Building a virtual exhibition: The Honan Collection Online

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Introduction

The chapel of St. Finbarr, known as the Honan Chapel, on the grounds of University College Cork is celebrating its 90th anniversary in 2006. It was consecrated in November 1916. The chapel is central to the history of the Irish Arts & Crafts movement (1894-1925). Its furnishings and liturgical collection feature the work of many of the movement's major artists and designers. The chapel features the earliest commission for Harry Clarke's stained glass. This project, *Honan Collection Online*, aims to build upon recent scholarship by promoting awareness of the chapel and its liturgical collection. It will also illustrate how the artistic renewal of the chapel and its collection during the mid-1980s arose from the spirit of the Irish Arts & Crafts movement.

The *Honan Collection Online* project received funding from the Quality Promotion Unit, University College Cork to develop an image driven website. The site will feature essays linked to a comprehensive image gallery and a virtual tour of the chapel. The site will also include a discussion forum. The core project team members include: Rev. Fr. Joseph Coghlan, project director; James Cronin, History of Art, project co-ordinator; Daniel C. Doolan and Xiaoye Dai, both multimedia doctoral candidates in University College Cork, and Miguel Suarez, document scanning.

Principles governing website design

Websites should be designed so they may be viewed across the most widely used web browsers. Websites should look similar no matter what browser is being used or what operating system platform. Browser differences often create problems when websites contain JavaScript, even for simple operations the use of JavaScript can cause certain features of the site to break on some browsers. Currently there are about half a dozen browsers that are more commonly used: Microsoft Internet Explorer[1], Firefox[2], Camino[3], Opera[4], Safari[5], Konqueror[6]. Some are platform specific (such as Safari) which is the default browser for Apple made machines. To ensure that websites are optimised to correctly under as wide a range of browsers as possible, websites should be designed to comply with the W3C (World Wide Web Consortium) standard[7]. A very useful technology developed by the W3C is Cascading Style Sheets (CSS)[8]. CSS is a simple mechanism that allows the website developer to focus on the content and appearance separately. Hence by changing the style sheet applied to a webpage the entire appearance can be changed without any change in the actual content.

Many websites use Java applets[9] embedded within web pages to carryout all manner of tasks, from database retrieval, and image processing to animations and games. For an applet to execute it is necessary that a Java Virtual Machine (JVM)[10] is installed on the system. Java based executable programs are delivered in the form of Java bytecode. This byte code must be interpreted by a Virtual Machine to execute the programme. One of the chief advantages of using Java within websites is it cross-platform compatibility. Hence a program need only be written once and should run anywhere (WORM, Write Once Run Anywhere). Unlike JavaScript where client side programs can easily break due to browser inconsistencies, a Java applet will not encounter these difficulties. The applet executes within a Sandbox[11], thereby protecting the client computer system, from malicious code execution.

Image based websites

Several websites that are currently online have interesting features, and ease of navigation that meet our requirements for the Honan website. The Vatican Museum[12] provides a very easy to use interface, keeping the amount of text to be read to a minimum. The images that are available on the site are viewed by the use of Java applets. These applets allow for both the zooming and panning of the images. The actual viewing area of the applet is quite small perhaps 250 x 300 pixels, thus providing a level of security of the original image. A website dedicated to images

from the Hubble Telescope[13] has a very simple to use interface. A menu allows for the viewing of the entire collection, with sub options for various sub classes such as: galaxies, stars, nebula to name but a few. Selection of a category displays fifty (by default) thumbnail images arranged five across. The overall appearance is of a very clean crisp image based system. It also provides access to the full quality images in both JPEG and TIFF formats. Well-known photo storage and sharing facility is Flickr[14] run by the yahoo search engine company. It allows users to tag images with specific keywords. This tagging allows for images to be easily searched based on the tagging information.

Website architecture

Based on the review of several sites that deal with images. The Honan website is image-driven. Keeping the amount of text to a minimum and maximising the visual driving forces are the key components in the sites design. The general technologies employed within the site are: PHP[15], HTML, CSS and a backend database using mySQL[16]. The primary purpose of the site is to provide a visual reference to the Honan Chapel and its liturgical collection. Yet we wish to maintain some degree of control over the ability of users to the site to copy images. Given this requirement it was decided that all the vital image data would be stored within a mySQL database as Binary Large Objects (BLOB's). Within the main tables containing the image data several textual fields were included giving information in summary form about the image in question. To keep the amount of traffic down it was decided to limit the data size of the image to just a few megabytes.

For a user to retrieve and view images from the database several PHP based forms are provided, allowing the user to view images based on certain categories or to search the system based on certain criteria, for example searches based on year, description, photographer, artist and so forth. One a category or search has been chosen by the user the resultant generated webpage provides a listing of the key attributes associated with the image along with a thumbnail preview of the image itself. Selecting one of the images will load the corresponding within a Java based applet.

The mySQL database is also employed to maintain a discussion forum. Several short articles about specific aspects of the chapel's history are stored within the database. To provide the site as a means of open discussion, visitors to the site are able to post their views about the topics in question. In so doing it is envisaged that this will lead to increase in the body on knowledge about the history of the Honan. By providing an open resource such as this it is hoped that it will benefit both academics and people interested in local history.

