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BROADBANDPROPERTIES

KILLER APP

MAGAZINE

EMERGING APPLICATIONS FOR A CONNECTED WORLD

THE TELEPRESENCE REVOLUTION

WILL IMMERSIVE ENVIRONMENTS CHANGE THE WAY THE WORLD DOES BUSINESS?

Collaboration: From the operating room to the design studio, new videoconferencing technology brings far-flung workers together.

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Fiber Communities Seek Killer Apps

By Geoff Daily

"The killer app for us is that people want turnkey services."

If anyone knows what applications fiber-to-the-home customers are looking for, it's Glen Lang, CEO of Connexion Technologies. Connexion has built and operated fiber networks in nearly 30 housing developments in the Southeast, and it delivers services under contracts with homeowners' associations.

Lang was speaking at Killer App Magazine's panel at the Broadband Properties Summit in Dallas, Texas, where he shared the podium with Michael Johnston, VP of Information Technology at the Jackson Energy Authority; Paul Morris, executive director of the UTOPIA consortium; and Lars Krumme, executive vice president of HomeMovie.com.

Lang explained, "When we built our network, we didn't know what the killer app would be, and we still don't." Rather than a single application, it seems that Connexion's customers want bundles and support – "a single number to call to solve their problem." Connexion has obliged by expanding its service bundle from the standard voice-video-data triple play to include security, access control, concierge services and in-home network maintenance.

What are fiber communities doing with all that bandwidth? FTTH network providers are experimenting with selling security services, online storage, videoconferencing, targeted ads and much more.

Connexion's next project will be targeted advertising for local TV. Television programs downloaded from satellite allow two to three minutes of each hour for locally inserted ads. Usually, everyone in the service area receives the same advertisements – but because Connexion has individually addressable set-top boxes, it has the capability of sending custom ads to each box.

"Let's say the whole family's watching the Super Bowl on their own TVs," Lang said. "Well, at 2:05 Grandma might get a Geritol ad, while the kids might get a Toys R Us ad, and Dad might see a Mercedes Benz ad….Now all of a sudden the local pizza place can do targeted local TV advertising. We think this will be the killer app for us going forward." Targeted advertising isn't feasible without a large enough subscriber base, but Connexion expects to reach the critical threshold sometime next year.

The Motivating Factor

For Connexion, which is the exclusive network provider in its developments, new applications are a means to increase average revenue per customer. But for Jackson Energy Authority, which competes with other network providers, new applications can also help attract new customers.

Glen Lang of Connexion Technologies speaking at the Broadband Properties Summit

A public utility in Jackson, Tennessee with 12,600 customers on its FTTH network, Jackson Energy is actively seeking the next killer app, according to Johnston. Power users who are sophisticated about high bandwidths are already JEA customers. Now the authority is looking for applications that might be motivating factors to win over the less-sophisticated users.

One application that has been popular is live remote local programming, especially streaming and TV coverage of high school football games. According to Johnston, "This immediately drew a lot of consumers to the network to watch." Jackson Energy also offers offsite storage and co-location services to small businesses, which pay anywhere from $50 to $100 per month to store their data in a secure facility.


Michael Johnston of Jackson Energy Authority

Johnston also said several local companies had begun leveraging Jackson Energy's fiber network to offer remote computing solutions for small businesses. "Instead of having to worry about buying thousand-dollar computers and updating them all the time, for $10 per month per user at your office they'll provide all the applications that you'll need," Johnston said.

Videoconferencing Unbound

At UTOPIA, a consortium of thirteen Utah cities that is creating a fiber-based "multilane freeway to the doorstep," executive director Paul Morris is frustrated because so many applications are written for the lowest common broadband denominator and don't take advantage of fiber's enormous speed.

Morris demoed a desktop videoconferencing application called VSee, which he has been using to communicate with other FTTH network executives. He explained that the software was initially written with its upload capabilities capped: "The assumption when they wrote the software was that people wouldn't have the upload speed, so it stops at 700 Kbps. But when they found out what people have in places like UTOPIA, they decided to start working on a version that will go up and up." Morris introduced Dr. Milton Chen, VSee's inventor and the CTO of VSee Lab, who told the audience that the new fiber-friendly version of VSee will produce "full-screen gorgeous video" like that found on high-end videoconferencing systems.

