



ALLEGIS CAPITAL QUARTERLY

Tracing the Web's Trajectory:

Mutating, shape-shifting and changing everything in its path

By Paul Saffo, Director, Institute for the Future

The Web is a shape-shifter. It is not so much maturing as it is mutating into a new form, driven by the relentless advance of underlying technologies and exponential growth in the population touched by the internet. The economist Joseph Schumpeter's elegant concept of "Creative Destruction" was both misused and overused during the dot.com bubble but it nonetheless describes precisely what the Web will be for at least the next decade: an expanding, complexifying environment in constant change and turmoil, punctuated by a wild and exuberant species radiation of business models, user experiences and technological forms. We are going through the Cambrian explosion of cyberspace, and like the Cambrian explosion 4.5 million years ago, most of these novelties will go extinct as quickly as they arrive, but the minority that survive will have a disproportionate impact on the shape of the Web to come.

Media is the organizing principle. The Web's growth seems as predictable as tracing the airborne fragments fleeing out from an explosion, but fortunately there is a larger organizing principle: the Web is at the center of an emergent Personal Media revolution in the same way TV in the 1950s was at the center of the Mass Media revolution that shaped the latter half of the 20th

Century. Mark Twain once observed that history doesn't repeat itself, but it often rhymes, and thus comparing today's events with the earlier mass media order offers a powerful way to order the Web's trajectory, even if it doesn't quite rhyme.

From Mass Media to Personal Media

	MASS MEDIA	PERSONAL MEDIA
Dominant Medium	TV	The Web
Location	Living Room	Everywhere
Experience	Watch Consume	Participate/Create
Players	Few and Large	Many and Small
Business models	Product/Service	Subscription (and more)

One-way to two-way. Mass Media delivered the world to our TVs, but it was a one-way trip — all we could do was press our nose against the glass and watch. In contrast, Personal Media is a two-way trip and we not only can, but also *expect* to be able to answer back. Blogging, chat groups and adding comments to online articles are obvious examples, but just the beginning. There is a deep collective desire to be heard. Thus we will see rapid innovations around clever new ways to scratch this itch, including new kinds of group discussions, new forms of betting, and new forms of news aggregators using blogs as informal stringers. This of course is where Schumpeterian creative destruction comes in, as established media incumbents like newspapers, magazine publishers, and broadcasters

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The Web is a shape-shifter, relentlessly mutating.

will stumble over the shift to two-way and leave the field open to entry by new challengers.

Location, location, location. Just as mass media came only to our living rooms, cyberspace and the Web originally came only to our desktops. 802.11 and other wireless conduits are changing this, and thus a key trait of Personal Media is that it will increasingly arrive *everywhere*. In fact, within the decade, mobile access to the Web will be much greater than desktop access, and this will deeply transform the Web, creating important new startup opportunities.

Add GPS, Geographic Information Systems (GIS) and other location technologies that give our devices position awareness and things get very interesting. One obvious short-term innovation is location-based marketing — geo-spam on our cell phones from companies that know where we are and are trying to entice us into their shops. But consider how mobile connectivity and location awareness affect incumbents like Google, whose push into mapping and more recently free 802 wireless come into sharp focus in a new world of geo-search. Looking for a Starbucks in San Francisco? Just tap your handheld device to call up a photo-map centered on your location, displaying all the local Starbucks, and then as you roll your cursor/stylus over the rooftops, the names of the other businesses

appear. Then tap the roof of one and that business's webpage comes up.

Of course wireless geo-search is just the tip of the iceberg, and while it may well make Google even richer, other more exotic applications wait in the wings. For a hint of future mainstream applications, look to today's niche passions. Geocaching is a popular nerd-hobby where users track down hidden treasures with GPS units; look for new sport applications of continuous-connection wireless. Dodgeball.com, off and running in several cities, is but the first applications to come that will connect web-users with not just things and shops, but *people* as well. Where twenty-somethings are using Dodgeball to track cute friends who they have a crush on today, future services built around similar models one day may connect business travelers in unfamiliar cities in the future.

