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MAKING THE PUNISHMENT FIT THE CRIME

Integrated Interactive Systems in the Museum

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When we place an application into a museum, we change it. The context, the conditions of use, the place it has in the unfolding drama of a museum visit, its relationship to the site, all these conditions subtly or grossly reshape our designs. So we need to consider, from the beginning of the design process, how the application will be embedded in and resonate to a particular environment. The complexity of the site means we need to make applications that reflect the diversity of use and occasion in the museum. Programs suitable to the classroom may be totally inappropriate for a public place. And even within a museum, programs should vary according to site and function: electronic displays can bring theatrical dazzle to a space, diverting the eye and breaking the monotony of consistently-scaled replicas, while smaller-scale exhibits can provide another kind of local magic. In short, we have to think of the museum as an encompassing and unified environment in which all the elements - exhibits, electronic applications, administrative networks, and links to the outside world - form a consistent and unified system.

This paper explores the variety of forms interactivity can assume in the museum and how to adjust those forms to their specific contexts. It also addresses the problem of designing applications that work in crowded and demanding public spaces.

Exploit the full variety of interactive technology

Instead of a stultifying sameness of format and function, interactive technology can provide visual and emotional variety in the museum. In an exhibition space, interactive technology can help vary the visitors' experience, creating a balance between seeing and doing, large and small scale presentations, intensive and casual learning, and different styles of presentation.

Here are some generic forms interactive exhibits can assume:

- *environments*: The museum space, itself, can be the experience. Through appropriate technology and design, entire areas, or indeed museums, can make a statement and convey information.
- *workstations*: these can be separated from the main exhibition area, or placed near relevant exhibits, or combined with exhibits.

- *information kiosks*: used for information, sales, publicity.
- *large-scale displays*: *Dramatic and eye-catching displays are not as efficient in conveying information but can startle, entertain, and delight.*
- *playful and informal exhibits*: These can alternate with more serious exhibits to give rhythm and variety to the visit.
- *Traditional-looking exhibits*: *The transformational magic of technology can be employed to teach and dazzle without violating the feel of a traditional space.*

The basic rule is to envision the application as an integral part of the function, goals, and style of the spaces they will inhabit. In some historical museums, for example, modern workstations would be completely out of place. But we can introduce interactive exhibits in disguise, hidden in cabinets or under furniture; only the guides will know where they are and how to activate them. Sometimes however we want applications to literally leap out at the visitor, enlivening the environment and surprising the eye. For a section on Renaissance world images, I planned for the Globe Theatre museum, I designed a huge electronic interactive skyscape, stretching over three dimensional rooftops, which provide the audience with a graphic display of the variety and imaginative versatility of 17th century cosmology.

Applications do not only provide information, they can stretch and extend the visitors sense of involvement. After viewing complexly structured and 'serious' exhibits, why not allow the visitor some fun time in a discovery and exploring space? In the National Museums of Scotland, after going through an exhibit on the 20th century, visitors can spend time in a Memory Room, where they can take pictures of their family, reminisce about the past, and write electronic postcards to friends. At the Globe we plan for a carnival area, full of things to do that are light-hearted and participatory.

Integrating applications into the overall functioning of the museum

The museum is, in fact, a complex of interlocking activities, spaces, and functionalities: exhibits, education, research, marketing, outreach. The application should be embedded in the ongoing functions of the museum, and should help integrate and unify the numerous activities and functions of these spaces.

Visitors can be helped to assemble and organise their experience, by using electronic 'smart' cards or PDAs, which they could insert in exhibits to collect information, or record their interests, Once they are through, they would put the cards into stations in the information area, and receive printed information on the areas of interest, or directions to published materials. These cards could also be used to assemble packets of take away materials, including tapes and software. Moreover, the museum shop might also have information kiosks, that offers latest news about exhibits, special events, and productions, sells tickets, and offers preview selections of forthcoming events. These cards can also be used to track visitors and keep an ongoing record of important information about exhibit use and visiting patterns.

Museum officials can design multi-purpose data systems that keep track of the museum's holdings and at the same time serve as the basis of a kiosk information system for the museum visitor.

