



THE BENEFITS AND CHALLENGES OF VIDEO CONFERENCING

An Interview with Victor von Schlegell, President, Appia Communications Inc.

Q: What is video communication?

Video communication combines voice, data, and video in a live, interactive session. It might be a video conference, in which some or all of the participants can be seen and heard by each other. It could also be a broadcast, in which only the host needs to be seen and heard, such as in a distance learning session.

Q: What are the benefits of video communication?

We have known for a long time that visual cues represent up to 90 percent of communication. This is why a face-to-face conversation, such as a video communication, is always much more informative and engaging than a phone call.

Video communication also reduces or even eliminates the need to travel, resulting in both hard and soft savings. Escalating travel costs provide an obvious and immediate return, but it's also worth considering the hassles, lost time and lost productivity, and the harmful effects of travel on an organization's carbon footprint.

Another benefit is that video allows teams to meet in person regardless of where team members are located. Of course they could travel. But if one team member is in Chicago, another in New York, and another in L.A., it's difficult and expensive to bring them together, especially on short notice.

Finally, video fills a communication gap. The past several years have seen an explosion in methods of communicating. When I started in business, all you had was a phone and a fax machine. Today, there's email, chat, and more. But these are all impersonal forms of communication, which do not allow either participant to see the other and truly interact. Video fills in this gap very nicely. It's the next best thing to being there.

Q: So why hasn't video been adopted more widely?

I think there are several reasons. First, video equipment has been expensive. This is because most solutions required proprietary equipment, which blocked alternatives and allowed vendors to set high prices.

Also, video used ISDN, a telephone line technology, as the method of transport. ISDN is charged by the minute at high rates, which made video sessions expensive, especially if

some of the participants were located outside the US. ISDN is also unreliable and subject to outages.

Finally, traditional video solutions were difficult to use, which meant you needed people with specialized expertise to hold video sessions, and complications were frequent and disruptive. All of these created barriers to the adoption of video, especially by small and midsize companies and organizations.

Q: What has changed?

The most important change is the Internet. Internet bandwidth is widely available and relatively inexpensive, especially when compared to ISDN.

Second, a new generation of vendors has begun to offer solutions that allow users to purchase key elements – displays, cameras, etc. – from third parties. This makes it possible for users to choose from more options, and to buy what they need less expensively.

Third, new compression techniques have made it possible to hold even high-definition video sessions with relatively little bandwidth.

Q: Why is bandwidth important?

To put it mildly, video is a bandwidth hog! To appreciate how much this is so, let's consider high-definition video as an example.

For 720p, each video frame is 1280 by 720 pixels. That's a total of 921,600 pixels per frame. A pixel is 12 bits, so each frame is over 11 million bits. At 30 frames per second, that's over 330 million bits per second! A broadband T1 connection can carry about 1.5 million bits per second, but it would take more than 200 T1s to send video without compression.

Q: What can be done about it?

That's where today's compression techniques come in. The most recent is what is called H.264. This technique was designed to maximize compression while providing excellent quality. In low-motion settings (such as video conferences or broadcasts), H.264 can achieve compression of 200 to 1. So the transmission we just discussed would require a little over 1 million bits per second, or less than the capacity of a T1.

Q: You keep referring to a T1 connection. What about other ways to access the Internet,

such as cable or DSL?

They work too, although the quality of the experience depends on the provider you use. Remember that T1s, cable and DSL all have an outbound path and an inbound path. Generally, cable and DSL providers offer packages that have more inbound capacity than outbound. That's ideal for a video conference, since you usually want to see more than one other participant.

Q: Why did Appia decide to develop a video offering?

I've already mentioned some of the reasons why video is such an essential communication medium. But when we looked around, we found that the offerings on the market were either too expensive, used too much bandwidth, or both — which made them unaffordable or impractical for many companies and organizations, especially smaller ones.

Q: Appia has just introduced Appia Video Communicator technology. What makes it different?

Appia Video Communicator, or AVC, is a next-generation video communication technology developed specifically for real-time applications. It is based on a proprietary implementation of the H.264 codec. But we have also added what we call ActiveFrame™.

Q: What does ActiveFrame do?

The first benefit of ActiveFrame is that it reduces bandwidth requirements beyond what H.264 achieves by itself. In fact, with ActiveFrame, a high-definition video session (such as the one we have been using as an example) requires much less than 1 million bits per second — more on the order of 700,000 or less.

But the other benefit of ActiveFrame is the way it accommodates the Internet. To efficiently transport large amounts of information, the Internet breaks it down into smaller pieces called “packets.” Video packets are quite large, especially compared with voice and most data, so there tends to be “burstiness” with video. Bursts result in packet arrival-time variations, which can mean lost packets and therefore lost frames. ActiveFrame includes a component that smoothes out the delivery of packets, which minimizes packet bursts.

Q: Appia is offering “video as a service.” What does that mean and why is it important?



If you have more than two points participating in a video session, you need what is called a multipoint control unit, or MCU. MCUs are expensive. Also, the site hosting the MCU has to have a large amount of bandwidth, because the streams from all of the sites need to be “coordinated” by the MCU.

We offer video as a service. It does away with the need for users to buy and operate an MCU, because we host and operate it on their behalf. So each site needs only to send its own stream and receive the streams from the other participants. This means a lower capital cost, fewer technical demands for users, and less money spent on bandwidth every month.

Q: How many sites can participate in an Appia video communication session?

There is no practical limit. However, video conferences between more than five or six sites tend to be unwieldy, so 90 percent of conferences are six sites or fewer. Broadcasts can accommodate many more. The only real limitation most people run up against is bandwidth.

Q: How well does AVC work?

We’ve been doing tests with participants all over the US and internationally. Some participants have T1s, some have cable, and some have DSL. The consistent response is that people are overwhelmed by the quality.

Q: How are they planning to use AVC?

AVC serves both conference room and remote users. This allows organizations to customize their video communication strategy and maximize its benefits. Reducing travel is a common goal. Some organizations are very interested in video as a teaching tool, while others want to engage more directly with dispersed staff. The possibilities are endless.