Morris also demonstrated Slingbox, a television place-shifting device made by Sling Media, which sends television signals to a PC over the Internet. He talked about calling Slingbox's help line and asking what customers had the most trouble with. The immediate answer: unreliable upload speeds. "When Slingbox figures out that people have fiber, they'll change their software to leverage the available bandwidth," Morris said. "I have HD channels I can't get through there because it doesn't have the streaming capacity."


Paul Morris of Utopia

In the future, Morris said, FTTH customers should be able to use applications like the immersive technologies being developed at the University of Southern California's Integrated Media Systems Center: 3D face modeling and animation, "immersivision" panoramic video technology and immersive audio. Immersive experiences require bandwidths of 70 to 140 Mbps, according to Morris, but concerts transmitted using this technology are so realistic that test audiences say they would pay to attend them.

The Application Provider's View

HomeMovie.com's Lars Krumme introduced his video editing, sharing and archiving platform, which differs from other available services in its emphasis on long-form videos. (You can read more about HomeMovie.com in the August issue of Killer App Magazine or online at KillerApp.com.)

Why would a network operator want to partner with HomeMovie.com? Krumme had a list of answers:

- Reselling the service can generate additional revenue quickly, since HomeMovie.com is designed to be easily deployed with the network provider's brand.
- Storing their videos at the site makes customers reluctant to leave the network, thus reducing customer churn.
- HomeMovie.com offers flexible financial options, ranging from simple revenue sharing to pay-per-use to fixed fees for deploying across an entire network.

And as for why HomeMovie.com would want to partner with a network operator, Krumme explained that such a partnership could be a winning strategy for an application provider: "We need to maintain our focus on research and development to stay ahead of our competitors. That's why we're looking for partners who already have the customers.

Geoff Daily is the assistant editor of Killer App. He can be reached at geoffd@killerapp.com.

The Power of Portals

By Masha Zager

E-mail. Web hosting. Maybe news headlines and the local weather. Until recently, customers couldn't expect much more than broadband itself from their broadband providers.

But times are changing. Today, it's common for providers to lure customers with elaborate portals featuring services like games, photo storage, network security and even home security. Some of these are free basic services, others are premium services, and still others are advertising-supported. Most or even all of them are applications that consumers could easily find elsewhere. So why are broadband providers offering them?

Applications Add Value

The simplest answer is that bandwidth has become a commodity item. Connectivity is cheap, and the cost per Mbps keeps falling. Consumers now treat broadband as a utility, a necessary basic expense rather than a product they want for its own sake.

"Broadband providers have to either drop their prices or add value," says Drew Buckley, until recently the VP for business development at Synacor (www.synacor.com), which sells private-label portals and premium content, "and their strategy is to add value." Value can be added through increasing speed or services – or both.

As users adopt the digital lifestyle, broadband traffic has grown exponentially. This growth represents both a problem and an opportunity for providers. It has put such a strain on networks that some telcos have threatened to charge application providers who are not their customers for use of their networks, and in so doing have sparked the "net neutrality" debate.
On the other hand, it also gives providers the chance to add value by selling customers the applications they want. As Gemini Waghmare, VP for marketing at Casero (www.casero.com), a developer of white-label social networking applications, says: "It's your subscribers' content, and your network, and someone else is getting the revenue from it."

Hosting applications also allows network providers to reduce their costs. Shipping all those user videos to MySpace's data center in California is expensive; by keeping traffic within their own footprint, they avoid wholesale transport charges.

Yet another benefit is the opportunity to attract new customers. According to Waghmare, Casero originally expected its clients to offer applications only to their own broadband customers, but

Application portals help broadband providers monetize their network traffic while retaining and growing their customer bases

that hasn't proved to be the case. Providers may offer their own customers a better deal, but they're happy to sell applications to other consumers in their footprint – not just for the additional advertising or subscription revenue, but also to bring new customers into their networks.

Selling applications gives providers market insight that may be a valuable asset. "Service providers have a local advantage in understanding their subscribers that Google and the others would never have," Waghmare says. For example, they may sell aggregate information about how many customers are using specific applications, how much time they are spending, and how much bandwidth they use.

