DESIDOC Journal of Library and Information Technology, Vol. 28, No. 4, July 2008, pp. 43-54

Comparative Study of HTML and Animated User Interfaces of an Online Exhibition

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ABSTRACT

The advancements in computer and telecommunication technologies have made the World Wide Web a vibrant place. Museums worldwide have recognised this phenomenon and are tapping the multimedia and interface technologies to present their contents online and in a more interesting manner. First priority to this is the user interface design and appropriate technologies to represent the contents. The paper discusses an animated interface created for an online exhibition with the Macromedia Flash software and compared the same with HTML user interface. The system evaluation results shows that only less than half of the users were satisfied with the animated version because of its inflexibility in terms of reusing and customising of information. Therefore, a HTML version was developed for the same system and compared for strengths and weaknesses in terms of user interfaces. The results showed that the respondents, especially those with lower bandwidth connections, were very comfortable with the HTML interface but aesthetically a few more percentage of respondents rated high to animated interface. The paper conclude that a balanced combination of HTML and animated interfaces will provide both aesthetics and functionality required for an online exhibition.

Keywords: Online exhibition, user interface, animated user interface, interface design.

1. INTRODUCTION

The virtual space of World Wide Web (WWW) is being well utilised by many museums for putting their collections online so as people from all over the world can use them. The multimedia and other interactive technologies have provided new ways to museums to improve the communication with the public and to attract even the visitors at far of places to their collections in a virtual environment. The shift from the physical exhibition to the online format has also provided the visitors an altogether different experience that is not possible in the physical medium. Such a virtual form is now becoming the preferred medium, especially where research is concerned. Studies have shown that the number of visitors to the museums is dwindling and the online visitors are rising rapidly[1]. The paper is mainly targeted to a broad spectrum of people including school students, tourists, academics, and researchers. Online exhibition is a boon for those who can not visit museums, such as disabled, large families and elderly people. The most important is that the remote visitors (people not geographically close to the museums) can also visit the online exhibition from various parts of the world.

The paper compares the strengths and weaknesses of HTML and animated user interfaces of an online exhibition system. For this "*Colours in the Wind—Old Hill Street Police Station in Retrospect*" online exhibition system was chosen. Two versions for the same content were produced. The objectives of the study are: (i) to examine various technologies and authoring tools that are needed for the development of an online exhibition system; (ii) to design and develop an online exhibition system for disseminating cultural and heritage information; (iii) to compare HTML and animation-based interfaces of the same online exhibition system and find out their strengths and weaknesses; and (iv) to study the problems faced by the users of HTML and animated user interfaces.

2. REVIEW OF RELATED LITERATURE

It is evident from the literature that Internet-based online exhibitions offer better flexibility in all respects compared to their physical counterparts[2]. Online exhibitions allow visitors to select the level of information they wish to consult, thereby offering something useful to the users of all ages and experience. Studies show that the museum viewers would less likely to make a special trip to museum to see the original artifacts when the facility is available to see a similar digital copy at their computer. But Freedman states that the demand for the original work will increase rather than decrease, following repeated exposure at an institutionally authorised site on the WWW[3].

Present technologies are helping in the growth of wired museums of all kinds to younger generations and providing both education and entertainment[4] and the number of digital visitors are steadily growing and in some cases, outstripping the number of visitors to the corresponding physical museums.[5,6] This encourages geographically distant digital visitors to become a physical visitor to all types of exhibitions, and to encourage physical visitors to maintain contact with the museums through online after they walk out of their doors.

2.1 What makes a Good Online Exhibition?

A good virtual/online exhibition should make its collection and knowledge accessible to the general public as well as specialist audiences[7]. The main requisites of a good online exhibition are good content, a narrative theme, intuitive navigation, and inviting graphics. Visitors respond favourably to an online exhibition website that possesses a lot of narrative guidance simultaneously with great ease of navigation[8]. The exhibition should encourage people to learn about the museum and the activities it provides and also should be updated on a regular basis to attract visitors. Thomas, *et al.* stated that a good museum exhibition should provide opportunities for people to visit the museum website more than once, allowing for surprises and wonders[7]. So, a dedicated museum website obviously has the potential to provide the most comprehensive, correct and latest information on the museum concerned. It should incorporate interactive functionalities like JavaScript, Flash, streaming media, DHTML and dynamically interfacing with server-side databases to provide access to their collections. It should make each page as self-sufficient, with interpretative text to bring out the salient points to the reader, while leaving the image to speak out as much as possible.[9]