The Java based applet is used as a means of protecting the image from being downloaded. As the viewing area of the applet is relatively small it results in a small onscreen view of the image. The main purpose of this is to prevent people using facilities such as PrintScreen on a Personal Computer or utilities such as Grab[17] on an Apple machine to capture a screen shot of the image and bring it in to a photo-editing package to save it. When viewing the entire image it is displayed over a limited area making the use of screenshot capturing utilities extremely labour intensive. To get a clearer view of the Image the Image viewing applet allow the user to zoom in and out of the image. It also provides facilities to pan the image along both the horizontal and vertical axis. The ability to capture screen shots in this manner is still a problem for DVD manufacturers. Some DVD application even allow for the capture of DVD video frames as bitmap image, PowerDVD[18] being one example. One can write a simple Java application to allow for screen shot capture, by calling the createScreenCapture(...) method of the Robot class, which returns the resultant capture as a BufferedImage[19].

Another feature of the website is the inclusion of panoramic images. These images require the use of QuickTime[20], which is a standard addition to the software systems of most personal computers. These panoramic images give a 360-degree overview of the main areas of the Honan. Several panoramic image are provided, the content includes views from both the interior and exterior of the chapel. Throughout the panoramic image are hotspots that like to specific

images within the database system. These set of panoramic images add an additional mechanism for navigation through the images available on the system. Using such a system gives the user a greater sense of the location of the key works of the chapel.

The Home page of the Honan website includes a simple animation that occurs in a circular motion. The embedding of this applet within the webpage requires the passing of several parameters within the applet tag. This allows for the easy addition or removal of elements. The initial site has six elements that appear within this applet, clicking on either one will take you to the appropriate page of the website. Typically Flash based systems would be used for creating such a "SplashScreen" on the sites initial page, the use of Java was the preferred method, for maintaining cross browser presentation and uniformity between technologies within the site itself. A Thread allowing for independent execution of the animated sequence drives the animation itself. To ensure smooth onscreen display double buffering [21] is employed, ensuring all graphic operations that could result in flicker are carried out within an off-screen buffer.

One of the most important requirements of the website is that it should be easy to add, edit and remove content as required. Hence the use of a backend database system to drive the content of the site. An administration facility was provided that allows for images to be easily added simply by filling out an appropriate PHP based form. Modification and deletion of table entries is so too designed to allow the administrator to search for a particular entry and modify or delete it as required.

Conclusion

The design of this image-based website is conditioned by the following principles:

Legibility

A website should be easy to read. For example, text and background colours need to be chosen carefully. It is better to produce HTML text, background images, and the text in graphic images with the highest possible contrast.

The font and the size of text are crucial for the website to be legible. The most legible typefaces are standard serif (usually Times) and sans-serif (usually Arial or Helvetica) fonts. Decorative or cursive fonts are much more difficult to read.

Navigation

Visitors are guided through the site by means of a clear hyperlink route. Graphic images, such as buttons and tabs, are clearly labeled and easy to read.

Location

The Honan Chapel Website will be promoted online by means of search engines and links from other web sites. The site also uses page footers.

Consistency

Standard typefaces and background colours make the site easy to follow. Our website's consistency and coherence can be achieved by the support of the World Wide Web Consortium (W3C) Cascading Style Sheets (CSS).

Protection

The database images are protected by Java applets. Authorized users are allowed to download or upload original files directly form the database, which decreases the transfer file size and shorten the processing time.

[1] Microsoft Internet Explorer, http://www.microsoft.com/windows/ie/

[2] Firefox, http://www.mozilla.com/firefox/

[3] Camino, http://www.caminobrowser.org/

[4] Opera Web Browser, http://www.opera.com/

[5] Safari Web Browser, http://www.apple.com/macosx/features/safari/

[6] Konqueror Web Browser, http://www.konqueror.org/

[7] W3 org, http://www.w3.org/

[8] Cascading Style Sheets, http://www.w3.org/Style/CSS/

[9] Java Applet Description, http://en.wikipedia.org/wiki/Java_applet

[10] Java Virtual Machine, http://en.wikipedia.org/wiki/JVM

[11] Java Application Security - The Java Sandbox, http://www.unix.org.ua/orelly/java-ent/security/ch01_02.htm

[12] The Vatican Museum website, http://mv.vatican.va/3_EN/pages/MV_Home.html

[13] The Hubble Telescope Image Gallery Website, http://hubblesite.org/gallery/

[14] Flickr, http://www.flickr.com/

[15] PHP Website, http://www.php.net/

[16] mySQL Website, http://www.mysql.com/

[17] Grab “Impossible” screenshots, http://www.macworld.com/weblogs/macosxhints/2005/10/impossibleshots/index.php

[18] CyberLink PowerDVD website, http://www.cyberlink.com/multi/products/main_1_ENU.html

[19] Take a screenshot and save it to a PNG file using javax.image.io, http://schmidt.devlib.org/java/save-screenshot.html

[20] Apple QuickTime Viewer, http://www.apple.com/quicktime/download/

[21] Double Buffering, http://en.wikipedia.org/wiki/Double_buffering