Multimedia in Public Space

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Abstract The intersection of interactive multimedia and public space environments such as museums provides the opportunity to examine some of the fundamental environmental qualities of both domains. Public spaces are clearly public, spatial and timeless. Multimedia is multisensorial and provides for controlled segmentation and group experiences. Both focus on the interactive experience. The key to good multimedia design in public space settings is to examine the relationship between the nature of the interactivity and the objects within the space as well as the space itself. This paper presents a framework for analysis and some suggestions for good design practice.

Introduction

This is a study at the intersection of two exciting domains, multimedia and public space. Just as the juncture of computers and media such as film, audio and graphics, what is called "multimedia," has lead to a re-examination of the potential of both these media and computing, the juncture of multimedia and public space can lead to a new understanding of these fields and how they can be combined. Designers who ply their trade in public environments and multimedia have a lot to learn from each other and to contribute to each other as well.

Interactive media have been the staple of public space for years. From the news kiosk on the corner and the shop windows down the street to the museum exhibition, theme park experience or the information display at the local airport, designers have used a mixture of images, sounds, texts and graphics to provide a mixture of education and entertainment which affect our everyday life.

And public space is big business. There are over 10,000 museums and visitor centers in the United State alone. Over 50,000,000 people visit science centers annually -- more than attend all professional sports combined. And every day, millions of people pass through

city parks and squares, airports, transit systems and public buildings, either on their way to somewhere, or to enjoy the environment and the people they contain. Millions of dollars are spent annually on information, education and entertainment systems which fill these public spaces.

The use of multimedia computing has also exploded during the past few years. The introduction of new and simple tools such as Apple Computer's HyperCard, CD-ROM players, NTSC video display hardware and the improvement of consumer and professional video and audio equipment has fostered the increasing integration of computers and computer generated graphics and text with sounds and images. More and more people are designing and using multimedia systems in their workplace, in education and for entertainment. As a result the true power of the active manipulation of pictures and sounds is just now being discovered.

Although diverse in nature, public spaces have a few elements in common that appear to be essential to their success. They are public; that is, they are social, people come to them with other people, to interact or to watch other people doing things. They are spatial; the nature of space and how people use it is key to their design. And finally they are timeless, or to put it another way, the timing of interaction is exceedingly variable and idiosyncratic with the participant.

The extension of personal computing into multimedia results in certain features as well. These systems now support group experiences; activities where a number of people can interact with one system. The experience can also be multimodal, providing a mixture of real images, dynamic models, rich sounds and tactile sensations. Finally, the media information and experience can be segmented under the control of the user. A piece of video can be viewed, reviewed, stored and then retrieved for a new purpose.

All of these features make the merging of public space and multimedia computing exceedingly interesting from an interactive designer's point of view. Public space offers to multimedia designers an exciting environment to work in with rich content and contexts and a group of practitioners who understand fundamental issues concerning human interface design and true interactivity. It is important to note that the nature people's interaction with computing systems in public spaces is fundamentally different than it is in school or office settings. Often people are standing, visiting in groups with mixed ages and passing by with little time or sympathy for learning an interface.

Multimedia offers to people working in public space a set of new and exciting tools to augment their 3 - D displays and a way to extend the experience of visitors to greater depth and other environments. Through access to rich interactive kiosks in museums, for example, it is possible for visitors to move from a glancing experience to a deeper involvement with an underlying idea. The potential now exists to extend at least part of the public experience with all of its drama and senses into the private world of the home.

Thoughts on the Nature of Public Space

Multimedia producers need to come together with public space designers to test strategies that have impact on a public audience. To proceed with our particular projects we need to explore the questions and considerations that arise when the human mind, technology and environment interact with one another. We need to examine projects that have put computers in public spaces and learn from the veterans of the logistical and economic trenches how we might combine design elements effectively.

Environmental psychology, influenced by the multidisciplinary academic trends in the early 1970's, attempted to show public space designers how to anticipate human use of architectural settings. At the environmental architecture group at UC Berkeley, we tried to articulate to designers a representation of human experience through prototype environments. We constructed a model of a town and devised probes for discovering the affective experience of a particular site before construction.

With multimedia technology we have a similar puzzle: Place a computer box of interactive experiences into an unknown situation; what are its effects on human experience? We have a "Trojan Horse" opportunity, a small box holding powerful changes. How do we design for the elements of human awareness? We have a clue: Computer use has the clear potential to be a group experience and can ideally support collaborative work.

Computer developers have traditionally designed the computer encounter with little concern for where it will be experienced. Physical conditions, such as lighting, colors, eye-level heights, or conditions of social interactions, such as the number of users and the nature of their acquaintance with computers or each other, are unknown. The assumption of a single user at a desktop monitor doesn't hold in a public place setting.

