

# Knowledge Sharing and the Next-Generation Network

## Abstract

*The devices and networks we use to communicate, learn, and create are becoming increasingly interdependent. We can share knowledge of our successes and failures to make the library hype cycle more collaboratively productive.*

## From Hype Cycle to Innovation Trajectory

The hype itself is integral to innovation, which thrives on ingenuity, enthusiasm, and imagination. The productive result of inflated expectations is energy, required in abundance if one hopes to seek the freedom to develop, prototype, and gain knowledge in order to help the rest of us distinguish between real and imaginary potential. If some librarians take emerging tools at face value, as I did in the case of video calling, over time and in the community of our colleagues we can develop insight into their actual value: the actions and interactions they facilitate.

It is tempting to veer off at the trough of disillusionment in search of the next best thing. Problematically, this is when a platform or device starts hitting its productive stride among the non-librarian or non-tech obsessed population. Technology hype requires media coverage—Twitter, blogs, etc.—which, in this field and many others, tends to be most avidly created and consumed by early adopters. Implementation, on the other hand, is a drawn-out process, and the true test of any innovation is its day-to-day plateau of productivity.

The video kiosk was a relative bust, and the Skype a Librarian call-in service a modest success. The same simple evaluation can be made of any of the library services

profiled in this issue: some worked, others didn't. What matters is how you learn from this information and apply it in your own context. Instead of taking a new application and running with it blindly, we can create a layered perspective on how and why it suits our needs:

- **Utility**—First understand a product's technical foundation.
- **Application**—Then, examine how it is hyped, adopted, adapted, and rejected.
- **Insight**—Finally, implement with a critical understanding of its capabilities and caveats.

It is this process that transforms the hype cycle into an innovation trajectory: A strategy of investigating utility, discovering application, and implementing insight can and should be applied to any emerging technology as a means of understanding its holistic development rather than its superficial promise. I have found that VoIP provides two principal benefits for libraries—reducing costs and enabling rich virtual communication experiences. These insights are derived from VoIP's proven, long-term characteristics:

- VoIP is a mature technology. New uses of VoIP still emerge, such as Skype's 2010 integration with HDTV, but the devices, programs, and services it enables are no longer strictly beta.
- VoIP is a stable technology. Unlike some bleeding-edge tools that require watching and waiting to determine their usefulness, VoIP has had time to perform in a number of contexts, from virtual instruction to video interviews.
- VoIP is an intelligent technology. The adaptable nature of IP communications means that its end-use

products can continue to develop with other emerging technologies, such turning a mobile wifi device into a free Web phone by simply installing a Skype app.

- VoIP is a converged technology. Rather than representing a wholesale departure from fixed-location use, VoIP is part of the fixed/mobile convergence that characterizes next-generation computing and communications.<sup>1</sup> Wired and wireless combine to create the seamless, high-capacity connectivity that allows users to interact in many ways.
- VoIP is a bellwether technology. Organizations that switch from plain old telephone service to some form of IP calling can do so only if their communications infrastructure is up to speed. When broadband connections are robust enough to support end-user demands for quickness, coverage, and reliability, VoIP adoption is indicative of superior service and an early-adopter IT orientation.<sup>2</sup>
- VoIP is an equalizing technology. The one piece of hardware virtually all librarians share—a desktop or laptop computer—allows you to take advantage of multiple communication modalities, no matter how behind or ahead of the technological times you or they might be.

## From Disruption to Diversification

One negative consequence of hype cycle thinking is the tendency to see a particular technology as either in or out, but it's never as simple as SMS over IM or landline versus mobile. The communications and connectivity landscape has become fundamentally enmeshed—wireless and wired, analog and digital transfer and route over a complexly interoperable network. VoIP, in its infinite adaptability, has become widely distributed across and instrumental to this network. Independent silos are no longer viable: a software VoIP user needs to be able to connect with an analog user and a mobile user, which requires mutually enabling standards and protocols.

This modulated chaos is the hallmark of modern communications: why you can call your grandma's Google Voice number from her old Princess Phone, or use Skype to text someone from your iPad. The reality of device proliferation and interconnectedness requires wider knowledge among users: understanding not only how "your" gadget works but how it meshes with others is now an important aspect of technological literacy. Three related trends provide insight into the explosion of formats and gadgets: *interoperability*, *unified communications*, and *fixed/mobile convergence*. Together, these form the "next-generation network", in which universal, always-on connectivity is becoming a reality.

## Interoperability

Built-in and downloadable apps make devices more multifunctional, customizable, and prone to work together, while cloud applications like Dropbox or Google Docs spread function across format. Open source tools and APIs have shifted the old paradigm of technology disruption, wherein the introduction of something new meant the forced phase-out of something old. This undeniably still occurs to some degree: competition rules the social media market, where products cannibalize one another with frightening regularity. Information and communication technology is, however, beginning to trend toward diversification rather than disruption—the arrival of a new format does not necessarily mean the disappearance of another; upgrades and versioning keep gadgets and applications viable. In the case of phone communication, copper landlines are being replaced by high-performance fiber optics, and mobile devices have not replaced fixed-location calling or wired network access.

