Hope, Hype, and VoIP: Riding the Library Technology Cycle

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About the Author

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Char advocates for library cultures of experimentation and assessment, explores free and open source solutions to library sustainability, and promotes the integration of instructional design and pedagogical training in library education. In 2009 she published Informing Innovation: Tracking Student Interest in Emerging Library Technologies at Ohio University (ACRL Digital Publications) and has a book on teaching and technology effectiveness forthcoming in Fall 2010, Reflective Teaching, Effective Learning; Instructional Literacy for Library Educators (ALA Editions).

Char completed an ME in educational technology at Ohio University in 2008, an MSIS at the University of Texas at Austin’s School of Information in 2005, and a BA in history at Reed College in Portland, Oregon, in 2001.

Abstract

After the initial hype is past, the real value of an emerging technology unfolds as librarians adopt, test, and learn from it on the ground. This issue of Library Technology Reports examines the long-term adoption cycle of one established tool, Voice over Internet Protocol (VoIP), in order to gain actionable insight into the library innovation process. It outlines the types of online calling and conferencing products that have developed, examines their library implementations from video kiosks to telecommuting to distance instruction, and considers how their successes and failures can inform other emerging applications. By understanding a tool’s practical library affordances and how there are adopted, adapted, and rejected, we can better evaluate its local promise critically, creatively, and with an eye toward sustainability.

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VoIP Demystified

Abstract
VoIP tools come in many configurations and have been applied with great diversity in libraries. This chapter outlines the technical foundation and adoption patterns of online voice and video calling, and explores how VoIP provides insight into the library technology cycle on a broader scale.

Why VoIP?
In a 2007 Librarian in Black post, Sarah Houghton-Jan described Voice over Internet Protocol (VoIP) as “not a really sexy technology.” In terms of the bleeding-edge concepts Library Technology Reports tends to focus on, I’d have to agree. Web voice and video are old news: Skype’s international popularity is established, voice and video chat proliferate in social media, embedded webcams are commonplace, and many organizations have made the transition to IP phones in offices and classrooms. The rise of mobile technology is another nail in VoIP’s nonsexy coffin: international cell subscriptions continue to skyrocket and have already far outstripped landline and Web phones.

Bearing this in mind, you might be wondering why I’ve chosen VoIP as the subject of this report. When Web calling tools began to emerge several years ago, I took on the de facto role of video reference evangelist. I predicted that applications like Skype could transform how librarians provided public services over the Web. I imagined video consultations and kiosks that could increase service point efficiency and humanize the virtual reference experience. When I worked at Ohio University between 2006 and 2008, my colleagues and I built an interesting, innovative, and frequently hilarious proof-of-concept
Learning to Fail

Piloting Web voice and video in libraries personally taught me an important lesson about working with technology: snafus are going to occur, and a concept rarely performs to expectations. This reality is not often addressed in the discourse of our field—in presentations I have given on the video kiosk, the audience has invariably been surprised when I have spoken about our difficulties with candidor. Challenges in experimental initiatives are inevitable, but can be guided by planning and made didactic through reflection. The kiosk program taught me to try and understand my users at least as well as I understand the application itself, to learn from setbacks in order to address problems, and cultivate a perspective that is simultaneously positive and critical. This education did not occur in one fell swoop. Rather, it accumulated over the kind of time that is sorely lacking in the day-to-day whirlwind, the very condition that makes taking a tool at face value so tempting in the first place.

A Lesson in Layers

Successful technology development takes depth of perspective. In this issue, I explore VoIP in the three successive layers of utility, application, and insight, each of which examines a critical stage in the process.

Layer 1: Utility

Behind every application and platform are practical affordances that translate to library implementations. Skype is the tip of the VoIP iceberg, and in the first two chapters...
I run the gamut of Web calling and conferencing options, functionality, and costs:

- Chapter 1: VoIP Demystified
- Chapter 2: IP Phones, Software VoIP, and Integrated and Mobile VoIP

Layer 2: Application

Those using Web voice and video in public services, education, and professional communication become familiar with the capabilities and quirks of the technology. This familiarity translates to best practices for the rest of us. The next two chapters examine how Web voice and video have been put to work throughout the field:

- Chapter 3: VoIP in Professional Communication, Collaboration, and Development
- Chapter 4: VoIP in Reference, User Services, and Instruction

Layer 3: Insight

It is equally (if not more) instructive to look at where Web calling has proven itself not useful along the library hype cycle. Chapters 5 and 6 critically examine the OU kiosk pilot and the video reference experience. In an era of constant innovation, VoIP’s adaptable longevity also merits closer examination. Chapter 7 considers shifting user communication and connectivity paradigms, and closes with an analysis of the implications of knowledge sharing for emerging technology development.

- Chapter 5: Video Kiosk as Hype Cycle
- Chapter 6: Lessons for Library Innovation
- Chapter 7: Knowledge Sharing and the Next-Generation Network

Figure 3

Blog search terms.

You Asked for It

I have written this LTR for many reasons, but primarily in response to persistent curiosity about VoIP tools in library contexts: people find my blog (info-mational) several times a day by searching for “Skype in libraries” or “video reference” (figure 3). I also wanted to evaluate the assumptions I once made about Web voice and video, and carry my experience with this specific platform through productivity instead of ditching out at inflated expectations. This amounts to a personal exercise in technology literacy, an opportunity to learn deeply about the communication tools I not only take for granted in my working and personal life, but that I once held in irrationally high regard.

Think of this report as a long-range view on how to brace for impact in a culture of perpetual beta. Examining a platform that has for years paradoxically promised, delivered, and disappointed is an excellent way to identify strategic, reality-based, and resource-conscious local decisions. I look critically and creatively at technology “success” and “failure” in order to develop lasting local best practices for pilots and proof-of-concept projects. In VoIP’s library lifespan there is evidence of how we anticipate change and adapt to the complex information landscape. By the end of chapter 7 end you may still not find web calling particularly sexy, but you should be able to determine whether or not one of its applications (or something else entirely, for that matter) can be used to achieve cost reduction, productivity, service, or collaboration goals. Now, down to business.

Unequal Access: Phone and Broadband

Personal telephones are almost ubiquitous in the United States. A 2010 FCC report estimated that 95 percent or more of U.S. residents have some type of subscription phone service, a number that is unlikely to decline in coming years. How people use their phones is changing dramatically, however. The demographics of analog, VoIP, and cellular phone use are complex: a growing number of younger, mobile-only consumers are causing a decline in fixed-location service, while many legacy home subscribers are switching to subscription IP phones. Age is by no means the only factor: there are many areas in the United States where analog service is the only option or where other access barriers exist. I encountered this myself while living in rural Ohio—My house had no cellular reception and exorbitant broadband satellite fees. Having
ditched landline for cell half a decade before, this forced me to forego home Web access and grudgingly subscribe to an analog phone service for the first time in years.

This experience is still quite common. Due to Web-based voice and video telephony's reliance on high-speed Internet, it is limited largely to those with access to developed and relatively affordable broadband networks. Broadband (or high-speed) Internet is a DSL, fiber-optic, cable, power line, satellite, or wireless connection that transmits data at greater than 200 Kilobits per second, with speeds reaching to 100 Mbps or more in many Asian and European nations, where network speed and coverage often far exceeds the U.S. While increasingly deployed to urban businesses and institutions, individual high-speed subscriptions in rural and urban areas are far less ubiquitous within the United States than phone subscriptions. As of 2009, fully one third of the U.S. population (not to mention billions internationally) still did not have home broadband. While smartphone use is spreading and initiatives like Google Fiber and the National Broadband Plan seek to give 100 million American homes 100 Mbps access by 2020, VoIP use mirrors the current access divide.

Laying the Groundwork

When I started my research, I sent messages to several e-mail lists asking for examples of VoIP use in libraries. Among the first comments I received was this observation from OhioLINK's Peter Murray:

One of the things that comes to mind is the need to distinguish between various kinds of VoIP. By way of example, I'm currently using two “VoIP” systems in my office. One is my desk phone—a Cisco-supplied “IP Phone” that is in effect indistinguishable from my previous “hard line” phone. The other is a “software phone”—Skype on my laptop. Both have a “phone number” reachable by any phone, and the person calling probably does not know they are getting to me by VoIP. One is fairly fixed in location (it is only usable on my desk) while the other is portable (wherever ever my laptop has a network connection). One has chat and file sharing while the other does not.

Much obliged, Peter, for describing the goal of what what I previously described as “Layer 1: Utility.” VoIP is the foundation of an ever-expanding array of communication tools. Chances are excellent that you are already a VoIP user, whether you realize it or not—if you attend webinars, talk overseas, or basically ever use any phone for any reason, this technology is already a part of your life. In the remainder of this chapter I provide an overview of how VoIP works and outline its main three types (IP phones, software VoIP, and integrated and mobile VoIP), and in the next chapter I examine each in detail.

VoIP Defined

Internet protocols are standardized sets of rules that govern the transfer of information across networks. Voice over Internet Protocol specifies how real-time audio travels between Web-enabled devices: by breaking data into pieces called “packets” that are queued, routed, and reassembled at a destination. When network traffic is high or connections are slow, packets can be held up or lost, causing the slight to severe delay, echo, or “jitter” one sometimes experiences in Web calls.

VoIP’s extensibility, or its capacity for ongoing adaptation, is one of its core features. According to one author, “contrary to the traditional telephone system (where the end devices are dumb), VoIP architecture pushes intelligence towards the end devices (i.e., PCs, IP phones, etc.) giving the opportunity to create many new services that could not be envisaged using traditional phone systems.” Web calling services have continually conformed to changing technology, moving from dial-up to broadband to third-generation (3G) cellular networks, and onto new devices and delivery methods.

Three Types of VoIP

Many of the products I describe are feature-rich and interoperable, meaning that they can call not only each other but also landlines and cellular phones. Most also incorporate video and other data functions like text messaging and chat to the extent that almost none are actually limited to voice communications. Multimedia VoIP tools are often described as enabling “unified” or “rich” communications, which can also exacerbate the format confusion that Peter described above. Three main categories of VoIP help distinguish its many applications.

IP Phones

IP phones most closely resemble traditional phones. Although carrier VoIP services like Vonage are often presented as an alternative to landlines, the two are not mutually exclusive. VoIP was first used over dial-up, and IP phones frequently rely on broadband wires or cables, effectively creating a newer generation of landline. The difference is in the type of line—whereas the public-switched telephone network (hereafter referred to as the PSTN—think switchboards as in figure 4) used copper wire, IP phones use broadband lines via fiber optic or DSL. IP phones can also operate via satellite, WiMax, or other high-speed connection.

Software VoIP

The best-known type of VoIP services are software VoIP. This category describes online free calling and
conferencing tools like Skype. In addition to voice calling, many provide video, multiparty conferencing, and text chat as well as screen sharing and other features. While Skype is the dominant service, competitors like VoxOx, Jajah, and Google Voice have growing subscriber bases and are poised to gain a larger marketshare in coming years. VoIP also supports Web conferencing tools like Dimdim and ooVoo on the free or open source side, and Adobe Connect, Elluminate, and WebEx on the subscription side.