Accessibility is crucial. The Apple dream is to make computer information and tools available to the populace at large, and placing computers in the public environment allows the expense of technology to be absorbed by site sponsors. Education is the transfer of information from one organization to another, and interactive installations can expand the educational functions of many familiar props, of the information kiosk, for instance. Decentralized personal computers, equipped with software for analysis of large stores of data, text and images, will allow more people to study complex problems and participate in solving them, even while at an airport or an exhibit. The public, with computers, can participate in policy making by educating others, as well as being educated.

What is the nature of interactivity?

Cybernetics, the study of communication systems and their interactions, has already been developed for public space by museum people who must anticipate how patrons will move through an exhibit. Similar to "mousing around" on a computer, in a museum "the feet do the browsing". The layout of information is with respect to space. Interaction with information is not controlled as in film or narrative storytelling; people ask what they want and go

where they want. Multimedia design must accommodate the fact that a computer is not just a box, it is responsive, it has a "where-ness". We must devise navigation schemes for traversing information. We are not dealing with just text and graphics, we are constructing multimedia "objects", compositions for use in other situations. Which techniques might be transferable from a museum floorplan to an interactive format?

What is the nature of public space?

It has staying integrity, yet it is reshaped by use, transformed by participation. The best designs engage people, encourage new experiences, prompt personal actions, even though public space is entered primarily to get somewhere else. Can we create virtual environments with electronic media and achieve the same coherence of movement and sturdiness of objects as in a physical space?

What is the nature of time?

With computers we expect information on demand, we want to have a response now. In a public space we have only brief interactions, including structured events. How do we negotiate this contrast between "on demand" vs "ritualized" human experience? Souvenirs become the important link: we can take something home with us and construct a more sustained, personal interaction with the experience. We can go to an event in a public space, then go to a private space for more depth and to investigate references. We should have the technology there, at the exhibit, the classroom, the playground and at home, so we can take these experiences with us and build on them.

A Framework for Multimedia in Public Space

There are many ways in which multimedia applications fit into public space environments. Sometimes access to a multimedia database can provide an important context for an exhibition. Or a large screen interactive video presentation can provide an exciting group experience. Different multimedia projects perform different functions and an individual institution or location may have a variety of different ways that multimedia is used. To help focus the discussion of multimedia in public space on some of the fundamental design issues, it is helpful to view these various public space applications in a framework which relates the nature of the interactivity to the relationship of the multimedia system in the space itself. It is important to understand this relationship because the specific design of a multimedia element and how well it works often depends on the particular setting and its relationship to the whole environment. Larry Friedlander's paper which follows on the development of an interactive exhibit space for the Globe Theatre Project in London will serve as a good set of concrete examples of what we are discussing here.

There are a variety of ways to use interactive multimedia in public space and in many of them the nature of the interactivity is quite different. The chart presents some of these interrelations. The horizontal axis describes the nature of the interactivity. For example, one common and important use of interactive media is to support the <u>passive presentation</u> in an

accessible way. The hallmark of this application is the existence of few choices and some-what lengthy interactions. Examples might include a selection of short films on the life and times of a particular artist whose work is being exhibited or audio programs of railroad sounds associated with an exhibition on steam engines. The system is designed to play clips of video or audio, 5 to 20 minutes in length or maybe longer, which support the context of a particular exhibition or location. The visitor can select which clips they want to see at a particular time. Since interactive video and multimedia systems have fewer moving parts than film or videotape machines, they offer greater mechanical reliability. This is an important consideration in a public space setting where the staffing is minimal, and many of the audio/visual presentation are self actuated. And since the interaction time is long, the physical comfort of the viewing space is important.

In some cases it is desirable to take a tour through an exhibition or location. These guided experiences can be provided by a walking audio or videotape tour or a radio receiver handset receiving location specific stories from a low power transmitter. With this application the interactivity is already significant because the visitor can stop the presentation at will and review the material by rewinding the tape. This experience can be used to give visitors a guided tour through an art exhibition or to provide atmospheric stories and sounds at a collection of historic ships. The personality of the guide and his or her knowledgeability and genuineness is critical to making these applications a success.

In an interactive browsing system, the visitor is able to browse, often quite quickly, through many pieces of information before working through a particular set of images, text or sounds in detail. The part of the system you view at any one time may be only a small portion of what is available. This multimedia database can be outfitted with all sorts of maps, guides and indices. For example, a database of images and background text may support an exhibition of historical objects. Or an informational kiosk at a busy downtown location could provide information about the cultural or historical facilities nearby. Here, the framework for navigation becomes an essential tool because of the volume of data available. In this kind of application the program elements have to be brief and easy to quit and the interface design has to be very transparent and easy to master because the visitor allocates only a brief time to master it before they move on to something more compelling.

