3-2 Multimedia Communication Applications in the US

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1. Introduction

Recently there has been much written about the convergence of television and computing. Popular press articles attribute this phenomenon to the emergence of digital video. The logic of this point of view stems from the observation that computers deal with bits while a television is an analog device. Although this is true, this is not the main point. It is more the point that memory and processing speed have increased while the digital requirements of video have decreased to the point where video on a Macintosh (Registered Trademark of Apple Computer) is within the reach of an average elementary school teacher. Therefore, improvements in the price/performance ratio of computer hardware have finally gotten to the point where cost is no longer an issue in having some video and sound be part of a session with a computer.

This is a necessary but insufficient requirement in achieving a new level of computing capabilities. The other ingredient is customer need. Why would anyone want a multimedia computer? The answer comes from the fact that there are 16 million, occasionally used PCs in American homes while there are more than twice as many TV sets as homes (about 180 million TVs in the US.). Furthermore, TV’s are used about 7
hours each day by the family. The market expectation is that in the home a PC will be used more often and purchased by more people if it feels more like a TV than a computer. In a business environment the need is less obvious until you take note of the extent to which video has migrated into the office as an important medium of communication. This was dramatically demonstrated during the Gulf War when stock brokers in Wall Street watched their CNN monitors as closely as the New York Stock Exchange price quotes. Many of the PC's with video cards were purchased by brokers to watch CNN on a window next to their favorite spreadsheet program.

The reader should not think that the movement in the US towards multimedia computing is another technical fade without much substance. There are significant mergers, acquisitions, and partnerships that have occurred or are in the process of occurring. These partnerships are characterized by the vertical alignment of entities that produce multimedia content such as films and TV shows, that build equipment for the home and office on which this content can be viewed, and which provide the connection or network between the producers and consumers of this information. The business pages of US newspapers have daily reports of deals being discussed or consummated among industry giants such as Apple Computer, Paramount Communications, and TCI, each bringing their respective market strengths to the table.

This paper addresses the current state of affairs in the US with regard to the deployment of multimedia applications and the telecommunication services that support them. In Section II we review the available computing equipment and peripherals. We also review the system software that provides the seamless glue that supports and binds the applications that run on these machines. In Section III we present offerings now available or on the drawing board for new telecommunication services that could support or are specifically designed to be synergistic with the development of multimedia applications. Finally, in Section IV we describe those evolving applications that exist or are about to be deployed which take advantage of mixing video, sound, text and graphics.

2. Terminal Equipment

Multimedia terminal equipment is becoming widely available in the US. Recently Apple Computer announced their Performa (Trademark of Apple Computer) series which features a built in Sony CD-ROM drive. What is significant about Performa is that it is being sold in retail chain stores, such as Sears, and targeted for the home and small office market. Currently, only three percent of the PCs in the US have attached CD-ROMs, with the most widely used platform being an AT-compatible not a Macintosh computer. This move by Apple Computer is “round two” in the current market warfare to gain predominance as the preferred multimedia development and playback platforms. A challenger is the assortment of AT-compatible vendors sharing the banner of MPC which is an often stated, under-powered set of standards led by the Microsoft Corporation. Another important challenger is the Ultimedia (Trademark of IBM Corporation) platform of IBM's new OS/2 machines. Their platform is perhaps the most sophisticated and powerful but it is yet to be seen whether third party developers will give IBM another chance.

In the consumer area, Philips has been selling its CD-I players under the label of the “Imagination Machine”. Commodore Computer is marketing a packaged version of their Amiga computer under the label CDTV. Both machines were recently reviewed in “Consumer Reports” with this warning, “Interactive home multimedia is now too expensive, the number of worthwhile programs is too limited, and the chance of choosing a quickly obsolete format is too great”.

