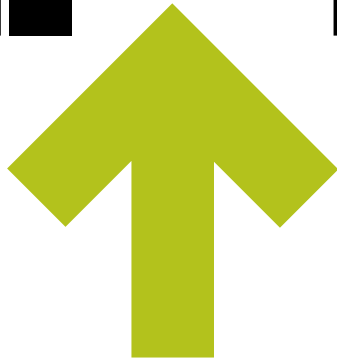


THE SHIFT



THE EVOLVING MARKET, PLAYERS AND
BUSINESS MODELS IN A **2.0** WORLD

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PROLOGUE

THE END

OF THE WORLD WIDE
WEB AS WE KNOW IT



> IN 1999 I (ALLISON) WAS EMPLOYED BY ONE OF THE LARGEST

service providers in the United States, marketing a service that was in its infancy at the time: Digital Subscriber Line. I recall sitting in several meetings where we held vigorous debates over how to best market this new flavor of telecom alphabet soup—DSL—to the masses. We were eager, yet cautious, about its potential. If successful, this service could give us a new revenue stream not seen since the days of dial-up. At the same time, many couldn't help but wonder if it would ever really take off. After all, we lived in a world where email remained the proverbial “killer app” of the Internet. Why would anyone need, yet alone *pay for*, faster Internet speeds when the 56K modem was perfectly adept at navigating a virtual world largely defined by text?

Ten years later I found myself at a different, and much smaller, regional service provider. And again I sat in a healthy debate about the company's broadband service. Only this time we weren't contemplating if anyone would actually pay for faster Internet speeds; instead we were asking ourselves how we could afford to continue with the flat-rate broadband retail pricing popularized in the 1990s. Our issue was no longer in attracting new customers to the network. We found ourselves in a much more difficult position: How could we keep pace with our customers' usage when the traffic consumed on the network was growing

at a rate faster than anyone could have anticipated? The debate around the table—and the landscape around us—had changed radically in the past decade. What happened? How did we get here? Just a couple of landmark moments in broadband history show us a hint of the answer:

In February 2005, three unknown former PayPal employees took a quantum leap forward in revolutionizing the Web as users knew it. What started as an obscure video-sharing site marked the shift toward a Brave New Web World. A scant 21 months later, the phenomenon now ubiquitously known as YouTube would sell to powerhouse Google for an astounding \$1.65 billion. Less than 2 years later, the site added one more coup to its meteoric ascent as a Web 2.0 heavyweight, displacing Yahoo! as the second most popular search engine worldwide.

This certainly wasn't the first time in history an unknown web fledgling would command a premium on the market. The "superhighway" was littered with investments in start-ups. But this was different. YouTube wasn't just any web start-up. It sat at the crossroads of two game-changing web trends: the proliferation of user-generated content married with bandwidth-hungry video distribution. The result was a seismic shift that rippled far beyond user behavior to impact the underlying broadband networks strangled beneath the weight of exponential data usage almost overnight.

Fast-forward to another historic date in broadband history: June 29, 2007. On this date, hundreds of curious consumers lined up at retail stores across the United States to get a glimpse of the newest device to hit the mobile scene: the Apple iPhone. Mobile phones come and go. But there was something special and much anticipated about the iPhone's debut. A phone with no keyboard, no complicated owner's manual and no obtrusive user interface had been the product of pipe dreams. If any company could deliver on these wildly ambitious promises, it was Apple. And those eager consumers who waited patiently in long lines for the next wireless "it" device would not be disappointed. Within a few months of launch, the iPhone was home to thousands of third-party applications that produced a ten-fold increase in traffic consumed by users. If YouTube had revolutionized the Web from a one-way, text-laden experience to a fully immersive multimedia playground, the iPhone had upped the ante and rocked

the wireless world with new business models directed at a burgeoning developer community. The Web 2.0 shift had moved from wireline to wireless networks, indelibly changing the broadband landscape once again.

Quite simply and subtly, the consumer had become the producer. Few could have anticipated such a radical shift back in the 1990s when broadband first reached critical mass. In a Web 1.0 world, the consumer is just that—the beneficiary of content provided by others. A Web 1.0 world is characterized by professional content providers creating a one-way communication path to consumers. Download speed reigns supreme. Text-rich environments are the norm. And consumers are happy simply to digest media and content made available to them by others.