### Integrated and Mobile VoIP

Voice and video are already built-in features of many platforms and gadgets, including massively multiplayer online games (MMOGs) like *World of Warcraft*, virtual worlds like Second Life, and social networks like LinkedIn and Facebook. Such features also fuel conventional and unconventional Internet dating and communication services like ChatRoulette and are being integrated into media products like HDTVs. Mobile VoIP is also on the rise, affording free or inexpensive calling and texting over smartphones and handheld wireless devices.¹¹

### Rates of Adoption

It is challenging to quantify the true scale of VoIP adoption. It is safe to say that it is widely viewed as the ascendant landline or fixed-location option, in tandem with cellular telephony for mobile communication and connectivity—only traditional telephony is in decline.¹² Global subscriptions to IP phone services like Vonage reached 100 million in 2009–22 million in the United States alone—with VoIP subscriptions capturing up to 38 percent of the fixed-line market in Web-advanced countries such as France and South Korea.¹³ According to a 2009 ECAR study, VoIP phones are currently in active use or planned for implementation by 90 percent of American college and university campuses.¹⁴

These figures do not even take into account Skype, which, by 2009, boasted a staggering 443 million registered users and accounted for 8 percent of all international calls.¹⁵ Skype's popularity has raised awareness of Web calling and video communication, as media figures like Oprah strike high-profile deals to host guests via video call and media outlets like CNN use it for in-field reporting.¹⁶ The multimedia capability of computers is also improving, as laptops, notebooks, and desktops come equipped with integrated webcams, microphones, and speakers. This makes their application as rich communication and content-creation devices more viable and virtual collaboration, participation, and learning more accessible.

### Quality, Stability, and Security

Traditional phones, despite their lack of multimedia features, have long provided clear sound, reliable service, and relative security. Common concerns among VoIP users are quality of service (QoS), security, and the underlying stability of a communication system that is dependent on both a power grid and data network. Among VoIP types these differ greatly: IP phones are considered less susceptible to hacking and spamming because they can be centrally protected like other types of Web services. Furthermore, IP phones don’t follow the individual user account archetype that makes software and mobile VoIP providers like Skype widely viewed as privacy and security risks and bandwidth monopolizers.

While it lags behind quality standards set decades ago by analog phones, overall VoIP voice quality continues to improve.¹⁷ QoS issues affecting VoIP result from the underlying instability of networked versus dedicated, one-to-one communication:

- **delay**—also known as latency, or time gaps caused by slow networks
- **echo**—users hearing their words repeated back to them, often caused by microphones picking up speaker noise
• **jitter**—audio distortion due to data packets arriving erratically at their destination, caused again by slow or inconsistent network speeds

• **packet loss**—the complete loss of packets of transmitted data, resulting in choppy and incomplete call quality

As next-generation broadband becomes more pervasive, most of these issues will gradually improve and can already be addressed by shoring up speed, stability, and consistency. In general, the faster and more reliable the network, the higher the quality of service—all types of VoIP are currently more stable than wired connections, which tend to have stronger bandwidth and fewer network interruptions than wireless.

### Notes


5. Ibid., 5–6.


Chapter 2

IP Phones, Software VoIP, and Integrated and Mobile VoIP

Abstract

In order to establish their technical, communication, and service affordances, this chapter explores and three types of VoIP tools: 1) IP Phones, 2) software VoIP, and 3) mobile and integrated VoIP.

Type 1: IP Phones

Another reply to my e-mail list call-out came from consultant Susan Knoer, who reflected:

VoIP is an old technology now, and many people didn’t even realize that their “new” phone lines are VoIP. Even the smaller corporations I work with have gone over. . . . It might be more interesting to talk to campuses that don’t have VoIP and find out why.¹

Excellent point, Susan. The first VoIP type I explore is the most institutionally established yet least obvious form of networked calling: the mass-market carrier IP phones sitting inconspicuously on desks at a growing number of offices and homes. Digital voice is becoming standard for schools, organizations, and business, which still tend to rely on fixed-location communication. As IP phones are bundled with high-speed Internet and television subscriptions, individual consumers still interested in landline service are steadily adopting them, as well.

User Experience

The most mature form of Web calling in terms of technical stability, pervasiveness, and government regulation, IP phones also most closely approximate the traditional calling experience. Due to their fixed nature and use of hardware externals they are also virtually indistinguishable from older phones (figure 5). Broadband IP calls are initiated with either specially made IP handsets or headsets or with existing handsets converted with adapters. Unlike the small-scale startup culture of software VoIP, IP phones tend to follow a more traditional provider-subscriber customer service model. These characteristics make IP calling an easier conceptual leap for users who might find other Web-based calling tools less accessible.

Infrastructure and Benefits

IP phones differ from their analog counterparts in underlying connection infrastructure, provide additional features (transcribed voicemail to e-mail, SMS messaging and emergency notifications) and are typically less expensive
Residential and office IP phone service has been widely available since the mid 2000s. While home subscribers have likely made a conscious switch away from analog phone service, landline VoIP in an office context is often not obvious to those who use it. Despite this, at the institutional level VoIP presents a paradigm shift to the extent of becoming a bellwether technology. In order to support digital voice, an organization must have a robust data infrastructure and be comfortable with change in a core communications area. IP phones unify data, voice, and video services, reducing costs and centralizing control with local IT instead of external companies.²

A 2009 study of communications in higher education found higher employee satisfaction with digital voice, which led to higher evaluations of campus IT competence.³ Cost savings can also be significant. The University of Louisville, which by 2007 had transitioned completely to IP phones and emergency notifications, estimates that after an initial network upgrade it saves roughly $1.5 million annually on 10,000 broadband IP lines.⁴

Digital telephony’s high-speed network requirements often necessitate a considerable front-end investment of resources and strategic planning.⁵ Spreading the Word: Messaging and Communications in Higher Education, the 2009 ECAR study cited above, characterizes VoIP as a “revolution . . . in the realm of two-way audio communication,” so much so that if an organization hasn’t yet or isn’t planning to switch to IP phones, it is likely held back either by technological conservatism or degraded data infrastructure (copper cabling that needs to be replaced by fiber optic, etc.), or it is considering foregoing desksets completely in favor of all-mobile communications (although likely still using IP networks for video conferencing).⁶ Higher education has lagged at developing comprehensive mobile strategies and fixed-location phones are still dominant among staff, meaning that nonadoption of VoIP at the campus level may indicate financial, technical, or cultural barriers.⁷ Students are trending in the opposite direction, preferring mobiles over fixed-line or software IP phones.

### Quality, Security, and Stability

Among all forms of Web calling, broadband IP phones are regarded as the most stable, secure, and best in terms of voice quality, and are sometimes used by the same institutions that ban Skype and other types of software VoIP. Although emergency 911 service was not initially available to IP phone users, the FCC issued a series of regulations that mandated extended emergency coverage to residential users in 2008.⁸ On the security side, firewalls, anti-spam measures, and other well-established network security approaches can protect IP systems. Power loss can cause total service outage; if an electrical problem occurs or an external device fails, it can render IP phones unusable unless secondary power is available.⁹ While many organizations plan for this eventuality, some home Web phone users cannot. Therefore, it is inadvisable to use a home IP phone without backup power or an alternative communication source.

### Carriers

There are many local and national IP phone carriers. The gray box contains a brief list of the more widely recognized enterprise and residential providers, which are generally representative of typical rates and features across the spectrum.

#### Type 2: Software VoIP

Unlike IP phones, software VoIP is best known by its most recognizable brand: Skype. Already well established, software VoIP use has increased during the global recession.¹⁰ The desire to reduce costs and cut back travel has motivated many consumers to choose free or inexpensive calling and conferencing applications, most of which
integrate voice, video, text chat, and additional options such as file or screen sharing. If a technology is judged “disruptive” based on how significantly it upends the market share and modus operandi of the technology that came before it, software VoIP was as disruptive to traditional telephony as the mobile shift is to fixed-location computing, for two reasons:

- Software VoIP is not controlled by the industry giants that held sway over communication for a century, the same companies that largely still dominate mobile telephony. Instead, it was pioneered by start-ups like Skype and Jajah.
- Software VOIP transformed two of the most expensive forms of interaction—international and video calling and conferencing—to among the least expensive. This has had a transformational effect on communication and collaboration across distances.

Audio/Visual Externals

Software voice and video calls are almost always made from personal desktops, laptops, and other portable platforms using Web-based or downloadable applications. Software VoIP users rely on built-in or external audio and visual devices, or, less frequently, plug-in adapters that convert legacy handsets. While many laptops, notebooks, and tablets feature built-in voice and video components, most desktop computers still require external webcams, microphones, headphones, or speakers, most of which are available from a base price of $30–$50 per item. Recent advances include high-definition and motion-tracking webcams, some of which have experienced notable problems (several Hewlett Packard models notoriously failed to track faces with dark complexions). Apple has also applied for a screen-embedded camera patent that could address the eye contact problem in webcam communication, a topic I revisit in chapter 6.

Classes of Software VoIP

Because software VoIP spans many subtly different applications, my approach is to present it in three subcategories and highlight a few products in each: Web calling (Skype, VoxOx, and Jajah), voice and video instant messaging (Google services, iChat, Windows Live Messenger, Meebo, and TokBox), and Web conferencing (Dimdim and Adobe Connect).

Web Calling

These cross-platform (Mac, Windows, or Linux) multifunctional programs enable free user-to-user voice or video calling and conferencing via personal accounts. They tend to display screen names and presence data (available/not available), and often facilitate in- and outbound calling to a from landlines and mobile phones.

Skype

Operational since 2003, Skype is now the de facto program for calling over the Internet. Skype’s unique peer-to-peer architecture provides greater stability as more users log on, and it can be operated from a USB drive as well as a computer and many smart mobile devices. Skype-to-Skype calls are free, and for modest fees users can establish traditional phone numbers (SkypeIn) or call out mobiles and landlines at competitive rates (SkypeOut) using a subscription or prepaid balance (figure 6). Skype also enables SMS and text messaging for a flat fee, browser extensions and conference calling with up to 25 participants, and screen and file sharing as well as text chat during voice and video calls.

Skype Features: voice and video calling and conferencing, text chat, file sharing, SMS, screen sharing, Skype In/Out, call recording, voice mail.

VoxOx

VoxOx is a more recent Web communication startup that has set out to become the first “universal communicator.” It allows users to combine all of their social media and communication channels, from e-mail to IM to Web voice and video and Facebook, into a single interface and address book. VoxOx freeware is interoperable with Windows XP and higher and Intel Macs running Leopard 5. VoxOx users are numbers with unlimited free call-in time and can charge funds to an account to make outbound calls. The service’s “any to any” capability reroutes incoming VoIP or analog calls to cell phones and translates voice messages to SMS or e-mail. VoxOx gained notice in February 2010 when it released the Universal Translator, a real-time translation app for email, chat, and SMS.

Web Calling Carriers and Startups

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Jajah offers a range of individual and enterprise Web calling products. Its most popular service, Jajah Web, connects traditional landlines and mobile numbers for free and also facilitates free online calling between subscribers. Jajah does not require a download to operate, but instead uses the existing telephone network to connect calls placed through a browser. Jajah also allows websites to embed “click-to-call” buttons for visitors to place direct calls to a designated VoIP, mobile, or landline number.

