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ABSTRACT

This paper suggests that desktop computer-based video conferencing, with high fidelity sound, and group software support, is emerging as a major communications option. Briefly addressed are the following critical factors that are propelling the computer-based video conferencing revolution: (1) widespread availability of desktop computers interconnected on local area networks; (2) new domestic and international digital communications options and support; (3) integrated groupware and communications protocols for visual and audio communication; and (4) management's readiness to accept video conferencing as a way of increasing staff productivity. Products and services available for desktop video conferencing are discussed and problems facing the business communicator when planning, developing, and implementing video conferencing systems in business are examined. There is a significant requirement for education and training to make effective use of this new media for business communication. It is concluded that training and planning take on a new role with business video conferencing. Contains 19 references. (Author/RS)

# VIDEO CONFERENCING: THE NEXT WAVE FOR INTERNATIONAL BUSINESS COMMUNICATION

by

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## ABSTRACT

Every business communicator realizes that the best communication is through direct, face-to-face contact. Only under these conditions, can you have truly interactive communications in which the sender and receiver respond to every nuance of the verbal and non-verbal aspects of the conversation. Imagine direct interactive conferencing that also allows the use of a complete set of visual aids, supports the use of a wide array of computer software, and supplies a permanent record for later reference and study. To many business communication professionals and professors, this may seem more like a distant promise of science fiction than science fact. Yet, that is exactly the way business communications will be done in the near future. Desktop computer-based video conferencing, with high fidelity sound, and group software support, is now emerging as a major communications option.

The paper briefly addresses the critical factors that are propelling the computer-based video conferencing revolution: (1) widespread availability of desktop computers interconnected on local area networks, (2) new domestic and international digital communications options and support, (3) integrated groupware and communications protocols for visual and audio communications, and (4) managements readiness to accept video conferencing as a way of increasing staff productivity.

The paper discusses products and services available for desktop video conferencing. The paper then examines the problems facing the business communicator when planning, developing and implementing video conferencing systems in business.

The paper points out that there is a significant requirement for education and training to make effective use of this new media for business communication. The paper concludes that training and planning take on a new role with business video conferencing.

## INTRODUCTION

It is almost axiomatic that face-to-face, direct communication is the most effective way to conduct business. Only under these circumstances, can you have truly interactive communications in which the sender and receiver respond to every nuance of the verbal and non-verbal aspects of the conversation. Unfortunately, international (and even domestic) business trips can be time-consuming, inconvenient, expensive, and sometimes dangerous to undertake.

Voice communication systems have been in use for nearly a century, and electronic mail has been available for more than three decades. As valuable and important as these technologies are, they are still a poor substitute for a direct encounter. Imagine a direct interactive conferencing technology that also allows the use of a complete set of visual aids, supports the use of a wide array of computer software, and supplies a permanent record for later reference and study. Exciting new developments in the computer industry and in the field of data communication networking are quietly supplying the infrastructure that will revolutionize business communications.

Video conferencing is not new. AT&T recognized the potential of interactive video with its Picture Phone of the '60s. For a variety of reasons, the Picture Phone was not a commercial success. But, the potential and enthusiasm for using teleconferencing in business remained undaunted, so much so, that in the '70s and '80s, several firms designed and constructed special video conference rooms to support efforts in this area. However, the cost of specialized facilities and the expense of transmitting video sessions put interactive video conferencing beyond the reach of most organizations.

Today, the key elements needed to make interactive video conferencing a practical reality are already in place. First, desktop computers are now required business equipment. Second, the majority of these computers are already networked together into LANs (local area networks) and WANs (wide area networks) with high bandwidth lines. Third, international standards for electronic messaging, including interactive video, are either in place or well into the development phase. Fourth, the business computer user community is acquiring experience and growing comfortable with multimedia computing, groupware, and electronic communications. But, most important of all, management is now aware of the importance of remote, electronic collaboration for increasing business productivity, and is supportive of new technologies that can increase this level of collaboration.

## VIDEO CONFERENCING

Initial teleconferencing systems were based on analog technology. They were basically sophisticated telephones that provided support for a group of people in a room, enabling them to converse with another group located elsewhere. Modern teleconferencing systems are based on DSP (Digital Signal Processing). These systems employ multiple microphones to provide balanced, echo-free, high-fidelity audio and signal processing to eliminate line delay effects.

Video conferencing adds video to the transmission data stream. With video, conferees can see as well as hear each other. Originally, significant investments in specialized equipment, dedicated rooms, and special communication lines, were needed for this capability. Cost for such a setup could amount to more than $100,000. Even rudimentary, cartable (roll-about) video conferencing equipment could cost $20,000 and up. Because of the expense and difficulties involved, these early systems had limited applicability and appeal.