Another recent entry into the multimedia platforms is Kodak’s Photo CD unit. Although this device is equally high priced as CD-I and CDTV (Trademark of Commodore Computer), the overall service concept may be the trigger that causes consumers to buy into multimedia. Kodak is billing Photo-CD as the replacement of 35 mm film. In fact you can now take your 35 mm slides to a photo shop and have them return to you a photo CD. The new Apple Performa series and CD-I units will be compatible with this format.
Finally, we should mention game machines being introduced by Sega and Nintendo which will have built-in CD-ROMs. The Sega unit, which will be sold this November, features 15 frame per second full motion video of Hollywood movie stars.

Apple Computer already won Round 1 by introducing a software upgrade that turns any Macintosh Computer into a multimedia development platform. A popular selling low end machine that can run this “QuickTime” software is the MAC LC. Although it looks similar to many late model personal computers with a standard 4 Megabytes of RAM, 40 Megabyte hard drive, and color monitor, it also features audio input and output capabilities. In fact each unit is shipped with a microphone, built-in speaker, and a HyperCard (Trademark of Apple Computer) application that permits voice annotation of an address book.

In addition, with QuickTime extensions to the System 7 software, documents written in a popular word processor can not only have sound but also a minimal quality movie. It is significant that this particular version of a multimedia PC does not have a CD-ROM, although one can be added easily.

Most people would agree that multimedia applications need to have some degree of color imagery, especially moving pictures. There are now low priced video capture boards for under $500 such as the VideoSpigot that produce excellent stills and reasonable video from a standard 8 mm camcorder. Somewhat amazingly one can purchase the hardware and software to create multimedia documents for under $5000.

In short, there is an abundance of terminal equipment and authorware that is giving application developers a wide choice of hardware and software platforms from which to choose. Unfortunately, there is very little available in the intercomputer connectivity sense. Although large companies have LANs, most of them run at 10 Mbits per second or slower. This was more than adequate for connecting workstations to file servers for text and graphics but is woefully inadequate for sound, images and video. Even though these networks could easily support bursts of data at the one to two megabit per second rate, they become logjammed when each terminal is streaming data at these rates. We saw this at Bellcore in the mid-80’s when we had a multimedia prototype called Telesophy running on our Apollo workstations. In the next section we review this situation.

3. Network Platforms and Services

Multimedia communications are most often assumed to be of high bandwidth. Although this is clearly the trend and likely direction, it should be recognized that a great deal can be accomplished with CD-ROM (or for that matter an 80 Megabyte hard disk) and a 2400 bit per second modem. In fact, since there are dial-up modems that can operate at 19.2 Kilobits per second it is even possible to transmit some level of full motion video over dial-up lines. The effectiveness of a hybrid low bandwidth connection using the switched public telephone network coupled with a large, inexpensive storage device such as a CD-ROM should not be underestimated. In fact, I would argue that the networking of multimedia PCs will not be limited by bandwidth but by the creation of clever and useful applications that require networking. On close examination one discovers that a determined application developer that needs network bandwidth can already find ample hybrid solutions that mix Cable TV, satellite transmission, or microwave with telephone networks.

That having been said, it should be pointed out that the US. telephone companies are planning substantial deployments of ISDN, switched DS1, frame relay, and SMDS network services. For example, Bell Atlantic, one of the Regional Holding Companies, has said that it will have 90% of its 18 million customers able to order ISDN by 1994. To an information service provider such as Prodigy or Compuserve, ISDN offers an exciting communications upgrade from the existing POTS based service. However, to take advantage of this communications offering, customers need to buy additional hardware to support the new network service. Nevertheless, the upgrade package will support a substantially new look and feel. Graphics will appear on the screen instantly, full color images will take a few seconds, and there can be TV quality sound. This combination might be enough to make retailing with a videotex system a success.
It is unlikely that from a user's perspective, frame relay or SMDS network services will enable a different look or feel to a data, graphic, or image application. However, for some customer environments it will fit better with their Local Area Networking of their workstations and PCs. The situation for switched DS1, i.e. a full duplex 1.5 Megabit per second transmission service, is different. The communications hardware for DS1 would not be much more expensive than ISDN, in fact it may be cheaper. Yet, with the additional expense of a H. 261 or MPEG codec, one can now configure an impressive video teleconferencing facility with full motion video that will look reasonably good on a large screen. There had been substantial growth in teleconferencing, however, with the recession in the US, businesses have reduced their spending for this functionality. Most experts expect this to pick-up as the economy recovers.