**Jajah Features:** voice calling and conferencing, SMS, screen sharing, call in and out, social media.

Voice and Video Instant Messaging

Instant messaging applications with integrated voice and video operate similarly to Web calling programs, but are more focused on connecting internal users than they are on external communication. Some products are single account (Google Talk) while others are multiaccount

**VoxOx Features:** voice and video calling and conferencing, IM, file sharing, e-mail, SMS, screen sharing, call in and out, social media.

**Jajah**

Jajah offers a range of individual and enterprise Web calling products. Its most popular service, Jajah Web, connects traditional landlines and mobile numbers for free and also facilitates free online calling between subscribers. Jajah does not require a download to operate, but instead uses the existing telephone network to connect calls placed through a browser. Jajah also allows websites to embed “click-to-call” buttons for visitors to place direct calls to a designated VoIP, mobile, or landline number.

**Jajah Features:** voice calling and conferencing, SMS, screen sharing, call in and out, call recording, voice mail, embeddable calling widgets.
text, audio, video, and screen-sharing functionality and can be used with instant messaging services AIM, ICQ, MobileMe, and XMPP. iChat does not feature computer-to-phone calling.

The PC equivalent of iChat, Windows Live Messenger, uses a feature known as Windows Live Call to allow computer-to-computer voice and video calling or computer-to-mobile or -landline calling. It can also double as an IP phone with handset.

**iChat Features:** text, voice, and video chat.

**Windows Live Messenger Features:** voice and video calling, text chat, file sharing, user-to-user calls, user-to-phone calls, external handset.

**Google Talk, Gmail Video Chat, and Google Voice**

Google provides voice and video chat and calling, but distributed across three services: Google Talk (voice and text chat) Gmail (video chat), and Google Voice (voice calling, voice mail, and SMS via a dedicated number). While Google Talk and Gmail have featured voice and video chat (respectively) for years, Google Voice is a recent addition that differs from Skype by providing a digital gateway that routes calls to all of your phones simultaneously through a universal “Google number” (figure 7) and offers additional features like transcribed voice mail. Google Voice remained invite-only as I was writing this report, but Google’s late 2009 acquisition of VoIP startup Gizmo5 not long after a failed attempt to purchase controlling interest in Skype signals that Google is positioned to compete with other Web calling apps.13

**Features:** voice calling, voice mail, text chat, file sharing (Google Talk), video chat (Gmail), call in and out, call recording.

**iChat and Windows Live Messenger**

Apple’s proprietary IM application, iChat, comes as a standard feature on the OS X operating system. It works with built-in and external webcams and uses Apple’s signature “chat bubble” interface display. The application allows

**TokBox and Meebo**

TokBox and Meebo feature similar functionality to application-based chat, but in Web-based form. Meebo is a multi-signon text IM client that allows voice or video during an interaction, while TokBox is a video-focused chat application that allows you to record and e-mail video messages of up to 10 minutes (figure 8), conduct video chat with up to 12 participants and 200 viewers, or embed video chat windows in other pages and applications.

**Meebo Features:** text, voice, and video instant messaging.

**TokBox Features:** video chat, scheduled video chat, and video messaging.

**Web Conferencing**

Web conferencing platforms are used for rich, configurable synchronous distance instruction, presentations,
meetings, and collaboration. They typically operate either through free Web-based interfaces (Dimdim) or licensed Web interfaces or software packages (Adobe Connect). Other Web conferencing services include WebEx, GoToMeeting, and LearningTimes.

**Dimdim**

Most Web conferencing involves hosting or software fees, but Dimdim is among the few free options. For up to 20 remote participants, Dimdim features shared audio, video, chat, screen sharing, and whiteboard tools (figure 9). More participants and “webinar” features can be added for a fee. Dimdim is also available as an open source API, which lifts the simultaneous users limitation and allows enhanced customization. In March 2010, Dimdim released a Google app for embeddable hosting and meeting participation in compatible collaboration or course management platforms.

*Dimdim Features:* voice, video, and text chat; screen sharing; whiteboard and annotation; surveys and polls; record and share meetings; custom meeting URLs.

**Adobe Connect Pro**

Adobe Connect Pro is among the most popular hosted Web conferencing services, is available in both individual and professional versions, and is one of the largest in terms of simultaneous viewers or participants (up to 80,000). Connect is Flash-based and features a highly configurable interface. A related product, Adobe ConnectNow, offers free online meetings for up to four participants, and a mobile app accessible from iPhones and iTouches.

*Adobe Connect Pro Features:* voice, video, and text chat; interface customization; surveys and polls; screen sharing; whiteboard and annotation; record and share meetings; custom meeting URLs.

**Quality, Security, and Stability**

Whether you are using Web calling, chat, or conferencing, you may experience the same usability and quality issues as any other form of VoIP—delay, jitter, and echo. These problems can be exacerbated, however, when vying for network space with other Web users. Security and privacy are notable concerns with Skype, which has been banned by local governments, institutions, and even entire nations (South Korea and the United Arab Emirates) as a potential risk and resource monopolizer. Its peer-to-peer architecture can make bandwidth-hogging “supernodes” out of user computers, an issue Skype has attempted to address with a security section on its website. Despite more acceptance in recent years, software VoIP continues to be contentiously viewed in some educational circles—many primary and secondary schools prohibit Skype, while the 2009 ECAR study *Spreading the Word: Messaging and Communications in Higher Education* found that among the third of college and universities that had a specific software VoIP policy, almost 40 percent either discouraged or prohibited its use. Conversely, less than 3 percent encouraged or required the use of software VoIP.

**Type 3: Mobile and Integrated VoIP**

**Mobility and Adaptation**

By 2013 there will be more smartphones than personal computers as more users bypass landlines and wired Internet in favor of Web-enabled mobile devices. This is more than a simple matter of preference: in developing nations, towers that broadcast 3G cellular Internet signals are cheaper to construct and maintain than other forms of wired or satellite broadband. In another demonstration of its adaptability, VoIP is now available on many smartphones and Web-enabled handhelds, meaning that users of even non-“phone” portable Internet devices like iTouch and iPads can make free calls and send text messages over 3G or WiFi (figure 10). Scaling back on minutes and text plans with the help of mobile VoIP is
calls might be “free” for Verizon users, they are still required to buy a data plan, and SkypeOut calls are deducted from a user’s balance of minutes. In early 2010, AT&T and Apple opened their services to VoIP over 3G, giving mobile device owners the ability to download popular apps Nimbuzz and Fring or subscribe to Vonage World Mobile. Skype Mobile has been available in the United States for iPhone and iPod users since mid-2009 and is slated for the iPad as well. Users can make free user-to-user and SkypeOut calls or send text messages over WiFi, but the app is not yet compatible with slower 3G mobile data networks due to “contractual restrictions” (figure 11). SkypeLite is also available to those without Apple or Verizon mobile devices, although with less functionality.

Benefits and Issues of Mobile VoIP

Like software Web calling and home or office IP phones, mobile VoIP offers savings particularly for international voice communication—one can avoid steep per-minute charges while traveling or collaborate free across borders. Mobile VoIP can also eliminate the need for domestic text messaging and cellular plans, but this may become less viable as carriers adopt service models tailored towards capitalizing on mobile VoIP. Call quality over 3G and WiFi networks is diminished from wired networks and is as inconsistent as the wireless network itself. With more of the broadcast spectrum being reserved for wireless and the 4G mobile Web upgrade slated in coming years, consistency and performance of Web calling applications via mobile should improve and incorporate more features. In addition to Web calling’s limited availability and performance issues, the developing cellular VoIP marketplace itself remains unstable. For example, Skype discontinued its Windows Mobile and Java products in February 2010 in response to inconsistent performance and low popularity of these devices.

Integrated VoIP

Voice and video communication is becoming standard in more types of consumer products in response to user demand, notably in the XBOX and other gaming consoles since the mid 2000s, and in the Sony PSP and handheld devices.

Adoption (and Resistance)

In 2009 the Federal Communications Commission Chair Julius Genachowski called for the principle of “network neutrality,” or greater openness and competition in all things Web-accessible, to extend to the telecommunications industry. In response, a few major telecom companies began to open their phones and devices to third-party Web calling. Mobile VoIP use increased by more than 40 percent in the second half of 2009, noticeably affecting carrier profits. The global research firm In-Stat estimates that by 2013, 300 million mobile users will use VoIP via smartphones, creating a market in excess of $35 billion. Mobile VoIP apps are either smartphone of software VoIP providers like Skype or mobile-specific services like Fring and Nimbuzz. Because they allow users to bypass minutes and roaming charges by using their data plans to make and receive calls, send text messages, and (eventually) video chat, mobile VoIP is banned by some major telecoms, while others offer scaled-down or “light” applications that allow only user-to-user calls and chat or outbound calls and SMS messages for a fee.

In February 2010, Verizon Wireless announced that it would offer Skype Mobile and Google Voice out of the box on BlackBerries and Androids. While Skype-to-Skype

Figure 10
YouTube video on Skype over iPod Touch.
Hope, Hype, and VoIP: Riding the Library Technology Cycle
Char Booth

Virtual worlds, and voice and video applications have been available in social networks for years. Online dating sites increasingly rely on VoIP to establish secure voice connections: Match.com and eHarmony both adopted Jajah in 2009 as their chat and messaging provider. The comparatively antisocial site ChatRoulette, which randomly pairs participants for up to sixty seconds, relies on webcam voice and video to help users cycle through, reject, and accept other players.

Voice and video over IP is also a growing feature of productivity and collaboration-oriented tools—in early 2010 Ribbit released synchronous voice conferencing gadgets for Google Wave.

Notes

2. Robert Albrecht and Judith A. Pirani, “University of Louisville: Fulfilling the Promise of VoIP,” Case Study 2 accompanying Mark C. Sheehan with Judith A. Pirani,


5. Sheehan and Pirani, Spreading the Word, 65.


7. Ibid.


16. Sheehan and Pirani, Spreading the Word, 76.


VoIP in Professional Communication, Collaboration, and Development

Abstract
This chapter examines the organizational uses of Web calling and conferencing for communication, collaboration, and learning.

Evaluating an emerging technology based solely on its hype-cycle potential can lead to one-size-fits-all implementations created in anticipation of imagined user needs. In the last two chapters I explored VoIP’s technical background and major types; in the next two chapters I examine how these are applied in libraries and influenced by local context. On-the-ground uses of library web voice and video tend to fall into two categories: professional and public. This chapter examines organizational VoIP in communication, collaboration, and professional development, and chapter 4 explores VoIP-based reference, user services, and instruction.