Shortened product development cycles, distributed processing, and global marketing require prompt, effective, corporate communications. The rising cost of transportation, the loss of productivity, and the time wasted in travel, directed management's attention back to broadcast-quality interactive video conferencing as a viable alternative to direct, face-to-face meetings. However, the passage of time created an additional difficulty for traditional video conferencing.

Today's business runs on computers, and much of the information needed to successfully conduct a business meeting is computer-based. Traditional video conferencing systems were not optimized for on-line information sharing. Indeed, in a short span of a few years, the whole nature of business had changed, spawning a new set of requirements -- such as the need to manipulate spreadsheets, word processing documents, databases, and presentation files, all created and stored in desktop computers.

**Document Conferencing**

One of the early variants of video conferencing produced by the desktop computer revolution was *remote log-in.* A sophisticated version of the technology is currently referred to as *whiteboarding* or *document conferencing.*

In this system, the various conferees establish a modem-link to implement the desktop computer-to-desktop computer connection. The session presents a whiteboard window on the computer screen of each participant, which can be viewed and manipulated.

Whiteboard conferencing software supports drawing, painting, and annotation on the whiteboard. The electronic whiteboard window attempts to simulate a flip-chart pad used in a face-to-face brainstorming meeting.

Current technology calls for the use of compressed, bit-mapped whiteboard files to reduce the data communication burden of the conferencing. PC systems using Windows transfer (pass) objects, rather than bit-maps, onto the whiteboard. The whiteboard then acts as a client application for Window's OLE-compliant server application. The server application, such as a spreadsheet program, can make changes or edit the object, and these changes are reflected in the whiteboard (client) application. In this way, collaborative computing is an automatic feature of the video conference.

Databeam's FarSite is an example of document conferencing software. Microfield's Softboard ($2,995) is a more elaborate document conferencing software/hardware package. It supplies a

high-quality porcelain whiteboard that is scanned by an infrared laser system which tracks every stroke, and even recognizes the color of the pen used.

The digital nature of the data in document conferencing allows it to use any standard computer-to-computer communication channel, including LANs and WANs. Conferees can transmit text, images, graphics, spreadsheets, and drawings over the link, but not voice. When simultaneous voice is required, separate phone lines must be used.

**Data Conferencing**

The requirement for separate voice and data lines places a severe limitation on document conferencing. A new technology, *data conferencing*, overcomes this limitation. With data conferencing, voice and data are transmitted simultaneously over the same communication link. The voice is digitized and treated as another data element in the data transmission stream.

Digitizing voice requires the use of a DPS (digital signal processor). Voice is normally sampled at 8,000 samples per second, using a 12-bit resolution (72-dB dynamic range). This approximates the bandwidth (3,500 Hz) used with audio telephony. The voice data is then encoded and compressed to produce a 64 Kbps data stream.

Quality of the voice transmission is a key factor in the success of data conferencing. Two systems of voice encoding are in use. One system uses waveform encoders, such as ADPCM (Adaptive Differential Pulse Code Modulation). These encoders make no assumptions about the nature of the original sound signal. This is the technique used for transmitting voice over digital ISDN telephone lines.

To transmit digital voice over lower speed lines, vocoder technology is used. Vocoders, such as CELP (Code Excited Linear Prediction), encode speech signals in terms of codes and parameters that mimic sounds produced by the human vocal tract. Basic sounds are stored in a code book. When the code is received, the sound of the voice is reproduced by modifying the coded sound in amplitude and pitch, according to the input parameters. The result is acceptable speech transmission at significantly reduced bit rates (6,400 bps).

Vocoders require more computation than waveform encoders and are not general purpose. However, modern vocodes can support voice and data transmission with V.32 (14,000 bps) and V.34 (28,800) modems over POTS (Plain Old Telephone Systems) telecommunications circuits.

Another technique for data conferencing involves the use of VoiceSpan technology, developed at AT&T Bell Laboratories. This technology splits the telephone bandwidth into three virtual channels: one for audio (voice), one for data, and one for control of information. VoiceSpan technology is commercially available and can be installed on desktop computers. The Paradyne DataPort 2001 modem ($535) is an example of a commercial VoiceSpan product. The 2001 is sold with whiteboard software for data conferencing.

Interoperability with data conferencing systems can be a problem. The T-120 standard is being developed to cover document sharing protocols. Once T-120 is adopted, any compliant systems can be interconnected for an international data conference.

**Real-Time Desktop Video Conferencing Systems**

In January 1994, Intel introduced ProShare Video System 200 ($2,500 for hardware and software). This system operates over 128 Kbps ISDN connections, using Intel's software-based Indeo codec. An upgrade kit by Creative Labs ($1,500) allows the system to operate over POTS.

