Baseball: 1985-2002" by Frederick Wiseman and Sangit Chatterjee. They perform a sophisticated grouping of team salaries by quartile and then five-year averaging and, guess what: Higher-paid teams generally win more games.

However, this averaging approach, like all integrated views, masks the details Billy Bean and others now use to actually win games without much money. This is the same lesson of avoiding the pitfalls of generalizations and averages that I showed in "Web Performance – Not a Simple Number," *BCR*, January 2003, pp. 8-10).

### **Implications for VCs**

By this time you may be thinking that all this baseball talk is nice, but it's January and what's it got to do with telecom/networking? Well, I've had several recent conversations with venture capitalists, all of whom wanted to know how to find the proverbial "next big thing." I advised them to look for innovations that deliver incremental improvements to existing networks, enhance how applications operate or are new applications that can operate on existing networks.

That wasn't what they wanted to hear. They want an idea and team that could "swing for the fences." Clearly, even though they often use baseball analogies, they haven't read *Moneyball*. They don't

have the proper understanding of how to win in a market where Cisco is the equivalent of the Yankees.

It's kind of like how the automobile industry was acting during the mid-1960s. The radical innovations had all been tried, but the car was essentially defined and there were only a few big players remaining in the market. Every once in a while an inventor would unveil some alternative engine and maybe even get it into production, but they never caught on.

But if you look at cars today compared to then, there's been both innovation and a lot of money made making them incrementally better. Gas mileage and safety improved. There are better, more comfortable interiors. Cars are starting have entertainment centers, and there have been other innovations, like fuel injectors, computerized engine control, anti-lock brakes, air bags and integrated communications. Companies made a lot of money supplying these technologies; indeed, there's more product value inside the passenger compartment than under the hood of today's car.

That said, I don't think the kind of innovations that we're likely to see in networking in the coming years are going to sustain the interest of the VC community. Anyone with a good idea about how to improve what's in or on a network should probably try either self-funding or some other privately funded strategy. VCs aren't going to like the small risk-return ratio.

### **Implications for Consultants**

This new reality also changes the role of consultants. Many of the big firms developed their capabilities based on the old model: They review the alternative choices and then decide what is the single best solution. They use a variety of frameworks, like "quadrants" or "reference architectures," to simplify the decision process for the enterprise. And these approaches have proven themselves, particularly when there were many conflicting alternatives from which to choose, and there were substantial risks to the enterprise if the wrong choice was made -- the biggest mistake was investing in a soon-to-be-obsolete or dead-end technology.

But, that's no longer the norm. Enterprises still face choices when it comes to networking, but most of them involve relatively small changes to the current infrastructure. The biggest mistake one can make today is waste money or an opportunity -- to invest in an improvement that doesn't change anything for the better or, worst case, actually hurts performance.

In today's environment, "one-size-fits-all" advice is inherently flawed. Consultants have to begin with a determination of actual state of a client's infrastructure and applications and, from there, begin a constructive dialog about where the firm

wants and needs to go in the future. Don't look for consultants who claim to have answers; look for those that do a good job of asking questions and know how to listen.

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