

Chapter 1: Telepresence Overview

Introduction

More than a decade after the first videoconferencing-based telepresence solution was introduced to the public, and after more than ten years of languishing in the backwaters of the communications market, telepresence hit the limelight in 2006. The re-emergence started in the closing weeks of 2005 when HP announced the release of the company's Halo telepresence solution. Designed in collaboration with partner DreamWorks, Halo proved to many observers that there was still significant interest in a two-way, interactive visual communications solution that somehow exceeded the boundaries of "traditional" videoconferencing systems. Equally important, the apparent success of the Halo marketing thrust indicated that CEOs and high level executives at large enterprises were interested in high performance, immersive visual communications systems that were highly reliable and easy to use, despite the high initial costs and operating costs of many such systems.

The renewed interest in telepresence initially fueled by HP was further strengthened during the first half of 2006 by two other initiatives. Cisco's CEO John Chambers began to talk about his company's forthcoming solution that would take videoconferencing far beyond its current capabilities and provide a communications vehicle that was a serious alternative to corporate travel. During the same time period, Polycom announced its own pending telepresence solution, to be based on a product line dubbed RPX, that would be delivered in conjunction with partner Destiny Conferencing (later acquired by Polycom), one of the original telepresence suppliers. A prominent September Wall Street Journal article added fuel to the fire. Finally, in October 2006, Cisco formally announced its Telepresence Meeting System, supported by a massive advertising and PR campaign. With three "credible" vendors now talking about telepresence solutions and joining the ranks of half a dozen smaller stalwarts, the industry appeared at the close of 2006 to be headed for a long-awaited take-off.

Many people are confused by the concept of telepresence. For some, the mere mention of telepresence conjures up images of traveling to remote galaxies without leaving the comfort of one's living room sofa, or to remote business locations without leaving one's own conference room. This fantasy is exactly what the telepresence suppliers are trying to deliver.

The most common question Wainhouse Research is asked today in this area is: "what is the difference between telepresence and videoconferencing"? To answer this question and to help define different market segments, we offer the following definition of telepresence:

A videoconferencing experience that creates the illusion that the remote participants are in the same room with you.

To meet this deliverable, telepresence solutions use videoconferencing as well as other "arts and sciences" to create a two-way communications experience that simulates an in-person, interactive encounter. In fact, many elements embedded in "traditional" videoconferencing systems are intentionally left out of telepresence systems since they would break the "immersive" experience or shatter the "sitting across the same table" illusion.

To create the same-room illusion, telepresence solutions use a combination of technology elements and environmental design that are described in further detail in Chapter 2. Many of these telepresence elements we believe are synergistic, i.e. improved audio realism is more

effective when accompanied by increased video realism than it would be alone. Hence, the entire telepresence solution cannot be appreciated as the sum of individual technology components, but rather must be experienced in its holistic presentation. Some refer to this as the 1+1=3 phenomenon.

Telepresence System Objectives

In order to produce the illusion of sitting in the same room” and satisfy the demanding requirements of high-end customers, telepresence solution suppliers have focused on four key elements, explained in further detail in chapter 2:

- High quality audio and video: If the experience is to emulate an in-room meeting, then the audio must be clear, without noise, intelligible, echo-free, and of sufficient volume. Multi-channel audio (like stereo) can also provide directional cues as to who is speaking if multiple people are in the room, much as sounds from people sitting around a table come from different directions. Likewise, video images should be clear, life size, and noise-free, while providing sufficient resolution and detail. The audio and video signals must also be synchronized and provide no noticeable delay.
- Simplicity: One of the two major complaints with traditional videoconferencing is that video calls are too complex to set up. Telepresence vendors have addressed this issue by making connections as simple as pressing a single button, or in the case of those supplying total managed services, pressing no buttons (a support person or management system places the call on your behalf). In addition, telepresence solutions typically include no user-configurable settings (call speed, camera pan-tilt-zoom).
- High reliability: The second major complaint with traditional videoconferencing is that connections are unreliable. Either the calls do not go through, or the connections provide poor quality audio or video, despite the fact that the same connection made 24 hours (or even 5 minutes) earlier was perfectly fine. Telepresence solution suppliers have taken many steps to ensure that their systems deliver a consistent experience time after time including extensive system monitoring and management services, high performance network services, and call launching / meeting management services.
- Environmental excellence: Telepresence vendors realize that a successful telepresence experience requires more than just a successful video connection. While not all telepresence suppliers approach environmental issues in the same manner or to the same degree, some go to integration extremes by providing furniture, lighting, even wall paint colors (and in some cases the actual walls) to maximize the videoconferencing experience and make remote rooms look identical to the local room (same chairs, same table, etc). In a real face-to-face meeting, there are no speakers and microphones involved. Some suppliers have designed their telepresence environments so that most of the technology elements are hidden, again making the virtual face-to-face meeting feel very much like a physical in-person meeting.

