

A New Approach to the Process of Exploration and Interaction for Visitors to a Museum Exhibition

S.J. Fleming, W.R. Fitts and P.C. Zimmerman

MASCA, University of Pennsylvania Museum
3260 South Street
Philadelphia, PA 19104
U.S.A.
wfitts@sas.upenn.edu

Abstract. There is a consensus view among communications experts that, despite a growing reliance upon databases and CD-ROMs, museums have not kept pace with the extraordinary advances in multimedia technologies that have taken place over the past decade. If that situation is to change, many museologists argue that exhibitions must provide the visitor with a sense of exploration, and appeal quite directly to his/her intrinsic motivation for wanting to know more about some aspect of the past. We are addressing these issues by the development of computer-based kiosks, each of which outputs a concise package of dynamic images and relevant commentary, with story lines that supplement the hard copy texts included in adjacent artifact displays. These kiosks would be linked together in such a way that the preface to each story line is adapted to recognize the previous path the visitor has taken through the exhibition. At the same time, each story line would be available at a number of levels of informational intensity which respects the visitor's prior knowledge of the exhibition's subject matter. The case study presented here covers various aspects of the production and use of glass in the Roman World. As far as we can judge, however, the computer technology underlying the organization of such a kiosk array is applicable to almost any kind of exhibition format.

Keywords: museum visits, multimedia technologies, computer-based kiosks.

1 Introduction

Museum visitorship is higher than ever before. It is estimated that during 1997, in the United States alone, more than 156 million adults went to one kind of museum or other (fig. 1), and that those adults, on average, made about 3.3 visits each (Lusaka and Strand 1998).

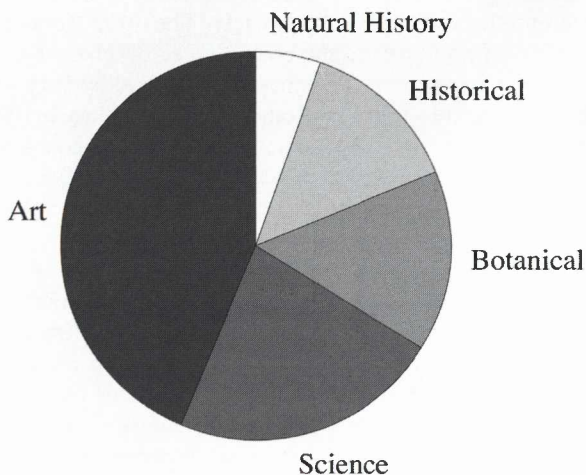


Fig. 1. A breakdown of the annual museum visitation in 1997, by museum character. The total number of visitors in the US was close to 865 million. (Graphic by Lindsay Shafer, MASCA; after Lusaka and Strand 1998: 59)

Yet many museum professionals feel that they could be reaching a far wider audience. Since five out of every six Americans did not go to a museum in 1997, it could be argued that museums still are having trouble reaching a sizable portion of their intended audience. In par-

ticular, younger visitors, most of whom we admit visit a museum only by obligation, as part of a school group, are invariably describing the experience as boring and unrewarding. That amounts to about 160 million dissatisfied or disenchanted 'customers'.

It is true that several museums are altering their approach to the presentation of information in an attempt to gain a larger share of the potential market for leisure education. Exhibit designers are looking for ways to stimulate visitor imagination, and provide a stronger sense of exploration through an increased and direct interaction with the display. Among some of the successes in that direction are the robot docent that roams the dinosaurs hall in the Carnegie Museum of Natural History, in Pittsburgh (see www.mobotinc.com); and the 'time elevator' in Jerusalem which dovetails an amusement park ride with a historical film sequence covering the history of the city (see www.time-elevator.com).

For many years, computerized kiosks were seen by museums as the obvious means of increasing visitor interaction with exhibitions. The thinking was that they would appeal to a young public that is increasingly comfortable with that means of information transfer. And such kiosks had an undeniable appeal to exhibition designers because of their ability to present, at a relatively small cost, vast amounts of information – far more than could ever be printed on a conventional text panel. In practice, however, most uses of computerized kiosks in museum galleries thus far have been quite unimaginative. They power only slightly interactive slide shows and movies, store encyclopedic databases, or, just occasionally, provide access to a simplistic educational game.

2 Developing Networked Kiosks

In 1994, when we first considered developing computerized kiosks at MASCA for use in the exhibition *Roman Glass: Reflections on Cultural Change* (which eventually opened in September 1997: see Fleming 1999), we too envisioned the roles of kiosks in a museum as very similar to those we have just described and criticized. But it only took us a matter of days to realize that such roles were an incredible underutilization of the technology; that kiosks had far more potential than just a means of keeping hordes of children from rampaging through a gallery. They could entirely replace many kinds of conventional text panels, and so bring about a radical change in a museum visitor's experience.