Finally, applications keep customers loyal. Applications are "sticky," according to Buckley, because consumers can personalize them. The more user profiles they set up, the more playlists they store, the more game scores they save and the more automated birthday greetings they create, the less likely they are to change providers. "If you leave, you lose all this," Buckley says.

Consumers Benefit, Too

Of course, consumers wouldn't use these applications unless they also benefited. Usually, the provider's leverage gets them better prices and/or more free content than they could obtain on their own. For example, Synacor's original application bundle, marketed by SusCom as Broadband Plus for $8 per month, included subscriptions to American Greetings, Encyclopedia Britannica, and other sites that were separately worth about $50 per month. (SusCom has since been sold to Comcast.)
Consumers also benefit because:

- They can feel confident about using applications and storing personal data without concerns about security or data loss.
- All their applications are in one place – the provider's portal – and can be accessed with a single ID and password.
- They can pay for all the applications on a single bill, along with their monthly broadband subscription.

Choosing the Right Apps

Which applications appeal to broadband providers for resale to their customers? Synacor and Casero have come up with different answers to this question, but their applications share certain similarities.

Casero offers a digital media suite that includes photo sharing, music sharing, video sharing, blogging and online storage, as well as a home monitoring application. While it developed all these applications in-house, it is open to allowing other vendors to build applications on its platform. The applications are meant to be resold with the service provider's brand.

Synacor brands the portal and the bundles, rather than the individual applications. It licenses applications from mostly well-known providers and makes them available for resale in educational, music, sports, Internet security and general-interest bundles. The general-interest bundle, which is the most popular, features games, greeting cards, news, weather, learning, sports and movies.

What these two approaches have in common is:

- **Mass appeal.** Casero began with a home monitoring solution, which it still markets, but decided that not enough people are concerned about home security. On the other hand, everyone shares family pictures. Synacor, too, has chosen applications with wide appeal – everyone sends birthday cards; all parents want educational resources for their children.
- **Ease of use.** Part of mass appeal is simplicity – most consumers aren't technical wizards. For everyday use, an intuitive interface is more important than bells and whistles.
- **Customizability.** As discussed earlier, the more work the consumer puts into the application, the less likely she is to abandon it. Casero's applications let users store and share their digital media; many of Synacor's applications encourage personalization.
- **Fixed and mobile.** Consumers want to access music and, increasingly, video from their mobile phones or MP3 players. Both Casero and Synacor offer "on the go" applications.
- **Bundling.** Consumers like bundles. They like paying a single bill, using a common ID, learning a single interface, and having access to applications they might not otherwise have discovered. While Synacor will let clients sell applications a la carte, it believes that bundles are more advantageous. Casero also points out that one application can leverage another – for example, a provider that has a million subscribers storing photos on its site is in a good position to negotiate with a photo printing service, and then to offer photo printing as a premium application.

The Telepresence Revolution

By Howard S. Lichtman, Human Productivity Lab

Business is all about face-to-face relationships. Effective communication, whether between board members and corporate officers, salespeople and clients, or partners in joint ventures, requires the understanding and trust nourished by eye contact.

For decades, business has relied on commercial air travel to bring people together. Today the capacity of commercial aviation is seriously strained, with flight delays and baggage losses increasing, carriers declaring bankruptcy and fuel prices soaring. But business continues to globalize, and technologies like e-mail, Web conferencing and instant messaging have reset our expectations of turnaround times for decisions. Waiting days or weeks to huddle the team doesn't cut it anymore.

Many people expected videoconferencing to solve these problems. But even with improvements such as higher resolution, bigger and better displays and IP networks replacing ISDN, the average usage of videoconferencing systems remains an abysmal 15 hours per month.

Videoconferencing users complain that talking to the "camera-on-the-TV-set-on-the-dessert-cart" is uncomfortable and unnatural. Traditional videoconferencing is often the option of last resort, and even then it is almost always used internally, rather than for important meetings with customers or partners.

Telepresence dramatically improves the acceptance of visual collaboration by creating a more natural, productive and realistic experience. It works at any scale, from the desktop to the auditorium. Users feel they are "present" in the same physical space with others who might be thousands of miles away. Owners of telepresence group systems report usage between 60 and 275 hours per month – far higher than for traditional videoconferencing.