And once your phone or handheld knows where you are and is in constant touch, the possibilities for new and stranger applications is endless. Instead of leaving a voicemail at a phone number, how about leaving it at a location like a virtual Post-it instead? Need to give a hiker friend directions? Then leave a voicemail for them at a trail intersection, and as they approach, their handset flashes, telling them to have a listen. Or leave a message for anyone who approaches the spot where the message was left,

perhaps pointing out a particularly nice view, or warning about a hazard ahead. This idea has yet to appear in an actual product, but similar ideas are in the wind: Ricoh has introduced a digital camera with a built-in GPS unit that tags every shot taken with spatial coordinates. A traveler thus can load their vacation shots on a computer or webpage and the pictures automatically sort themselves out by location. Instead of flipping through your shots, imagine simply clicking on an interactive map to view your photos.

In the longer term, using wireless to bring the Web everywhere does much, much more than just creating a few new startup opportunities. Combine wireless connectivity with position awareness, GIS and other sensor technologies, and it is obvious that the symbolic world of cyberspace and the "real" (physical) world will deeply intertwine. In a decade or so, we will take it for granted that there is an invisible cyberspace overlay atop everything we see in the physical world, and we will count on that overlay to help us navigate through life.

The reverse notion of the physical world penetrating into cyberspace is a bit stranger, but it is already happening. The US military routinely fuses the datastreams from objects moving in the physical world (like helicopters) into virtual simulation environments, and the fusion is so complete that the operator on the simulator often doesn't know whether the helo on their screen is purely electronic or linked to an actual craft. As the physical world intrudes into cyberspace, count on some big surprises that translate into compelling new commercial ideas.

Business models: from Product to Subscription.

Obviously, the Web's evolution will have a huge impact on business models and in more than one dimension. But one aspect is especially interesting. The seemingly tired 1980s notion of the "service economy" may come to pass in surprising ways as the Web enabled a transformation of products into services. An example from the recent past, white goods manufacturer Electrolux teamed up with the Swedish power company Vattenfalls in a test on the island of Gottland to offer web-enabled washer/dryer combos to apartment dwellers. Title to the appliances remained with the company and the

customer was charged every time they ran a load of laundry, and the charge appeared on their electric bill.

This is more than a mere shift from product to service; it is a shift from product to *subscription*. The customer isn't buying a washer; they aren't even renting a washer — instead they are *subscribing* to a new way of getting clean clothes. Another web-enabled example of this trend is CityCar and the other car-share startups. Instead of buying a car or renting a car, one subscribes to a car through a service that combines the best features of renting and owning without the downsides. The customer gets convenient use of a car when needed without having to maintain a hunk of metal in their garage, deal with mechanics or trot down to the rental counter.

From the few and the large to the many and the small. The shift from mass to personal inevitably translates into big changes in market structures. Historically, new markets are filled with a myriad of small players. Then as the market matures, consolidation occurs until finally a few huge businesses remain, dominating the space. During the dot.com bubble, it became clear that the internet was giving new muscle to small players.

Visionaries spoke of a new economy that would never be dominated by big players.

Obviously this never happened, but we also are not repeating the old big-player structure of the mass media age. We have replaced the big company monoculture with a new creator-centric business ecology in which the success of the big players is directly dependent on the participation and good will of multitudes of small players. eBay is a particularly dramatic example, as both its size and success is built upon a vast network of small sellers from casual members offering the odd piece of garage junk to full-time "PowerSellers" making a living off of eBay transactions.

Other web-based companies are dependent on the many and the small to varying degrees. Amazon depends on user reviews as a key part of its model. Virtual world providers depend on users to create the spaces that attract other

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"We have replaced the big company monoculture with a new creator-centric business ecology."