2.2 Design Considerations for an Online Exhibition

All art museums, small or large, share the same mission to communicate to the public about their collections. The strengths of the Internet should be exploited to enhance the visitor's virtual experience and by avoiding creating the traditional museum experience. Design of 'Home Page' should be done with utmost care, as this sets the 'scene and tone' for the rest of the exhibition site, and gives an overall impression to visitors about the physical exhibition or a real museum. Bowen, *et al.* suggest that the technicalities and tricks of trade should be followed to improve the apparent downloading speed of web pages[10]. Online exhibitions are websites where people can access information directly, rather than just knowing where the information is held[9]. They should help them (visitors) by saving a great deal of their time and efforts and provide information they are looking for. Each web page containing an image should be self-explanatory and self-sufficient, so that it carries all the information that the reader needs to make it intelligible.

A museum's online website should be brief, logical, provide equivalent alternatives to auditory and visual content, and ensure that user interface follows principles of accessible design[1]. Wallace pointed out that logo, theme line, typeface, layout format, design motifs, colour, icons and tone of voice are among the features that must be deployed at the same levels throughout the website to make it coherent, easy to navigate and fun for young people[11]. He feels that a well constructed and easily navigable website will never compromise in its design.

2.3 Types of Interfaces for Online Exhibitions

2.3.1 Hypertext-based User Interfaces

Hypertext-based interfaces are non-animated pages mainly focusing on text-based content. Hypertext interfaces overcome the limitation of displaying text by structuring information into a network rather than presented in a linear mode. There are many ways of reading a hypertext document; the intention is that the user is able to read it in the way that suits him/her best. Some museum websites provide hypertext interfaces, especially for researchers and academics. According to Lehman, hypertext pages allow learners to have more control on how the information is presented and it is an important requirement for an effective learning which made it widely acceptable to the education community[12]. Unlike Flash (animated) interface, HTML interface allows easy copying, reproduction, modification, searching, classification and reclassification.

2.3.2 Animated User Interfaces

Animated user interfaces make use of abundant desktop computing power and present information in an animated mode along with exciting effects. Animated interfaces consume more time for the content to display. The average time spent by a user on most of the web pages is only a few seconds because much of their time is spent in following links from page to page in order to arrive at a page where the content may be of actual interest to the visitor. This process should be made as painless and as fast as possible to ensure that the visitor is not discouraged. Bogomazova discussed the special problems faced by museum websites in using state-of-art web technologies such as use of proprietary design and software[13]. He stated that the web resource should provide information and documentation in a way that favours the learning process and stimulates users' enquiries and practical experiments. Kennedy suggested that Flash websites should avoid overloading of web graphics, audio and video content because vector material cannot be searchable and takes long time to download[14]. Since the design tools are of propitiatory nature, a Flash player is required to view the content. They should use non-Flash-based solution for those who do not have a Flash player or broadband capability. Online museum exhibits developed with too much animation might lead to disastrous results due to low speed, and lack of searchability and flexibility in the content. So, proper balance between these interfaces is always better for users to satisfy their requirements.

2.3.3 Other User Interfaces

With the developments in user interface technologies and the fifth generation languages, new user interfaces will not require the user to control computer through commands but will let the computer to adapt the dialogue the user needs based on its inferences from observing the user. A good example of creating animated interfaces without much hassle is using Pavlov, a programming-by-demonstration (PBD) system that allows even non-programmers to create animated interfaces (http://www.acm.org/sigchi/chi95/Electronic/documnts/demos/dww_bdy.htm). The next generation of user interfaces may move beyond the standard WIMP (window, icon, menu, and pointing device) paradigm to involve elements like virtual realities, head-mounted displays, sound and speech, pen and gesture recognition, animation and multimedia, limited artificial intelligence, and highly portable computers with cellular or other wireless communication capabilities. It may focus more on the user-oriented and task-oriented approach, rather than the present standard object-oriented approach. The object-oriented approach in this context means the way the user interacts with the objects such as text box, buttons and menus. Gesture-based interfaces such as pen computing, which simulates paper-like interface can be an alternative to printed material.

