

NAPIER UNIVERSITY
SCHOOL OF COMPUTING
UNDERGRADUATE PROJECT REVIEW REPORT

1. Student details

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2. Project details

Title: Empire Video – *A reconfigurable e-commerce website with dynamic content.*

Scope and aims of the study:

The main aim of the project is to create a reconfigurable website with dynamic content. It involves research into different methods of creating reconfigurable media components, such as Macromedia Flash, XML, PHP, Microsoft ASP and so on, and allows content to be dynamically delivered.

Research also includes an investigation of database-driven and e-commerce sites, which integrate both server-side and client-side scripting languages. It also investigates methods of video streaming to WWW clients, such as using Real Video, Microsoft Windows Media or QuickTime.

This research is then applied to the creation of an e-commerce system, which is used to sell video content (DVD). Real-time video streaming is used to show movie trailers.

In addition, the interface will be designed to facilitate easy navigation through the different sections and stages of purchase. This will be done by using an intuitive user interface including a logical approach to the process of buying, easy choices and previous user recognition or new user subscription.

3. Progress to date

a) Research undertaken

1. Interface:

My first work was to look at several e-commerce and database driven websites. I discovered that some of them are using cookies in order to recognize the user. For instance, www.amazon.com, one of the biggest online shops is using cookies in order to recognize users and present them, thru a particular interface, articles matching with their previous purchase. On the other hand, there is a large polemic concerning cookies. Many users are afraid of them because they don't really know what they are and what they contain. We can see websites named "You can be tracked from your mouse clicks" or even "How web servers threaten your privacy" dealing the subject of cookies in a very negative way.

I also discovered that almost all e-commerce website are using the same process of buying scheme (Ref: 6, 8) and I analyzed it in order to create a base for my design and implementation.

Furthermore, I investigate ways of creating reconfigurable interfaces and I found two main ideas:

- ? CSS (Cascading Style Sheets), a very nice tool to unify fonts on a website.
- ? Templates.

The notion of template is here very important because the whole idea of reconfigurable component is based on it. There is a high analogy between using templates to develop a website or using reusable components to develop a software:

? In a software point of view, there are two main techniques to develop a product: Using standard development tools or using object oriented languages (java, C++) and components languages (Visual Basic, Visual C++ and so on).

? When developing websites, the same strategy can be applied: Using standard development techniques (static pages or even dynamic pages) or using templates based techniques. In this case, every piece of code is coded only once and called by other pieces of code when necessary. With this technique, modifying a sites takes minutes rather than hours or even days.

2. Streaming:

I have analyzed the different methods of delivering video in real-time thanks to streaming techniques (Ref 1, 2, 12, 13, 14) and I found three main ways of doing it:

- ? Using Microsoft Windows Media,
- ? Using Real Networks Real Media,
- ? Using Apple QuickTime.

I discovered that Real Media is the oldest technique but Real Networks is still the leader on the market of sound and video streaming. Furthermore it supports the synchronization

with multimedia contains (SMIL or Synchronization Multimedia Integration Language). QuickTime also support SMIL but it is a very new feature of it.

After testing the three techniques (encoding with Real Producer 8.5, Microsoft Windows Media Encoder and QuickTime and testing the streaming from Microsoft Internet Explorer with the dedicated plugins), on average, I got better results with Real Media (faster to start streaming, same quality as Windows Media). QuickTime has one advantage: the quality of the video encoded is almost as good as the original, but on the other hand it takes a lot more time to start streaming.

I also discovered that there is two ways of streaming video with Real Media:

- ? From a streaming server (i.e.: Real Networks Server),
- ? From a standard web server (i.e.: Apache, IIS).

Except large companies, most people stream from standards web servers (for cost reasons). Streaming from a web server has some limitations:

- ? No Sure Stream Clips (a web server cannot send just one stream from a Sure Stream clip encoded for several bandwidths). Note that this problem can be overcome by using SMIL in order to detect the bandwidth of the user and then let Real Player choose which clip to play (this involve encoding the same file several times for several bandwidths).
- ? No secure clips (users can record the clips),
- ? No Real Player seeking (because a Web server cannot jump to a new position in a clip's timeline, the Real Player position slider cannot fast-forward the clip).

Web Servers have some others limitations but of lower importance. In order to stream from a web server, two files are needed :

- ? A file.rm
- ? A file.rpm

The file.rm is the encoded video, the file.rpm is a text file containing the address of the file.rm. This is the only way to stream the video according to Real Media protocol. I am currently investigating a way of creating the file.rpm on the fly with a server-side language (PHP or CGI).

3. Client-side scripting languages:

Thanks to the WWW, I have discovered several client-side scripting languages, this includes:

- ? JavaScript,
- ? DHTML,
- ? CSS,
- ? Java applets,
- ? VBScript,
- ? XML.

