4 HYPERMUSE: A PROTOTYPE HYPERMEDIA FRONT-END FOR MUSEUM INFORMATION SYSTEMS

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Hypermedia offers a new paradigm for the design of information systems within museums. Yet working applications are few and far between.

One problem has been that the query-based mode of searching has tended to be completely overshadowed by the navigational mode in hypermedia. Both are required for different ends in an information systems application. A naive user may prefer to browse using navigation, while a regular user may be able to formulate a query which retrieves the information desired.

Another problem has been the one-off nature of many hypermedia applications. Input and maintenance of data can be a tedious task for hypermedia systems. Organisations already have database systems which need to be re-used rather than replaced in a move to using hypermedia.

The best situation would be for a database to hold the stored information, and for a hypermedia package to provide the interface. A hypermedia package could then be used to build one (or more) interfaces to that database. This arrangement utilises the best features of both types of system.

Museum information systems

Museum information systems are ideal for investigating the augmentation of traditional database systems with hypermedia, for three reasons:

First, in the current generation of museum information systems, the mode of access is exclusively by Boolean query, as some form of text retrieval system is typically employed. This means of access alone is constraining, as there are strong and obvious links between museum items, whatever their nature, and other pieces of information (makers, users, historical events, etc.), which would best be traversed navigationally.

Second, despite the enormous diversity of items that museums collect only textual descriptions of these items are stored, if a text retrieval system is used. Such systems cannot handle the multi-media nature of much museum information (photographs of museum objects in storage, film clips of related events etc.).

Third, demands placed on a museum information system very widely according to different user groups, either of staff (management or curators) or the public (researchers and visitors).

Currently implemented systems tend to consist of text retrieval packages for museum staff use, (Burnett and Morrison, 1991), (Wentz, 1989) and separate specially-built 'stand-alones' for public use within exhibitions, some of which are hypermedia applications, (Prochack, 1990). Nielsen (1990), note two advantages of hypermedia for this role: browsing is encouraged by hiding the extent of collection information contained, which might be off-putting if visible: and the casual visitor can be enticed to use the system, through the use of attractive initial displays and by presenting information well. Such advantages will only show if a museum-based public access hypermedia system can accommodate 'walk-up-and-use'.

Hypermedia applications are not new to museums. One of the earliest hypertext systems, was used in experiments in three museums in the United States, (Schneiderman, Brethauer, Plaisant and Potter, 1989). Within the United Kingdom, attempts have been made to present entire museum collections by means of a hypermedia application such as the Micro Gallery at the National Gallery, London, as well as individual applications designed for inclusion within exhibitions, such as those developed by the National Museums of Scotland, (Burnett and Buchanan, 1990) and the Tate Gallery, Liverpool (Arts Council for Great Britain, 1992) (Prochack, 1990).

The latter two examples, however, are not object-based applications, as they contain additional information about the theme of the exhibitions. Since this type of application contains information relating primarily to the exhibition they support, they cannot be reused easily in support of other exhibitions, without major re-design. Although popular with visitors, they are a drain on scarce resources in both capital and skilled staff, which may account for the lack of widespread use of hypermedia in museums.

These applications whilst impressive in design, do not utilise the museum's existing databases and object records, but take selected collections information and re-work it in a different manner. The information used has to be research and placed into a different format to the existing documentation system. This means that whilst the visitor may be able to access collection data, it is in a packaged form, which is controlled and limited. This control reduces the freedom of the visitor to explore information and not be part of the museum, may require a massive input in rewriting information for public consumption.

System design

It is to be expected that as museums automate their collections records they should make this information available to the public. Museum professionals and government agencies are aware of the implications and benefits of computerisation for the public (Audit Commission, 1991 and Holm, 1991). Of the four potential interfaces identified by the project (curator, manager, researcher and public), the one between the public and the museum database would have the most useful impact. This was the goal of prototype development.

A major problem when designing a generally applicable interface is the diversity of type, size and nature of museums. A structure which is developed for one museum is likely, at best, to need major revision before being useful at another. To avoid this problem, object records from two real collections were used, Leicestershire Museums, Arts and Records Service local history collection and the George III collection of early scientific instruments from the Science Museum, London, so that generalised access routes would have to be devised. Other information in the prototype was culled from a variety of published sources from real museums and fictionalised.