2.4 Suitable User Interfaces for Online Exhibitions

Users interact with museum application interfaces for many reasons[15]. Thus, it is important to have such user interfaces that are able to adapt to different user's requirements to facilitate the accomplishment of the desired goals. Mixture of both animated and non-animated interfaces produce better results in browsing and navigation. Purely animated interfaces might cause inconvenience to the users. Bowen, *et al*. suggest avoiding high quality graphical images, which results in slower downloading of web pages, unless or until it is really required for the website[10]. Milekic's study found that "the general interface guidelines for the design of web-based art education sites is to minimise the dependences on technology during pedagogical activities[16]. The major technical difficulty for most of the users is the narrow-bandwidth and undependable telephone connection. These could be avoided by off-line browsing of pre-loaded content, and creation of hybrid pre-loaded and interactive sites.

It is important to provide users with a variety of easy-to-use and understandable navigational buttons

to prevent them from getting lost and to minimise cognitive overhead problems[12]. Consistency in all respects including design, colours, graphics, etc. can help the users in accomplishing their tasks quickly. Wallace[11] suggests that an online exhibition should have the following basic requisites: (i) it should present visuals and text in easy-to-absorbable portions; (ii) its links should allow people to explore and learn at their own pace; (iii) it should not force the users to navigate rather allow the users to achieve their purpose of visit; and (iv) it should load quickly and no single page in a site should try to show or tell too much.

Dierkind and Falk states that the visitors would like media options in museums to be more 'user-friendly' to assist them in knowing what options are available. And once an appropriate choice of interest has been made, they are able to successfully experience that option[17]. They also stated that 'one can create the most wonderful website in the world, but if users do not know about its availability, understand how to use it effectively, or cannot make sense of the content presented, all that effort has been wasted'. So, the overall website development process should focus attention on understanding users and acknowledging their demographic diversity[18].

3. METHODOLOGY

An appropriate development model may be chosen by taking into account the nature of the software project and the strategies needed to meet the users' expectations and needs. A few important software development models existing in the software engineering are: (i) hacking model; (ii) linear sequential model; (iii) prototyping model; (iv) incremental model; (v) spiral model; (vi) component-based model; and (vii) the clean room model[19].

The prototyping model was used to develop this online exhibition system. The advantages of prototyping model are: (i) high user emphasis, (ii) teamwork promoting, (iii) waste reduction, and (iv) flexibility[20]. Prototyping is an excellent way to analyse and define a website's requirements[21]. Since users were not clear about their requirements so designing multiple prototypes, may be time consuming, was useful process in this context. The valid reason for choosing this methodology for the project was the unavailability and unspecific user requirements. However, the user requirements gathered by Leong, *et al*. were used for the development of HTML version of the exhibition[22].

Macromedia Dreamweaver 4, a web design tool, was used to build a quick mockup prototype, which was tested with the real users. The mockup prototype provided better interactivity, and also helped the users to express their ideas more clearly. Regular interaction and collection of feedback from the users was used to modify the prototype. The process continued in a cycle and helped in developing a successful implementation. Heuristic evaluation technique was used for design evaluation phase of this online exhibition because it helps to find out many usability problems[19]. Survey method and questionnaire tool were used for evaluating the final online exhibition. The main reason for choosing this methodology was to get the user's viewpoints directly and to reveal issues, which have not been considered during the design phase apart from its relatively cheap and simple administering advantages. The questionnaire covered a mixed set of general, open- ended, multi-choice and ranked questions but priority was given to closed-ended questions such as scalar, ranked or multi-choice to reduce the burden on the respondents and to encourage a high response rate. It also have an advantage of being easier to analyse.

4. DESIGN AND DEVELOPMENT OF ONLINE EXHIBITION

4.1 Design of the Online Exhibition

The design of the online exhibition was carried out based on the user requirements. Initially a prototype was developed and presented to its real users, based on their feedback, full-fledged system was developed.

4.1.1 Interface Design Issues

The HTML-based online exhibition system was developed and uploaded on to the Information Studies Laboratory's Windows NT-based Web Server. 1024 x 768 pixel screen resolution was used, on the belief that most computer monitors nowadays have a higher resolution. As desired by most of the users, a highly interactive HTML web interface with a balanced mix of multimedia elements and interactions was provided. Thumbnail images (each image could be enlarged by a click on it) were provided in the web pages to reduce the downloading time. This is in line with the dialog design in the Systems Application Architecture (IBM developed architecture), wherein a series of requests and responses between the user and the application takes place[23]. The online exhibition contains more than 200 still images along with a good number of web pages.