After analyzing these languages, I decided to categorize them into groups of functionalities:

- ? (JavaScript / DHTML) / VBScript,
- ? Java applets / XML.

I discovered that VBScript has a lot of compatibility problems (only compatible with Internet Explorer). JavaScript and DHTML are very similar; most publications (books or on-line tutorials) associate them together. Java applets and XML are very different. They are higher level and a lot more powerful than the others.

4. Server-side scripting languages:

There are many different server-side scripting languages (Ref 10):

- ? JSP : Java Server Pages,
- ? PHP,
- ? ASP,
- ? ColdFusion,
- ? CGI,
- ? IPScript,
- ? SSI (Server Side Includes)
- ? MivaScript
- ? Java Servlets

IPScript and MivaScript are almost unknown and should rapidly disappear. ColdFusion is certainly the best way of developing an e-commerce website because it is designed specially for this purpose. The main problem of this language is the cost. It is very hard to find professional hosting accepting ColdFusion, and they are very expensive. SSI is quite a new language and most professional servers accept it.

CGI (Common Gateway Interface) is not a language but an “interface”. It’s possible to develop CGI in C, C++, PERL and so on. It’s quite an old technology but it is still widely used. Most form2mail scripts available on free web servers for instances are CGI scripts. Furthermore, when developed in PERL, CGI can be very powerful to parse text-based data. This can be very useful, for instance, when trying to feel a remote database with a local database file (CSV) and parse forbidden characters.

PHP, ASP and JSP are very similar and largely used. Many Free providers accept PHP or ASP. PHP is a free product (GNU license). ASP isn’t. Benchmarks tend to prove that PHP is better than ASP (Ref 7) for many reasons, this include cost, speed and load handling. Furthermore, PHP’s fast development time, ease of use, and extensibility make it a popular choice over Java (JSP and Servlets).

5. Databases:

The main databases used on the WWW are:

- ? PostgreSQL,
- ? MySQL,
- ? Access.

PHP can access various databases but most often people use it in conjunction with MySQL. This choice has a main advantage, which is the possibility to use phpMyAdmin (a tool available on most servers and allowing the administration of the database in a user friendly manner). ASP is generally used with Microsoft Access, which has the inconvenient of being based on Microsoft COM technology known to be particularly slow.

b) Practical work undertaken

I decided to use PHP/MySQL to develop the website (Ref 3, 4, 9). The implementation can be viewed at the following web address:

<http://www.empire-video.com>

1. Interface:

I have designed several interfaces, all based on the ease of navigation through the site. Rather than using frames, I decided to use tables because of two main reasons:

- ? Faster to access the pages,
- ? Possibility with tables to based the development of the sites on templates (see “research undertaken” for more details).

The site is accepted by screens with a minimum resolution of 800x600. I haven't yet tested the interfaces with Netscape communicator, only with Microsoft Internet Explorer.

2. Interrogation scripts:

Interrogation scripts are all the scripts accessed by the user, in a transparent manner. They create on the fly the html pages the user asks for. Theses pages allows all the actions currently available on the web site:

- ? User signup,
- ? User login,
- ? Change password,
- ? Change settings,
- ? Storefront,
- ? Catalog,
- ? Search engine,
- ? Basket,
- ? Movie Trailers,
- ? Mini-basket, Special offers, News.

3. Administration scripts:

These are the scripts accessed by the administrator in order to update the web site. They allow different actions:

- ? Add categories and movies,
- ? Remove categories and movies,
- ? Edit categories and movies,
- ? Remove users,
- ? Access users orders.

A category is represented by:

- ? A name (i.e.: Adventure),
- ? A description (i.e.: Ex: The mask of Zorro),
- ? A relative position (category or subcategory of another category).

A movie is represented by:

- ? A name (i.e.: Artificial Intelligence),
- ? A price,
- ? A description,
- ? A category,
- ? A video server (among a list of 5 servers: Streaming 1 to 5),
- ? Eventually, an extra position (special offers, news, selection of the week, coming soon).

4. Movies encoding:

I have encoded movie trailers in Real Video 8 using Real Media Encoder 8.5. The original trailers (MPEG1) have been found on a web server distributing video for pocket computers (Ref 11). I then created the associated rpm files and uploaded them (rm and rpm) on 5 different servers (up to 500MB space storage).

4. References

BOOKS:

- 1 - Real Networks Inc. 2000. *Real Producer Plus 8.5 – User’s Guide*. Real Networks Press.
- 2 -Real Networks Inc. 2000. *Real System 8 – Production Guide*. Real Networks Press.
- 3 - Programmer to Programmer. 2002. *Professional PHP4*. Wrox Press.
- 4 - Rasmus Lerdorf. 2000. *PHP – Pocket Reference*. O’Reilly Press.
- 5 - J. Tarin Towers. 2001. *Dreamweaver 4 for Windows and Macintosh*. Peachpit Press.
- 6 - Jim A. Carter. 2002. *Developing e-commerce systems*. Prentice Hall Press.