The object records were stored in Dbase databases, which were separately structured for each collection, on a PC compatible, controlled by PC Anywhere. The hypermedia front-end was built using HyperCard on a Macintosh LC, with CommsTalk to communicate with the database back-end via a serial connection.

An opening screen with a limited range of categories was designed (Fig. 1), to give a concise overview of the information contained within. Each category was intended to correspond to a particular avenue of public enquiry:

- general questions about the museum
- the whereabouts of particular facilities
- 'whats on' type questions
- what sorts of objects does the museum collect?
- specific questions about items in the collections.

For simplicity of use, a decision was made to have no more than seven control buttons at the bottom of the screen. For the opening the first five were named for each of the five categories. On subsequent screens control buttons would have functions pertinent to that screen, and be labelled accordingly. On every screen, apart from the opening one, the last two buttons were for backtracking (returning to the previously viewed screen) and for returning to the opening screen, labelled 'Back' and 'Menu' respectively.

The hierarchy of screens for each category was kept as shallow as possible. 'General' information was accommodated on one screen (Fig. 2) the 'Floor plan' (Fig. 3) screen led down to screens explaining each facility. The screen for 'Events' (Fig. 4) gave current events, and led to screens for future events by types. The 'Collections' screen (Fig. 5) led down to a screen with collection groupings by subject area (Fig. 6). From this screen one descended to screens detailing individual collections (Fig. 7).

The 'Objects' category led to the deepest hierarchy. The initial screen (Fig. 8) explained the choices of routes to find information about objects. There were four such routes:

- 'Name' - to find objects to associated personal or corporate names
- 'Place' - to find objects from a geographical place
- 'Date' - to find objects linked with a year or span of years
- 'Feature' - to find objects by general criteria not falling under the above.

Choosing either 'Name', 'Place', or 'Feature' takes the user to a screen which depicts a box of index cards labelled A-Z (Fig. 9). Choosing one of the lettered cards retrieves a list of terms starting with that letter (Fig. 10). Choosing a term from the list brings up information on the first object associated with that term (Fig. 11).

The procedure for 'Date' is similar, except that a timeline, with dates shown (Fig. 12), appears instead of a card index box. Choosing a relative position on the timeline brings up a list of dates, which then function in the same manner as the list of terms for the three routes given above.