To facilitate better readability, Verdana font size 12 points was used with justified texts blocks. Simple white colour screen interface with linear

gradient effect was provided using Macromedia Fireworks for the title. Visual consistency was maintained throughout the website by using the top navigational panel as part of the template for all the web pages. Animated images of the Macromedia Fireworks 4 version were used for most of the navigational drop-down menus, left navigational panel and the right top most icons (for search, help, print and e-mail) to enhance interactivity. Figures 1 and 2 shows HTML and animated interface homepages of the same online exhibition, respectively.

4.1.2 Information Organisation

Information in the website should be organised in a structured manner to facilitate ease of navigation. To ensure that the website is properly structured, the system used an intuitive site structure that is transparent to users. Clear and consistent navigational methods should be used to enable users to know where they are and where they can go[21]. This online exhibition uses many organisation structures such as sequential, hierarchical and associative. Menus provided in all the web pages, are hierarchical and yet sequential in the order of importance, and with hyperlinks to other web pages, following the associative structure.

The 'Home Page' contains windows, which are individually clickable and take users to the different sections of the exhibition. The main navigational structure of the 'Home page' is shown in the Fig. 3. There are six functional sub-panel links and five supporting panel links on the 'Home page'. The six functional sub-panels are further divided into various sub-sub-panels. The sub-panels can be found through the drop-down menu. The left navigational links and the text links can be found at the bottom of each web page. The window panels are organised as:

(i) A Time and a Place comprising five sub-panels, which describe the contents by years.

(ii) Here, There & Everywhere comprising three sub-panels further divided into 22 sub-sub-panels.

(iii) Memories in the Shell of Time comprising three sub-panels further divided into 10 sub-sub-panels.

(iv) A Present and the Past comprising three sub-panels, further divided into eight sub-sub-panels.

(v) The Wind Beneath a Nation's Wings comprising eight sub-panels.

(vi) Contact Us is comprising three sub-panel and five sub-sub-panels.

There are supporting panels to allow users to print, search for content, send e-mail and get help which is placed at the top right hand corner of the window. The 'Help Page' can be reached either through the image icon or the 'Contact Us' page. To avoid problems to the naïve users, these icons display its functionality below them once when users' moves mouse over the icons[24]. The 'Site Map' provides the users with a complete structure of the website along with brief explanation of the contents of each sub-exhibit.

4.1.3 Screen Layout

Lengthier pages have been avoided by splitting the screens into screen-sized chunks wherever possible. All web pages comprise consistent top navigational panel throughout the website. Drop- down menus in hierarchical structure avoid users getting lost problem. Icons such as 'Help', 'Print', 'Search' and 'E-mail' have been provided at the top navigational panel. Navigational icons have been provided at the

Figure 1. HTML interface home page.

Figure 2. Animated interface home page.

top most right of each page to get proper attention (Figs 3 and 4).

4.2 Development of the Online Exhibition System

The system was developed based on the users' requirements collected from a previous study conducted by Chee Khoon. Presenting the prototypes iteratively to the real users and improving the interface and functionality of the system, a total system was developed. Testable goals, early and continuous user testing were performed through simulations, prototypes and mock-ups. The aim was to address design difficulties such as too much information, impatience of web readers, limited short-term memory and tendency to get lost.

The content was considered first, the navigation second, and the appearance last. The developer also kept in mind the problems and drawbacks of the Animated Flash interface including lack of customisation, reusability, search capabilities and the time taken for downloading, and then tried to use the strengths of the HTML interface to find solutions to satisfy the users needs.

4.2.1 Development Tools

Macromedia's Dreamweaver 4 is the main authoring tool used to develop this exhibition. Other tools used in building this system included Macromedia's Fireworks 4, Adobe's Photoshop, Microsoft GIF Animator and Front Page 2000.

4.2.2 Macromedia Dreamweaver 4

Macromedia Dreamweaver 4 is a web authoring tool used for creating and managing website and web pages because it is easier for creating and editing cross-platform and cross-browser pages. It has advanced design and layout tools that allow any one to use Dynamic HTML features such as animated layers and behaviours without having to write a line of code. Dreamweaver 4 enables designers to visually develop sophisticated page layouts in an intuitive approachable environment. It is fully customisable and does not require any special software additions to the server on which the designed system has to be installed.