For example, in the Roman glass exhibition, there were two obvious sub-themes. The first was a history of the change in shape and function of glassware in the Roman World over the period of the late 1st century BC to the early 7th century AD. The second was the story of domestic usage of glass throughout a normal Roman day and in the funerary rituals that were practiced after dusk outside every Roman city. Here were two quite different timelines, each of which could be simplified into three parts (fig. 2). In one, the pivotal periods were the reigns of the emperors Augustus, Nero, and Constantine, respectively. In the other, the pivotal periods were Morning, Afternoon, and Night. The exhibition itself was to be laid out in such a way that a visitor could enjoy it simply by following the two timelines in turn.

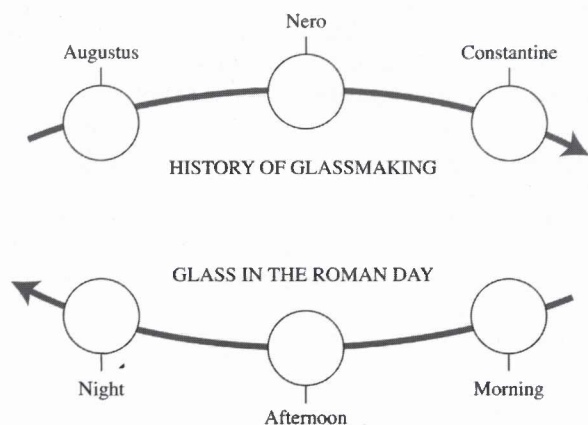


Fig. 2. The conventional "two streams, two timelines" format of exhibition layout, as used in the University of Pennsylvania's *Roman Glass: Reflections on Cultural Change* (1997). (Graphic by Lindsay Shafer, MASCA)

What would happen, however, if a visitor chooses to move more freely through the exhibit space? What if one area of the floor was crowded, or if one display unit in particular caught the eye? The next text panel he visits would have only local relevance and would be out of context as far as the time-based story line of either of the exhibition's sub themes was concerned. Clearly

something more would be needed to maintain a sense of exhibition coherency.

A network of kiosks, based on an array of modern microcomputers, offers a practical solution to this situation. By keeping track of the visitors through a log-on procedure, each kiosk can be programmed to present an adapted story line that refers back to elements in any of the kiosks previously visited. Thus, in the Roman glass exhibition, for a visitor moving from the section on *Augustus* to that on *Nero*, a specific kiosk-stored file would present a transitional story on how Roman culture and technology changed in the four decades between the reigns of these two emperors. Similarly, if the visitor went from the section on *Nero* to the section on the *Roman Night*, another specific kiosk-stored file would present a transitional story on the use of glassware in funerals.

An exhibition equipped with n kiosks offers $n[n-1]$ different paths of exploration. In the Roman glass exhibition, as described here, the six kiosks then would provide 30 quite different story lines for the exhibition.

3 Customizing Kiosk presentations

In addition to the transitional material that kiosks would provide visitors as they moved through the exhibition, the flexibility of such computerized kiosks also make it feasible for them to offer several different versions of the same basic information, each aimed at a specific expectation of the visitor's educational background. The simplest level of division here could be adult *versus* child, but there also could be a scholar's version. Even more paths of exploration could be developed by introducing the notion of virtual 'tour guides' favouring different elements of Roman society. Thus in a Roman glass exhibition, we might create a set of characters such as a Greek tutor, a businessman, a wealthy lady's maid, and a mischievous Roman boy. Since each of these people in the real Roman World came in contact with glass in quite different ways, the stories told by them at each kiosk would reflect their personal life experiences.

Kiosk stories also could be customized to the interests of specific groups of visitors. Thus the Roman glass exhibition could have a path for students taking an introductory class in Roman archaeology, with the kiosk carrying information about the contexts of the different kinds of glassware, the changes in decoration that glassware underwent through time, technological aspects of the production, and so on. Whatever means might be used to articulate the visitor's path through the exhibition, computerized kiosks inevitably would encourage exploration by rewarding backtracking and repeat visits, rather than an endurance for pushing buttons.

One feature of the data files used to organize transitions between kiosks is that they automatically contain the location of each kiosk already visited, and when the visitor was there. Such information could be invaluable to an exhibition that will travel to various venues, since

it documents the frequency with which all the various paths through the exhibition were actually used, and which sections received the most and the least attention. An ongoing analysis of such data would allow an exhibition to be 'fine tuned', in terms of both its layout and its content.

4 Considerations of time

While raising these novel ideas of exhibition organization, we are aware of the low attention span of most museum visitors. The average time for interacting with computerized kiosks seems to be slightly over one minute. After this, the visitor rapidly loses interest, in spite of having many different options with which to interact and to explore. During longer kiosk presentations, if there is break in the presentation – e.g., while a complex video segment loads – and the screen is blank for even a few seconds, people tend to assume that the presentation is over and leave. Strict time limits on a kiosk presentation also help to stop both children and adults from thinking of kiosks as being little more than educational video games. Time limits also prevent groups of children monopolizing the kiosk, something which would further convince adults that kiosks have nothing to offer them.

Curators might well wince at the imposition of such time constraints. Their years of preparation of the exhibition's themes mean that they have in store, both in hard copy and in their minds, a huge amount of fascinating supplementary information that could never be covered by concisely written text panels alone. Some compromise is possible, by using kiosks to provide what we refer to as an 'information saturation'.