Workplace Telephony
Most libraries are still firmly rooted in the fixed-location communication paradigm in their offices and public service points. Therefore, the most pervasive professional use of VoIP is the organizational transition to IP phones. Typically motivated by cost-cutting aims, libraries from across the spectrum have already or are planning to exchange older-generation lines for digital voice solutions managed by IT staff. This can be a complex undertaking for distributed systems that may have to coordinate incremental change and training across multiple facilities. The Public Library of Charlotte and Mecklenburg County (PLCMC) began piloting IP phones in two of its branches in early 2008 as part of a fiber-optic upgrade to provide faster Internet access, and by August of the same year had transitioned to IP in all 24 branch libraries. According to communications manager Sarah Poole, VoIP is “more cost effective and . . . offers additional benefits, such as system-wide paging, integrated voice mail and email, and individual voice mail accounts, which will enhance the efficiency of the library’s internal communication and operation efforts.”

Despite behind-the-scenes changes this might require, the IP calling experience is familiar enough that it is unlikely to present a disruption beyond orienting staff to a new voice mail system or handset. However, if VoIP adoption brings a change in established phone numbers, a significant public education and outreach initiative may be necessary.

Provided that they are allowed third-party software, many librarians are already using Skype in the workplace. While IP phones are viewed as easier to secure and manage at the organizational level, some institutions are also beginning to experiment with Skype for office communications. In 2009, massive budget cuts across the University of California system motivated the UC Berkeley Library Systems Office (LSO) to pilot a Skype program among its employees. Campus extensions are available at Cal for hefty fees, so as part of a radical cost reduction strategy, the LSO began giving library staff the option of either consolidating individual lines into shared extensions or using Skype as their desktop telephone client. Skype has thus far been adopted by roughly 30 employees, who received new Skypeln numbers and SkypeOut with their choice of a headset, wireless phone, or “D-Link” adapter to convert their old handsets.

The cost benefits are striking: a Skypeln number is $30 per year with a $3 monthly charge for unlimited calling and a one-time $30–$50 hardware purchase, compared to $45–$55 monthly for a campus line—a tenfold difference
per user. By reducing subscriptions to campus phones through line consolidation and Skype adoption, the UCB Library was able to cut its voice costs by a third (roughly $120,000) in one year. Although quality issues (dropped calls, etc.) have resulted in significant troubleshooting and training for some and even a return to campus service for several initial adopters, Director for Library Technologies Bernie Hurley notes that the project has nonetheless been successful according to its aims. He characterizes it as a somewhat imperfect opt-in means of reducing expenditures rather than a mandated switch, noting that the “clear and urgent motivation to reduce costs has helped employees accept some degradation in phone service quality.”

Flexible Work and Distance Collaboration

Telecommuting and distance collaboration are among the most powerful professional applications of VoIP. As virtual work becomes a reality thanks to cloud and rich communication tools, many organizations are grappling with the implications of flexible staffing. In early 2010 Inc. magazine produced an issue away from its offices to gauge the effectiveness of telework. Opinions varied, but the fundamental feasibility of distance work emerged, as well as the revelation that personal preference was an important factor in virtual productivity.

Libraries are largely site-specific enterprises that tend to require face time from their employees, but with the digital transition more staff are working partially or totally online. Elizabeth Winter, electronic resources coordinator for Georgia Institute of Technology Libraries, began working remotely after a change in her husband’s job necessitated an interstate move. She relies heavily on VoIP to maintain connections with her colleagues: “I use Skype video calls to attend meetings with my department and exclusively for my business calls, and it actually works really well. Attending meetings via Skype feels almost like being there—it’s cheap and simple.”

For cross-organizational collaboration, Skype, WebEx, or other Web conferencing tools can replace expensive voice or video conference calling equipment. Web calling platforms are commonly feature rich and inexpensive to use, meaning that geographically dispersed employees, committees, and project teams can cut costs and interact virtually using Dimdim, Skype, and other multimodal voice and video platforms. Collaboration environments and virtual meeting spaces are growing increasingly sophisticated and customizable, as Google Wave and other new platforms integrate dynamic features and create rich real-time and asynchronous networks. Jennifer Smathers, head of Technical Services at SUNY College at Brockport, observed that “New York State has many geographic and weather challenges for whole-state collaboration. . . . With many of our campuses experiencing travel freezes due to budget cuts, Skype has allowed projects to continue unhindered.”

Most Web calling and conferencing tools are highly configurable and can accommodate a number of simultaneous users before becoming pay-for-play. Testing and experimentation can reveal the most productive option for a working team or committee. In her 2008 LTR, “Changing the Way We Work,” Michelle Boule examined a number of methods for conducting meaningful work across distance. One of the teams she interviewed, the Oregon State University Library Find project, noted several free VoIP clients instrumental to their collaboration approach:

We used a few different tools. Initially, we had free access to an online collaboration tool called Breeze [now Adobe Connect]—this allowed us to hold meetings where we had voice, video, and screen presentation capabilities, as well as collaborative whiteboarding and document editing. Eventually, our free access to Breeze ended, and we migrated over to using Skype for our weekly meetings, and Campfire, an online chatroom service from 37 Signals. Skype was software that most of the team already used, and it provided us the ability for both voice and video communication.

Recruiting and Interviewing

Many professional sectors now use software VoIP as a “cheap, low-hassle way to vet job candidates,” a still-underutilized application of video calling in libraries. It is typical practice for academic libraries to invite potential hires for one or two onsite interviews, an expensive proposition even in sanguine budgetary climates. A first-pass or vetting interview that uses Web video can preclude an onsite interview in extreme circumstances, or give a hiring committee a more personal sense of a candidate than is possible via voice alone. I made several call-outs via Twitter and other channels seeking librarians who had had Skype interviews, but received no response save from nonlibrary contacts. Ben Wurgaft, a friend and lecturer in the UC Berkeley History department, responded that he had recently been interviewed via video:

The committee requested a Skype video interview in lieu of the usual conference first-round interview, and I agreed—I would have preferred phone without video since my computer is older and doesn’t have a camera, but I knew I had very little pull in such a case. The actual interview took place on a borrowed computer. I was seated in an office and my committee was also, albeit 3,000 miles away. There were no technical difficulties, although both sides acknowledged finding the slight time lag distracting. My chief complaint was
the discrepancy between the camera lens itself and the video representation of my conversation partners; it meant that I never actually appeared to be looking at them when I was looking into the camera, and as a result they had the luxury of not looking away while I had to, constantly, whenever I wanted to see their reactions. I’m sure that had I been able to rehearse with the camera ahead of time I would have foreseen the problem. I was already a Skype user, but not a video Skype user.

Ben isolates the benefits and drawbacks of Skype interviews. On the one hand, they affordably bridge distances and offer a more individual connection with a candidate. On the other hand, they can present technical hurdles and create conversational problems in an environment where reading and responding to subtle cues is vitally important.

**Virtual Participation**

Digital communication has advanced to the degree that (some) participation in (a few) professional organizations is no longer (totally) limited by physical distance. Within membership organizations such as ALA, calls have been mounting for years for greater virtual participation in events and organizational decision making, resulting in the development of collaborative platforms such as ALA Connect. The Virtual Participation Resources Community is a venue for pursuing digital participation strategies within ALA itself, while the LITA EParticipation Task Force created a virtual participation “decision tree” (figure 12) that provides suggestions for collaboration at different levels of interactivity.

In response to budgetary shortages and technology improvements, conferences and events also increasingly occur either entirely virtually (e.g., Handheld Librarian 2009 and 2010) or in a “hybrid” fashion, with virtual components for supplementary purposes or as an alternate attendance track (e.g., PLA 2010). Virtual conferences combine Web voice, video, text, and screen sharing.
to create live and archived learning and networking experiences, and although most charge fees equivalent to in-person registration, they can still dramatically reduce travel costs. VoIP often provides the voice component to virtual events, but other methods such as streaming media (e.g., Ustream) are also used.

The technical platform of virtual events is largely dependent on their scale, with larger programs often contracting with experiences clients such as Adobe Connect or WebEx, or via online learning communities such as LearningTimes. There are also products such as vConferenceOnline and Digitell, Inc. that create immersive Web conferences complete with attendee avatars, digital conference centers, and full video networking rooms, although I have not discovered a library event that has used one of these services. Smaller events are likelier to use free and open source Web calling and conferencing tools to create interactive live sessions and archive multimedia.

Presenting at conferences and the like can be a considerable investment of time and funds, and webinars and other virtual options present a viable alternative. My earliest attempt at presentation via VoIP occurred in late 2007, when I gave a remote to the Future of Libraries Conference in San Francisco, using Skype video via web cam and a screen-sharing plug-in, Yugma, to show my slides (figure 13). Although somewhat impersonal and disjointed for someone who enjoys a lot of audience interaction, even in Skype’s relative infancy the event went off without a hitch. It was the intrepid attitude of organizers Paul Signorelli and Sarah Houghton-Jan that facilitated what at the time was a quite novel approach. In my experience, live Web voice or video presentations of this sort are still rare in libraryland. I have suggested presenting virtually at several events I could not attend in person, usually to be shot down for technical limitations in the venue or eminently understandable anxiety on the part of organizers.

Online Learning and Development

Professional learning and development communities such as WebJunction and Blended Librarian are also facilitated by Web voice. These tend to provide attendees with a options from simple live listening or viewing to fully integrated video chat with presenters and coparticipants. Webinars often occur with minimal to no participation expected from the audience. I have observed both presenting and participating that relatively few attendees use the full range of communication media during these events, many hesitating to use even text chat (let alone voice or video) to engage with presenters or coattendees. Steven Bell, co-organizer of Blended Librarian Online, reflects on this partial participation tendency:

Since we do fairly regular webcasts we make significant use of [VoIP] for our programs. I think it works great. What amazes me is that so few of our attendees ever have headsets or mics so that they can participate vocally. It seems most are content to chat what they have to say. I know some are equipped with mics but those folks seem hesitant to use them in these public meetings. I don’t know why this is. I wonder if it is just a technology that hasn’t caught on yet. I think librarians are hesitant because they think it will fail
or others won’t hear them and they’ll look foolish for having tried. But given that there are so few on-the-job opportunities to use VoIP, perhaps it isn’t a surprise that so few librarians are ready to use it during a webcast. Even in an ACRL committee where we are meeting online and have VoIP support, only three out of eight use the VoIP—the others use the chat exclusively. . . . I wonder if this will change as more library students are enrolled in online courses. I can’t speak for all of them, but when I’ve taught online I’ve made use of WIMBA, which works great with VoIP and supports our ability to talk with each other.10

WebJunction
www.webjunction.org

Blended Librarian
http://blendedlibrarian.org

Depth of virtual participation is a matter of choice and personal preference, but like Bell I believe that the distance learning experience could become more engaging if it more frequently leveraged the interactive elements that can humanize an otherwise detached virtual space. Tom Peters, coordinator of Online Programs for All (OPAL) and author of a recent book on virtual library conferencing, observed, “Personally, I don’t think video adds much to the webconferencing experience (watching someone’s head bob and lips move gets old pretty quick). But voice adds a lot of personality and warmth.”11 When used well, voice and/or video can help create a sense of shared experience and increased motivation. This will involve a shift away from the spectator orientation many of us have long held towards our personal and work computers, where watching and listening is more natural than speaking and being seen, and interaction occurs almost exclusively at a textual level.