4.2.3 Macromedia Fireworks 4

It is a graphics design tool used to develop sophisticated navigation with multi-level pop-up menus in a step-by-step visual environment. Fireworks 4 also has facilities to produce enhanced graphics interactivity, live animations, drag and drop rollovers, object masks (both vector and bitmap) and a new batch-processing environment. Integration between the two applications, i.e. Dreamweaver and Fireworks creates a seamless environment for the web content production. The Fireworks new pop-up menu creator was used for creating the main navigational drop-down menus. Basically the image is a .png file, exported into a GIF file with HTML and images options. The HTML page created using Fireworks is the basic template for this website. Radical changes to the document layout were made in the Fireworks before being exported into the Dreamweaver's web pages.

4.2.4 Adobe's Photoshop

It is an image processing tool used to capture and edit the images required for this exhibition.

4.2.5 Microsoft GIF Animator

It is used for creating animated GIF files for highlighting the images occurring in various panels.

Figure 3. HTML drop-down menus.

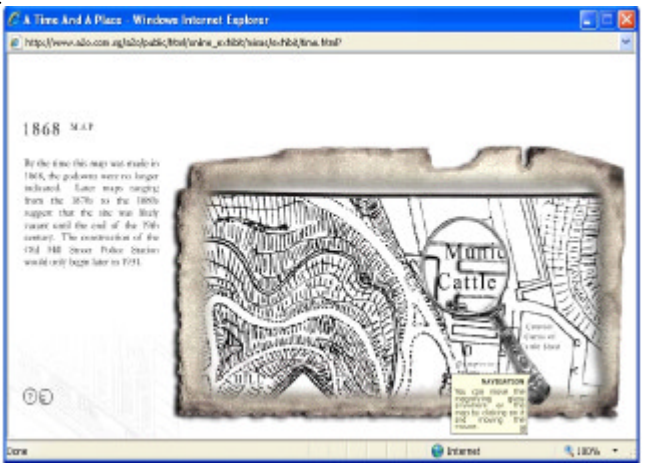

Figure 4. Animated interface zooming tool.

The GIF animation was provided to add attractiveness to the website.

4.2.6 *Microsoft FrontPage 2000*

It is also a web authoring tool used to create web pages to complement the features and facilities missing in the Dreamweaver 4.

4.3 Implementation of the Online Exhibition

As per user's requirements, a similar and most appropriate HTML interface was developed for the existing animated version without many variations in content. Design considerations were made with the consent of end-users through repetitive prototyping technique. The HTML version of this online exhibition was uploaded on to the Information Studies Lab Web Server at http://islab2.sas.ntu.edu.sg:8000/projects/virralingam/index.html. Then Information Studies students and others were encouraged to evaluate both the interfaces of the same system and provide their feedback through questionnaire supplied to them.

4.4 Other Features of the Online Exhibition System

4.4.1 *Search Facility*

Search page uses the client side search engine in JavaScript. The page allows the users to search the entire website. As the search engine is client side one, the speed at which the search page displays mainly depends on the number of records matching to the keyword and the user's Internet connection. Search engine displays results as a hyperlink, which can be clickable to reach the specific web page. Subject headings have not been used for search terms, instead any word in the title of the page can be used. This is an additional feature added to HTML interface and is not available in the animated version of the online exhibition system (Fig. 5).

4.4.2 *Help Page*

It provides assistance to the users on how to use the website and to reduce their browsing time. It can be reached either through the navigational icon on the top right hand corner of the web page or through one of the sub drop-down menus under the 'Contact Us' web page (Fig. 6).

4.4.3 *Print Facility*

Print facility is to print any web page of the exhibition. This is especially useful for academics, students, and researchers.

4.4.4 *E-mail Facility*

The facility is provided as a navigational icon at the top right hand corner of all the web pages to enable the user to contact the staff members of the National Archives of Singapore.

5. EVALUATION OF THE ONLINE EXHIBITION

To evaluate both the interfaces of this online exhibition system, a questionnaire was designed and sent to 75 students to find out the strengths and weaknesses of these two interfaces. Of the total, 50 people provided their responses and the same were analysed.

5.1 Personal Profile

Of the total, 62 per cent of the respondents were males and 38 per cent females. The majority (68 per cent) were between 26-30 years age group, 20 per cent of 31-35 years, 10 per cent below 25 years and the remaining 2 per cent above 36 years

Figure 5. The search page.

