

IMCCA Article: *Telepresence: A Background and analysis that goes beyond the hype*

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A realistic and balanced overview of the collaborative conferencing industry's hottest technology, with a historical perspective and application analyses.

IMCCA Mission Statement

The IMCCA is a non-profit industry association resolved to strengthen and grow the overall conferencing and collaboration market by providing impartial information and education about people-to-people communication and collaboration technology and applications. Founded in 1998, the IMCCA membership is open to end users, vendors and other interested professionals who wish to share their disciplines and knowledge for the benefit of members and the interested general public. The IMCCA offers an open and interactive environment for these activities, including participation in trade shows and industry events and the IMCCA Website. If you are interested in more information about the IMCCA please visit our website www.imcca.org or contact the Executive Director, Carol Zelkin at +1 516 818 8184 or czelkin@imcca.org

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Telepresence: A Background and Analysis that Goes Beyond the Hype

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Every once in a while a product comes along with both a unique marketing approach and consumer appeal, and thusly redefines the space it is in. Some past examples of this would include “designer jeans” and “gourmet bottled water”. In both of those cases the products had been around for many years, somewhat as a niche market, but were branded and promoted to such a degree that they became accepted, if not required, as part of our every day lives. Also in both cases, it was considered blasphemy to point out that the marketing efforts were providing the product with unrealistic or undeserved importance.

So, heathens that we are at the IMCCA, the following article will provide a realistic and balanced overview of the collaborative conferencing industry's shiny new darling, telepresence. It is our hope that this information will help you make the right decisions in your collaboration strategy.

The telepresence prologue

Commercial video conferencing has been around in one form or another since the late 1980s. It is the process of having a real-time conversation with people in one or more locations other than yours – with each location seeing and hearing the other(s). While the technology to enable this has steadily improved over the years, it is still generally perceived as difficult to use and unreliable compared with the traditional telephone - often with a single bad experience leading users to abandon the solution altogether. In reality, today's solutions, if deployed with sufficient planning and resources, can be just as easy as using the telephone.

At a number of times in the history of video conferencing, it dawned on users and/or engineers that one could increase the bandwidth, increase the picture size, and simulate a real meeting between far end participants as if they were in the same room. This more lifelike experience was referred to as “immersive” or “full perspective” conferencing. This model was very expensive to implement, so it was used in a very limited number of applications. For example, companies with two specific offices, that always and only needed to connect two specific rooms using very high quality communication for critical decision making or senior level meetings, found this met their needs very well. There were also a number of innovative business models created utilizing similar systems. One example of these - and one of the true precursors to the telepresence space - was a company named first Teleport, then TeleSuite. Their model aimed to create a hotel network that would avoid the costs and hassles of flying by

providing an accessible ‘just like being there experience.’ (TeleSuite eventually closed, with the technology becoming part of Destiny Conferencing, which was later acquired by Polycom becoming the heart of their RPX system.)

Creating one of these immersive experiences had its difficulties though. The lower quality of codecs of the time and the cost of bandwidth were limitations that were expensive and difficult to overcome. The quality of projected images was also a barrier to the realistic portrayal of the far end. Immersive video conferencing was therefore relegated to the few users that had access to the expertise required to create such customized facilities, had plenty of funding available, and had a true need for these peer-to-peer high quality meetings.

The first real attempt to make this mode of conferencing widely available to business goes back to 2001 and the Global Table product envisioned by a firm called Teliris. Their UK based team created a design to address all of the perceived flaws in the video conferencing offerings of the day. It involved a number of nuances that set them apart. They utilized the newly available high quality displays to improve the appearance of the images. They utilized commercial codecs not being widely marketed to end users. They developed camera positions that optimized eye lines. Then, to address the reliability issues, they provisioned their own network that could handle the unique needs of video, they created hooks into each piece of equipment used so that faults would be reported immediately, and they put a team in place to constantly monitor these rooms and systems.

