Guide to Opportunities in Volunteer Archaeology
Case study of the use of a hypertext system in a museum exhibit

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Abstract:

This case study shows how a hypertext system was used in a traveling exhibit of the Smithsonian Institution. The database about archaeology was constructed by a professor and students of the history department of the University of Maryland. Regular updates of the database were made for each new venue of the exhibit. Finally the database was translated into French and automatically rebuilt to be used in Canada. Helpful features of the hypertext system as well as the difficulties encountered are described. System users were observed in the museum and collected usage data was analyzed.

Introduction

In the summer of 1987 Professor Ken Holum of the History Department of the University of Maryland approached the Human-Computer Interaction laboratory to explore the possibility of using Hyperties - a hypertext research project of the laboratory [1] - as part of a museum exhibit to open the following spring. This was the beginning of a two year collaboration between the two groups, which allowed us to test our research on public access information systems, in the "real world". This case study describes the steps of the birth and traveling life of GOVA, the Guide to Opportunities in Volunteer Archaeology, and demonstrates that such an adventure can be successful without being burdensome.

The museum exhibit

Two freestanding podiums were installed in the final chamber of the exhibit on "King Herod's Dream". This exhibit was about the ancient Roman port city of Caesarea located on the shores of what is now modern-day Israel. It focused on the rise of urbanism in ancient times and the archaeological methods used during the past 20 years of excavation [2] [3]. This last station of the exhibit invited visitors to learn more about the sites around the world that welcome volunteers, and how to join a dig (Figure 1.)

The exhibit was organized by the Smithsonian Institution Traveling Exhibition Service. It opened in Washington DC March 1988 at the National Museum of Natural History, then traveled to five museums for the next two years (Los Angeles, Denver, Minneapolis-St. Paul, Boston and Ottawa.)

The two custom made podiums housed IBM PC-AT computers. The EGA monitors, each equipped with a Microtouch touchscreen, were at about waist level at a 45 degree angle. The only permanent instruction is "Touch the screen" written above the monitor, and there was no keyboard.

The database

The GOVA (Guide to Opportunities in Volunteer Archaeology) database was developed under the direction of Ken Holum (Professor of History at the University of Maryland). It consists of about 200 articles. The contents include information about archaeological digs (Figure 2) taking place around the world, description of historical periods, and practical questions about how to join a dig. A special effort was made to cover the local sites near each current exhibiting museum. The archaeological sites are organized both geographically and by historical periods. The information can also be accessed by direct selection on 11 maps (Figures 3 and 4).

The initial database was constructed in a relatively short period of time. Between two and three person-months were necessary to collect information about the digs, structure the information, write each article following a predetermined style, and mark the links. This was done using the authors' usual text editor. Graphic artist Karen Norman prepared the maps and created three graphic screens (e.g. Figure 1). Then about two weeks of work was necessary to build the database in the computer (import articles, adjust their formatting, verify the links in the text and create the graphic links). As expected - as it probably should be - the initial writing itself was found to be the most important and time consuming task. Most of help given by the Human-Computer Interaction Laboratory team was about the use of DOS and the handling of graphics. Hyperties was easily learned by the History Department team.

The browser

The hypertext system used was Hyperties (now available from Cognetics Corp., Princeton Junction, N.J.). We used a version which included the use of a touchscreen as input device, automatic restart after a period of inactivity at the computer, and the automatic logging of usage data . The museum patrons merely touched highlighted words on the screen to see the related article. A standard color indicates the selectable items: in the text as well as the maps only the blue words are selectable.

Users receive feedback about the exact touch position by a cursor just above their fingers. When the cursor is on a selectable item, the area is highlighted. The selection is activated when users lift their fingers from the screen. This method produces low error rates and high user satisfaction [4].

Data collection and observations in the museum

Data on the articles accessed, the time spent in each, the number of times the index was accessed, etc. were collected from a total of about 4500 sessions while the exhibit was in Washington, DC. Results show that visitors used the embedded menus of the Hyperties hypertext system in moving from one article to another more than the traditional index (Figure 5). Article selection appears to reflect anticipated interests of patrons (information about the local sites) suggesting success in traversing the database (information on local sites was neither the focus nor the front end of the database) [5].