The museum as an unfolding narrative

We should think of the museum from the point of view of the visitors. For them it is a time-bound experience, a 'meaning' that is created by the specific unfolding of their

journey through the space . We must plan the space so that it has a beginning, middle, and end and insure that this 'narrative' structure is both rich in drama, surprise and wonder conveys a consistent feel and tone.

We can take advantage of this 'unfolding process' in many ways. Individual applications should refer to and build on each other. If, for example, I introduce visitors to the idea of historical development of a subject matter in an early application, I can then install subsequent applications that directly transport them to a specific time, and allow visitors to create a simulation of a past period. Or, if I place large collections of material in central information workstations in the entrance areas, I can then repeat small portions of this information in those sections where the material is in fact displayed.

But more important, walking through the museum should be like travelling through a story. For example, when I imagined the new museum that is destined to lie beneath the Globe Theatre in London, I thought of the rhythms of the visitor's experience as much as of the content of the exhibits. This museum's task is to introduce visitors to the world of 17th century London and of Shakespearian theatre. My task as a designer was to foreground the most obvious strength of the museum, its site. The visitor stands on the very place where four centuries ago Shakespeare's plays were performed and, in fact, the museum is to be built beneath a reconstruction of that same theatre. My problem was to find a way to design the space so that it communicated to visitors the wonder of exploring the very place, in the very city, where Shakespeare mounted his works. I decided to make a trip to the museum a journey into and out of the past.

As the museum is underground, the visitors enter in a lobby on street-level before descending *via* stairs to the museum level. On this level, therefore, the visitors can look through large windows at a view of the Thames, St. Paul's, and the London skyline. As they descend the stairway, the windows turn into window-like film projections, featuring the same view of London from the Globe but now going back in time. For example, at the first turning they view Edwardian London, at the next Victorian London, and so on. When they reach the floor of the museum proper, and the exhibits of 17th Century England, the windows show them Renaissance London. They are still in London, but have moved miraculously backward in time and space.

Now I build on this experience with interactive displays that help our visitors to identify with the Elizabethans who, as they are now doing, also made a journey to the Globe. On the wall, our visitors see filmed projections of Londoners travelling to the theatre: rich burghers arriving in coaches, apprentices ambling over the London Bridge, nobleman in ferries being rowed over the Thames. Large electronic maps trace the various routes. Visitors can press buttons to choose a type of theatregoer - noble or worker, and watch each route light up on the wall; and perhaps see a short film of the home and the neighbourhood from which they journey. Workstations scattered about could supply more detailed information about the sociology of London; its neighbourhoods, its class distinctions, its transportation technology. This experience sets the stage for the visitors' exploration of the whole range of exhibits of Renaissance London and Theatre available.

We then guide the visitor both psychically and conceptually out of the past and prepare him or her for the culminating experience of the complex: attendance at a production in the reconstructed Globe theatre. Moving upwards out of the museum, the visitors also move forward in time, from the Renaissance to the present, through twisting tunnel-like spaces that dramatically present the history of Shakespearian productions from the 17th century to the present through a mix of large-scale film projections, paintings, sculpture, recordings, texts, and real objects such as costumes. As visitors are about to leave, they find themselves in 'Backstage Alley,' an area designed to present the working life of the Globe. Here they can peer through peepholes at actors rehearsing, at props and scenery being built, at performers preparing the production they will go to see that afternoon at

the theatre just above their head. Hopefully, the shape of this experience will provide a sense of finish and closure to the visit.

Linking the Museum to the community

Interactive technology can also integrate the museum into the community, linking it to other museums, schools, archives, and research centres. Indeed, we can recreate the museum as a virtual space that exists as a nexus for interlocking electronic centres that can be spread across a country or the world. At the National Museums of Scotland, we are planning to link the museum in Edinburgh to a series of outlying centres in the Scottish islands and Highlands. Exhibits can be shared, and local communities can collaborate in creating their own displays.

On a more modest scale, exhibits within the museum could be redesigned as computer programs for the home and school; or visitors could create projects in the museum and research area which could both be taken home and exhibited within the museum. If students had multimedia programs about Shakespeare and the Globe to study at school before they came to the Globe, their visit would be richer. Then they could discover, collect, and create information during their visit to take away with them and add to the materials at school, embedding their visit in a larger educational framework.