Web 2.0 changed everything. With greater ease, more attractive pricing, and higher quality than ever, consumers became equipped to produce their own content. The digitization of everything from cameras to cost-effective storage made every user a potential cinematographer, paparazzo, or artist. Further, always-on broadband networks delivering speeds once reserved for the enterprise power user and available at mass-market pricing fanned the flames of growth. For the first time, consumers were given a voice. And that voice would be heard. Without making professionally generated media extinct, user-generated content created a new forum of expression. Blogging, podcasting, social networking, texting, and crowdcasting all changed the landscape from a one-way communication aimed at the masses to a two-way conversation of millions. The proliferation of content produced and consumed would spawn a new generation of bandwidth-insatiable “Millennials,” who would literally grow up in this online, immersive world.

THE EXAFLOOD COMETH?

The traffic explosion born on the wireline network, and quickly replicated on the wireless front, had prognosticators spinning. Soon there was talk of a new wave in the broadband industry, coined the “exaflood” phenomenon. The question was simple: How much exponential traffic could the network sustain given incremental increases in bandwidth over such a short time frame? The question

was not grounded in profitability as an end pursuit; rather, it contemplated the physical capacity constraints of underlying broadband networks.

While capacity planning is certainly important, a more fundamental question was on the table: Who would continue to invest in networks crippled by a seemingly insatiable broadband appetite? Look to history for the obvious answer. Broadband networks are the product of billions of dollars invested by service providers. For years, AT&T, Verizon, Comcast, Time Warner, Sprint, and their communications ilk poured money into fatter and faster pipes for end users. We witnessed broadband speeds accelerate from a paltry 768 kilobits per second (still over twelve times faster than the fastest dial-up service) to well over 10 megabits per second. Simultaneously, wireless morphed from a voice-driven luxury reserved for the enterprise employee or safety-conscious consumer to an entertainment and communications necessity for the masses. And, at the time of this writing, a new FCC administration under Chairman Julius Genachowski has issued an industry call-to-arms to equip 100 million US households with 100 megabits per second over the next 10 years.

Where do we go from here? Some would argue that the service providers that have invested in these networks simply must continue to do so. After all, they benefit from subscription-based revenues paid directly by end users for the privilege of access. But, if these service providers must continue to make investments in networks in the face of escalating broadband traffic and do so with flat, if not declining, retail pricing plans, how can they generate an attractive Return on Investment (ROI) to shareholders? Some point to greater efficiencies in networks themselves, akin to Moore's Law, a trend coined by Intel co-founder Gordon E. Moore all the way back in 1965, which finds computing power doubling roughly every 2 years. Though Moore's Law certainly plays a part in allowing the service providers the benefit of more attractive costs per transported bit, not even it can offset the incremental expense born of an insatiable broadband appetite on the part of end users. And, if there is no compelling reason for these service providers to continue investing, how does the next Facebook or YouTube reach an audience over a network capable of delivering its value?

Some are turning to the broadband cap as one potential answer. Rather than

offer end users a flat-rate, all-you-can-eat, monthly broadband price, cap their usage at a specific allotment per month, after which point the user pays per byte downloaded. The cap places the tax of the network largely on the backs of those consuming it the most. The challenge remaining, however, is two-fold:

- 1 How does a service provider begin re-educating a consumer base on how usage will be billed under this new model? The industry spent the better part of 10 years explaining to the public what download and upload speeds are and why they are important. Even today, with broadband levels reaching saturation, few consumers could intelligently answer what a megabit-per-second rate really provides, though they have been educated that faster is better. Imagine the complexity associated with educating these consumers on what a gigabyte is or how many gigabytes their household consumes in a day, week, or month. Further, how do you empower the consumer—particularly parents—to monitor their household traffic and impose limits on children who could easily digest the monthly cap allotment all on their own? You get the picture. Marketing bits and bytes is complicated. Bandwidth caps add to the complexity.
- 2 Caps are interesting, but temporal. Today's broadband hog is tomorrow's casual user. How does a service provider retain flexibility in adjusting broadband caps dynamically as usage continues to escalate? Yet again, we have added complexity to the system.

