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### How would you describe the current “State of the Industry” with regard to Telepresence technology?

HSL: Before I can describe the state of the industry, I think it is important to define the word: telepresence. The term over all can be used to broadly describe any technology where one can be “tele-present” with others. We use the term to mean visual collaboration solutions that address the human factors of participants in an attempt to create, as closely as possible, an in-person experience. The marketing efforts of traditional and software-based videoconferencing companies has led to the term being used to describe those solutions even though they, in my opinion, only have the potential to address the human factors of participants when properly deployed.. The value of creating visual collaboration solutions that address human factors is greater “end-user acceptance” that leads to higher usage, better comprehension and retention between participants, improved productivity, and ultimately a higher return-on-investment for the organizations that invest in them.

Using these definitions telepresence is quite strong! On the high end of the market (immersive systems and multi-screen, multi-codec environments that cost north of \$100K per room) growth has been solid since major videoconferencing companies got behind the concept in a big way about 7 years ago, somewhere around 10,000 multi-screen, multi-camera environments have been deployed. The innovators, early adopters, and early majority have seen end-user acceptance and usage much higher than could be expected with just a videoconferencing appliance and a flat screen LCD monitor.

Just as importantly, more and more organizations realize that even if high-end immersive environments are out of reach, that their deployments of traditional videoconferencing end-points should address as many human factors as possible: larger displays (that thankfully keep dropping in price), across the table format, lighting, touch panels to simplify directories and calling, etc.

# Executive INSIGHTS

In this new series of executive interviews, ISPR President Matthew Lombard discusses important issues related to the Telepresence with industry thought-leaders and technology experts.

Finally, high-quality, low-cost traditional videoconferencing capabilities are dropping in price while simultaneously improving in capability. For large enterprises this is translating into Unified Communications capabilities that are giving employees the ability to use video at their desk, on laptops from remote locations, and on tablets while on the go while incorporating the ability to easily and instantly upgrade an IM or phone call to a webconference or a videoconference. For small companies these capabilities are coming on-line as cloud-based services with per user costs that are averaging around \$30 per user per month for capabilities that would have cost several thousand per user less than a decade ago.

their own “meet me” room where other participants can dial in with whatever video tool they are using or just a conference call and the platform handles the inter-op and multi-point including the data collaboration elements with per minute pricing similar to reservationless conference calling today.

**Q. You have stated that whether it’s laptop or tablet-based visual conferencing or even room-centric telepresence systems, it is all ‘telepresence’ with varying degrees of quality. Can you elaborate? What do you think is the minimum requirement for presence?**

HSL: If you take the broad definition of telepresence, of being “tele-present” many visual collaboration solutions even a soft client and a webcam on a laptop can produce some state of being “tele-present”. the quality of that experience is really determined on a variety of factors: the amount of immersion you are able to achieve, the quality of collaborative tools available to participants, the reliability and ease of use of the platform, etc. One could say the bare minimum is a webcam, an internet-friendly soft-client, and a decent size monitor. After meeting the bare minimum the goal is to improve the level of immersion between participants which improves the quality of

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communication. Immersion can be thought of as a continuum where the graduations can be slight but the entire spectrum broad. Some human factors like lighting can be improved at relatively low cost. Achieving lifesize remote participants that can walk around in a room without having their heads chopped off by the limits of a LCD display is much more expensive. I believe the minimum requirement for immersive telepresence is hidden camera, a seamless display without any visible bezels that are the brain's chief psychological cue that it is talking to a television set, fluid motion, high res images, and high fidelity sound.

**Q. What do you think is the immediate short-term effect of widespread user adoption of cloud-based video conferencing and collaboration on the presence industry?**

HSL: Cloud services are solving a number of different problems with delivering affordable, feature-rich high quality visual collaboration.

The first problem that cloud services are solving is the ability to deploy visual collaboration without having to buy and maintain video network infrastructure that takes up valuable data center space and requires high-cost employees with specialized skill-sets. So cloud providers are taking the cost and much of the complexity out of video for small-to-medium businesses that get big company capabilities for flat-rate, per user pricing that scales without attendant infrastructure costs. Right now the sweet spot seems to be around \$30 per user per month and users get a dialing list of all of your colleagues, soft client that will run on PCs, laptops, and tablets and the cloud based infrastructure to provide multi participant conferencing, and, in many cases, interop with traditional videoconferencing end-points.

The second major innovation that the cloud based services are providing is ease-of-use and video interoperability with the ability to connect different vendors solutions including standard based video conferencing solutions with consumer solutions like skype and google talk. The cloud service providers are also making this easy to do where participants get their own "meet me" room where other participants can dial in with whatever video tool they are using or just a conference call and the platform handles the inter-op and multi-point including the data collaboration elements with per minute pricing similar to reservationless conference calling today.