Designing the individual application

Interactive applications are really a form of theatre¹. In both multimedia systems and the theatre, the job of the producer of the event (the director in one case, the designer in the other) is to control and shape a rich but potentially chaotic mass of materials. The director's and the computer designer's task is to co-ordinate details of design, technology, movement, and artistic interpretation to create a unified whole that guides, teaches, and entertains.

In the theatre, unless great care is taken the spectator may be overwhelmed by the events taking place on the stage: there is so much to see, to understand, to integrate. At every moment, the audience is confronted with multiple kinds of experience: words, designs, lights, costumes, movements, psychological and narrative occurrences. It is the job of the director to focus the audience's attention by artfully shaping and combining these elements into clear and intuitive unities on the stage. The director's task is to make us care about the event, to motivate us to expend the effort needed to grasp and assimilate the complex event flowing past us on the stage. The director acts as a guide, focusing our attention, showing us where to look and how to understand what we see. And, to fully engage our attention, the director should appeal to our whole selves, to our minds, our bodies, our hearts, and our sense of beauty.

So to, in multimedia, the designer must shape a unified, focused, and meaningful experience, moment by moment, out of the richness and potential of the medium. Museum programs often confront the user with an overwhelming onslaught of pictures, texts, diagrams, and audio which had not been adequately formed and selected. No matter how ambitious and comprehensive the overall plan, the program is a failure unless it provides the user at every moment with a clear, simple and focused experience.

1 The analogy is a natural one for me as I began my career as an actor and director. While initially this may seem strange preparation for designing interactive multimedia applications, the more I work in this field, the more I feel how useful my theatrical background is to the demands of interactive design.

Recently, I watched visitors to a museum sit at workstations and explore an interactive program featuring images from the museum's collection. This program contained a vast amount of material: pictures, film, historical explanations, models, simulations, indeed, everything one could possibly want to know about this particular subject. The users had, at the touch of a screen, multiple choices leading to ever-expanding pathways and new bits of knowledge. I was impressed by the ambitiousness and polish of the presentations: such a marvelously intricate and comprehensive resource seemed to offer exemplary proof of the usefulness of interactive technology. But as I watched visitors' browsing through the choices offered, going down one pathway after another, I noticed a certain dispirited glaze spread over their faces. The initial novelty having faded, visitors seemed to lose interest and, in fact, soon stopped their explorations.

What was the problem? My sense was that, overwhelmed by the sheer mass of information, the visitors were reluctant to continue accumulating more facts when, indeed, they seemed not to know what to do with those they had already collected. After a while, they stopped engaging with the experience and simply gave up.

People need a reason stronger than idle curiosity to keep them at the arduous tasks of learning. The subject matter must stimulate their curiosity and the information must seem personally important to them. And when they do acquire knowledge, they need a place, a 'conceptual basket' so to speak, in which they may store, order, and absorb that information. In other words, interactive programs must do more than offer information; they must attract learners, guide them to the facts and ideas they genuinely need, supply them with concepts to help them assimilate and evaluate information, and give them tools to re-employ and apply what they have learned.

How do we do that? What steps do we take as designers to shape information into powerful and attractive programs that genuinely serve the interests of students in classrooms or visitors in museums?

The designer should

- draw and arrest the user's attention. Make it clear why the user should care about the information
- define the central concern of the project, its cognitive spine, clearly and strongly
- involve the user's full capacities to learn; engage the emotional, aesthetic, personal, as well as cognitive abilities of the user
- put the interactive experience into a meaningful context, and provide ways for the user to extend and increase their understanding in new arenas
- involve the users in responsibility for the experience, allowing them to intervene, alter, and add to the information.

Attracting the user

The program should draw us into its world by awakening in us some connection and relationship to the subject under consideration. Thinking of the program as a building, we need to create an attractive entry hall, one that invites in the visitors and also informs them of the purpose and nature of the edifice they are about to explore.

Once you have enticed the user into the program, the world she or he encounters must be clear, simple, and meaningful. A good interface design is priority number one. Designers must learn to put themselves in the users' shoes. When users open the program, do they

see a screen that is inviting, simple, reassuring? Can they intuit with ease how to navigate through the system, what buttons and icons mean, how to get help? Does the design tell the user what the program is about, what it is for, and how to proceed?