A sleeper technology is Asymmetric Digital Subscriber Loop or ADSL for short. This is a transmission technology which will give ordinary copper loops a one way 1.5 Megabit per second service, in addition to a functioning POTS service, and a reverse data channel of at least 9.6 kilobits per second. Since many if not most information services are asymmetric in that the bulk of the data, video, and sound are coming from a media server and headed towards a customer, it is believed that this technology might be the most logical next step after POTS. There is at least one major field trial of ADSL scheduled to take place in Union City, N.J. in late 1993.

4. End User Applications

What are the compelling applications that will cause a telephone customer to develop, offer, or purchase communicating multimedia products? There are many conjectures but very few experiments that can be relied on to accurately predict the future. People point to the success of Nintendo and video stores as evidence that residential customers will pay for multimedia entertainment products. John Scully, chairman of Apple, has been quoted as saying the convergence of computing, communications, consumer electronics, and entertainment will Create a one trillion dollar market by the year 2000. It is anyone’s guess, however, whether better imagery and sound will command a premium or whether more interactive forms of TV will appeal at all to the American couch potato. Deal making in the US is epidemic. The most publicized has been the IBM/Apple alliance to form Kaleida to develop the cross-platform authoring tools. The first fruits of this alliance will appear in the Apple/Toshiba developed “Sweet Pea” a variant on the notebook computer theme called a Personal Digital Assistant. Other possible alliances include Microsoft and Cable TV companies, IBM and Time-Warner, and Apple and Random House. The point of these alliances is to make sure that the applications are there when the hardware is ready.

In business, where high quality graphics and multimedia presentations are not that uncommon using more traditional film and tape media, the immediacy and flexibility of computer-based presentations is likely to find value among those that make their living packaging and marketing an information product to a client. My guess, however, is that the importance of multimedia applications in business is overrated.

The most likely, near term application of multimedia products, of both the communicating and non-communicating kind, is in education and training. In spite of the current recession in the US training budgets have held steady or even increased. With increasing disenchantment with the results of the US education system and the industrial restructuring that significantly raised the retraining requirements of vast segments of business, planners and developers are putting a grat deal of attention on this aspect of the market. Multimedia presentation techniques may provide all the benefits of individualized learning while at the same time offer students more engaging and thought provoking educational experiences. This is not a new idea, however, the hardware and software development platforms are now powerful and cheap enough that the failures of the past are not likely to be good predictors of the future.

For example, electronic encyclopedias are now outselling paper versions in American libraries. McGraw Hill, a major US publisher, is collaborating with ABC News Interactive, a division of an American TV
broadcaster, to produce an electronic history book that follows the hypermedia paradigm. Educators now have the tools and a small number are beginning to use them to develop engaging lessons that are aimed to compete with TV to improve learning skills.

5. Summary

Multimedia applications, hardware, and networking are only beginning to take form in the US. While there is a great deal of hardware and software development there are few examples of successful applications, i.e. the “VisiCalc” of multimedia. CD-I and CDTV units are not selling particularly well as they appear to consumers as expensive game machines or inexpensive but low functional PCs. The most exciting product is the combination of a MAC LC and QuickTime extensions to System 7 which is for all practical purposes giving the home and small business customer a full functioning PC with multimedia capabilities added in as a free bonus.

The networking to support multimedia applications, should they develop, is committed at ISDN and DS1 rates and being explored in several hybrid arrangements. The effectiveness of a PC with a CD-ROM and a 2400 bps modem should not be ignored in evaluating various multimedia deployment scenarios. While many application areas are possible none have risen above critical mass, with one notable exception: education and training.

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