The Global Table solution had its fans and customers, but with costs going up to a third of a million dollars per room (plus bandwidth) in an industry where the entry point was still less than a tenth of that, it was a difficult sell.

Cut a couple of years later to California, where Dreamworks CEO Jeffrey Katzenberg was very happy to have won his Oscar for the movie Shrek, but was exhausted by the travelling it took between Dreamworks campuses in Redwood City and Glendale and associated facilities in the UK. In order to produce the number of animated films he wanted in the time available, the wasted effort travelling would have to be addressed. High quality video and animations would need to be shared between offices in a collaborative, real time environment. Rejecting the video conferencing solutions available, ▶▶





- ▶ Dreamworks and Hewlett Packard created a custom product (soon to be called Halo) to meet this need. Teams in different locations could sit around what seemed to be the same table and share content and conversations. Armed with the newly developed system, HP began to leverage their investment by offering Halo to its customers.

Sometime shortly thereafter, engineers at Cisco Systems (who admittedly hated the video conferencing systems of the day as a prerequisite to join the team) began to design their own system. They developed something they felt would be more of an experience than a product, utilizing high definition images, low latency - high frame rate codecs, and a blending of lighting, furniture, colour and ambience. The 2006 launch of their telepresence product was the quintessential defining of this new niche space. Cisco announced telepresence with great fanfare as a never before seen triumph and positioned it as a solution to replace traditional video conferencing, both infuriating and galvanizing an industry at the same time. Their trademark has become synonymous with all of the products in this part of the conferencing industry. Cisco's visionary CEO John Chambers sometimes personally called the senior executives of other firms to extol the virtues of their solution, often offering "no-charge" demo systems to large Cisco customers - helping their sales team obtain a foothold in the now competitive landscape.

A definition of telepresence

So then, one would have to ask, what exactly is telepresence? Being that it is a market niche rapidly evolving, defining it has been a very difficult task. I was amongst a number of professionals that gathered in San Diego last June to attend the very first Telepresence World conference, specifically to answer that question. We didn't succeed. Some said the conference failed in its mission by not clarifying the continuing confusion around the space. Others said the very effort of bringing almost all of the players together in one venue was a tremendous success in and of itself.

What has become clear is that there are two distinct definitions of telepresence forming. They are not necessarily at odds with each other but the second is couched in more specific and familiar terms used in video collaboration today.

Telepresence – definition number one: telepresence represents the use of a number of technologies, aesthetics and acoustics that together allow a person or people in one location to meet and collaborate with a person or people in another location (or locations) where the experience simulates all people being in the same location. Implied in this experience is the understanding that the technologies, aesthetics and acoustics involved in the simulation are, or should be, practically invisible to the users.

Telepresence – definition number two: telepresence is a video conferencing industry buzzword that represents a class of products

that purportedly perform much better than the perceived past video conferencing norms. Any one of a number of differentiators (possibly including high definition video, spatial audio, large screen displays, images projected or reflected in front of a camera's eye line and/or other features) can be identified as the reason a product in the first person (your product) is truly telepresence, and the lack of any or all such differentiators can be identified as the reason a product in the third person (their product) is not truly telepresence.

The debate around the two definitions above can be endless. All manufacturers in the space have their own view and will be more than happy to share it with you.

Why telepresence is great

It would be difficult to come up with a more attractive appeal than the one being used by the current telepresence manufacturers. In comparing themselves to traditional video conferencing systems and products, they stress the following three points:

- The system will meet all of your visual conferencing needs with a quality that is almost lifelike, reducing the difficulties and expenses of travelling.
- Unlike past video conferencing products, telepresence systems are reliable – the calls always go through.
- No specific training is required to use the systems. There are little or no control buttons. Just walk into the room and use it.

It is not difficult to understand why such a message is being widely embraced. Who wouldn't want to invest in a technology that is 100% successful, 100% reliable and requires no knowledge to use.