Telepresence System Tradeoffs

While focusing on the above key objectives, telepresence product designers have had to make compromises in areas where traditional videoconferencing system vendors have not had such liberties. These include:

- System cost: For the past twenty years, videoconferencing vendors have long held cost and price reductions to be key to increasing market acceptance. Much of the research conducted

by Wainhouse Research suggests that end users still perceive cost to be a major barrier to further room systems deployment, despite the fact that equipment and network costs have declined continuously year after year. Telepresence vendors, on the other hand, have focused on quality and reliability, and have used whatever technology and services deemed necessary to meet these goals. Due at least in part to the relatively high cost, most telepresence systems are not positioned as alternatives to videoconferencing, but rather as executive communication tools that can reduce travel and speed decision making by top-level managers.

- **Bandwidth:** When broadband networks were both expensive and limited in availability, traditional videoconferencing industry engineers and experts developed systems designed to operate at connection speeds of 384 kbps or even less in some situations. The idea was to make videoconferencing available to the masses by limiting bandwidth requirements, often at the expense of motion handling and image quality. Telepresence solutions, on the other hand, are designed to deliver an all-immersive experience, and today's systems typically require 4 - 24 Mbps of high performance, high QoS IP bandwidth. For many customers, the high bandwidth requirements of telepresence solutions means that these systems must be deployed on dedicated (overlay) networks, providing the needed performance and reliability, although at higher cost.
- **Interoperability:** Long a rallying cry of videoconferencing users who want (or need) to make video calls without having to know the brand name, model number, or feature-set of the receiver's equipment, interoperability requires tight adherence to standards and call handshaking. Many telepresence solutions, on the other hand, do not provide interoperability with traditional video systems or other telepresence solutions. Vendor A's systems can only connect to other systems from vendor A. This limit, however, not only greatly increases the call reliability and quality, but also ensures that the immersive experience is preserved, which is a major reason the telepresence system was deployed in the first place.
- **General purpose environment:** Traditional videoconferencing systems are typically deployed in meeting rooms that are also suitable for general purpose, non-videoconferencing-based meetings. In addition, traditional systems can fit into a variety of room designs and environments. Many, but not all, telepresence solutions include specially designed furniture and other room design elements that either limit the use of the room to hosting remote telepresence sessions, or make in-person meetings in that space less than optimum. Given the high cost of telepresence systems, we believe most customers use their telepresence suites almost exclusively for remote meetings, making this design limit less of a factor than the others.

Given the cost, quality, interoperability and other factors inherent in a telepresence system deployment, we believe the telepresence purchase decision makes sense in the following environments.

- A company with a small number of sites (hubs, main offices, regional HQs, etc.) where each site has a number of executives who need to communicate regularly with executives based in one of the other main sites. The need (or benefit) is even greater if those sessions tend to last several hours (or days), involve very high level staff, or focus on high-impact, high-stress topics. Because of the high recurring monthly cost of bandwidth per site, locations with high utilization factors (hours per week) will find telepresence a more cost-effective solution. For example, if executives at the London facility spend 20 hours per week meeting with their counterparts in the New York headquarters, telepresence may be easy to justify. If, on the

other hand, the London executives spend 20 hours per week meeting with executives from 20 different branch offices (one hour per week with each location), a telepresence solution may be very difficult to justify.

- Educational institutions with one or more remote campuses may find that their communication needs are similar to those described above for an enterprise with a small number of headquarters operations. In this situation, a telepresence solution can give students at remote facilities the friendly illusion that they are in the same room with the main campus lecturer or professor and the real ability to interact with the teacher and other students in the same class.
- Government agencies and other associations / groups with distributed operations and a critical need to make high speed decisions and tightly coordinate dispersed resources. In this case, the travel reduction benefits and cost savings are secondary.
- Healthcare providers with a limited number of dispersed sites will find telepresence an efficient tool to increase the viability of continuing medical education (CME) programs.
- Design, development, and work teams charged working with remotely located resources on high-value, time-sensitive creative projects (drug development, product launches, etc.).

Telepresence investments may be difficult to justify in situations where there is a frequent need to communicate with legacy videoconferencing systems or where inter-company, rather than intra-company, communications are important. This situation is changing rapidly however, and should be investigated fully before purchase commitments are made. Six months ago virtually all of the telepresence systems were “closed” systems; recently several vendors have announced telepresence designs based on industry-standard codecs, while others have announced their intention to bridge between their own environment and H.323 / SIP deployments. We believe that for the next 12 - 36 months users should expect to be able to communicate from a telepresence system to standards-based videoconferencing systems and even telepresence systems from other vendors (via standards), but those sessions will result in the complete loss of the “immersive” experience.

Telepresence Vendor Differences

Virtually every telepresence system vendor makes the same claims in his product literature:

- Very easy to use
- Highly reliable
- Providing excellent audio and video quality

Prospects will find that the differences in these areas may be subtle and in many cases may depend more on the skills and vision of the system integrator / installer than on anything else.

There are, however, significant differences in the various solutions in other areas including:

- Eye contact
- Support for multipoint (3 or more location) sessions
- Interoperability and operating modes with non-telepresence systems
- Support for data collaboration
- Initial system cost
- On-going operational costs
- Breadth of available support services