Solutions that business people are willing to use can cut down intracompany business travel, improve productivity and reduce wear and tear on road warriors. They also simplify collaboration with partners, vendors, investors and customers.

The ability to effectively conduct global inter-company business will make telepresence the “killer app” of the 21st century, with the potential for the exponential growth that characterized telephony, the Internet and other communication networks.

Within the next decade, nearly every major corporation will adopt a technology that few have heard of today. Telepresence, which takes videoconferencing to the next level, lets people interact as if they were in the same room.

No Slam Dunk for Videoconferencing

Instantaneous, not limited by geography, and allowing communication between multiple parties in multiple locations, videoconferencing should be a slam dunk for business communications. Why is it used for only a small fraction of meetings, and rarely for meetings where relationships with partners, clients or prospects are formed, and where body language is important?

Traditional videoconferencing fails to replicate the experience of a face-to-face meeting. It offers tiny remote participants, jerky motion, poor audio, limited body language and no eye contact. In addition, the lighting is often poor, the colors off, the resolution bad, the format artificial, the controls complex and the collaborative tools weak. Trying to process the videoconferencing experience (TV set, camera, 8-inch-tall participants) along with the meeting itself (what participants are saying and doing) is fatiguing. As a result, productivity and return on investment suffer.

The ugly little secret about traditional videoconferencing is that many people don’t like the experience and prefer not to use it. For years the industry produced spreadsheets, graphs and interactive tools that promised return on investment based on travel avoided. Some companies estimated additional benefits from improved productivity. There was only one problem: Since no one liked videoconferencing very much, the systems weren’t used nearly as often as providers projected.

Organizations where traditional videoconferencing systems are used more than 15 hours per month typically have mandates curtailing business travel and/or requiring videoconferencing. They also tend to follow “best practices” such as using dedicated high-bandwidth IP networks, and they keep the videoconferencing room-to-employee ratio low.

Human Factors First

About a decade ago, two resort developers in the Caribbean took a different approach. Herold Williams and David Allen wanted to give their guests an effective way to conduct business without having to leave their little slice of paradise. They decided to get the human factors right, and then develop the electronics around the human experience. They founded TeleSuite, the first commercially successful telepresence company, and developed a product that was used between 60 and 130 hours per month at each site -- four to seven times the usage of traditional videoconferencing.

Flying in the face of the conventional videoconferencing wisdom – stack ’em high and sell ’em cheap – TeleSuite systems cost (and still cost) hundreds of thousands of dollars per room, with thousands more in monthly charges for network connectivity, support and maintenance.

Telepresence solutions from HP and Teliris can run more than $10,000 dollars per month, per location. Deploying a site to an international location with limited fiber optic capacity can run as high as $40,000 per month. By contrast, traditional videoconferencing desktop solutions range from under-$100 webcams between $3,000 and $5,000 dollars for dedicated desktop videoconferencing solutions.

Eye contact is chief among the body’s non-verbal cues. People with strong eye contact are perceived as more honest, attractive and successful, while “gaze-avoidant personalities” are rated less favorably. Eye gaze provides feedback, conversational regulation (turn taking), and access to others’ thoughts and emotions.

Traditional videoconferencing systems deliver poor eye contact because participants focus on the eyes of the remote participants and not on the camera. Telepresence providers use several methods to avoid this “parallax problem.” For example, Digital Video Enterprises mounts eye-level cameras behind a piece of silvered glass.

Telepresence in a Nutshell

Telepresence environments duplicate in-person experience as closely as possible.

They typically include:

* Life-size images of participants
* Fluid motion
* Accurate flesh tones
* Studio-quality video, lighting and acoustics
* The absence of visible technology
* True eye contact, or the approximation of eye contact in large-group settings
* Immersive and/or mirrored environments where participants feel as if they are in the same physical space
* Consistent quality between disparate locations

The room environment affects the quality of the videoconferencing experience. Overhead lighting casts harsh shadows that the camera magnifies; placing the videoconferencing system at the head of the conference table assures an unnatural meeting format. Telepresence providers use lighting that is optimized for video, and they position seats and equipment to make the meeting format natural. They also create identical environments everywhere on the network, so that participants seem to share the same physical space.

Acoustics can be improved with proper acoustical materials and sound insulation. Many telepresence providers use directional audio to make sound appear to come from remote participants.