**Q. What kinds of research, especially given the rapid evolution in telepresence technologies, do you think members of the industry do and will value? What roles do you think academics can play?**

HSL: Tough question because the industry is encompassing so many different technologies: video/audio compression, interoperability, video infrastructure virtualization, display technologies, collaborative peripherals, etc.

Some areas that I think are fertile and overlooked: low-cost display technologies that can create seamless panoramic environments with the ability to hide the cameras with their attendant psychological baggage. The work being done with Microsoft kinect cameras and the ability to sense depth and create 3 D augmented reality versions of participants that can be inserted into virtual meetings, and wearable displays (glasses or contact lenses) that will allow for virtual representations of remote participants and AR info to be seamlessly projected into the field of vision.

**Q. At ISPR, we are concerned with research that focuses on human behavior and interaction as a result of utilizing presence technology. Do you have any thoughts on how human communication, or society in general, may change as a result of widespread visual communication systems?**

HSL: The biggest benefit in visual collaboration is the ability to accelerate collaborative work and the ability to share knowledge globally. Visual collaboration improves the comprehension and attention of information shared between participants especially with languages as a barrier, the collaborative tools that are included in many visual collaboration solutions now allow the effective sharing of data, white boarding, and visualization of physical objects in real time at high degrees magnification and this capability is allowing organizations to accelerate their time market on products to improve their research and development, to cut down the time cycle it takes to bring a product to market and to work with different individuals and organizations globally that they would not have had the capability to interact with in any other format. Societally this will have a number of different impacts: accelerating the labor arbitrage where companies will outsource more and more white collar work especially R&D, software and hardware development, and other traditionally domestic functions to lower cost labor centers around the world. More and more knowledge workers will be able to work effectively from anywhere. More and more customer service will be turning to video where companies, especially on the high-end will compete to offer more intimate customer service to their most valuable clients. Companies will be hiring these customer service agents and sales professionals using the same qualities that reality show contestants are picked for today: photogenic and the ability to be "on" at a moment's notice and operate that way throughout the day. Finally, I think on-line dating will come to resemble a mix between Logan's Run and THX 1138.

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**Q. In terms of technology suppliers, what companies do you feel will emerge as the industry 'winners' and which do you feel will ultimately be judged as 'losers' in this new world of IP-based telepresence? What decisions will distinguish the successful and unsuccessful companies?**

HSL: Tough question. Many companies are able to achieve a temporary market leadership position only to see that market leadership evaporate from new participants that innovate in ways that big companies can't.

In fact the bigger the company, the less the organization seems to be able to innovate, attract and retain creative talent, etc.. What big companies can do to do well is small incremental improvements to their exciting portfolios but they are also creating an inventors dilemma of not being in the spot to disrupt their exciting product line. Some of the winners will be: Vidyo that is high quality H.264 SVC and evolving h.265 SVC and their infrastructure approach which does not require decompressing, compositing, recompressing multi-point video on expensive hardware-based platforms . Vidtel and Blue Jeans Networks which developed cloud based solutions for managing interop among

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**Q. Do you expect that residential consumers will adopt presence technology as a TV application in the next five years?**

HSL: Absolutely! Solutions are already beginning to emerge from set top cameras from companies like Logitech and Biscotti and most major television manufacturers have announced or are already starting to build HD cameras into their television set of the future. Lots of big companies are incentivized to make this happen from the cables

companies and FTTH providers that want to sell the data that transmits interactive 2 ways video to a host of retailers that could leverage their early adoption into a strategic competitive advantage. Finally, and probably the biggest reason it will succeed: people like seeing their friends and relatives on video. I have coined the term "The Grandma Channel" to describe the coming dynamic that will plug families together in the coming years. Go ahead a beat the rush and redesign the dining room for the family dinner of the future.

**Q. Assuming telepresence technology (at various quality levels) becomes more common and widespread, how do you think it will impact business travel? Do you think Presence will become an application that replaces other modes of communication (audio phone, text messaging, social networking, etc.)?**

HSL: It is already impacting business travel and Gartner predicted in 2009 that telepresence would replace 2.1 million airline seats this year. I haven't seen any research since to tell if we hit that number but whatever the impact it comes out of the airlines' most profitable passengers: business travelers who book last-minute, high-price tickets.

Telepresence and HD videoconferencing will continue to gain "marketshare" especially on audio phone conferencing and data-only webconferencing, not as much impact on text messaging and video calling is already getting integrated into social networking sites like Facebook as add-on applications and will definitely, ultimately become an integrated part of the platform.

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