Some suggestions:

- Right at the start provide a clear sense of what the program is meant to accomplish, how long it may take to finish a section or complete a goal, and offer initial guidance;
- Offer comprehensive directories (and ways to navigate through them) and clear spatial maps of the structure of the program.

The temptation is to make the system so free and interactive that users have complete control at every moment. While this is a praiseworthy goal, users can often feel bewildered and overwhelmed by choices and uncertainty. Instead, find a simple 'spine,' and organise around it. In general, the more material, information, and procedures in the program, the simpler the basic organisational principle. Some ones that have worked well are: a trip through a museum or library, where information and activities are stored in appropriate rooms or galleries; maps of locales, cities, interesting spaces; using sets of experts, each of whom introduces and guides the user through a sub-set of the information. Striking a balance is a key to effective design.

Most important, work at developing a format appropriate to your subject matter. Every discipline generates its own appropriate forms for learning. Art appreciation, psychology, and biology - all these require us to develop specific standards of judgment, specific criteria for truth. The program should enhance students ability to think in that discipline.

To find an appropriate form for a specific application it is urgent to involve the content expert from the very start, and let the design emerge from his or her real insight into the subject matter. Too often, educational programs are initiated by technological experts who say, 'Gee, we have these new gadgets, let's put them to use!' What may result is a fancy, over-designed application which no one wants to use. I began in multimedia out of a long time experience as a teacher of Shakespeare and out of my long time frustration with a specific pedagogical problem. I wanted to make students realise that the text of a play they held in front of them in a large lecture room was not the play itself, but merely the beginning point for the intricate process that would finally lead to a stage production. I knew pretty clearly what I wanted the program to do for me. This clarity of focus on my part helped tremendously in the design process. So the heart of the *Shakespeare Project* is a program that allows the user to watch numerous versions of the same scene, so they can study in detail how different groups created different productions out of the same text. It also contains a simulation program, *The Theatre Game*, which allows them to stage their own version of the scene. The choices I made in designing the project flowed directly from my knowledge of the subject and my pedagogical experience.

Caring about the user

Your design should not only be simple, informative, and efficient; it should appeal to the whole user, to the user's sense of beauty, curiosity, and fun. Learning is a form of enthusiasm, an excited reaching out towards the new. The more we are excited and stimulated and intrigued, the more energy we have to direct towards what is new and difficult. A good design allows us to relax and focus attentively on a subject.

The program should look appealing. While this may seem obvious, it is in fact often not heeded. Beauty is a form of positive attention; we look with delight and interest at what attracts us. We also like to be surprised, caught of guard, and amused. Humour too can be

an important tool to engage and hold the attention, only be careful that it is not cheap and patronising.

We feel stimulated when we engage our whole selves in our reality. So, as a designer, aim for the full-spectrum of learning afforded by the capabilities of multimedia. Interactive technology permits students to learn in many different ways, through seeing, hearing, reading, doing. Too often, we work out many ways for students to collect, link, and manipulate information, without exploiting the wide variety of ways they can confront, absorb, and shape that information.

For example, we can read a play, hear it, see it, criticise it, report on it, and participate in it. All these activities are really different forms of learning about the same event. In *The Shakespeare Project*, I organised the material into different learning activities: watching, studying, organising, writing, browsing, imitating, and creating. By encountering the same material in a variety of modalities, students grasp the richness and depth of the material. They also extend and refine their own capabilities, becoming better viewers, creators, and critics.

We should also appeal to the user's sense of fun and to her or his underlying fantasies. For example, when designing a program on Shakespearean theatre for the Globe museum, I asked myself what would truly excite someone about Shakespearian acting. The answer was: to be able to play with a great actor oneself. And so I created a program would allow one to do just that.

Give user power to intervene, improve, alter the experience

Finally let us use this technology to empower rather than control, building applications that permit users to add and change information, and to leave their mark in the electronic world. Visitors can be invited to share their experiences, questions, and comments with others through interactive installations. In a program I designed on the history of French theatre, called *Paris/Theatre*, the user not only explore the relationship between theatre and other social and political institutions, but can add and rearrange information. Their research becomes part of the program for other people to use.