At this writing, desktop interactive video conferencing is limited to point-to-point connections. However, AT&T expects to have a multipoint conferencing service available during 1995. AT&T will offer multipoint collaboration of two to 22 stations for a video conferencing session as part of its WorldWorx Network Services.

AT&T's Vistium Personal Video 1300 ($4,995) supports PCs operating under Windows and connected over ISDN. It includes an AT&T speakerphone. Besides video, the software supports whiteboarding, application sharing, file transfer, meeting minutes, and phone dialing. A software version, Personal Video 1200 (intended to compete with ProShare) is offered at $2,500.

PictureTel Live PCS 100 ($5,995) allows up to 1024x768 SVGA video, using ISDN. The software is a modification of IBM's Person-to-Person Window's based conferencing software. In addition to video, the software supports whiteboarding, application sharing, file transfer, meeting minutes, and a phone directory. PictureTel is also known for its larger-scale video systems. PCS 100 is compatible with these.

Invision Systems Corporation's Invision Desktop Video/Document Conferencing Software V. 3.0 ($595) is a Windows-based package. A third-party video capture card is required. The system is designed to operate over a wide variety of network operating systems, including LANs and WANs, as well as V.32 bis (14,400 Kbps) or faster modems. As with any computationally-intensive software-only system, its performance is closely linked to the speed of the PC processor.

SGI's InPerson ($495) and Sun Microsystems' ShowMe ($1,295) are two LAN-based video conferencing systems. InPerson works with SGI's Indy video equipped workstations. InPerson also supports whiteboarding and file transfer for document sharing. ShowMe works with Sun's M series workstations and the Solaris operating system. The package supplies a full set of conferencing functions, including whiteboarding and application sharing. Both InPerson and ShowMe are UNIX-based programs.

The maximum video resolutions for the above products range from 640x480 for ShowMe to 160x120 for InVision Desktop. The frame rates range from 15 to 30 frames per second (fps) with ShowMe again leading the group at the 30 fps rate.

Creative Labs' Share Vision 3000 ($1,500) is a low-end video conferencing system that operates over POTS. The kit includes a frame grabber video card, a NTSC video camera, a 28,800 Kbps modem, and a serial I/O - audio card. The software supports whiteboard, application sharing, file transfer, and a phone book. A video resolution of 96x80, 128x96, or 160x120 pixels at a frame rate of from 5 to 15 fps can be selected.

Target Technologies offers C-Phone ($1,995 per PC), a Windows-based hardware/software system for video-only conferencing (no whiteboard or application sharing) over a LAN. An optional gateway can connect the system to ISDN, Switched 56, or T1 lines for connecting with the outside world. The system supports 720x484 resolution at 30 fps over a LAN or 352x288 (CIF - Common Intermediate Format resolution) at 15 fps over ISDN. Multiple conferees can be viewed on a multiple window screen, or one participant can be broadcasted to many conferees.

### Video Conferencing Standards

Standards are the foundation upon which all data communications systems are built. ITU-T (International Telecommunications Union - Telecommunications Standards Section) develops these standards. The basic standards for video transmission over data communication lines are covered in the ITU-T H.320 group of standards. This standard was originally adopted for room-based video conferencing over ISDN lines.

H.261 is a key component of the H.320 group. It specifies how video data can be effectively compressed for transmission over Px64 digital channels (64 Kbps to 2.048 Mbps). H.231 and H.243 cover linking video conferencing stations together for a single conference. H.233 and H.Key specify how video conferencing data streams can be encrypted for security.

Two common video display formats used for video conferencing are CIF and QCIF (Quarter CIF - 176x144 pixels).

Both AT&T Vistium Personal Video 1300 and PictureTele Live PCS 100 are H.320 compliant.

## MANAGING VIDEO CONFERENCING

The wide-spread introduction of video conferencing into business firms should occur rapidly over the next few years. The video conferencing revolution will most likely begin by the installation of LAN-based systems, followed quickly by video conferencing over the company's WANs and backbone network. World-wide video conferencing will be the next step as common carrier support (such as ISDN and WorldWorx Network Services) becomes commonplace.

### Conducting Video Conferences

While video conferencing is far more convenient and economical than direct contact, it still can involve significant personnel, communications, and other costs, particularly if the

conference takes place at the international level. Now is the time to begin establishing corporate procedures for video conferencing. Experience with audio conference calls and E-mail systems has shown that such procedures are necessary.

The criteria for good business communications is well understood. Business communications should be clear, effective, and should engender good will. In addition, every message should be adapted to its intended audience. These fundamental rules apply to written, verbal, and electronic business communications alike.

With these principles in mind, the following set of heuristics is suggested for video conferencing:

1. **Establish a Conference Coordinator**. Any conference should be run efficiently, and video conferences are no exception. The first step in setting up a video conference is to have a coordinator who moderates the conference and establishes schedules.