Figure 6. The help page.

old. Nearly half (48 per cent) of them were undergraduates, over a quarter (28 per cent) were graduates, a fifth (20 per cent) were polytechnic diploma holders and a small percentage (4 per cent) 'O'/'A' level. These respondents were a mix of Singaporeans, Malaysians, Indians, and Philippines. The majority of the respondents were from Sciences (52 per cent), less than a third (30 per cent) from Engineering and a small percentage from Social Science (8 per cent), Library Science (7 per cent), and Humanities (3 per cent) backgrounds. These people though varying in their races and subject backgrounds, had similar computer experience. About two-third (64 per cent) of them were having 6-10 years computer experience. Advanced computer users varied in their experience from 11-25 years (16 per cent had 11-20 years, 8 per cent had 21-25 years), and a small percentage (12 per cent) with less than five years computer experience. While evaluating a project, especially an online exhibition system, personal profile of the users plays a vital role.

5.2 Interface Design

The various factors that an interface design contains are the readability of text, appropriate use of colours, the navigational icon buttons and attractiveness of the exhibition and visual consistency of the website. User's ratings for the 'interface design' is presented in the Table 1.

Overall, the majority of them (84 per cent) rated the design as 'Good' for the text readability because they were comfortable with the Verdana font with 12 points size. They opined that the text was very clear and readable. Most of the respondents were very comfortable with the appropriate use of background colour (white background was used for most of the screen space but a different background colour for the top navigational panel). They felt that the colours were used consistently and efficiently, so they could easily keep track of the colours and their meanings. Some respondents appreciated the reverse video technique used to present the text on the web page and the colours chosen in contrast for every navigational drop-down menus.

The navigational icons were meaningful and acceptable to most of the respondents. About 80 per cent of them rated "Good" or "Very Good" and a small percentage (6 per cent) only rated as acceptable. The hierarchical structure of the drop-down menus with mouse over events, reverse video techniques attracted them along with their interactiveness. The majority of the respondents were also satisfied with the text clarity on the navigational icons (80 per cent), menus and left hand navigational panel. The most liked part of the exhibition by the respondents was the 'site map' with links directly to the individual web pages. Most (96 per cent) of the respondents felt that they never encountered any problems with the navigational buttons. However, a few were not comfortable with the 'Print', 'E-mail', and navigational icons. Some felt that the text links at the bottom of every panel were redundant, but many of the users were concerned about the same so the links were not removed from the screen/system design. The majority (88 per cent) of the users were satisfied with the visual consistency and most (96 per cent) of them were satisfied with the consistent use of the supporting functional icons like Help, Search, Print and E-mail, which were placed at the top right hand corner of the website.

5.3 Ease of Use

In addition to ease of use, other features like user friendliness, easy to learn, easy to understand, information search and the help facility were evaluated (Table 2). Most of the respondents (96 per cent) felt that the system was good because of its user friendly and simple interface. They felt that the overall architecture of the site was attractive, however, a small percentage (4 per cent) of them felt that the search capability was not comprehensive. More than three-fourth (78 per cent) of them felt that the online exhibition was easy to use, due to its good navigational aids, help guidelines and proper labelling of the contents. The majority of the respondents were able to understand the system with ease, though a few (7 per cent) found it difficult because of its information overload. Of the total, more than a third (40 per cent) felt that it was 'easy or very

Table 1. Users' ratings for interface design

Design Issue / Rating	Very Poor	Poor	Acceptable	Good	Very Good
Readability of text	-	2%	14%	76%	8%
Colours used in the website	-	4%	30%	60%	6%
Appropriate use of navigational icons	-	6%	14%	66%	14%
Visual consistency	-	4%	18%	66%	12%

Table 2. Ease of use of the interface

Issue / Rating	Very Hard	Hard	Average	Easy	Very Easy
Easy to understand	-	4%	4%	6%	-
Information search facility	2%	4%	14%	2%	-
Easy to learn	2%	4%	54%	34%	6%
Help section provided	-	4%	58%	36%	2%

easy' to learn the system. Overall, half (58 per cent) of the respondents rated the 'Help' screens as average and about 38 per cent considered as 'easy to use' compared to a small percentage (4 per cent) who felt these "hard to understand". Most of the users felt the system is easy to understand and without going through the 'Help Section' they can use the system.

