The Law of Mobility

Russ McGuire
Director of Business Strategy
Sprint Nextel, Inc.
December, 2005

The Law of Mobility

An article on page B1 of the September 22, 2005 issue of the Wall Street Journal began with this observation, "Alan Foster learned about Hurricane Katrina's landfall while watching news channel MSNBC -- on the small color screen of his Sprint cellphone, while waiting for his wife in a shopping mall near Los Angeles." The article went on to report "In the week that followed, he kept tuning into his cellular TV whenever he was away from a TV set. At work, colleagues gathered around his cellphone to watch live television updates on the hurricane's devastating impact."

Anyone who read this article had to ask the question, "Why would anyone want to watch television on a two-inch screen?"

The answer is that Mr. Foster and his co-workers want to watch cellular TV because television has become the latest product to experience "the law of mobility."

How valuable is a two-inch TV with a somewhat jerky frame rate? A fifty-inch flat panel set with HDTV can easily cost $4000 or more. Lower your appetite to a 32" tube set and you're down in the $400 range. If you can settle for a thirteen-inch portable, you're down to $70, and if you're really cheap you can pick up a Sylvania five-inch black and white set with AM/FM radio and interchangeable faceplates from Best Buy for less than $30. That would imply that a two-inch set probably shouldn't cost more than $20.

So, why is Mr. Foster probably paying that much EVERY MONTH for the opportunity to watch his mini set? The key phrase in the WSJ article is "whenever he was away." Mobility exponentially increases the value of any product. That is the essence of the law of mobility.

Over the course of a year, Mr. Foster will pay approximately twelve times the value of a two-inch TV simply because he can watch it anytime and anywhere. I once bought a small portable television thinking that I would then be able to watch shows that I otherwise would've missed. I never took it with me to the mall. I never took it to work. In fact, within a couple of months, I never took it anywhere. Mr. Foster takes his two-inch television everywhere. He has it with him all the time. Anytime he has a few minutes that otherwise would be wasted, he can pull out his television and get caught up on the latest news.

Why is this true? Because his television has been built into a device that Mr. Foster carries with him nearly all the time and everywhere he goes – his cellphone. This simple reality makes this otherwise tiny excuse of a television many times more valuable than anyone would have ever imagined.

Mobilized Products

I mentioned that the television is only the latest product to experience the law of mobility. A growing list of mobilized products enjoy the increased value promised by this nascent reality. Camera phones and mobile e-mail are two of the most prominent examples.

Think about the cameraphone. The Samsung model A560 is very similar to the Samsung model PM-A740 cameraphone, except that the A560 doesn't have a camera. The PM-A740 has a $60 higher list price. Being able to send photos from the cameraphone also requires a data plan that's likely in the $10/month range, so the first year cost of adding a camera to your phone can easily exceed $150. That must be a valuable camera!

Back at Best Buy, with $150 I can buy the Fuji FinePix A345 digital camera with 10.8x zoom and picture resolution up to 2304x1728 pixels. The Samsung cameraphone doesn't zoom and only takes pictures at 640x480. Best Buy doesn't carry digital cameras with those lowly specs, but WalMart offers a Vivitar camera with similar specs plus a flash for less than $20.

But all of us with cameraphones understand why they are worth many times the value that the quality of the product would imply. Cameraphones are valuable because you have a camera with you all the time and everywhere you go. Everytime I capture a photo (even with poor resolution) of an event that otherwise would have been lost, I experience the law of mobility.

Every Blackberry addict fully understands the law of mobility. Does mobile e-mail offer the richness of Outlook or Notes on the desktop? No. And yet we are willing to pay a premium so that we can access our e-mail in every otherwise-wasted moment everywhere we go.

What are the implications of the law of mobility on the telecom industry? Quite simply that mobility will be built into every product and every process, and that mobility will rely on mobile and fixed telecom networks.

Three Laws

The phrase "the law of mobility" probably brings to mind other technology "laws" such as Moore's Law and Metcalfe's Law. It's worthwhile to consider these historical examples.