The data collection was complemented by direct observation and interviews of the museum patrons. Three observers spent 4 sessions of about 2 hours each at the exhibit, observing and discussing three potential problems: the touchscreen interface, the Hyperties mechanism and the database structure. Each session allowed us to pick out the weaknesses of the system and put in place a productive mechanism of criticism and modification back and forth between laboratory and museum. This double approach (usage data collection and direct observation) appeared to be appropriate to improve the user interface and database structure and guarantee the usability of the system [5]. Most of the patrons were able to traverse smoothly from article to article and focus on their reading and not on the mechanism.

The process of regular revisions of the database

For each new venue of the exhibit the database was updated to show the current digs and also to emphasize the sites local to the museum area. The authors of the database found that those revisions were made easy by the simple yet powerful Hyperties author tool. The alphabetical index of articles was highly appreciated when revising an already existing database. Additionally the browser guarantees that no invalid links (therefore no error messages) are presented to the user allowing authors to simply remove outdated information without danger. The updating of the maps was the most time-consuming task. The authors of the database expressed the need for a tool for handling lists of topics (e.g. list of sites per area or per period of the past).

Some assistance in the maintenance of the overall structure would probably also be useful. For example, using newly developed tools [6], we found several structure anomalies in the fifth version of the database revised two years after the original writing (e.g. some articles could not be reached other than by the index).

A language translation

For the last stop of the traveling exhibit in Ottawa Canada the database was translated in French and the browser modified to handle the two languages.

The translation was made by a team in Canada from a printed copy of the database. Translators were instructed to leave in the French text the marks of the links as they appeared in the English (a link is marked by a pair of tildes (~) surrounding a word or group of words to be highlighted) as well as the formatting commands (e.g. @p for next paragraph). The French was then automatically imported in the author tool. Most of the links were resolved directly by the author tool and a French speaking person had to complete and verify the adequacy of the links (mainly by assigning synonyms to counteract the human translation variations and the fact that the author tool didn't handle the accentuated vowels properly in the article titles). Changing the graphics had to be handled manually.

A few changes were made to the browser: the very few messages were translated as well as the command labels, and an introduction allowed users to choose which language they wanted to use.

Conclusions

This hypertext system was used successfully during two years. Patrons were able to traverse the database and find information related to their own interest. To reach this goal direct observations in the museum were necessary to identify the problems and successes that patrons had and suggest improvements which were made in the first two weeks of operation. The authors of the database were able to easily update the content and the structure of the database over the two year duration of the exhibit. The translation process was made easier by the textual representation of the links and the automatic re-construction of the database.

Acknowledgements

Ben Shneiderman, Professor of Computer Science and Richard Potter, graduate student of the laboratory, were major participants in the development and evaluation of GOVA. Professor Ken Holum initiated the project and actively directed the writing of the database, assisted by Diane Everman. Rodrigo Botafogo created the graphic tools used with Hyperties. We greatly appreciate the cooperation of Myriam Springuel of the Smithsonian Institution.

References:

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Other things not for the book but for the record...

• Hardware check up:

Both monitors stopped functioning at least once. Was is bad luck, heavy usage or overheating due to the fact that the monitors were installed at a 45 degree angle for which the casing ventilation is not designed?

On the other hand the PC's CPUs and the touchscreen hardware themselves still work normally.

No special cleaning was done! I assume the screens were cleaned by the regular cleaning team of the exhibit with no special care.

Calibration! This seems to me the only danger of using a touchscreen in a museum... There is no way to ensure that the touchscreen is calibrated properly (unless by asking users themselves to recalibrate it all the time, which is unrealistic). The miscalibration was among the very little feedback I had from colleagues who visited the exhibit. How could we enforce that somebody from the museum come regularly and check the calibration???? A possible answer is to monitor the number of errors/mishits and somehow inform somebody... Or could the miscalibration be corrected automatically at least for a while? Or will new touchscreens be more stable?

• No feedback from museums.

We had NO feedback from the museums... For example: there was a spelling error on the French title page and nobody even told us about it.

• More data!

We have usage data in all 5 museums but it has never been analyzed.