Beyond these messages though, there is a large list of advantages that a telepresence system will provide:

- A meeting's remote participants will typically appear normal size – as if they were in the room with you. This is called framing.
- Visual details will typically be extremely sharp – you will be able to make out subtle changes in facial expression, which is a key part of interpersonal communication.
- Eye contact between local and remote participants is typically excellent – people will generally look like they are looking at whatever they are actually looking at - and this is important when building consensus and trust in a meeting.
- Sounds are typically directional, just as they would be in a face-to-face meeting – things happening to your left sound like they are happening to your left, and you can hear side bar conversations, just like in a same room meeting.
- Visual images and sound will happen in virtually real time – there is no noticeable delay between participants over great distances. People can interrupt and challenge just like physically being there. ▶▶



- ▶ • Depending upon the system and/or services you purchase, an operator or concierge may be at your disposal, connecting calls for you as quickly as you feel you need them. As a user it is just like walking into a meeting room and starting the conversation.

Experienced together, the list above tremendously enhances the quality of a meeting with remote participation. Users will experience less “technology fatigue” than they would have in a traditional video conference. Meetings will be more productive, livelier and more interesting than they may have been in the past. When used specifically in its optimal situation, comparing telepresence to a video conference is like comparing a live orchestra to someone playing a harmonica.

Why telepresence isn't really a single universal solution

Most of the conferencing industry has firmly embraced the hype of telepresence. If you are one of the new firms in the space you're quick to announce that your product is the best thing since sliced bread. If you're one of the traditional conferencing manufacturers you're quick to embrace the onrush of new customers for whom you have a suite of solutions that includes telepresence amongst other offerings. If you're one of the industry analysts you're delighted with the excitement in the space you cover. Everybody is happy.

Remember what your parents said about things that sound too good to be true?

Telepresence systems perform well in very specific applications because of some very specific parameters. Veer from these parameters even a little and the experience collapses.

First of all, the manufacturers' positioning that “telepresence is video conferencing that works/is reliable” requires some scrutiny. Why has traditional video conferencing had reliability issues? The most typical reason for video conferencing failures is the lack of a robust network to support the calls. If your network can't support IP calling rates between devices at 384KBps to 768KBps how will it support telepresence calls requiring anywhere from 6MBps to 20MBps? You're either going to need to buy a whole lot of additional network infrastructure or move your telepresence calls to an off-premises (paid) network. These are both models that the telepresence manufacturers suggest. They are also both models that would “fix” most of the problems experienced with traditional video conferencing.

Another reason traditional video conferences have failed is the inherent instability when trying to call infrequently used endpoints. As an example, your New York to London weekly call may usually work, but your annual Fiji to London call does not. Or similarly, your regular internal calls work, but your calls to a new customer or client site do not connect.

Does telepresence fix these problems? In the first example, telepresence systems are so expensive that you'll never put one in your Fiji office or anyplace where there would be necessary but infrequent usage – the return on investment would never be justified for the limited applications. In the second example, unless a client or customer has bought the exact same product from the exact same provider that you have, it would take a string of minor miracles (involving connectivity, compatibility, bandwidth, etc.) to connect a telepresence system in your firm's offices to one at their site. Put simply, telepresence is like a luxury car where the steering wheel has been removed and you have about five destinations you can select with a single button on the dashboard. It's luxurious, comfortable, and very, very limited.

Beyond the comparison to traditional video conferencing, the basic telepresence concept presents some challenges in and of itself. When you do have two locations that always need to connect just to each other, each with a non-mobile compliment of staff, then telepresence is the clear answer for high quality, effective communications. But, what if you have three locations...or four? Telepresence systems have really struggled with these multipoint scenarios. One solution is called “voice switched” where a complex algorithm figures out who is speaking and makes sure that person is visible on one of the displays at each location. Another solution is “continuous presence” where everyone at each participating site is visible on the displays (in a smaller image) at all times. While both of these solutions allow for multipoint meetings, it really isn't telepresence anymore. In the first scenario you have to sacrifice the eye contact with those that aren't speaking – which frankly is sometime more important than looking at who is speaking. In the second scenario, you've sacrificed life-sized images, directional audio and all of the other things meant to differentiate the experience. In this frequent real world application the whole reason a firm has invested heavily in a telepresence system is gone. Also gone is telepresence favourable contrast with legacy video conference systems which can do the very same job with a rapid return on a much lower investment.