Moore's Law

**Power** (vertical axis) vs **Time** (horizontal axis)
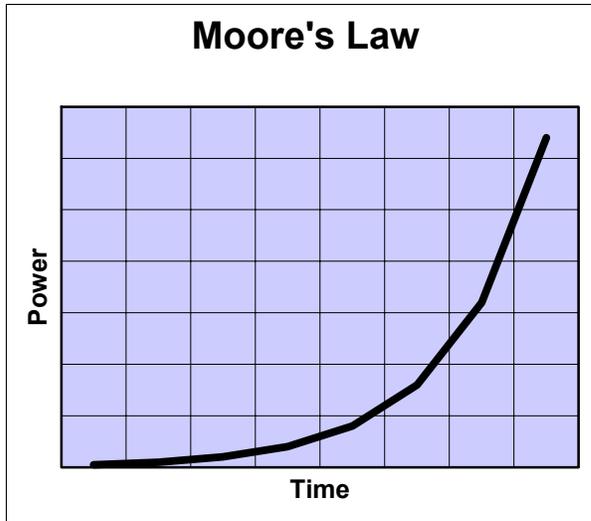
Moore's Law predicted that the effective cost of computing power would be cut in half every couple of years. The most obvious impact of Moore's Law has been the introduction and mass adoption of personal computers. Moore's Law effectively predicted that there would come a time when it would make economic sense for computing power to move out of the data center and onto the desktop. Once that moment occurred, PCs exploded onto the scene in homes and offices around the world. Moore's Law hasn't stopped, resulting in computing power being built into virtually every kind of product with the power to feed a microprocessor from $2 toys to $60,000 cars and every kind of item in between.

Metcalfe's Law

Value (vertical axis) vs **Users** (horizontal axis)
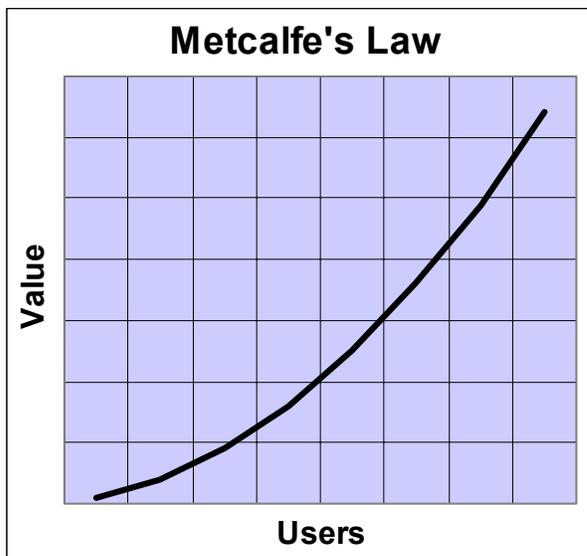
Metcalfe's Law observed that the value of a network is exponentially related to the number of users of that network. The most obvious impact of Metcalfe's Law has been the emergence of the Internet. This global network plugged away in obscurity until a moment in the mid-1990s when suddenly the number of users of the network translated into value in the network that outweighed the cost and trouble of implementing it. From that moment forward, a chain reaction of exploding value rapidly resulted in it being unimaginable for individuals or businesses to not be connected to the Internet. The Internet is now being built into a vast array of products, anything that has information that could be shared or that would benefit from information beyond it, including games, telephones, televisions, encyclopedias, magazines, maps, utility meters, cameras, and watches.