Many would argue with us on these points and refer to several successful examples of broadband caps being imposed elsewhere around the world as proof points in their corner. While we certainly agree that other service providers worldwide have successfully transitioned from a flat-rate to usage-based broadband pricing model, we submit that there are other, perhaps better, ways to monetize the incremental traffic load on networks rather than through a purely transactional model between end user and service provider. This shift simply commoditizes gigabytes on the provider network as opposed to megabits per second. Network providers remain a utility through which others provide services and applications with perceived value to the user, and they still fail to establish a richer relationship with consumers and developers that creates enough revenue to cost-justify continued network investment.

If we begin to look at the broadband network and ecosystem fundamentally differently and more broadly, we can discover new business models that go far beyond subscription-based billing between service providers and end users.

THE SHIFT: 1.0 TO 2.0 DIFFERENCES

1.0

One-way communication

Text-laden web environment

Broadband for fixed networks

Flat-rate broadband pricing

Providers aspire to develop the next “killer app”

2.0

Two-way experiences

Video-rich web environment

Broadband across any network

Metered broadband pricing

Ecosystem of developers leveraged to create apps

THE NEED FOR A NEW MODEL

If there is one lesson the iPhone has taught us, it’s the value in exposing intelligence—in this case, through a device—to a broad developer community. iPhone users have much more than just a phone. They are armed with well over 100,000 applications in their arsenal, from the most inane and obscure to the most practical and popular. Consider the power of 100,000+ applications limited to one device that has only reached critical mass in the past 2 years. If one device can create this frenzy, imagine for a moment if intelligence in networks could be exposed in the same way.

Another lesson from the iPhone is the hunger consumers have for being able to do everything they need to do and access all the data, video, communications, social media, and any other imaginable content in a seamless way with a simple interface. Consumers want the content they want, when they want it, and how they want it. With demands like that, even a device like the iPhone fails to deliver completely.

To fill this need, over-the-top competitors take advantage of service gaps between providers, offering point solutions that tie together traditional communications services, video, and social media. Right now, consumers are forced to use these makeshift point solutions to achieve their goal of anytime, anywhere access.

For example, if consumers want to watch video they've purchased on different devices, even with all the options available to them, they must be their own systems integrators. They can load video onto a mobile video device—an iPod or other portable player. They can hook up their PC to their television. They can also watch video from on-demand services, like those from Amazon or Netflix, on the PC or on TV if they have a set-top box or special Internet-equipped DVD player. They can buy Sling hardware or software to watch their TV service while away from home. But not all of the services users have paid for are available across all of the available platforms. A consumer runs into the constraints of the walled gardens offered by their iTunes, Amazon, Netflix, or TV services, and these limits occur even after significant investment in subscription fees, digital content rights for different platforms, and the cost of devices such as portable digital video devices, specialized set-top boxes, PCs, HDTVs, and more.

What's phenomenal is that despite the complexity of stringing together these different services and devices, many consumers are doing it. They are doing it for video, for communications, and for their social media profiles. They have already decided it is worth their time and their money.

While they may be loyal to a particular device, such as their iPhone or BlackBerry® smartphone or their HDTV, providers who can offer the most seamless experience across platforms and integrate with new media will hold a strong lure with consumers. In a Web 2.0 world, even a device like the iPhone is, in the end, a delivery system for the applications and services that consumers value. A business model that requires systems integration by consumers to derive maximum value isn't working well; yet that's exactly what we have today.

So what role does the network play? Networks are robust in many ways. First, they are device-agnostic. The same network is capable of connecting thousands of varieties of mobile devices, broadband modems, and even set-top boxes with

ease. Second, they are pervasive. They are not constrained by battery challenges that are often the bane of wireless devices, for example. Finally, networks are powerful. From storage to processing power, networks are equipped to handle the load equivalent of thousands of devices. Now, this isn't all to suggest that devices are less important. Quite the contrary. Device intelligence allows the network to provide more capabilities. This is a symbiotic relationship in the ecosystem. When devices become more powerful, so too do networks. And, in the end, the user benefits from a richer experience.