Fig. 1 Opening screen

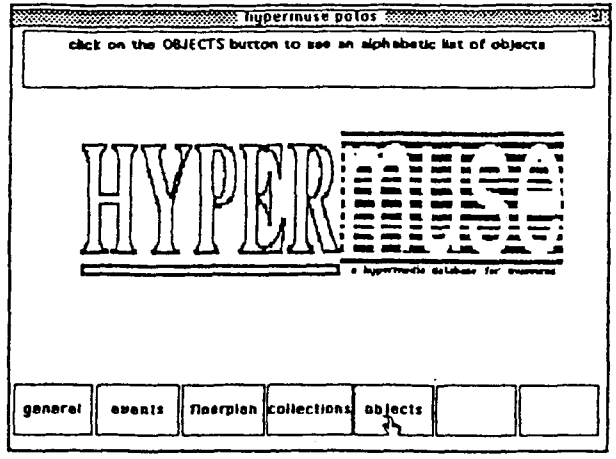


Fig. 2 General

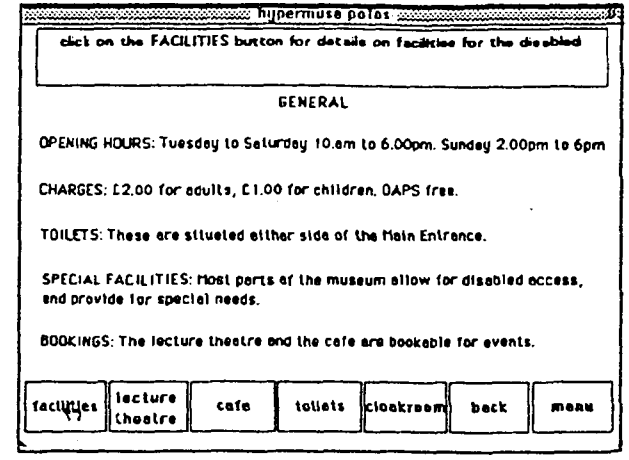


Fig. 3 Floor plan

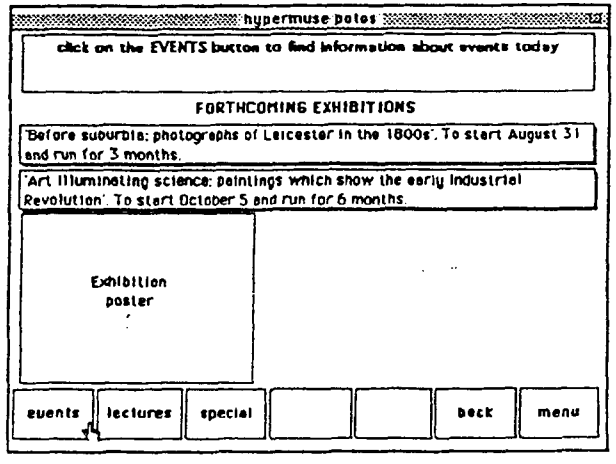


Fig. 4 Events

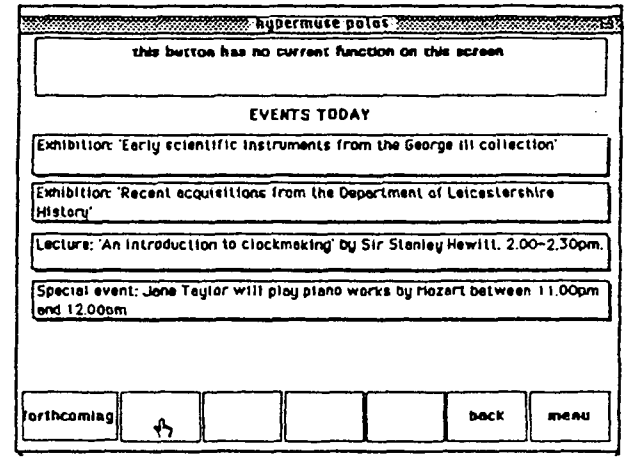


Fig. 5 The collections

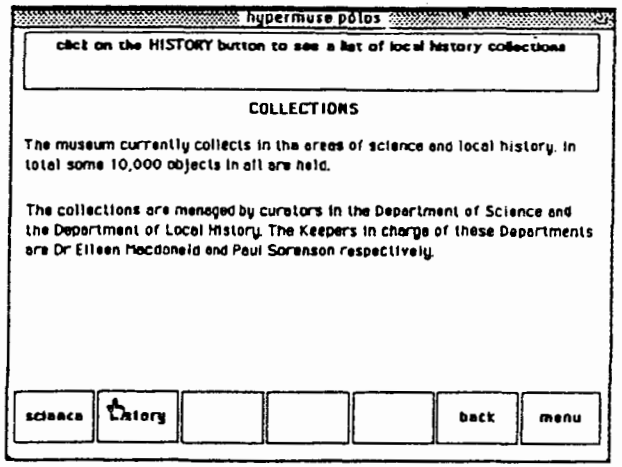


Fig. 6 Collection groupings by subject area

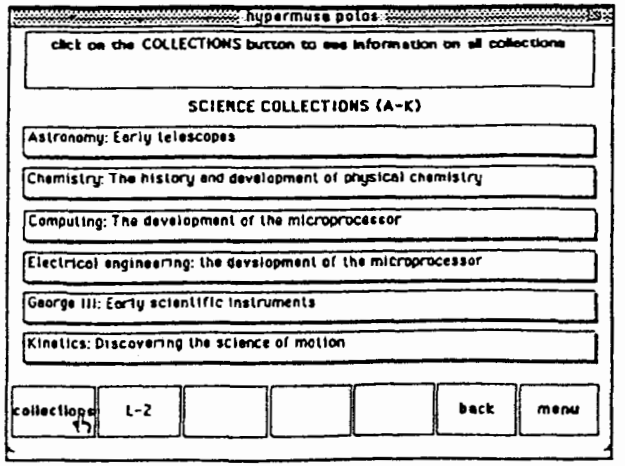


Fig. 7 Individual collections

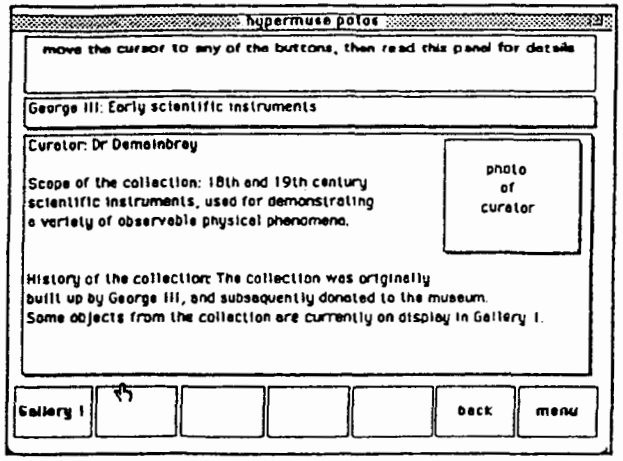


Fig. 8 'Objects' category, initial screen

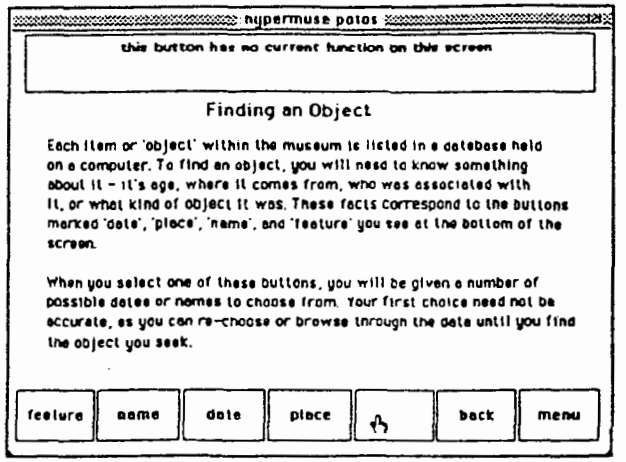


Fig. 9 Box ofi ndex cards labelled A-Z

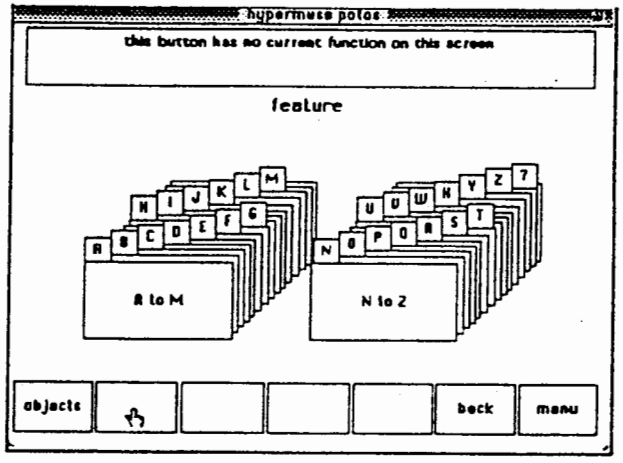


Fig. 10 List of terms starting with chosen letter

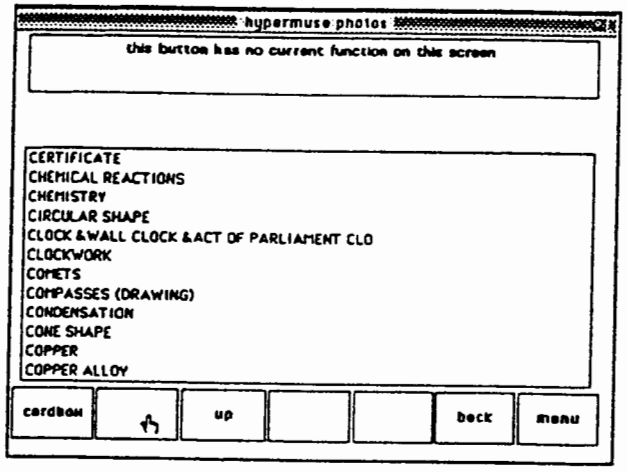


Fig. 11 Information of the first associated object

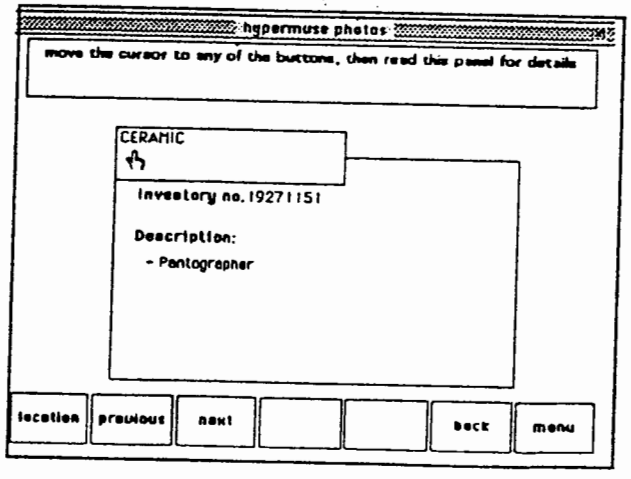
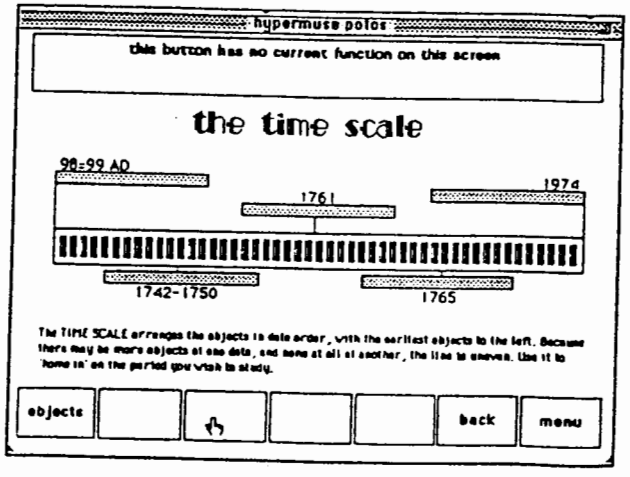


Fig. 12 Timeline of dates



System evaluation

We needed to evaluate the overall design of the hypermedia front-end and of its component screens, in terms of the effectiveness of their layout, the quality of on screen instruction, the clarity of terminology used and the functionality of the control buttons.

Evaluation was carried out in Leicester and Loughbrough, using nine students with no particular experience of museums, and three museum curators. Each session involved giving a brief explanation to the subject, who was then left alone with the prototype system and asked to use the system to answer eight example questions which museum visitors might ask. Subsequently the subject was debriefed and encouraged to give examples of system behaviour to illustrate their answers.