McGuire's Law

Value vs **% Time Available**
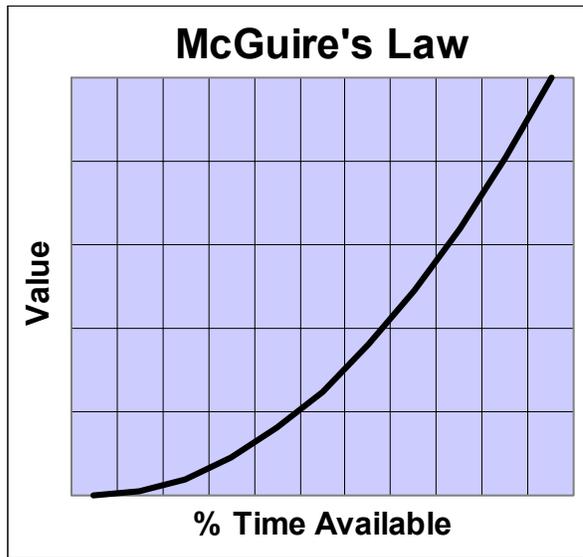
The Law of Mobility observes that the value of a product increases with mobility. However, until recently, the cost of adding mobility to any product has outweighed that increased value. A simple measure of mobility is the percent of time that the product is available for your use. Thanks to a combination of Moore's Law, scalability resulting from Metcalfe's Law, device convergence, and the increasing ubiquity of 3G wireless networks, the cost of making any product (especially one involving information) available all the time is plummeting. Therefore, just as computing power and the Internet have been built into virtually every product, mobility is beginning to be built into every product.

Power and Danger

The implications for business customers are also significant. Again, it's worth considering the impact that the PC era, predicted by Moore's Law, and the impact that the Internet era, predicted by Metcalfe's Law, had on businesses.

From the mid-1980's to the mid-1990's, business IT activities were dominated by the impact of the PC. On one hand, the PC unleashed tremendous power for businesses. Spreadsheets enabled every employee to quickly perform complex financial analysis. Word processing and even early forms of e-mail greatly accelerated and improved internal communications. In short, the PC allowed businesses to make better decisions faster and communicate those decisions more clearly and broadly.

However, the PC also introduced tremendous danger to businesses, and especially to IT departments. Critical company information could easily be lost due to a hardware failure, malicious software, or simple human error. IT budgets exploded with increased capital spending for rapidly evolving hardware and software and the staffing of armies of desktop support personnel. As information became decentralized and open to easy analysis from multiple angles, counter-productive political battles were armed with carefully selected and creatively presented "facts."

The Internet era similarly resulted in IT scrambles to capture the power and manage the danger of this new technology. From the mid-1990's to today, IT departments have been consumed with the implications of the global connectivity of information.

The Internet unleashed tremendous power through increased velocity of information flow through and between companies. Power was also released through the use of the web browser as a universal user interface and the ability to access applications and data from any location with an IP address. The dangers of the Internet to business are similarly well documented and well understood.

We are already beginning to see business IT departments wrestle with the power and danger of mobility. It's reasonable to guess that the next ten years will be dominated by these opportunities and challenges.

Telecom Opportunity

The telecom industry needs to partner with our business customers to help them capture the power of mobility. We must provide ubiquitous mobile broadband services so that anyplace can be a workplace. We must deliver on the promises of network convergence so that our customers can focus on their business while counting on voice+data and fixed+mobile networks to simply work together. We must enable business applications to leverage identity, location, and presence information to operate with meaningful context and with appropriate security.

We must help businesses become mobile businesses so that they can grow into new markets and drive efficiencies into their operations. The service providers that help business customers capture the power and manage the danger of mobility will capture inordinate value.

Arguably, the biggest winner in the PC era was Microsoft. DOS and then Windows provided a standard platform on which businesses could deploy multiple value-creating applications. By providing a standard platform that could be deployed across the enterprise, Microsoft helped IT departments minimize user training and therefore user error, reduce supply chain and support complexity, and leverage an accelerating pipeline of new applications and tools.

Similarly, the biggest B2B winner in the Internet era arguably was IBM. The eBusiness campaign clearly positioned IBM as the partner businesses could trust to capture the power of the Internet while managing the danger. At the beginning of the Internet era, IBM was a commoditized product company. Today, IBM is a highly valued solutions company.

Who can play a similar role as business customers wrestle with the power and the danger of the mobility era?