Data on the sensory stimuli produced by television and other kinds of modern electronic entertainment indicate clearly enough that the human brain is able to process information from several different sources at once. Increased exposure to the media seems to only enhance our skills at parsing different information streams. Thus, a kiosk can provide text, video, and speech simultaneously, without confusion and within an abbreviated time-span. For example, while the narration on a kiosk might talk about how the emperor Augustus consciously made Italy the center of glassworking in the early Roman Empire, a map could be in place that shows the areas from which materials and craftsmen were obtained, while a video animation could demonstrate the practicalities of glassblowing at that time.

If the presentation of information is well planned, visitors will not walk away from the kiosk feeling that they were a passive observer having just been spoon-fed a simplified reality quickly forgotten. Instead, they can move towards the display of artifacts, their minds still processing the three or more streams of information that they just encountered. A one-minute time limit, therefore, is not a barrier to the amount of material presented. Rather it represents a cutoff point at which the short-term memory of the visitor is saturated.

Technologically, networked kiosks are not difficult to create (fig. 3). Even in 1997, we were able to develop working, stable prototype networks using out-of-the-box Apple Power Macintoshes with Mac OS 7.5 that ran kiosk presentations written and compiled in Macromedia *Director* version 4. Upgrades in both the system and *Director* software have only made this process easier and more reliable. The kiosks were networked via ethernet to another out-of-the-box Macintosh that acted as a server running the standard file sharing software included in the Mac OS. The server held the necessary user data files, log-on information, and all of the shared graphics required for the log-on procedure.

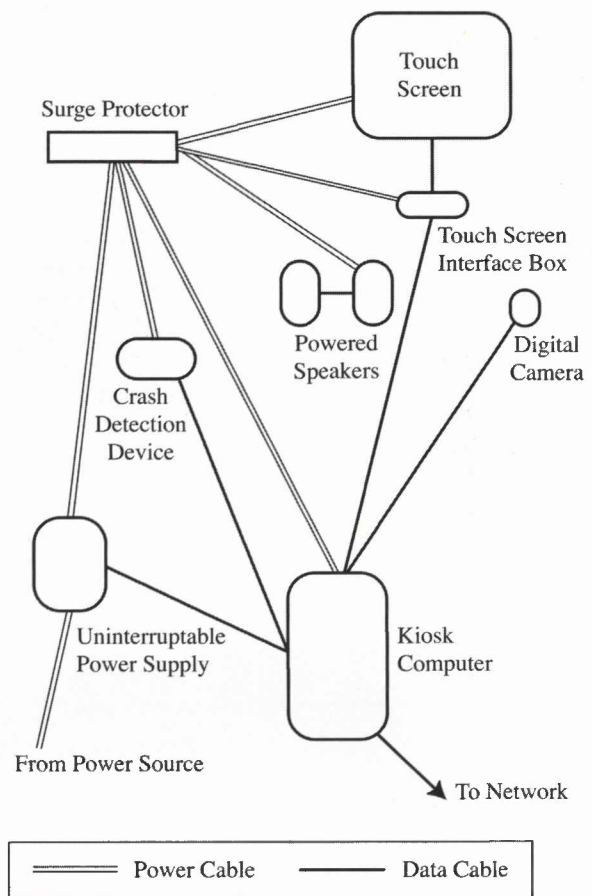


Fig. 3. The essential components of an effective network of computer kiosks. (Graphic by William Fitts, MASCA)

It has to be said, however, that networked kiosks are not so easy to maintain. To keep the visitor's attention, the kiosk itself must be working throughout the period of the day that the exhibition is open to the public. The preferred approach to this issue is to set up the kiosk computer in much the same way as a standard office server. The computer should start up and shut down automatically at each end of the exhibition's daily duration, and restart after power outages. If some element of the hardware is liable to freeze while running kiosk software, a crash detection device should be included as well. And obvious though it may sound, we would still

stress that physical plant and gallery supervisors must know who to contact when the kiosk is not working.

5 Looking ahead

Networked kiosks of the kind described here may well be the first step towards eliminating text panels from museum exhibitions altogether. Much thought needs to be given to the practical aspects of the idea, but at some point the kiosks should be integrated directly into the design of the artifact display units, so that they provide direct contextual information about the adjacent artifacts. One innovation might be to exclusively spotlight an artifact at the moment it becomes relevant in the kiosk commentary.

We note also that, unlike text panels, networked kiosks are capable of reaching outside the exhibition that contains them. If set up at a museum-wide level, they can allow visitors to explore the entire museum at their own speed and discretion, while keeping them aware of cross-cultural connections between galleries visited, and provide a constant sense of the timeline of antiquity. Because kiosk software can always be mindful of where the visitor has been before reaching a particular point, it is possible to create a unique experience for every visitor that would give them ample reason to return and take a fresh journey of exploration along a quite different path through the past.

References

- Fleming, S.J, 1999. *Reflections on Cultural Change*. Philadelphia: University of Pennsylvania Museum.
- Lusaka, J. and Strand, J., 1998. The Boom—And What To Do About it. *Museum News* 77.6, 55-60.