2. **Create clear goals for the Conference**. The conference coordinator should know what he or she wants to achieve with the conference and state it directly and straightforwardly, prior to establishing the conference.

3. **Supervision**. Successful conferencing requires supervision. A rambling, inconclusive conference is a waste of resources. It is the conference coordinator's duty to actively moderate the conference proceedings.

4. **Sensitivity to Cultural Differences**. The speed and ease with which international video conferences can be arranged and executed tends to catch participants off-balance. With international communications, we must all be sensitive to cultural differences.

5. **Use Visuals and Images**. Wherever applicable, participants should use data and graphics that bypass language limitations and enhance basic comprehension. The reason for the video conference is to allow the use of visuals and images. This means that participants must prepare, in advance, for effective video conferences.

**Checklist for Video Conferencing**

Integrating the basic guidelines for good business communications, allows us to develop a simple, checklist approach that can be used for managing video conferencing:

1. Is the goal of the conference clear?
2. Has the conference coordinator been selected?
3. Is the list of participants correct and complete?
4. Has the scheduled date and time of the conference been established? (remember to take into account international time differences)
5. Have the conferees acknowledged their participation in the conference?
6. Are the participants prepared to address and react to the video camera?

7. Are all the participants ready to compensate for size and scale differences between images on a computer screen and the original documents or graphic images?
8. Have all the required visuals and images been developed?
9. How will the results of the conference be documented and sent to the participants and other interested parties?
10. Is the mechanism for post-conference feed-back in place?

## CONCLUSION

The required infrastructure for the wide-spread use of video conferencing is rapidly falling into place. Video conferencing products, both hardware and software, are now within the cost and performance range that will encourage management to experiment with these systems. Standards needed for the general use of video conferencing are in place, or are well into the development stage. The common carriers are promoting the digital communication services needed for day-to-day use of video conferencing on a world-wide basis.

Now is the time for business communicators to research and develop methodologies and training techniques for the coming video conferencing revolution. Business students and practitioners must be taught how to make the most effective use of this new communications media. Differences in the way individuals react to the video camera, and the manner in which people react to information presented on a computer monitor screen must be addressed.

This paper suggests a set of principles for education and training, conference design, organization, and implementation, to increase information transfer via computer-based video conferencing. These principles were reduced to a convenient checklist that can be applied to the design and development of effective video conferencing. However, much research is yet to be done in this important area. Such research can have rich potential rewards in developing successful and efficient electronic business communications.

## REFERENCES

Andrews, Edmund, "GTE introduces an interactive video unit," New York Times, June 21 1994, pD4

Davis, Andrew, "Desktop Data Conferencing," Byte Magazine, V.19, No.5, May 1994, pp81-86

Diehel, Stanford and Greg Loveria, "Video for Free," Byte Magazine, V.20, No.2, Feb. 1995, pp105-110

Eglowstein, Howard, "Almost as Good as Being There," Byte Magazine, V.19, No.4, April, 1994, pp173-178

Gilder, George, Life After Television, W.W. Norton & Company, 1994

Grarland, Eric and Dave Rowell, "Face-to-Face Collaboration," Byte Magazine, V.19, No.11, Nov. 1994, pp233-242

Hammonds, Keith, "IBM: High gear for the superhighway," Business Week, 5/30/94 Issue 3374, p49+

Kessler, Andrew, "Marionated video," Forbes 151(June 7 '93) p114

Luther, Arch, Digital Video in the PC Environment, Intertext Publications/McGraw-Hill Book Company, 2nd Edition, 1991

Marlow, Eugene, "Electronic communications media: massaging the messages," Technical Communication v. 40, Aug. '93

O'Malley, Penelope, "Information delivery systems: the future is here," Technical Communication v. 40, Nov. 1993

Quickel, Stephen, "The mania over interactive video," Electronic Business v. 19 (July '93) p15-16

Schroeder, Erica, "Xerox eases PC conferencing with interactive video system," PC Week, 5/24/93, Vol. 10 Issue 20, p45+

Seybold, Patricia, "Video: the next revolution," Computer Decisions v. 20 (Nov. '88) p21

Sheerin, Peter, "Collaborating with hardware," Cadence, Nov. 1994, Vol. 9 Issue 11, p36+

Sondak, Eileen and Norman Sondak, "The Design and Development of Electronic Documents for International Business Communication," Proceedings, EMU Conference on Languages and World Business, Ypsilanti, MI, April 1994

Wallace, Bob, "Conferencing partnership aims for interoperability," Infoworld, 1/30/95, Vol. 17 Issue 5, p8

____, "AT&T launches multipoint videoconferencing design," Computerworld, Jul 4, 1994, V28n27, p 55

_____, "Intel's insider plugs into future," Advertising Age, Nov 15, 1993, V64n48