Measuring Value

In the mobile industry, the most basic measure of value creation is ARPU – average monthly revenue per user. Customers' willingness to pay for mobile services is a reliable proxy for how much value those services are perceived to create. Across the industry, ARPU has been relatively flat throughout this decade, staying in the $50-$52 range. However, two carriers have had significantly higher ARPU than their peers – Nextel and Sprint (now combined as Sprint). The outperformance of these two companies can be directly attributed to their ability to leverage the Law of Mobility in combination with Metcalfe's Law (for Nextel) and Moore's Law (for Sprint).

Arguably, all mobile companies are benefiting from the Law of Mobility. As mentioned above, the industry average ARPU for mobile service is about $50. The industry average monthly revenue per residential phone line is about $32. Given that a single residential phone line typically has multiple telephone handsets connected to it, used by multiple people, this probably translates to an ARPU in the $15 range. Therefore, as expected, mobile telephone service creates a multiple of value relative to fixed telephone service.
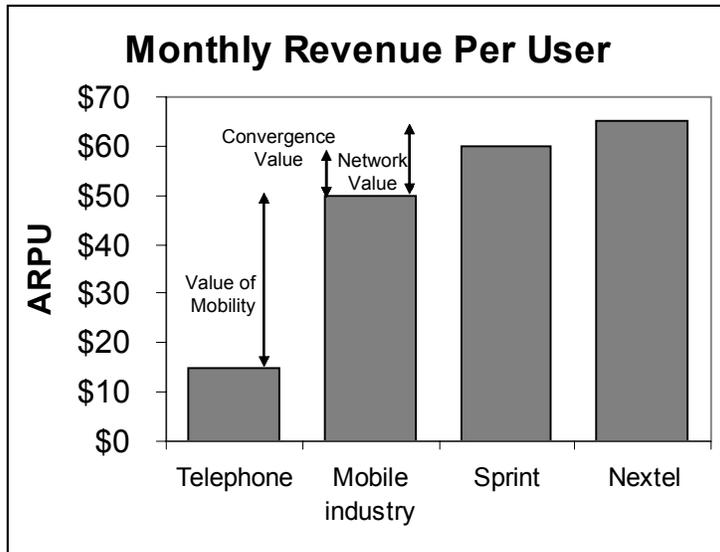
- Nextel
  - Metcalfe's Law
    - +
  - Law of Mobility

- Sprint
  - Moore's Law
    - +
  - Law of Mobility

- Sprint Nextel
  - Metcalfe's Law
    - +
  - Moore's Law
    - +
  - Law of Mobility

However, Sprint has been able to command an even higher multiple, with ARPU in the neighborhood of $60 – a 20% premium over the industry average. Sprint has clearly communicated that much of this ARPU lift is attributable to data services. Sprint has led the industry in introducing devices and services that combine the power of Moore's Law (computing power in the handset translating into valuable features for customers) with the power of the Law of Mobility.

Nextel has been able to command yet a higher multiple, with ARPU typically in the $65 - $70 range – a 30%+ premium over the industry. Industry observers attribute this premium to Nextel's DirectConnect push-to-talk service. Highly productive ecosystems have been built within specific industries using the Nextel service. Because Nextel's push-to-talk service has been built on proprietary technology, these have been closed networks. Once these networks reached critical mass, anyone wanting to participate in the ecosystem was highly incented to become a Nextel customer in order to connect with others using the DirectConnect network. This is classic Metcalfe's Law economics being borne out in real-world performance.

Those of us at the combined Sprint have the enviable challenge/opportunity of determining how to leverage these strong starting points to win the industry race to the applications that can combine the power of Moore's Law, Metcalfe's Law, and the Law of Mobility to create unique value for our customers. How can we reach the Alan Fosters of the world in yet unimagined ways that translate mobility into real value?

Stay tuned! I'm sure we'll watch the mystery and drama play out together.

http://www.sprint.com/whitepapers/index.jsp