## Unified Communications

The seismic disruptions in telephony demonstrate that mobile and VoIP platforms coexist because they offer distinct benefits to users and organizations in different contexts; both are useful, both are necessary. Sheehan and Pirani describe this trend, noting that, "Whatever new tools may enter our technology environments, their power to transform will be enormously amplified by a development already emerging today: the disappearance of discrete single-function channels in favor of a user-centric environment of unified communications."<sup>3</sup> Interoperability and choice translates to devices and workflows with more options and affordances. As new opportunities for access and interoperability arise, it is incumbent upon libraries to develop unified services that are accessible from many platforms, thus facilitating access among users with different connectivity needs and resources.

## Fixed-Mobile Convergence and the Next-Generation Network

It's not only devices and apps that are becoming unified; the Web is undergoing a profound convergence of its own. IP communications are a core component of the next-generation network (NGN), which in the coming years will form a blanket of intricately connected wired and wireless technologies. The goal of the NGN is not necessarily to enable the fastest speeds for downloading and streaming, but instead to achieve access "ubiquity," or seamless switching from wired to wireless to satellite connections.<sup>4</sup> At one time, voice, video, and data each had its own silo; next-generation fiber networks merge these into a combined platform that unifies the transmission of different data types.<sup>5</sup> This is not the case for wireless networks,

	Wired	Wireless
Capacity	Abundant	Scarce
Topology	Point-to-Point	Broadcast
Reliability	Reliable	Unreliable
Mobility	Fixed	Mobile

**Table 1**  
Persistent key differences of wired versus wireless networking

which due to their inherent bandwidth and spectrum limitations still separate voice, video, and data on different layers. In the midst of the mobile revolution, it is important to note that wireless networks are still some distance behind wired architecture in terms of stability, reliability, and speed.

There is growing consensus that the NGN will continue to develop as a hybrid of broadband over wired as well as wireless networks rather than a wholesale convergence in wireless.<sup>6</sup> Table 1 illustrates how the strengths and limitations of the two connectivity types balance one another.<sup>7</sup> While wireless may still have disadvantages relative to wired, their anticipated co-evolution into a hybrid network is based on the mutual connection needs they facilitate. When the primary goal is mobility, users accept less stable connection and slower speeds, relying on wired networks when their goal is faster downloads and media reliability. The outcome of a hybrid NGN is comprehensive coverage and performance choice based on the task at hand.

## In Closing: Knowledge Sharing Leads to Hype Cycle Productivity

I have looked closely at VoIP to examine the balance of prediction and realization in library technology innovation. In her 2007 VoIP-isn't-sexy post, Sarah Houghton-Jan speculated whether VoIP was a slow-to-adoption tool whose time had finally arrived.<sup>8</sup> She was right on both counts: VoIP arrived, but sometimes with a whimper instead of a bang. My intention in this issue was to challenge the library hype cycle, but over the course of this project I have come to view the hype cycle itself as fundamentally necessary: the coexistence of bang (evangelism and overzealousness) and whimper (crash and burn) is instrumental to a more productive, localized

dissemination of emerging library technologies. The key to this process is open communication and rationalized expectations—by co-experiencing the hype cycle, we speed our collective slope of enlightenment.

The video reference revolution may not have come to pass, but I am sharing the lessons learned from my own failed coup attempt in order to arm others. The kiosk and similar proof-of-concept projects are how we define the library affordances of VoIP tools, but these are only beneficial if they are widely understood. Those of us with the flexibility to experiment can contribute hugely to the field by shining a critical light on our efforts and outcomes, positive and (especially) negative. Those of us without flexibility who still manage to pull things off can contribute just as hugely by doing the same. Ours is a collaborative profession, and there are countless viable outlets for communicating our experiences—it is crucial, however, that we lend our voices frankly and view even “failures” in a positive light. Productive knowledge sharing takes candor: without it, misinformation goes viral. It also takes creative analysis: underexamined experience too easily becomes smoke and mirrors.

## Notes

1. Yochai Benkler et al., *Next Generation Connectivity: A Review of Broadband Internet Transitions and Policy from around the World*, (Cambridge, MA: Berkman Center for Internet and Society, Harvard University, 2010), <http://cyber.law.harvard.edu/pubrelease/broadband> (accessed Feb. 20, 2010).
2. Mark C. Sheehan with Judith A. Pirani, *Spreading the Word: Messaging and Communications in Higher Education* (Boulder, CO: Educause Center for Applied Research: 2009), [www.educause.edu/ers0902](http://www.educause.edu/ers0902) (accessed Jan. 17, 2010).
3. Sheehan with Pirani, *Spreading the Word*, 143.
4. Benkler et al., *Next Generation Connectivity*.
5. William H. Lehr and John M. Chapin, “On the Convergence of Wired and Wireless Access Network Architectures,” *Information Economics and Policy*, 22, no. 1 (2010): 33.
6. Ibid.
7. Ibid., 34.
8. Sarah Houghton-Jan, “VoIP at Libraries,” *Librarian in Black*, June 19, 2007, [http://librarianinblack.net/librarianinblack/2007/06/voip\\_at\\_librari.html](http://librarianinblack.net/librarianinblack/2007/06/voip_at_librari.html) (accessed Jan. 12, 2010).