Despite their usability curve, virtual worlds can also encourage and community building in professional learning interactions. In Second Life, where participants are represented by avatars and therefore less anonymous than typical webinar attendees, events often incorporate voice as well as text chat. This increases interaction among those already invested in an embodied and participatory (rather than disembodied and observational) virtual environment. Esther Grassian, library educator and active Second Lifer, reports that she frequently uses VoIP in-world “as a panelist and as a moderator at various conferences and programs,” in addition to arranging similar events in credit-based classes at the UCLA School of Information.12

Notes
10. Steven Bell, e-mail message to the author, Dec. 21, 2009.
11. Tom Peters, e-mail message to the author, April 1, 2010.
VoIP in Reference, User Services, and Instruction

Abstract

VoIP tools are applied in numerous public services contexts. This chapter explores web voice and video implementations from reference to instruction and beyond.

The last chapter considered VoIP in workplace productivity and professional development; this chapter focuses on its implementations in public and user services. As I mentioned in chapter 1, my personal “peak of inflated expectations” centered on Web calling as an extension of digital reference. Among the many applications of Web calling I describe in this chapter, call-in and kiosk voice and video reference models seem to be the least successful. What emerges instead is a pattern in which targeted applications of Web calling and conferencing provide cost-effective solutions local to communication, outreach, and learning needs.

VoIP Reference

Skype a Librarian

VoIP is being used to extend virtual reference, but often with mixed results. At Ohio University in 2007, my Reference and Instruction Department Technology Team colleagues (Chad Boeninger, Chris Guder, & Tim Smith at the time) and I began piloting a Skype a Librarian call-in service. Still in operation, this service is staffed 24/5 and long weekend hours from the Alden Library Learning Commons service desk (figure 14). Anticipating that Skype would become the preferred communication method of many faculty, international students, and graduate students, we promoted it as a way to use chat, voice, or video for general and in-depth research help.

Despite the continued success of OU’s IM reference program, Skype a Librarian remains moderately used (one to two questions a week). According to Chad, getting a question is still “sort of like spotting a unicorn,” but there has been a modest uptick in recent months as students increasingly use Skype for their own communication purposes.¹ For this reason and because it takes so little maintenance (Skype logs in automatically when the computer is started), OU will continue to offer Skype a Librarian for the foreseeable future.

A handful of academic libraries of varying sizes provide similar Skype a Librarian services, including University of North Carolina, Greensboro and Taylor University. Through interviews with program coordinators I located the following common characteristics, all confirmed by our experience at OU:

- Usage is nonexistent to modest and dependent on steady promotion.
- Participants initially tended to be faculty and international students, but more groups appear to be adopting Skype over time.
- Services can be difficult to staff and integrate with other virtual and in-person reference offerings.
- Users prefer to converse via text chat rather than initiate a voice or video interaction.
- Technical difficulties were regularly reported.
- The service seemed to be highly valued by the few who initiated interactions, who often tended to become repeat Skype chat users.

Interviewees consistently expressed hope for the future of Skype reference, but contingent on VoIP’s
popularization and local promotion efforts. “I still think Skype holds promise as a communications mechanism for pushing our reference services through means that our users may find most convenient, especially to those students most removed from our main campus,” said Paul Roberts, director of patron services at Centennial Library at Southern Seminary. He also noted, however, “The jury is still out as to whether it actually fills a need for us.”

More targeted applications of Skype, such as scheduled virtual research consultations, may produce a more scalable service model than an open call-in approach.

**Integrating VoIP in Chat**

Some large-scale chat software providers such as ChatStat and LivePerson have enabled “click to call” functionality, which could provide voice or video on demand in chat reference interactions. Another option is using external VoIP tools to achieve the same result. I located one consortial service that had recently experimented with software VoIP in this capacity: askON/Ondemande, a nonprofit chat reference provider serving about fifty public and university libraries in Ontario. Jan Dawson, project coordinator and virtual reference librarian for askON, describes the Skype pilot they operated between November 2009 and April 2010:

We didn’t originally intend on using Skype. We had always intended on piloting [LivePerson’s] “talk by PC” capabilities and were led to believe that our account had VoIP. Once we started planning, we were rudely awakened to the fact that we indeed did not have VoIP functionality as indicated. We had to quickly research an alternative and the obvious choice was Skype due to its popularity (via Oprah-ization!) and its ability to work on most operating systems. Our motivation to pilot VoIP on our service was multifaceted . . . as well as being a progression to the ultimate goal of providing the choice of face to face reference service at askON, we also saw adding voice as an opportunity for those with poor typing ability (perhaps due to disability, etc.) or also when . . . typed instruction becomes cumbersome [for askON staff]. Our visitors didn’t use Skype, but there were several limitations to the pilot project such as asking them to jump from the chat platform to another voice platform . . . so I feel as though had things been done differently, it’s possible we would have been more successful . . .

AskON CALL staffers invited patrons to use Skype during a chat session if voice was requested, if typing became too unwieldy, or if the staffer was simply interested in trying a different approach. Very few patrons elected to use Skype, with an overwhelming majority either uninterested or unable for other reasons.

Jen shared her results from an exit study tracking askON CALL use as well as patron and librarian experiences with the pilot. There were few successful Skype interactions; most staffers felt that it was difficult to navigate the external application from the LivePerson interface and that the benefit of adding voice was disproportionately low when compared to the difficulty of setting it up. Reasons for low interest varied across user populations, from institutional Skype bans to a perceived lack of convenience. Dawson notes that most of these difficulties were created by the unforeseen necessity using an external voice application rather than LivePerson’s unavailable built-in VoIP, and that fully 25 percent of participating staff were reluctant to use Skype either out of trepidation or because they “liked the moment of pause chat brings in comparison to the immediacy of voice.”

**IP Phones and Skype Handsets**

For traditional telephone reference via IP phone, network or power outages can cause significant service interruptions. According to Margaret Rodermond of the University of Lethbridge Library, “we have had [IP phones] for about two years. As soon as there is a problem with the Internet or any problems with any of the University’s computer servers, we are totally down. We cannot even phone out for assistance, if needed.” Some libraries have considered using software VoIP rather than IP phones to field calls at public service points. I corresponded with Carrie Phillips, a librarian from Bluffton University Libraries who posted to web4lib asking if any institutions had replaced worn-out reference desk phones with Skype WiFi handsets (she got no replies, by the way). Bluffton decided against Skype phones in favor of a cellular plan because “it was
a matter of new technology that we didn’t have time to properly vet for feasibility. The technology that we’d been using . . . was dying a quick death and we needed something to replace it fairly quickly. We might have gone the Skype phone route if we’d had time to do a trial will still maintaining the old phone. I found many instances of this dilemma—VoIP was often considered when communication issues occurred, but rejected if adequate vetting time was lacking or if a more familiar technology presented itself.

**Video Kiosks**

In addition to direct reference, software VoIP tools such as Skype and TokBox can be configured to create standalone information kiosks that incorporate click-to-call voice, video, and text options via touchscreen or keyboard and mouse. As far as I can determine, the Ohio University kiosk remains a proof-of-concept project that has not been replicated. I communicated with two academic libraries that considered creating similar projects—Temple University and San Francisco State University, both of whom decided to pursue other options. While the OU kiosk functioned for close to two years and went through a number of reconfigurations and interface redesigns, it was never successful enough to justify the maintenance it took to keep it operational. In the next two chapters I take on the kiosk project as a case study of the library innovation cycle, exploring its successes and failures as well as the Temple and SPSU scenarios in more depth.

**International Services**

The utility of Skype and other Web conferencing or calling tools for international communication cannot be overstated, and can help libraries serve user populations with cross-border contact needs. Many of professional Skype users are researchers and teachers for whom distance communication and rich cultural exchanges are necessary, yet prohibitively costly. Among Skype’s most well-known educational applications are language learning—the Mixzer, a free network hosted by Dickinson College—facilitates free group and individual language exchanges.

![The Mixzer](www.language-exchanges.org)

**International and Study-Abroad Services**

A growing movement to recognize the “internationalization” of higher education has focused attention on distance use of home library resources and the difficulty navigating unfamiliar research cultures. In a more promising iteration of the VoIP reference model, Skype and other clients can become a cost-effective outreach, information, help, and instruction tool to any audience that depends on cross-border communication, such as students studying abroad and international students at local campuses.

Andy Burkhardt and Sarah Cohen at Champlain College Library provided reference and instruction to study-abroad students via Skype, targeting a group of 30 students at the university’s Dublin study program. They experienced initial promotional difficulties but were able to conduct several successful teaching and research interactions, and had unexpected success using Skype to establish relationships with administration. Taking additional steps to increase student awareness, they will continue to offer this Skype program as a standard feature of the Champlain/Dublin study-abroad program.

**Public Skype Stations**

Library-provided Web calling and video conferencing station can help individuals without high-speed Internet at home connect with friends, relatives, and colleagues abroad. In Alabama, a Gates Foundation–funded and governor-sponsored initiative, Connecting Families, has equipped 100 public libraries with Skype video for military families to contact relatives stationed overseas (figure 15).

In addition to this initiative, I located several public libraries promoting video conferencing stations (usually a PC or Mac with a webcam and headphones or a Skype handheld phone). A successful example is the Tigard Public Library in Oregon: In operation since 2009, TPL’s Skype Lab allows patrons to make free video calls and connect to landlines for standard SkypeOut charges. Featured on the Share Skype Blog, reader services manager Len Anderson describes the program: “We currently have eight computers with Skype software downloaded and usable. We have, to date, purchased four Skype phones . . . depending on demand, we may expand to have all 16 computers in the Technology Room and also order additional Skype phones.” Program manager Ning Wang reported better-than-anticipated adoption of the service following a Skype education program, adding that this created unexpected technology literacy benefits:

We had no idea how the community would respond to this new service when we started. There were very few patrons taking advantage of it initially. We realized that most of the people knew little or nothing about Skype at the time so we increased publicity and started to offer a Skype class, making the library as an education center as our main focus. Our first class
was a huge success. The lab was completely full. There were military families, people who had families or relatives overseas and those who traveled frequently in the class. The demand was out there. Education and promotion was the key to draw them in. We had more patrons initiating voice and video Skype calls after classes. We added more Skype hours and had staff at hand assisting users to make calls or show them how to establish a Skype account on patron’s own computers. . . . This is a permanent service we offer. We believe it’s more than we expected from the aspect of educating and introducing new ideas and technology to the community.12

Virtual Participation and Community Building

VoIP is being used to create successful online versions of traditional library services that focus on meaningful interpersonal communication, such as author visits, children’s story time, instruction, and book clubs. For patrons unable to visit a library location for reasons of frugality, convenience, or physical access barriers, VoIP apps facilitate virtual visits, distance learning, and other contact-intensive services.

Virtual Author Visits

A small but growing number of public and school media librarians now use voice and video over IP to conduct virtual author visits. The Skype an Author Network, sponsored by media specialist Sarah Chauncey and YA author Mona Kirby, is a wiki-based community of young adult and children’s book authors available for scheduled video Skype visits free for a 10–15-minute introduction, or for modest hourly fees. According to Chauncey, “If you only have the option of in-person meetings, many schools are limited to one visit per year. . . . Hourly Skype visits range from $100 to $400 dollars—significantly less than an in-person visit.”13 When asked about student reaction to the virtual visits, Chauncey notes, “The younger students . . . are more attentive than when a person is standing in the room with them. The idea of seeing and hearing someone who lives in another state is pretty cool.”