However, this line of thinking does argue that, if one device as a platform can attract thousands of developers, why couldn't a network with capabilities of reaching even more users across even more devices? Here are just a few examples of the intelligence capabilities that could be exposed:

- > Presence, or availability status, of an end user across any device or network type
- > Location of an end user, either exact or approximate, with geofencing capabilities to detect customers entering a particular radius—perhaps within a store's footprint—and impulse coupons sent to the customer's mobile device as a result
- > Profiling of an end user, including what websites he regularly visits, what channels and programs he watches, and the length of time he spends with each type of media. For those consumer advocates reading this, we will continuously emphasize the roles of privacy, security, and permission-based data collection as cornerstones of any business model throughout this book. For now, we will summarize by saying that consumers must remain in control of their profile and explicit opt-in consent must be granted to ensure the user is protected. However, for those willing to offer some data about their habits in exchange for more targeted offers, entertainment or communications options, the benefits are tangible.
- > Quality of Service (QoS), which can optimize an end user's viewing experience by adapting network performance. The Internet has been characterized as a best-effort medium. In other words, an end user's speed can fluctuate depending on network performance. QoS automatically tunes a network to provide better performance—or more horsepower—

when a consumer needs it (for example, when temporarily downloading or streaming a video clip). Imagine this capability on a mobile network, where video transmission can be boosted and content automatically formatted and optimized for consumption through a smaller mobile form factor.

- Storage, which has been popularized by network-based approaches led by Amazon and others. The service provider in this equation offers the capability to distribute this storage closer to the end user. The more distributed the network-based storage of content becomes, the better the end-user experience. Think of it this way: It takes far fewer hops across the network to download a video located closer to the end user. The fewer hops, the faster the transmission. And service providers have strategic storage assets located at the edge of the network, in many cases even extending into the consumer's home.
- Security, which can translate itself in a variety of ways. Perhaps most obviously, the network can create a secure tunnel—or Virtual Private Network (VPN) type of connection for those familiar with enterprise communications—that can be maintained across a single session as a user switches devices.
- Billing, which can manifest itself in the ability, for example, to charge micropayments directly and securely to an end user's service provider bill

In short, this worldview is about exposing capabilities in the network in a managed and controlled way to a broad developer community. We call it “application enablement” in that the network enables smart functionality that delivers greater value to multiple stakeholders in the value chain. Developers benefit from robust network capabilities that can fuel their next application; network providers benefit from new revenue streams that can fund the next wave of investment; and end users benefit from more powerful and richer applications.

You may find yourself criticizing this approach in one of two ways:

- You may wonder why a developer community would need access to these capabilities, given the proliferation of web-based application programming interfaces (APIs) widely available through sites like