5.4 Content Coverage and Organisation

The majority of the respondents (82 per cent) felt good about the content coverage. These respondents found the website intuitive because the contents were clear, very precise, consistent and easily accessible. They also felt that the related contents were linked and labelled properly. Some of the respondents felt that the metadata corresponding to the images should be available both in enlarged and thumbnails versions of the images. Since this option would increase the content size, the metadata for the thumbnail images was dropped. However, the majority of the respondents (60-80 per cent) were still happy with the present form.

Table 3 shows that most (94 per cent) of the respondents were satisfied or very much satisfied with the 'information organisation'. Almost all the respondents felt that the information was well organised as it followed a pattern which normally a web reader would look for. They appreciated the well-organised content in the consistent layout.

5.5 HTML vs Flash Interface

The users were requested to compare both the interfaces (HTML and Flash versions) in terms of the time taken for downloading, information retrieval and the navigation. Their ratings are presented in Figs. 7 and 8. Of the total, 86 per cent of them felt that the downloading time taken by the HTML version was considerably lower compared to 30 per cent who felt the same way with the Flash version. The majority (82 per cent) of them were satisfied with the HTML version because of its good information retrieval, search capabilities and intuitive navigational aids. On the other hand, more than 80 per cent of respondents rated the Flash version as above average. Overall, 92 per cent felt that the navigation was much faster in the HTML version compared to 80 per cent who felt the same with the Flash version.

Secondary issues including the information coverage, information organisation, ease of use, easy to learn, easy to understand and the attractiveness of user interface were tested. In terms of the 'information coverage', 84 per cent of them rated the HTML version above average compared to slightly higher percentage (88 per cent) of the respondents rated the same to the Flash version. For the 'information organisation', most of the respondents (94 per cent) rated very high for HTML version and almost the same (92 per cent) for the Flash version. Regarding 'ease of use', more than three-fourth of the respondents (78 per cent) felt that the HTML version was above average, but only two-third (66 per cent) felt the same for the Flash version. For the 'easy to learn', 94 per cent rated the HTML version as above average, against 72 per cent for the Flash version. For the 'easy to understand', the rating (95 per cent) for HTML version was more than for the Flash version (89 per cent).

For the 'attractiveness' of user interface, 82 per cent of the respondents rated high to Flash version compared to 68 per cent who liked HTML version. So, overall Flash interface was attractive in terms of appearance but got comparatively lower ratings

Table 3. Content coverage and information organisation

Rating / Issue	Very Hard	Hard	Average	Easy	Very Easy
Content Coverage	-	4%	4%	10%	-
Information Organisation	2%	4%	54%	34%	6%

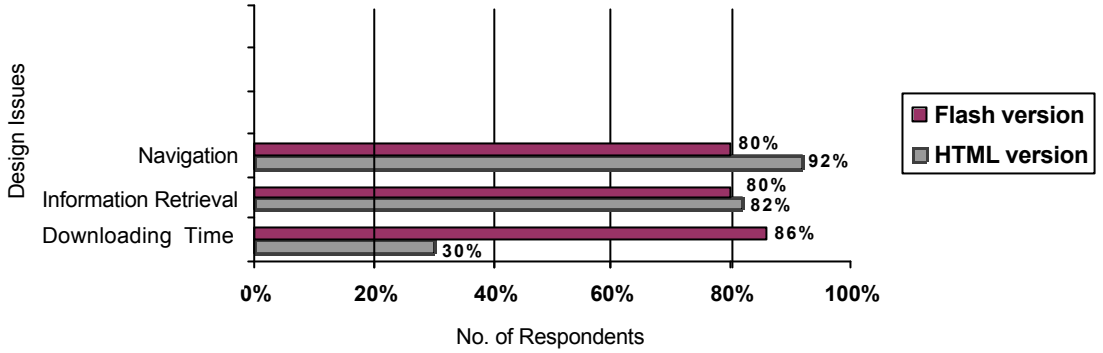

Figure 7. Comparison of navigation, information retrieval and downloading time on HTML vs Flash interfaces.