Mediaplanet.com

Media specialist Wendy Stephens reported that two Skype author visits she conducted with her high school students in New Market, Alabama, were quite successful. “They tend to work extremely well,” she said, “better than the virtual field trips we have conducted using much more expensive IVC equipment.”14 In 2007, she arranged for one group to meet with It Takes Time to Fall author Margaret Dean (figure 16), and in late 2009 Violet author and readergirlz.com creator Melissa Walker spoke with another:

I used an inexpensive webcam and digital microphone with Skype [for the first visit]. Margaret Dean and I had arranged a call beforehand to check the connectivity . . . we didn’t have any technical issues at all. I used a digital projector to throw the image from a laptop onto a screen. The visit was about forty-five minutes, and was later noted by several students as one of the most memorable things they did in high school. The Melissa Walker visit had an even better result. I was a big fan of readergirlz website . . . and I thought she would really engage my students. The chat was really fun, with Melissa quizzesing the girls about their favorite books and pastimes. And it actually resulted in connections deeper than I ever would have anticipated. That evening, Melissa let me know several of the girls had been in touch via email. One student began sitting in on readergirlz chats, started her own blog, and has begun a memoir since the chat. The fact that it began with the author’s largesse in allowing us a few minutes to

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Mobile learning—the 2010 Horizon Report predicts that as handheld features and speeds improve, m-learning with voice and video will become more viable.\(^{17}\)

### Distance Learning and Instruction

Similar to the VoIP-supported professional learning strategies in Chapter 3, many library educators rely on voice and video applications like DimDim and Elluminate to provide online instruction. Avril Cunningham, USC Library Instruction Coordinator, used the Web conferencing platform Macromedia Breeze (now Adobe Connect) to illustrate how chat environments such as Meebo, Skype, and now Google Wave can support distance or just-in-time teaching needs, such as in instances when it is difficult to schedule an in-class session (figure 17).\(^{16}\)

I have used Dimdim to reach students as far away as Ghana, and find that after testing and triaging to prevent echo and so forth, viable participatory learning experiences are quite possible. Teaching and learning in a virtual environment takes some getting used to, and instructors often report difficulty reorienting their teaching style. That said, as Web conferencing tools improve and voice and video widgets begin to integrate with Moodle and other course management systems, synchronous instruction will become more common in virtual and "blended" (hybrid in-person and online) environments. VoIP will soon influence content delivery and participation in mobile learning.

### Content Creation and Archiving

Many VoIP tools offer recording or voicemail features, making them useful for inexpensive DIY content creation. This shoestring approach to audio and video archiving is useful for preserving meetings and events and creating fixed or mobile recording stations. I recently met with a planning team at UC Berkeley interested in recording student testimonials for a campaign to renovate the undergraduate library: we brainstormed several Web calling configurations for a makeshift video booth. I also located a successful “audio harvesting” project at Bowling Green State University Library in Ohio. The library is using a Google Voice widget to help create a “digital scrapbook” to support the campus’s Centennial celebration. Users can access the widget and record audio memories by calling into a dedicated Google Voice number or sending a call to themselves through the project site (figure 18).

Gwen Evans, coordinator of library information and emerging technologies at BGSU, described the digital voice archive project:

We had a mobile “ingestion” booth at a recent event, and realized that as it got noisier, our cheapo
microphone wasn’t going to be able to cut out the background noise. My staff member suggested that we use a Google Voice number and let people “phone in” their story as voicemail, since phones did a really good job of cutting ambient noise. Not only can we harvest stories at events where we are scheduled to appear, we are going to put the Google Voice widget on the site and let anyone with a story “phone it in.” This is so much easier than setting up an audio booth or users having to know how to set up a microphone on their computer, saving the file, uploading the file, yada yada—all they have to do is phone the number, and Google and we do the rest. Google Voice even lets you record a custom greeting for each widget. Added bonus is that people can text a story in via SMS to Google Voice (one line at a time), a la cell phone novels in Japan.18

In an interview with the BGSU student paper, Evans noted that “this isn’t really what Google phone is intended for, but we are really pushing the envelope with it . . . it’s really just a phone service but we are able to upload these voice mails to the site and it works great.”19 Early coverage of the project resulted in two “genuine, unsolicited” contributions prior to its official rollout, both of which could be accessed at the project website.20

Figure 17
Teaching with Meebo, TokBox, and Skype.

Figure 18
Centennial Memories voice widget.

Notes

5. Dawson, e-mail message.

Conclusion

VoIP enhances the ability of geographically dispersed libraries and librarians to connect across distances, increasingly important in a time of digital transition and resource consolidation. Contrary to my original predictions of the transformational power of Web voice and video for information services, their value seems to be in digitally bridging distances and creating rich personal experiences. Author visits and job interviews lend themselves more naturally to Web video than reference interactions, which are often text-preferred and do not necessarily require face-to-face communication. Another characteristic of VoIP’s adoption is its context specificity; local programs differ from one another significantly. As Tigard’s Skype Lab and the BGSU voice widget demonstrate, the most successful insightfully address immediate issues and involve active user engagement.
15. Ibid.
Chapter 5

Video Kiosk as Hype Cycle

Abstract

This chapter maps the progression of the kiosk project over the library hype cycle, from planning to implementation to cessation.

Chapters 1 and 2 outlined the types and technical details of VoIP, and chapters 3 and 4 examined how they have been applied in libraries. In the next few chapters, I map my mixed experience as an early adopter of video reference across the hype cycle. To recap the rise and fall of the hype cycle, consider the example of Second Life: in its early days (technology trigger), SL was hailed as a revolution in Web ecology (peak of inflated expectations) but is now characterized by some as a “cringe-inducing technological wasteland” (trough of disillusionment). In spite of limited popular adoption (slope of enlightenment), a dedicated community of educators and librarians still thrive there, engaging in professional development and teaching even if their virtual service desks and buildings remain almost totally unused (plateau of productivity).

As I have noted, there were two components to Skype services at the Ohio University Libraries—a now-discontinued video help kiosk, and a still-active Skype a Librarian call-in reference program. In this chapter I focus on the the video kiosk, a more experimental service that underwent a fairly constant process of rapid prototyping over its lifespan. By critically examining an on-the-ground pilot from beginning to end, I will attempt to draw transferable lessons about what it means to innovate or fail when working with emerging tools, and what this implies about library users and their communication preferences.

Technology Trigger

The kiosk project, which operated between 2007 and 2009, was inspired by a member of the OU Libraries’ Systems Department who had seen a video help kiosk at a museum. Intrigued, he preliminarily investigated options before raising the idea with the Reference and Instruction Technology Team. Interested but daunted by the $3,500 price tag of a formal videoscreen kiosk, we decided to test the feasibility of more makeshift virtual face-to-face services in high-need areas that lacked adequate reference staffing. Our technology trigger was therefore simple: inspired by the success of local IM reference and other 2.0 initiatives, we were curious whether we could use webcams to create virtual “desks” in places we could not extend ourselves physically. In this way, one digital reference staffer could provide simultaneous assistance at multiple locations via voice, text chat, and video.

At its Athens campus, the OU Libraries serve 20,000 students from Alden Library, a large centralized facility relatively unique in that it has two entrances separated by several floors. This has the effect of distancing the main reference point in the second floor Learning Commons from the main circulation point on the fourth floor (figure 19). Cramped, difficult to navigate upper stacks floors created a service problem: patrons frequently travel two floors down to ask for help only to be referred an additional two floors down to reference staff.

The kiosk was tested in these two high-need locations; first on the sixth floor in the library’s stacks, later on the fourth floor opposite the main entrance. In addition, a long-range goal was to design kiosks that could be placed in other campus buildings to provide an inexpensive and convenient remote library presence. The first
(stacks) version of the kiosk was a PC with a webcam, speakers, two Windows Live Messenger accounts, and a small sign publicizing our “VideoIM” help station (figure 20). To replicate the experience of a face-to-face interaction in the virtual environment, we opted for a video chat window that displayed our faces live on screen between 9:00 and 5:00 (which became known alternatively as the “librarian in the box” or “Max Librarian Headroom”).

This model involved a librarian monitoring IM and chat reference and the video kiosk from an office cubicle outfitted with a dedicated webcam laptop and IM desktop (figure 21), eventually option for rotating shifts from our personal computers for the sake of convenience. In its prototype deployment, we oriented ourselves and about 10 participating coworkers to the user interaction protocol and issue triage strategies, resolved a number of technical kinks, such as choosing Skype over our initial choice of Windows Live Messenger. This decision was based on video quality and Skype’s superior ability to troubleshoot dropped calls, which required running up stairs with Windows Live Messenger—Skype mercifully has an auto-answer setting.

We received very little traffic on the initial kiosk—a few walk-ups and a number of patron referrals from stacks staff. In each case, a “video interaction log” kept by the kiosk staffer indicated moderately successful interactions using voice, video, and text chat to send URLs and call
numbers in response to research help and item location inquiries. After a number of months, we examined our initial service model and determined that its configuration and placement created unanticipated problems. The webcam peered out over a bank of computers, which gave some users the sensation of being watched as they worked (see figure 1 in chapter 1). The kiosk itself was not particularly identifiable—it too closely resembled other stacks PCs, which masked its intended use as a service point and caused some patrons to, for example, quit Skype entirely in order to open a browser.

**Peak of Inflated Expectations**

After the stacks prototype, we decided to redesign and reconceive the kiosk for what we expected to be a bigger, better implementation in a more heavily trafficked location, directly opposite the main library entrance. In this iteration the kiosk was more formal looking, albeit somewhat cobbled together from surplus parts—a webcam affixed to a flatscreen monitor secured to a podium with PC tower hidden beneath, all promoted with more visible signage (figure 22). Hopes for this version remained high, and based on its success we intended to again evaluate purchasing a more formal kiosk for use elsewhere on campus.

To address the issue of patrons closing down the video call or quitting Skype to use the kiosk for personal work, our redesign removed the external keyboard and opted to make only a mouse available for navigation. This intentionally scaled down the research help focus of the initial design in order to test a model oriented towards walk-up directional interactions. Around this time, I wrote a short blurb about the kiosk for OU’s quarterly library publication:

> The Alden Library Reference Department recently added an innovative new component to its virtual reference services—video chat. This pilot program uses rapidly improving internet video communication technology to provide a face-to-face virtual connection with users both inside and outside of the Libraries. While undeniably effective, other types of virtual reference service types such as IM and email reference can create something of a digital divide between librarians and users. Few other libraries have experimented with video call technology in this way, and our pilot seeks to test whether video services can provide an additional and more personal means of virtual research help to our patrons. The project will continue with a new kiosk on the 4th floor opposite the main entrance doors, which will hopefully attract increased traffic and give the service a more public face. We will also allow users to call in from outside

the library using Skype as a component of our Ask a Librarian service, and hope in the future to secure a campus location for a remote library kiosk.