Bob Ackerman on Entrepreneurs Foundation

“The goal of the Entrepreneurs Foundation is to encourage corporate involvement in communities and in charitable activity for small companies, start-ups, and the venture capital community.”

Small entrepreneurial companies usually feel that they lack both the time and resources to think much about community involvement. But about seven years ago a remarkable new organization was formed designed to make it both easy and logical for entrepreneurs to take a fresh look at getting involved. Allegis Capital shares the belief of the Entrepreneurs Foundation (efbayarea.org) in the benefits of community involvement and Allegis is an active participant in EF. We spoke with Allegis' Managing Director, Bob Ackerman, a member of EF's Board of Directors to learn more.

What exactly is Entrepreneurs Foundation? Entrepreneurs Foundation is a nonprofit organization that engages venture-backed companies in corporate citizenship and philanthropic efforts so that new resources are generated for community benefit. EF assists private companies in the formation of philanthropic foundations through equity donations. The Foundation also assists companies by engaging their employees in community benefit programs. We work with emerging companies to develop a culture of community support. Recognizing the time and resource constraints typical of young companies, we help companies develop community involvement activities, which match their own corporate culture and interests with the most appropriate local community organizations.

How do companies get involved with Entrepreneurs Foundation? Pre-public companies can join EF by making an equity grant that does two things. It is used to set up a community foundation and part of the equity is earmarked to cover the support and management services provided by EF. Once the grant is made, EF works closely with each company to develop and implement the kind of community benefit programs most appropriate for its particular stage of development. Successful community involvement pro-

grams generally include employee volunteerism, corporate giving, and corporate citizenship “best practices.” When a liquidity event for the private company occurs, proceeds of the equity grant are available for charitable distribution as advised by the company. To date, over \$3.5M has been distributed to charitable organizations and over 10,000 employees of venture-backed companies have become involved in community benefit programs. Additionally, private stock donated from hundreds of member companies will someday become liquid, enabling further, substantial charitable donations.

How do venture capitalists engage with EF?

Venture capitalists are critical to EF's success as they help to make introductions to their portfolio companies. Because companies join EF with an equity grant, venture capitalist support is crucial given that we serve as members of the companies' boards of directors, which must approve the equity grants.

How can I get involved as a company if we are not headquartered in the Bay Area? In addition to EF Bay Area, there are currently seven affiliated branches of Entrepreneurs Foundation with locations in Atlanta, Austin, Boston, Dallas, Honolulu, Portland and Tel Aviv.

How do companies benefit from their involvement with EF? Companies that integrate corporate citizenship and philanthropic programs into the fabric of the corporate culture have enhanced public reputations, stronger employee teams due to higher morale and retention, and they gain the respect of their customers and suppliers. Corporate citizenship is becoming a must do rather than a nice to do in our competitive economy. Employees value these programs because they want to work for a company with solid values and a positive culture. Additionally, many investors are more inclined to purchase the stock of public companies that have philan-

thropic and community involvement programs.

How is EF working with the NVCA? Entrepreneurs Foundation (EF) has also recently formed a partnership with the National Venture Capital Association (NVCA) to promote corporate citizenship at venture capital firms and the emerging companies in which they invest. Together, the organizations will work to engage venture capitalists and their venture-backed companies in philanthropic and corporate community involvement efforts. HP, Cisco, Adobe and other large successful companies have realized the important value of their corporate citizenship programs.

How can venture capitalists who like the EF concept get their portfolio companies involved?

It is as simple as facilitating an introduction between the Entrepreneurs Foundation and one of your portfolio company CEO's. If you are interested in engaging with EF as a venture capitalist or as a company, please contact Diane Solinger at dsolinger@efbayarea.org or (408) 616-4271.