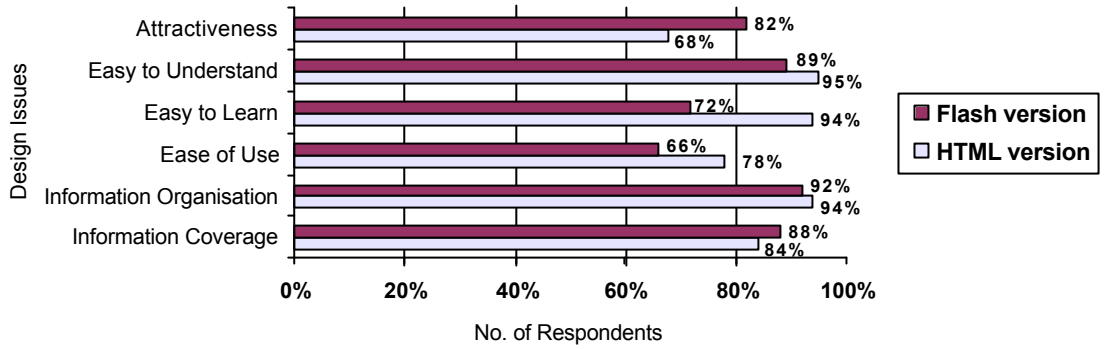

Figure 8. Comparison of easy to understand, ease of use and information coverage on HTML vs Flash interfaces.

in 'ease of use', 'ease to learn' and 'easy to understand'. People cannot search and use information in terms of copying for their work. However, HTML interface has much more advantages including searching, updating the content, and reusing of information for various purposes. So, many designers are now using Flash interface for introduction of the website and rest of the site in HTML interface so that users will get the benefit of both the interfaces.

5.6 Problems Encountered

One-fifth (20 per cent) of the respondents were not happy with the information search as not being indexed according to subject terms. Similarly, a few respondents (8 per cent) felt that the text links provided at the bottom of the web pages were redundant. As each and every web page has a template on the top navigational pane, a few respondents (12 per cent) felt the downloading time for the HTML version is a little bit longer, but certainly faster than the Flash version. Since the entire left navigational panel is made of images, the respondents (about 86 per cent) felt satisfied with its appearance and downloading time. Some (4 per cent) felt that the content organisation is a bit confusing, especially on the Flash version, where the windows have to be clicked to navigate to individual panels. On the other part, they felt that there is too much of text and very few images in the system. A few also felt quite uneasy about the downloading time on Flash. One of the respondents appreciated the navigational bar, which is a good idea to provide a better navigation in the online exhibition. Overall they did not face any serious problems while using both the interfaces except a few minor problems.

6. CONCLUSION

The popularity of the physical exhibition has dropped in comparison to the online exhibition. As the cost of maintaining traditional museums is increaseing, perhaps due to higher cost of artifacts or skilled manpower or maintenance costs of artifacts, the trend is moving towards online exhibitions steeply. However, museums of the future should continuously strive to capitalise on the availability of the latest technologies including virtual reality, multi-model, higher bandwidth communication interfaces, 3-D real-time computer graphics, advanced display devices, auditory icons, etc. in order to entice surfers to take the first step into their physical museums.

The evaluation results show that the HTML version was a better option for lower bandwidth because of content downloading time was lower (86 per cent

for HTML vs 30 per cent for Flash version). It was also rated favourably for its other features like information retrieval (82 per cent for HTML vs 80 per cent for Flash interface), navigation (92 per cent for HTML vs 80 per cent for Flash version), easy to understand (95 per cent for HTML vs 89 per cent for Flash), easy to learn (94 per cent for HTML vs 72 per cent for Flash), easy to use (78 per cent for HTML vs 66 per cent for Flash version) and information organisation (94 per cent for HTML vs 92 per cent for Flash). However, for attractiveness (68 per cent for HTML vs 82 per cent for Flash), and information coverage (84 per cent for HTML vs 88 per cent for Flash) HTML version was rated poorly.

In brief, the HTML version of the online exhibition performed relatively well in most of the aspects. The major limitation of this system is its search capability. This is primarily due to the cost factor as well as time constraint. Attempt must be made to rectify their limitations in order to provide a total integrated system that supports users. Though the search utility was not comprehensive in HTML version, it was compensated with common terms to help the users to search the system. Suggestions were provided by the respondents to enhance the search facility by indexing the subject terms. Overall, there is a need to improve the relevancy of search results and the speed of retrieval of information. The drawback of online exhibitions compared to its physical cousin, is the lack of touch and feelings capability. This can easily be substituted with simulations using the latest technologies such as virtual reality, 3-D models, etc. Additional research should be done to develop advanced tools and techniques for developing online museums, which can be a real boom for heritage and museums industries.

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