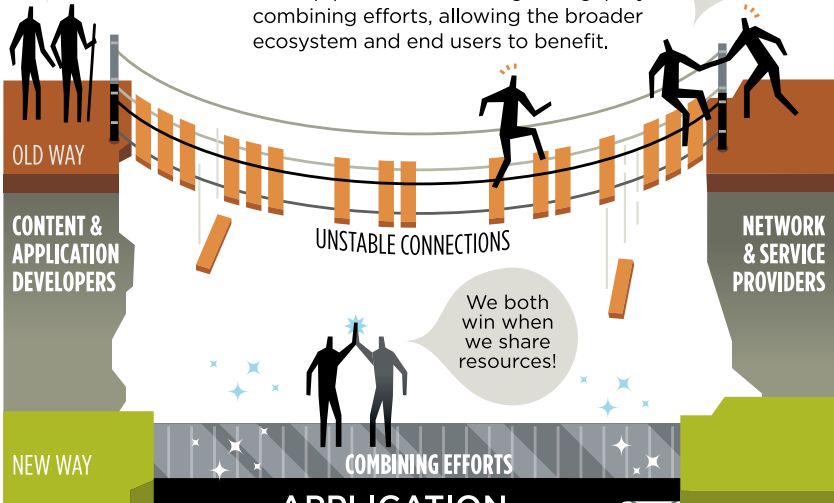
BRIDGING THE GAP WITH APPLICATION ENABLEMENT

INSTABILITY of the CURRENT SYSTEM

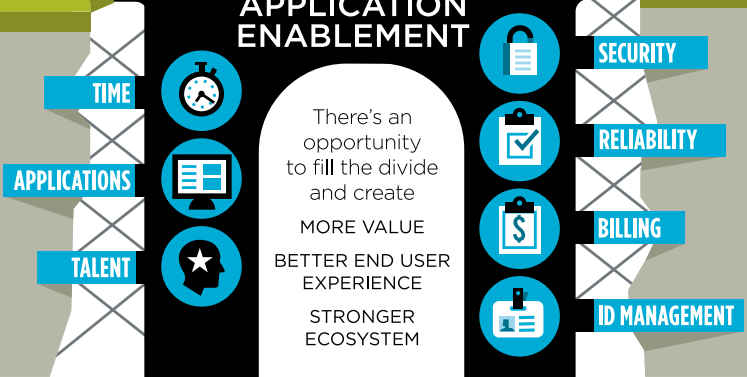
As the Web 2.0 world continues to grow, business models must evolve to keep pace. We can bridge the gap by combining efforts, allowing the broader ecosystem and end users to benefit.

How do we bring applications to a fragmented market?

How can I keep up with increasing demands on bandwidth?



APPLICATION ENABLEMENT



ProgrammableWeb and through devices like the iPhone and Android™ mobile technology platform. This book provides evidence based on a quantitative study aimed at over 1,300 developers in North America to prove interest in and willingness to pay for these enhanced network-based capabilities.

- You may wonder why a service provider would expose the rich intelligence of its network, given these assets have remained the bastion of the company's value. In short, this is not about randomly exposing network intelligence capabilities to the Wild, Wild West of the World Wide Web. Instead, this is about reinserting the service provider back into the value chain, recognizing it is just one very important stakeholder of many in a large and complex ecosystem. This is also not about imposing onerous controls by service providers on a developer community such that innovation is stifled; rather, it is about enabling collaboration between these two worlds such that both benefit. This paradigm shift does not place the burden upon the service provider to identify and build the next killer app. Let's face it. If history is any indicator, this endeavor is already in the works by someone in a garage or dorm room. It is, however, about identifying the tangible assets within the network that could make the next killer app even better.

If we haven't made it clear by now, let's state this differently: The approach argued in this book is about creating profitable and sustainable broadband models across a broad ecosystem of content and application developers, device manufacturers, advertisers, and service providers to create better end-user experiences. This is not about slicing up the same pie and offering a strategy that delivers a larger slice to network providers or developers. It's about baking a bigger, better pie with developers enabled to create new flavors and varieties, generating revenue for everyone. In other words, it does not suggest service providers must profit at the expense of developers, or vice versa. It starts from the fundamental argument that a Web 2.0 world necessitates an ecosystem of interdependencies. If there is no incentive for service providers to continue to fund next-generation broadband networks, investments will stop. Likewise, if developers cannot find profitable business models, innovation is compromised. When one stakeholder

group perseveres without damaging the larger ecosystem, others stand to benefit. Likewise, when one group loses, its interdependencies are also at risk.

This book seeks to understand the new business models enabled through a Web 2.0 world, where the consumer remains in control of his experience, a developer community benefits from enhanced capabilities, and service providers monetize their investments to fuel future innovation. It does so with a scientific approach, based on extensive research commissioned by Alcatel-Lucent and conducted by Penn Schoen Berland, across thousands of consumers, enterprises, commercial developers, and advertisers to assess their unique worldview and willingness to pay for smart network capabilities as they look through the Web 2.0 lens. Further, since research provides directional and strategic insights, but can be more limited in precisely predicting the future, we will incorporate market examples that lend additional support.

Since much of technology adoption is shaped by generational attitudes, we'll start with a look at Baby Boomers, Gen Xers, and Millennials to frame how emerging behaviors are creating opportunity for seismic shifts in the value chain. Next, we'll take a look at disruptors within the ecosystem and those with the greatest potential to shift business models: developers and advertisers. Finally, since value to be extracted across an ecosystem depends on addressing an unmet need in the market, we will cover consumers and enterprises as the critical finale of our analysis. And, since these end-user markets are not homogeneous blobs, we will carefully dissect the underlying motivators and challenges unique to multiple sub-segments, including Web 2.0 behavioral groups for consumers and specific vertical industries in the case of businesses. In the end, you as a reader should expect a deeper understanding of the broader ecosystem implications as business models adapt to a 2.0 influence.

Now, let's get started.