Of the Allegis portfolio what companies have engaged with EF? Four of the Allegis Capital portfolio companies located in the Bay Area are partnered with Entrepreneurs Foundation: IronPort Systems, LGC Wireless, Netcell and PacketDesign. LGC Wireless joined Entrepreneurs Foundation in 1999 and was the winner of EF's 2005 Impact award. LGC Wireless partners with nonprofit organizations such as Second Harvest Food Bank, Resource Area for Teaching (RAFT) & Family Giving Tree.

The company has contributed money towards various efforts including the recent Asian tsunami disaster, Hurricane Katrina and helps to facilitate employee matching programs. The company continues to demonstrate an active commitment to the community on a daily basis. "LGC Wireless has consistently included the community as a stakeholder in the company's success. Our community can count on LGC Wireless to care and give back" stated Diane Solinger, executive director of Entrepreneurs Foundation. "Our community programs are a testament to the loyalty our employees have for their communities. LGC Wireless has a deep-rooted commitment to the communities where our employees live and work and having our employees recognized for demonstrating that same behavior is a win for us all," said Ian Sugarbroad, President and CEO of LGC Wireless

People who want to learn more about Entrepreneurs Foundation can do so at their upcoming Leadership Summit which will be held on Tuesday morning, November 15th from 7:30 a.m. to 10:00 a.m. at Synopsys headquarters in Mountain View. The 2005 Summit will include a keynote presentation by Aart DeGeus, CEO of Synopsys and a panel discussion with Kevin Francis, CEO of CenterBeam, Jim Steele, President of Salesforce, and Julie Farris, Founder of Scalix. For more information, please contact Dipti Pratt at dpratt@efbayarea.org or (408) 616-4273. ■

"LGC Wireless is an example of a company that has shown deep-rooted commitment to the community through participating in the Entrepreneurs Foundation."

Allegis Portfolio Update

Vernier Networks Vernier Networks closed a \$21M oversubscribed Series E round led by top-tier venture capital fund, Venrock Associates. Venrock's Managing Partner, Ray Rothrock, is joining the Vernier Board of Directors. Vernier's prior investors, Allegis Capital, DCM-Doll Capital Management, Foundation Capital, Masthead Ventures, UV Partners and Weber Capital participated in the round. With an additional \$5M of debt financing raised from Silicon Valley Bank and Gold Hill Capital, the \$26M infusion will be used for strengthening Vernier's distribution channels, enhancing the award-winning Edge Wall platform and expanding Vernier Threat Labs.

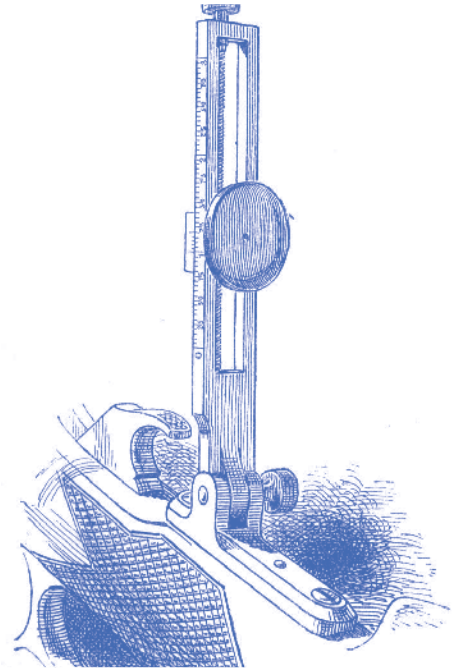
LGC Wireless, Inc. LGC Wireless completed Series B-1 equity financing and raised \$13M. Rembrandt Venture Partners led the round, and nearly all of the existing investors, including Allegis Capital participated in the round. GunnAllen Venture Partners, a new investor, also invested in the round. The company plans to use the funds for general working capital and to continue its expansion of international sales activities. ■

Vernier Networks: Providing Security in a Chaotic World

“Ask any operating system designer if their system is really secure. In order to prevent any I/O from violating borders one has to impose so many border checks that traffic comes to a halt.”