My inflated expectations are undeniably evident in this description as well as in my first professional presentation, nerve-wracking 20-minute affair at the 2007 ACRL Conference Cyber Zed Shed. My basic message was that voice and video over IP was the next big thing in virtual reference; I remember describing video as capable of bridging the digital gap that many staffers felt in chat and IM interactions. This optimism was based on little more than the fact that we had build a technically sound virtual service point, and the sky’s-the-limit technology ethic of the time.

According to OU Technology Team leader Chad Boeninger, this was “the era of reference innovation—chat, text, then . . . Skype was next.” Our work involved a full-speed-ahead determinism that seemed to anticipate no outright failure. While this might seem misguided in retrospect and likely caused the project to endure for too long, it was also rooted in the enthusiasm and creativity that motivated us to discover hacks and solutions to each new issue that occurred (which is lucky, because issues kept occurring).
Trough of Disillusionment

If putting a “public face” on digital reference was one of our main motivations, it also became our most persistent frustration. We experienced unexpected headaches from wireless interference to webcam tampering to staff irritation to a mysterious blue line that appeared in the middle of the video window for an entire month. From the public side, the librarian-in-the-box was sometimes seen as novel, sometimes useful, and often plainly disturbing. When interactions occurred, they sometimes involved answering honest-to-god directional reference questions—between 5 percent and 12 percent of all of our overall virtual transactions in one closely tracked six-month period. More often, we engaged in “what is this thing?” explanations, waved at campus tours, watched student antics and pantomime shows, or stared at an empty lobby when no one was around. In this sense the kiosk was an excellent temporary outreach tool, but public interest waned over the months.

After the constant video connection proved technically possible and unsuccessful from the standpoint of patrons and staff, in department discussions we determined that simply took too much staff effort and discomfort was required operate the constant call kiosk. Curious about finding a different configuration that might prove useful, the Technology Team decided to redesign the kiosk interface so it resembled something more along the lines of a touchscreen display (for mouse operation—a “click-screen”). This new model was more explicitly directional and allowed users to select one of four options—hours, building map, ask a librarian (which placed an auto video call via Skype), or contact information (figure 23).

Slope of Enlightenment

The clickscreen introduced a first-pass element of choice that allowed a patron to direct the interaction. It also changed the way we fielded questions; instead of being referred to a kiosk-specific account, calls were now directed to the Ask a Librarian account staffed at the reference desk. To better manage the kiosk remotely, I installed desktop control software that allowed me to monitor and triage most issues from my own computer. These changes drastically reduced staff dissatisfaction with the librarian-in-the-box model, which had proven itself cumbersome, uncomfortable, and not at all akin to the desk experience. It also resulted in far fewer walk-up reference interactions, indicating that, however problematic it might have been, the constant-call method with the more formal kiosk was indeed eye-catching and understood by many as a digital service point.

After we moved to the makeshift touchscreen, we were also able to gauge kiosk use with Web analytics—each time a user clicked an option, it was tracked as a page hit. This confirmed that while the map, contacts, and hours functions were used with regularity, few patrons clicked the “Ask a Librarian” link (which we already knew through low question volume). It had become apparent that we had mis-assessed popular Skype use as well as the desire for library services via VoIP. When I reflect on the hard-knock learning aspects of the kiosk experience, the most important element of our enlightenment slope was in recognizing the critical necessity of researching the habits and preferences of our users prior to creating new technology initiatives. In order to better anticipate the reception of the services we designed, we needed to understand (a) what social media and other tools our students were actually using, and (b) if they would use those tools in educational library, or research contexts.

In response to this need we conducted a large-scale technology and library environmental scan in early 2008 (I describe our research approach and findings in Informing Innovation: Tracking Student Interest in Emerging Library Technologies at Ohio University). In regards to VoIP, the results were clear: some students...
used Skype for personal reasons and indicated that they might contact a librarian for information help, but not to the extent that we had originally expected. A few other campuses have conducted scans based on the template Informing Innovation survey instrument since 2009, and report similarly modest interest in Skype services. Ann Roselle, a librarian at Phoenix College, notes that 81 percent of 444 students surveyed reported never using Web calling applications, and among those who did, about 30 percent indicated they would be likely to contact a librarian for assistance. Ellie Collier, Reference Librarian at Austin Community College, at conducted a similar survey among their campuses and found that only 16 percent of student respondents (N = 1000) used Skype on a weekly basis, and only 4 percent indicated that they would be interested in contacting the library (compared to 24 percent of Facebook users).

Plateau of Productivity

The kiosk remained in operation largely to support its other on-screen functions, but Skype call volume never became scalable after the constant call method was abandoned. After I left OU in late 2008, the Technology Team put the kiosk through one more signage and interface change to increase interest, profiled in a video post on Chad’s blog, Library Voice. They considered transitioning to text chat instead of Skype in the Ask a Librarian area as a final mitigation measure, but due to continued wireless issues and stretched resources the project had created a scenario of diminishing returns. Chad, who continues to do innovative work with video for outreach, and instruction, sounded the kiosk’s 2009 death knell:

We’ve been using Skype as a reference option for quite some time. At one point in time, people in library land were really hot about what we were doing with the service. It had great potential, was free, and was easy enough for anyone to set up. . . . We almost never got questions with our Skype Kiosk, even after trying several different staffing models and user interfaces. This past fall, we pulled the plug on our Skype Reference Kiosk, although we still offer Skype as an option for our general Ask-a-Librarian service.

The video kiosk proof of concept was there, but its proof of context was not. Video is a communication medium highly subject to preferential adoption: in our case (and perhaps most point-of-need digital reference contexts) it simply did not enhance the quality of service. Skype’s multiple communication affordances (e.g., text, video, voice) make it a powerful and flexible public service tool, which has proven far more useful to Skype a Librarian call-in interactions. This is the value of experimental projects: we only gathered this insight by testing a concept and learning from our mistakes.

Chad and I discussed what we gained from the project overall, and we agreed that it was a unique proof-of-concept team project in a risk-positive environment that rolled consistently with the punches until it proved itself unnecessary. Staff, although incredibly good-natured about the project, were taxed by its demands and were relieved when we moved to the touchscreen configuration. While patrons used directional elements modestly and had engaged in a number of meaningful interactions during the constant call phase, its core functionality went underutilized at a realistic level of staffing.

If the only measurement of the kiosk was its viability as a digital stand-in for a face-to-face service point, it was an unmitigated failure. If its other achievements are taken into consideration, such as the proven success of rapid team prototyping in a library environment, the value of testing experimental uses of emerging technologies, the importance of cross-departmental collaboration, the insight gained into staff desires, patron needs, and virtual service models, not to mention the wealth of experience team members have shared with the library community, then it was a resoundingly successful failure.

Notes


7. Ibid.
7. Ibid.
Chapter 6

Lessons for Library Innovation

Abstract

This chapter examines outcomes and insights afforded by the video kiosk in order to suggest best practices applicable to other emerging technology contexts.

Analyzing the Kiosk Experience

The economic climate is introducing a different shade of technological conservatism to many sectors of library-land, one based more on resource scarcity than resistance to change. Trying times make a “try it and see” approach far less palatable, upping the ante for new and proposed projects to have an immediate demonstrable impact. It is therefore more important than ever that we learn from one another’s experiences in order to inform local applications.

Critical perspectives can become buried in 140 characters, leaving out “why x really matters,” and the even more useful “be prepared for a and b to go right, and y and z to go wrong.” Anyone who has wrangled social tools into viable services knows that reflective, radically honest perspectives on performance are absolutely necessary to prevent us from replicating each other’s mistakes. In this chapter I analyze several angles and outcomes of the kiosk project that have implications for emerging technology development in other library contexts.

Knowledge Sharing

Our experiences at OU influenced similar project proposals at other institutions. Between 2007 and 2009 Temple University and San Francisco State University both considered and rejected kiosk pilots based in part on the project information Chad and I shared through blogs, papers, and presentations.

When they began considering kiosks, the SFSU Libraries faced a lengthy construction project that would render their public service points unusable for several years. Jeff Rosen, reference services coordinator, describes their decision-making process, which went as far as designing mock signage to share with library administration (figure 24):

Initially we felt the video kiosk would provide the next best thing to an in-person librarian. . . . While we were able to successfully set up the Skype service on our campus network, it was certainly not without problems and we felt these would increase were we to attempt extending the service to our downtown campus. We also felt that instant message reference service and text message service would provide a comparable virtual reference service and be more portable and easier to staff. Many of the librarians (including some of us testing the service) had less than comfortable feelings at being “on camera.” Moreover, after our initial investigation we felt that IM service offered the same level of being able to assist users without the exposure to both patron and librarian that video conferencing would provide. There was also the staffing issue. How would we provide in-person, IM, text and Skype reference services from one location and with fewer personnel than we had the previous year?

Jennifer Baldwin, head of reference and instructional services at Temple University Libraries, describes a different kiosk scenario—they considered a pilot similar to OU’s while exploring innovative stacks assistance models. Despite considerable interest among reference staff,
support was given to competing text messaging and roving reference pilots:

The kiosk idea came up twice in response to our annual budget initiatives requests that each library department makes to our administration. . . . Ultimately a request for a directional assistance kiosk was submitted in 08, but it was less a priority than our requests for things like handheld devices for our roaming reference project and an audience response system for our classroom. In the case of VoIP for reference, I think the reference department focused on the projects that best served our patrons at that time—expansion of virtual service (we were dropping docutek and implementing libraryh3lp), experimenting with modes of face-to-face service (roaming with handhelds), and improving our instructional sessions (audience response system). For the directional needs in the stacks, the technology idea that had a champion (cell tour) won out over the one that didn’t.²

I experienced a similar situation in my current position; at UC Berkeley in 2009 I considered and rejected a kiosk approach in our similarly understaffed stacks, supported by my experience that the resources required would far outweigh the benefit to users. Informed by our feet-first experience at OU, SFSU and Temple were able to anticipate potential overextension and shallow return on investment. Had we not shared the benefits and drawbacks of the project and the current viability of video kiosk reference, Temple and SFSU might have gone through a redundant hype cycles instead of starting at our slope of enlightenment.

Organizational Culture

An institution or department that sustains a flexible, and enthusiastic culture can engender a great deal of forward-thinking collaborative work, undoubtedly one of the best outcomes of our team-based, rapid-prototyping approach. Experimental outlooks can also unintentionally cause an overcommitment of staff and resources unless strong planning creates an understanding of how pilots will affect other operations. In more conservative or procedural environments, fewer projects may see the light of day due to overzealous vetting or “death by committee,” but those that emerge are likelier to begin scalably. The balance is a well-informed, risk-positive library that communicates well, helps ideas benefit from the input of affected stakeholders, and allows the strongest ideas to rise to the surface.

An interesting byproduct of the creative freedom enjoyed by our team at OU is that even a problematic concept was given time to right itself and thrive (or, in our case, die). Our iterative approach produced an undertone of resistance to letting the kiosk defeat us—after so much success with other initiatives, admitting its limited impact was difficult. My own attitude was that there was a buried secret in the project waiting to be unlocked, and my hope of discovering the “right” configuration is one of the reasons we kept changing things up. Even though it drew the pilot beyond its useful lifespan, prototyping created knowledge that otherwise never would have been gained. Our main error was in not gathering more patron input prior to designing the service; had we conducted user research earlier, we might have found that a Skype call-in service and video kiosk were both before their time and secondary to other priorities. In this scenario, our organizational factors added up to a well-implemented, interesting, overextended, and ultimately unnecessary project born of hype-affected expectations.