Concealed cameras make meetings more comfortable because human beings tend to behave differently in front of a camera ("the documentarian's curse"). Some telepresence providers use small lenses concealed in an opening in the display; others hide the camera behind polarized glass.

Video quality depends on bandwidth, network quality, and the resolution of the video codec and camera. Telepresence providers recommend using networks with speeds of at least 1.5 to 4 Mbps, and those that provide private networks use bandwidths up to 45 Mbps. With dedicated private networks, providers can offer service levels that minimize jitter (jumpiness) and reduce latency (one-way delay) to below 250 milliseconds.

High resolution is important for visual realism. Being able to see perspiration or a slight grimace provides a window into the thoughts, truthfulness, motivation or comprehension level of remote participants. With more visual realism, the brain can stop focusing on the "medium" and concentrate on the "message." Telepresence providers use current-generation video codecs, including many that are capable of high-definition images.

Audio quality is also maximized by private, dedicated networks. Telepresence providers can sync participants' speech with lip movement and offer CD-quality audio with good echo cancellation in a "full duplex" configuration, so that both sides can speak simultaneously without losing any audio. This level of audio can't be achieved in traditional multipoint videoconferences.

Ease of use is big with telepresence providers. While videoconferencing providers have simplified their controls, most telepresence providers have taken it a step further by providing concierge services for call setup, simplifying the use of collaborative tools, providing intuitive, touch-sensitive call setup menus, and positioning camera and display so that camera angles don't need to be adjusted.

Life-size and properly proportioned images are made possible with large-format video walls and multiple monitors. By contrast, most traditional group videoconferencing systems display images of remote participants to a single 36- to 50-inch monitor.

Success Stories

Usage levels don't tell the whole story of telepresence solutions. Even more important are the types of results that telepresence makes possible. Here are some projects that would never have been accomplished with traditional videoconferencing:

- Pearson used its GlobalTable to connect the talents and image library of its Dorling Kindersley subsidiary in London with the educational publishing expertise of Pearson Longman in New York City. The GlobalTable connection allowed the New York and London teams to meet for over a year, as often as twice a day, to collaborate on 140 titles including textbooks, teacher support materials and CD-ROMs in the fields of science, history, geography, art, design and technology.
- DreamWorks' Virtual Studio Collaboration initiative lets the company conduct virtual storyboard sessions between various campuses and Aardman Animation, a joint venture partner, in Bristol, UK. DreamWorks credits the use of telepresence with its ability to ramp up from producing one animated feature a year to its current pace of two animated features a year, effectively doubling its revenue potential each year.
- UBS and Oppenheimer used TeleSuite's publicly available virtual meeting center at the Waldorf-Astoria to meet with private investors at another publicly available TeleSuite at the Ritz-Carlton in Phoenix. The companies' mutual fund and portfolio managers could present to, answer questions from and develop a rapport with the remote investors. Some of these events were catered, and one concluded with a virtual wine tasting.
- HP, utilizing its own Halo network, transferred a production line from its R&D facility in Corvallis, Oregon to a permanent home in Singapore. According to HP, the usual timeframe for such a move is 12 months, with multiple trips between locations. The HP team responsible for the move estimated that its use of Halo enabled it to shave six months off the project and avoid 44 international trips.

Telepresence Vendors

Vendors whose products were the basis for this article include:

AudioTek/ATK Services www.atkservices.com
Cisco Systems www.cisco.com
Destiny Conferencing/TeleSuite www.destinyconferencing.com
Digital Video Enterprises www.dvetelepresence.com
Hewlett-Packard/Halo Collaboration www.hp.com/halo
MedPresence www.MedPresence.com
Polycom www.polycom.com
Telanetix www.Telanetix.com
Teliris www.Teliris.com

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Howard S. Lichtman is the president and founder of the Human Productivity Lab, a consultancy specializing in telepresence and visual collaboration, personal and organizational productivity, and sales model optimization. This article is excerpted from his report "Telepresence, Effective Visual Collaboration and the Future of Global Business at the Speed of Light," available at http://www.humanproductivitylab.com. The report was sponsored by a group of telepresence providers. Howard can be reached at HSL@HumanProductivityLab.com.