WEB PAGES:

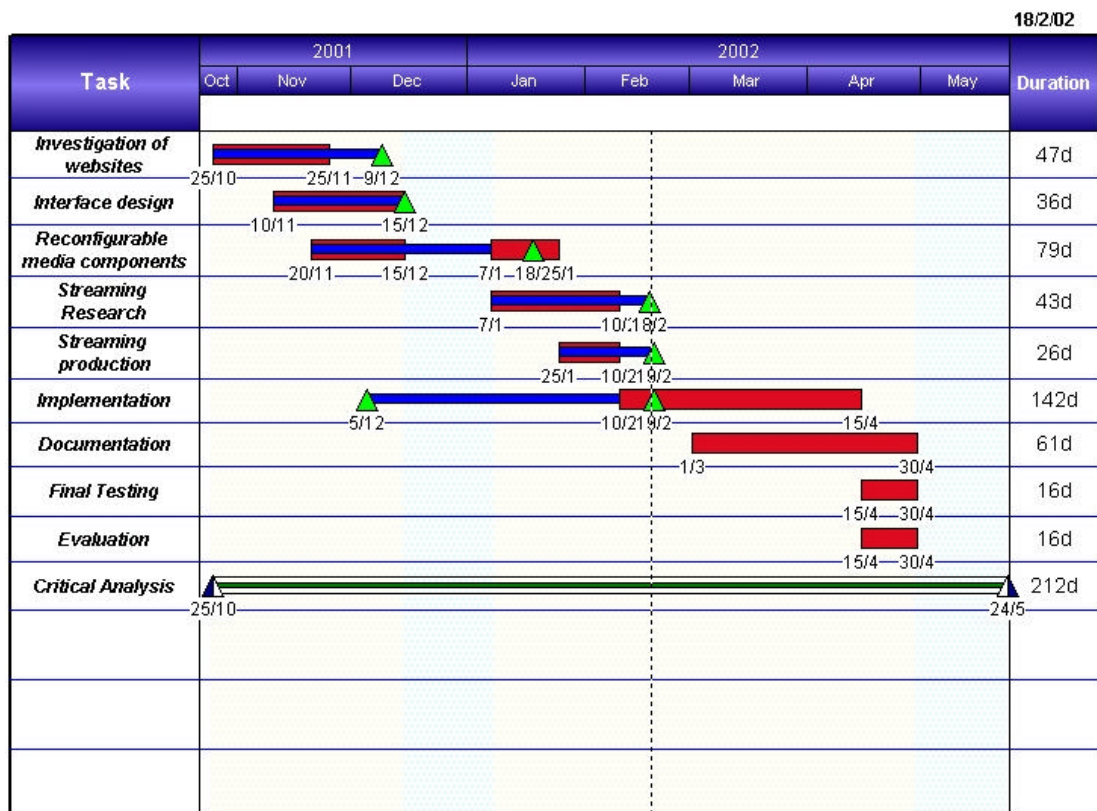
- 7 - PHP Everywhere: 7 Reasons why PHP is better than ASP.
http://php.weblogs.com/php_asp_7_reasons
- 8 - 50 Rules of Business Netiquette.
<http://builder.cnet.com/webbuilding/pages/Business/Rules/>
- 9 - PHP INFO: Le site d’information PHP/MySQL (French website).
<http://www.phpinfo.net/>
- 10 - Server-Side Scripting Shootout.
<http://hotwired.lycos.com/webmonkey/99/46/index1a.html?tw=programming>
- 11 - Pocket Movies.
<http://www.pocketmovies.net/index.php>
- 12 - Dossier: Streaming (French website).
http://solutions.journaldunet.com/0104/010424_introstreaming.shtml
- 13 - QuickTime Help Official Website.
<http://helpqt.apple.com/qthelp9w5/fr/QuickTime.help/QuickTimeHelp.htm>
- 14 - Windows Media Encoder On-line Help.
<http://www.microsoft.com/windows/windowsmedia/fr/wm7/encoder.asp>

5. Self-assessment of progress (Max 150 words)

I have accomplished most of the research and implementation. I have learn many aspect of web development and I now want to do the following:

- ? Investigate Macromedia Flash technology,
- ? Investigate XML, its relation with Flash and PHP,
- ? CSS is not yet implemented on some pages; it should be finished by the time you read this,
- ? Complete the administration to add more functionalities (change CSS, upload files),
- ? Use SMIL to stream the video in function of the bandwidth of the user.

6. Gantt chart



RED: Planned work – BLUE: work done.