In her description of why Temple discarded the kiosk idea in favor of other emerging reference service models, Jennifer Baldwin noted, “in reflecting on it I see this may be an illustration of how organizational culture and the structure of our budgeting process impacts adoption of emerging technology.” Organizational priorities are indeed key, which leads me to reflect that, in contexts that can produce them, experimental projects need to come and go so that we may all learn from their hits and misses. It is absolutely necessary for some individuals and institutions to devote energy to experimental pilots, even if they ultimately crash and burn. While this is more feasible within flexible or progressive climates, it is a cultural change important to promote throughout the library field.

There are best practices in project planning and local
Rationalizing Expectations

When I started talking about Skype kiosks and video reference back in 2007, I believed that Web video was the next inevitable step in the progression toward more personal and in-depth digital reference experiences. This thought process was built on the deterministic, hype-influenced assumption that each new communication or social technology is inherently disruptive, and should therefore be widely implemented. A diagram I created in 2007, the “Evolution of Virtual Reference,” which implies that e-mail is the old school while video reference is the new school (figure 25). While this may be the case to some extent, it cannot be seen as an inexorable progression. According to this reasoning, Second Life was the logical next frontier in digital reference, which it is safe to say at this point was wrong. Why not ChatRoulette reference, or arbitrarily jumping onto a blind and anonymous video chat site and randomly asking participants if they have a pressing information need?

It’s not incorrect to assume that the advent of a new platform creates the potential for new library products or programming, but it is equally important to reflect whether the audience for each service becomes smaller as options proliferate. In a different type of “long tail,” introducing SMS or IM reference can reduce the number of in-person and telephone inquiries, giving the appearance of service declines unless assessed in tandem. I overestimated the adoption curve of Web calling in part by missing this lesson: Niche services should be viewed with consciously (but positively) deflated expectations. Even though there are hundreds of millions of Skype subscribers, they are a fraction of total phone users who tend to use VoIP for personal and professional communication - a library use cohort is going to be modest from the outset. While the audience may exist, it is necessary to understand whether it is substantial or interested enough to warrant the work.

Video Reference

During the Skype project I made one relatively sound prediction: interfaces and devices that give users the choice of one or more modes of communication (voice, video, or text) would become increasingly popular, now undeniably the case with mobile devices, social media, and other tools. This trend seemed to promise powerful results for reference because it provided more types of information exchange and created dynamic interactions, allowing users to choose according to their preference. My mistake was to assume that they would choose video. Targeted or scheduled video consultations or recorded vodcasts may be effective ways of providing distance information help, or instruction, or to create a “sense of occasion,” but that no call-in interactions in any Skype pilot have to my knowledge involved user-initiated video indicates that visual communication is not a value-contributing aspect of most general reference services.5

Smart Mobs author Howard Rheingold has noted, “One thing about video . . . it does convey an authentic sense of the person being there, and I think there is real value in that.”6 There are several applications of VoIP in public services, and video kiosks are among the most problematic. As the OU pilot was being laid to rest, Alabama’s Connecting Families Skype initiative and Tigard’s Skype Lab were discovering the true potential of video calling in libraries—connecting people who truly want and need to see one another in order to create a valuable experience.
Meebo that allow simultaneous IM logins, universal communicators can be centrally field incoming reference queries from e-mail, Facebook, Twitter, IM, SMS, VoIP, mobiles, and landlines without affecting the patron experience.

**Fidelity, Social Presence, and User Preference**

In order to understand how our vision of video reference failed and why text is a more comfortable mode of reference communication, it helps to consider two concepts: communication fidelity and social presence. Communication fidelity is how closely a technology-mediated interaction (e.g., phone call, text message) resembles a face-to-face interaction (e.g., video chat has much higher fidelity than an e-mail, for example). Social presence is how interpersonally close a user feels to the individuals they are interacting with, regardless of medium.¹⁰

In a *Time* magazine article in early 2010, Joel Stein speculated on why video calling hasn’t become more popular, concluding that it’s largely because it forces you to focus on the other party, which is completely out of keeping with our increasingly control-centric, multitasking, and asynchronous world. In other words, video calling demands a level of fidelity that is contrary to how most people want to communicate: with a minimum of effort and time. In Stein’s words, “as far as the full-contact listening that Skype requires, I don’t think we want that all that often from people who aren’t already in our house. The fact is, we don’t really want to see other people that badly.”¹⁰

From SMS to tweet to in-person conversation to video call, individuals shuttle between modes of communication fidelity to satisfy different functions. They might video conference with their loved ones and text a library question in the same hour, making strategic judgments about fidelity preference based on what they hope to achieve from the interaction. People choose video when, whether for personal or strategic reasons, communication needs to closely replicate an in-person exchange. The error in judgment that led me to make outsized predictions was that people would continue to pursue higher fidelity in communications (i.e., video) irrespective of context as the technology improved, and that some would begin to prefer video as their general method of communication.

Fidelity in professional settings plays out similarly, some hesitating to fully engage with their personal

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**Consolidating the Streams with Universal Communicators**

Staffing multiple services was a constant issue among libraries piloting Skype reference on the call-in model, similarly taxing to us during the kiosk pilot. “The staffing of any service is a challenge,” noted Millie Gonzales of Framingham State College, recalling the difficulty of integrating Skype into Whittemore Library’s reference workflow. “We offer email, telephone, IM, SMS reference service as well. Sometimes it is difficult to juggle and prioritize the services because of our staffing levels.”⁸ By setting up a one-stop multifunctional account to consolidate the multiple reference streams that libraries contend with as natural consequence of social media diversification, universal communicators like VoxOx (see chapter 2) can provide a powerful way to mitigate this problem and integrate new options more gracefully into existing workflows. Building on the strategy already provided by tools like Trillian and

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Michael Buckland has argued that the discourse of digital reference has too often focused on “empowering” librarians than fulfilling information needs; in a sense, the kiosk project was a perfect manifestation of this tendency.⁷ It was an attempt to raise librarian visibility as a means of enhancing services, but it did not reflect user preference in the digital environment. In our kiosk discussions, Chad makes an excellent point about why text-based communication is easier for library users to handle (figure 26): it is faster and requires less social protocol, which facilitates streamlined, low-threshold information exchange. Text-based communication in its contemporary forms—chat, email, IM, and SMS—is proving to be the most efficient digital reference format. Putting a literal face on virtual reference may have been a laudable attempt to deepen the digital interaction, but it did not consider that users might simply prefer the simplicity and anonymity of text.

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**Figure 26**

Chad’s comments on the comfort of using text-based digital reference.
computer as a unified communications tool. In chapter 3, I quoted Steven Bell on the reluctance of many participating in the Bended Librarian Online to use voice or video in Web learning interactions. He elaborated, saying, “I do not think this is necessarily limited to our librarian community. When I participate in similar webcast for the TLT Group, attendees are typically faculty and instructional technologists, and even then there are few folks taking over the mic to speak... The next generation may be more accustomed to using VoIP to communicate in their courses. I hope you are able to find some examples of libraries using VoIP or video with the user community, but I suspect that even fewer of them are accustomed to having the mic or headset available for this sort of thing.”

Steven makes a critical point: until we begin seeing our personal computers as rich communication devices, we risk reducing the potential of our digital interactions.

The Uncanny Valley

People tend to use video when social presence makes them want higher communication fidelity, never casually. Conversely, they tend to choose convenience and expediency for utilitarian interactions. The video aspect of our kiosk thus made it virtually impossible to put patrons at ease, one of the primary aims of a reference interaction. Video was disturbing, distracting, and out of keeping with their simple desire for assistance. Rather than personalizing the digital interaction as we had hoped, video succeeded in alienating users to the point of service failure.

A concept known as the “uncanny valley” helps explain this phenomenon. Developed by Japanese roboticist Masahiro Mori, the uncanny valley is based on Freud’s notion of the uncanny, which describes the disturbance we feel when something is simultaneously foreign and familiar. The uncanny valley is a zone between digital figures that are not lifelike enough and those so lifelike that they are unsettling: “The notion was that if you made a robot that was 50 percent lifelike, that was fantastic. If you made it 96 percent lifelike, it was a disaster. A 96 percent lifelike robot is a human being with something wrong with it.”

Video calling also operates in an uncanny valley, one in which digital communication is almost lifelike enough but only if social presence is sufficient to sustain an acceptance of Web video’s flaws. In the average video call, not only do you frequently deal with low resolution and error, your own image is open in a distracting mirrorlike smaller window, and camera positioning makes it impossible to make eye contact with the other party or parties. To bridge this gap a few people have rigged DIY mirror systems to achieve eye contact (figure 27), but these are still infrequently used. Until screen-embedded cameras and faster network speeds are the norm, video callers will operate in this uncanny valley and accept a semidisturbing degradation of interpersonal communication quality only to satisfy a compelling urge to see someone.

Learning from History

Despite popular fascination with video communication for well over one hundred years, a persistent reality of “lackluster demand” has derailed its on-the-ground implementations to an extent I wish I had investigated before co-building the kiosk. AT&T launched
near-identical versions of its “Picturephone” in 1965 and 1973, as well as the “Videophone 2500” in 1992: three of many unmitigated failures. Several issues contributed to the videophone popularization problem: excessive cost, absence of demand, and poor quality of service precluded them from home markets. Business consumers were the only ones that could afford the technology, yet they could not find a compelling interest to use such “expensive toys” in their offices. Perhaps not surprisingly, this pattern of post-novelty consumer disinterest corroborates with the OU kiosk experience: video calling has stretched the hype cycle to historic proportions.

A recent enterprise VoIP study concluded that “factors involving inter-personal relationships [were] collectively more important than travel as reasons to use video: clear communication and understanding, understanding subtle cues, and building relationships,” all factors that shed compelling light on why we were not able to sustain a walk-up or call-in video reference model at Ohio University.

Inexpensive webcams, Internet protocols, and broadband networks have allowed this epically and epochally “stalled” technology to become popularly viable, but the fidelity afforded by interpersonal, real-time video seems firmly constrained to interactions with intentionally high interpersonal significance.

Notes

3. Ibid.
6. Howard. Rheingold, “Participatory Media for Education” (keynote address, Next Generation Teaching and Learning Symposium, University of California, Berkeley, April 17, 2010).
11. Steven Bell, e-mail message to the author, Dec. 21, 2009.
16. Ibid.
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 drawout 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. 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.

- 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.” 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 wireless to satellite connections. 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. This is not the case for wireless networks,
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

3. Sheehan with Pirani, Spreading the Word, 143.
6. Ibid.
7. Ibid., 34.
Library Technology Reports Respond to Your Library’s Digital Dilemmas

Eight times per year, Library Technology Reports (LTR) provides library professionals with insightful elucidation, covering the technology and technological issues the library world grapples with on a daily basis in the information age.

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