If you look up “vernier,” Microsoft’s spellchecker refuses to believe the word exists. The great British pharmacist, Roget (yes, he was British, despite the name), thinks otherwise: Vernier is the name of a 17th century French mathematician inventor of a precision scale that is still widely used in a wide array of measuring instruments today. If you Google “vernier,” you’ll see that some people credit this invention to one Pedro Nunes (Nonius in Latin), a Portuguese astronomer. As a result, a “vernier” is sometimes called a “nonius” in languages such as German or Dutch. Vernier sounds much better for a network security company, it evokes precision, fine readings — and nonius.com was taken anyway.

Securing networks has given rise to much imagery ranging from Aegean stables to boiling the ocean. What we call interchangeably the Web or the internet started as a network for academics, built on trust and open exchange of information. Similarly, personal computers were not architected for today’s broadband communication. Some argue the problem is they were not architected at all; they were just endlessly debugged into existence, microprocessors included. The counter argument is that no “correct” architecture has been commercially successful yet -- no processor, no operating system, no programming language. Performance suffers, at least in commercial comparison with designs that cut corners to improve speed. Ask any operating system designer if their system is actually secure. In order to prevent any task, any reference to a memory location, any I/O from violating borders one has to impose so many border checks that traffic comes to a halt. This said, there is such a thing as sloppiness, inexperience or stubbornness.



Vernier's namesake, Paul Vernier, a renowned 17th century mathematician, created a system used in precision instruments to this day.

We recall a certain “operating system” where every program had full control of the hardware and where the beautiful graphics were fast because there were no boundary checks. Even as this particular OS matured into something far more sophisticated and robust, it is still known for being less infected than the dominant OS.

Then, not so long ago, the dream of wireless Ethernet became a reality available at Fry’s, Radio Shack, and Wal-Mart. For about \$100, one could buy a radio device, called an access point, to plug into my home network and exchange wireless IP packets with my laptop equipped with the right PC card. Marketers saw this was good and christened the wireless 802.11 protocol as WiFi, laptops soon got an integrated WiFi device and now, from one’s home, one can see a

dozen access points in the neighborhood. Further, access points being inexpensive and easy (well, sometimes) to install, white collar workers did what they did with personal computers when corporations were still wondering about buying one per person, they walked them in through the back door. Soon, maverick access points were grafted onto corporate networks for the ease of use (and the amusement) of the people and the fear and annoyance of the IT organizations. I have personal knowledge of a once leading networking company where workers sometimes pulled in the parking lot to log onto their WiFi access point and retrieve the documents they needed for their Monday morning presentation. No one got fired, not the enterprising networker nor the IT manager.

Enter Vernier, originally founded to rein in wireless networking, automatically detecting access points, rogue or not, and interposing a login and password between client connected to the access point and the network itself. Of course, if you're technical enough and have enough time on your hands, you can collect the MAC addresses of the clients you'll let in (MAC addresses are the unique factory "burned in" 24 digit hexadecimal IDs of the network interfaces, something like 00-0E-7B-5D-53-91, yielding 16 to the 24th power possible addresses, which is close to 8 followed by 28 zeros, which is about 100 billion times more than the address space of a 64 bit computer). Then, you program the access points to accept only the blessed MAC addresses and, voilà, your network is safe. But this example precisely shows why an appliance that catches and controls access points is "safe and effective." No need to collect MAC addresses, no need to program access points one by one, no need to worry about the ones you don't know about, no need to note the MAC addresses of new laptops and run around updating access points or dealing with complaints from BYO (Bring Your Own) coworkers left at the networks door, one appliance secures the network. No running around, just issue logins and passwords, or centrally deny the use of an unapproved access point, or get nice tickets to Sunday's game. Vernier has made these inexpensive access points both useable almost at will and secure, logins and passwords being

updated centrally.