Human behaviour around the everyday use of telepresence systems also needs to be considered when choosing the right application environment. A smaller company with few locations represents an ideal usage. However, in a typical Fortune 500 firm you're likely working in a very large, multiple story building. Experience shows that it is very difficult to get users to leave their floor to access everyday meeting room spaces. Meeting rooms are requested to be no further than down the hall so that required attendance during a busy work day is not too difficult to achieve. If your firm has invested in a telepresence room, will your high level decision makers actually leave their floor (and possibly leave their building to go across a campus) to use it regularly? Is it that much better than the 50” flat screen and video conference system they may already have a few feet away? This could be true for very high level meetings involving critical ▶▶



► decisions, but probably is not true for everyday meetings where nearby traditional video conferencing would suffice. On this subject, it is also important to keep in mind that if even one scheduled participant in a telepresence meeting chooses to remotely connect from his local room (assuming you are one of the lucky people that bought a telepresence system that is interoperable with traditional systems), you hit the same problem mentioned above, no life-sized images, no directional audio, again it really isn't telepresence anymore.

IMCCA recommendations for evaluating telepresence

As you look at all of the offerings, we recommend you keep the following "top ten items to consider" in mind.

1. Only consider the use of telepresence systems where you will gain from their true strengths. Specifically, where you have at least two locations with relatively non-mobile personnel that frequently need to communicate with each other on a one-to-one basis.
2. Do not purchase telepresence systems because your current, legacy video conferencing systems are underutilized or unreliable. If those are your problems then seek an expert to help address them. Or in other words, if the plumbing in your house is bad there is no need to buy a new, more expensive house to fix it – get a plumber instead.
3. Determine if you want to utilize (and pay for) outside operator or "concierge" services. If so, select a system that has such a service available as an option. If not, or if this is a security concern, avoid those systems where it is a requirement.
4. Do not purchase any manufacturer's system that has features you currently need "on their roadmap." Assume that what they offer today is what you will have to live with for quite some time.
5. If you intend to use the systems in large cities where the cost of real estate is at a premium, look for systems that allow their room to be utilized for more than just telepresence meetings. Be sure you can make use of the room for more than six people and for meetings that do not involve telepresence.
6. Do not make the mistake of looking solely at the start-up costs of telepresence systems. Factor in the cost of support, operator services, required network upgrades, bandwidth, and real estate. Specifically regarding bandwidth, look for systems that will allow you to scale the bandwidth up or down per your individual needs on a day to day basis. Avoid systems that lock you into the maximum requirement at all times.
7. Look for systems that can provide interoperability with both telepresence systems of other manufacturers and traditional video conference systems.
8. Do not believe the manufacturers when they say a feature you would like is not possible because "it would upset the

telepresence experience." That is just doublespeak for the fact that they don't offer it. *Of course, only smart people can see the emperor's new clothes...*

9. If you currently use a management system or software program for your existing video conference units or meeting rooms be sure to purchase a telepresence system that works with that system and does not require the installation of a separate one.
10. When evaluating a manufacturer's telepresence offering, be sure to "pull the plug" on the system – simulating a power failure - and timing how long it takes to reboot from scratch. Despite any reliability claims the manufacturers may make, codecs sometimes need to be rebooted – usually when the participants are already in the room for a meeting and are very impatient about the interruption. Full reset times of more than 1 to 1.5 minutes are inappropriate for the mission critical uses that telepresence is meant to support.

Who are the manufacturers in the space

If you do have an application that will benefit from the unique strong points of a telepresence system, you should do your homework instead of selecting the first system you see or the first system marketed to you. Each manufacturer has strengths and weaknesses that could be very meaningful for your usage. Below is a list of the manufacturers in the space and very brief comments on each of their systems. Please do not use this list as a replacement for going to look at the systems in person and allowing the manufacturers to present their products in context.