Finally, at the far end of this axis are activities where you interact directly with the imagery, text and sounds. Youre making your choices directly with the media through direct creation and not from a menu or from some kind of a database navigation system. There is little if any mediation between you and the material. These multimedia systems allow you to create your own investigation, your own media project. A videodisc flyover of a city allows you to create your own tour and to examine in detail a neighborhood of interest. Or by using a simple computer based editor, you can combine a set of sounds and images related to the objects in a history exhibition to produce your own video catalog to take home for further viewing. The richness of the presentation and the immediacy of the interface is key for these applications. The vertical axis of the chart represents the physical and/or contextual relationship of the multimedia installation to the exhibition. At one level the interactive media project may serve as an adjunctive resource to the exhibition, located typically in an attached library or resource center in the museum setting. Visitors who are interested in ex-

ploring ideas in depth or dwelling on a particular set of images presented in an exhibit are able to access additional text and visual material and view it at their own pace on workstations in this center. The separation from the primary activity with its distractions can allow for longer and more concentrated interactions. A special resource room near to the exhibit floor and outfitted with multimedia workstations, activity tables, a stockroom of props and large projection screens for group viewing might serve as a lively instruction space for a class on a field trip to a theater museum. Different versions of plays along with sets and costumes could be presented and discussed. And an information kiosk in the lobby can have information about other cultural events in the city that the visitor might find interesting.

Multimedia workstations can also provide information through a mediated experience in the direct context of the exhibit on the exhibit floor itself. By using an interactive multimedia kiosk near a set of exhibits a visitor can learn more about the exhibit and answer questions that may have been stimulated by viewing the exhibit. For an exhibition on light and color, the workstation could have animated diagrams of the physics of making color as well as many examples of color formation in nature. This application supports a fluid back and forth relationship between the exhibit and the multimedia system. The visual connections between the exhibit or space and the material in the workstation needs to be very strong. And one has to pay exceedingly close attention to the physical relationship between the interactive system and the other exhibit elements. All too often the video monitor sticks out like a floating electronic sore thumb, a foreign afterthought in the midst of the exhibited objects.

The multimedia station may also become the primary exhibit itself where the interactive video may provide the main experience. A video showing the slow motion action of a playground swing or merry-go-round becomes an exhibit on mechanics. A multimedia system can provide provide the visitor with the ability to magnify and analyze an image; compare it to others or to experiment with changing lighting and color mixing in relation to a painters work. These kinds of presentations are some of the most challenging ones for designers. It is important to think beyond the computer as a box with a monitor on top. Large scale projections, multiple monitors and dynamic mechanical interfaces to other objects can provide exciting interactions.

Finally, the last category consists of providing a visitor a takeaway experience through the production of a video or audio tape, a videodisc, CD-ROM or a catalog. Interactive media then becomes an extension of the exhibit itself, one which allows the visitor to take a piece of their public experience home with them. Videodiscs already exist of the collection of a few major art museums and city architecture. A videodisc and software from a museum might be used by a school class to develop reports after a field trip. And a visitor produced multimedia presentation which can be recorded at a pubic space site onto videotape can be taken home for viewing. As multimedia platforms become more common, it will be possible to sell take home experiences which enable visitors to study exhibits in more detail at their leisure.

For all of these applications, the one essential criteria for success is to include designing the multimedia elements in the overall exhibition or space development right from the

start. Too often these stations can appear to be just an add on, subtracting from the experience rather than enhancing it. The material and the architectural design are the prime elements that should drive the multimedia development.

Future Directions

In addition to fueling the general development of multimedia, the public space environment will stimulate a number of specific hardware and software developments. The first is in the area of large screen and multiple screen projection systems. The general scale and group dimension of these environments naturally leads to innovative use of interactive and multiuser projections. And public environments are capable of supporting the hardware necessary for these kinds of installations. During the development of the Globe Theater design example at the Apple Multimedia Lab we experimented with interactive projections where you could act with actors on stage and get a video of your "screen test" to take home with you.

The second concerns the development of interface hardware and software which can stand the rigors of heavy use by inexperienced. A new generation of touch screens and trackball interfaces are being developed for public environments along with interface metaphors which are naturally easy to use. The interrelationship between exhibits and multimedia systems will lead to the further development of simulations and graphic modelling which directly visually couple to the exhibit elements as well as information kiosk systems which help visitors to navigate through particular spaces and get detailed contextual information supporting a particular exhibit.

Finally, because public space environments can support the hardware and software of multimedia today, museums and other such sites are ideal places to establish store front multimedia centers where visitors can experience multimedia computing for the first time. In a similar way to the creation of computing centers for visitors that were established in museums in the 1970's before personal computing became a reality, these multimedia centers will allow a wide audience to work with computer controlled images, sounds and text. As we stand at this crossroads of multimedia and public space, let us meet to get the conversation going. As we share what we know of specific projects, methodologies, and economic strategies, we will gain from our different points of view. The outcomes will not only be better projects for multimedia and public spaces, but hopefully a better understanding of the more general issues surrounding the pubic use of interactive computing power.