The overall impression that the subjects had of the prototype system was excellent: very favourable responses came from the museum curators. Problems were discovered however.

Of the categories leading down from the opening screen, confusion existed amongst some of the students on the difference between the 'Collections' and 'Objects' categories. They are both pieces of museum jargon (as one curator noted). 'Objects' would be better labelled as 'Exhibits'.

The control button labelled 'Feature' in the 'Objects' category initial screen caused difficulties. 'Features' was a term we were not happy with , but was chosen for lack o an alternative, and the subjects' feelings reinforced our disquiet. The only solution was to duck the question and go straight into an unnamed index care display on the initial screen for the 'Objects' category, which will include the terms previously access via the 'Feature' button. Control buttons will lead to subsequent screens for access by 'People' (some subjects though 'Name' ambiguous), 'Places' or 'Dates'.

Most subject though that the descriptions and inventory numbers given for museum objects were inadequate. sometimes object descriptions were identical and only the inventory number changed. Not surprisingly many subjects missed this. Including the collection title would give a context for the object. Slowing down the transition between objects would also help.

The textual explanation of the function of control buttons, residing on the top of the screen, was missed by a number of subjects. Some users conversely were distracted by the changing text, not realising that they were causing it by moving their mouse. It was decided to move the textural explanation to beneath the control buttons and add an upwards arrow pointing to a particular button from it.

There was very little adverse comment on the speed of response when viewing objects, caused by the retrieval of this information from another computer.

Evaluation also showed that the use of colour would be a significant advantage in highlighting and isolating information on the screen. Hypercard cannot easily be made to show colour, so it was decided to look at SuperCard (Aldus/Silicon Beach). This product only allowed the use of colour, but also allowed graphics to be treated a objects with associated scripts.

With SuperCard, stand alone versions of the application could be produced, making evaluation within a museum context easier. SerialHandler (Dartmouth) will be used to control the serial port, as few of the main features of CommsTalk were actually being used. Problems of incorporating CommsTalk into the SuperCard application, and potential license problems were thus avoided.

The prototype shows that the concept of a hypermedia package fronting a database is viable. The prototype has successfully allowed access to a databased museum object records, and other information about the museum and its services, in a structure which is suitable for public use.

It is intended to evaluate the result of moving to SuperCard. For this purpose a public trial of Hypermuse will be arranged over the summer at a museum. Negotiations are currently in hand.