From these auspicious beginnings Vernier has evolved into a more ambitious enterprise helping businesses enforce security policies at the network edge. To clarify what we mean by network edge, let's return to the neighborhood access points in our town. Let's say I'm connected to my corporate network through a VPN, a Virtual Private Network. This is a device (software, hardware or both) that lets me in with a login/password combination and encrypts the otherwise open communication between my laptop at home and the corporate network. So, we're safe, I think. Perhaps, but we need one more assumption: no one has penetrated my WiFi network at home and gained control of my computer, logged password and sneaked into our servers through the VPN. Enforcing security policies at the edge means here the Vernier appliance, now called EdgeWall, gains control and monitors my access point. As a result, an unencrypted access point will be detected and repudiated or an additional login/password will be interposed.

Having gained such control of the edge, the Vernier appliance can monitor traffic, scan for worms and viruses, check and enforce usage rights. For example, prohibit exchange or storage of entertainment content on or through the corporate network, no BitTorrent on company machines.

Today, Vernier offers a pleasant way to balance the need for easy access and the need for security. Here, "pleasant" translates into effective: even though security ultimately relies on the care and discipline of humans, easier-to-use security tools are going to be used more often. Last but not least, Vernier is today the only competitor in the security field to offer its security policies enforcement tools as an appliance that looks to the rest of the network as another switch. As a result of Vernier's product and marketing progress, Simon Khalaf, Vernier's CEO, an industry veteran from Volera and Novell, closed a \$21 million oversubscribed round led by Venrock Associates, with participation of existing investors Foundation Capital, DCM-Doll Capital Management, our firm Allegis Capital, UV Partners, Masthead Ventures and Weber Capital. Deloitte and Touche named Vernier a 2005 Technology Fast 50 Company. ■

"Vernier understands that easier-to-use security tools are going to be more effective than those that are difficult."

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players and their dollars. Social software companies like LinkedIn and others depend on members to bring in other members while photo sites like Flickr rely on the traffic of group viewing as a core part of their model. But these examples barely scratch the surface of what is possible, particularly as the Web matures, and it is clear that accounting for the new role of user-creators is a key part of emergent new business opportunities.

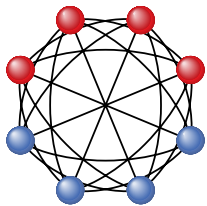
From Consumer to Creator. The advertising potency of the mass media world of TV led to a retail revolution that not only turned us all into consumers, but also made consumers the most important players in sustaining the economy. The message to viewers was very much one of shut up and watch — and then go buy what you see. Consumption remains hugely important today, but the two-way nature of personal media is turning once-passive consumers into active creators as well.

Blogs are but the most prosaic indicator of this trend, with more interesting examples elsewhere. Once upon a time, encyclopedias were written by professional writers and editors; today they are created by amateurs logging into wikis like Wikipedia. Consider also

the massively multiplayer role-playing startup, Second Life. Second Life is an online environment where members can hang out, socialize, buy and sell things, and also create their own virtual spaces. And create they do: according to the company, Second Life's members account for over 40,000 user-hours per day, and 30 percent of that time is spent creating! Places to live, places to shop. They are even creating new brands; one brand, "Pixel Dolls" has a level of brand recognition that would make a Madison Avenue type faint with envy!

As the Web evolves, new businesses that account for the rise of consumer as creator will discover important new markets. But the implications for society in the long run are even more dramatic. Richard Florida has noted the rise of the "creative class" as crucial to the health of economies, but this may just be the beginning of an even more profound shift from consumer to creator as the fundamental unit driving the new economy. Considering the huge impact of the rise of the consumer class in and after the 1950s, any web-fueled shift towards a world of creators could present breath-taking surprises — and may in the long run be the single largest impact of the Web's emergence. ■

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Allegis Capital invests in early stage companies developing enabling technology and infrastructure to serve emerging information technology markets.

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