Cisco TelePresence

Pros: Very high quality system; leverages the Cisco telephone to launch calls.

Cons: While admittedly rejecting all that was bad about legacy video conference systems their engineers also rejected all that was good – reinventing the wheel awkwardly in many places; a bandwidth hog without scalability; not interoperable with legacy video systems, legacy management systems or even Cisco's own desktop video solution.

HP Halo

Pros: Elegant full-room solution; excellent aesthetics and ease of use.

Cons: Requires connection on HP's private, very expensive network to function.

Polycom RPX (TPX)

Pros: Comprehensive, very immersive full-room solution; innovative use of hidden cameras and displays for data collaboration; can scale from 4 users to 48 users; fully interoperable with all legacy video conference systems; VNOC (concierge) services available as an option but not required. ►►



- ▶ Cons: RPX utilizes older model projection that could use some updating. Their new product (TPX) - offered side by side with RPX as a lower cost choice - undermines their arguments for using RPX.

Tandberg Experia

Pros: Least expensive appliance based telepresence system available; assembled from their very reliable MXP series codecs and cameras.

Cons: Minimalist approach requires you to come-up with room aesthetics on your own – essentially telepresence on a cart.

Telanetix Meeting Room Edition

Pros: Lowest cost telepresence system available.

Cons: Utilizes software based codecs – not as robust as appliances.

Telepresence Technology TPT42 & custom solutions

Pros: Produces remarkable 3D images of remote participant(s); maintains perfect eye line by viewing images reflected in front of the camera lens.

Cons: Not a complete solution – utilizes other's codecs; does not scale well for multiple far-end participants in a single room.

Teliris VirtuaLive

Pros: Has been serving the market longer than other large manufacturer and has developed remarkable camera tracking technology to assist in very lifelike conferences.

Cons: Will not sell you their technology – you have to pay an ongoing fee to use it, and you are forced to use their monitoring services.

Summary

Once one takes an objective look at all of the nuances of the systems available, and all of the potential applications, it becomes clear that telepresence is not a replacement for traditional video conferencing. It is a valuable application as part of a broader video collaboration strategy that includes traditional video conferencing. In fact, it could be argued that telepresence is just another form of video conferencing, albeit at a high level. It is clear that organizations that want to maximize their competitiveness and their capital ROI should utilize telepresence only where it is the correct choice, and implement a complimentary, interoperable, reliable video conferencing solution along side it for maximum benefit.

It is also clear though that the world of collaborative conferencing has forever been changed by the emergence of modern, widely

available telepresence systems. These systems do have the potential of providing dramatic results in both performance and travel cost/hassle avoidance. Hopefully, as people get past the hype about them, telepresence systems will stop being the industry's "shiny new darling" and will take an appropriate place in the catalogue of solutions available to assist and support business communications for many years to come.

About the author

David Danto has spent thirty years in the audio visual and broadcasting industries. He has designed facilities for firms such as AT&T, Bloomberg LP, FNN, Morgan Stanley and NYU. He is a contributor to many industry publications and a sought-after presenter at industry conferences and events. He is currently the Director of Global Multimedia Engineering for Lehman Brothers and an Executive Board member of the IMCCA. David can be reached at IMCCA@danto.com. Also contributing to this article were IMCCA Board Members: S Ann Earon, Chairperson emeritus, Phil Keenan, Chairperson and Carol Zelkin, IMCCA Executive Director.

About the IMCCA

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The IMCCA will be presenting and sponsoring the following events on telepresence:

1. Integrated Systems Europe- January 29th-31st at the Rai Convention Center, Amsterdam, Netherlands. www.iseurope.org
2. TELEPRESENCE World- March 18th and 19th at the ExCel London Exhibition and Conference Centre. www.telepresenceworld.com ■