



UNIVERSITY *of* LIMERICK

O L L S C O I L L U I M N I G H

Faculty of Science and Engineering
Department of Computer Science
and
Information Systems

Assessment Paper

Academic Year : 2008/2009

Module Title: E-Business Architectures

Duration of Exam : 2.5 hours

Lecturer : Michael Coughlan

Semester : 2

Module Code : CS4028

% of Total Marks : 85%

Paper marked out of : 150

Instructions to Candidates.

4 questions. Attempt 3. All questions carry equal weight.

Question 1	Website Promotion	(50 marks)
Question 2	E-Business, E-Commerce, Web Applications	(50 marks)
Question 3	E-Advertising	(50 marks)
Question 4	Security	(50 marks)

Q1. Web Site Promotion

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<html><head>
<title>School Directory</title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
</head><body>
<table width="500" border="0"><tr><td>
<p align="center"><font size="5"><strong>Dublin Schools Directory</strong></font></p>
<hr align="left" width="100%">
<p>Welcome to the web site. We hope you have a pleasurable experience. <br>
Below is a list of schools that can accept borders. Please follow the link provided
to load the local web site.</p>
<hr align="left" width="100%">
<p>Alexandra College, Milltown, Dublin 6 (girls)</a>
<p>Blackrock College, Blackrock, Co. Dublin (boys)</a></p>
<p>
<a href="http://www.castleknockcollege.ie">Castleknock College, Castleknock, Dublin 15 (boys)</a></p>
<p>
<a href="http://www.kingshospital.ie">Kings Hospital, Palmerstown, Dublin 20 (mixed)</a></p>
<p>
<a href="http://www.lfi.ie">Lycee Francais D'Irlande,Roebuck Road, Dublin 14 (mixed)</a></p>
<p>
<a href="http://www.kilians.com">St. Kilian's Deutsche Schule Dublin (mixed)</a></p>
<p>
<a href="http://www.wesleycollege.ie">Wesley College, Ballinteer, Dublin 16 (mixed)</a></p>
<hr align="left" width="100%">
<em>Last updated 17-Nov-2006<br>
</em><a href="mailto:webeditor@dubschdir.ie">email: webeditor</a>
</td></tr></table>
<p align="left">&nbsp;</p>
</body></html>
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Dublin Schools Directory

Welcome to the web site. We hope you have a pleasurable experience.
Below is a list of schools that can accept borders. Please follow the link provided
to load the local web site.

- [Alexandra College, Milltown, Dublin 6 \(girls\)](#)
- [Blackrock College, Blackrock, Co. Dublin \(boys\)](#)
- [Castleknock College, Castleknock, Dublin 15 \(boys\)](#)
- [Kings Hospital, Palmerstown, Dublin 20 \(mixed\)](#)
- [Lycee Francais D'Irlande,Roebuck Road, Dublin 14 \(mixed\)](#)
- [St. Kilian's Deutsche Schule Dublin \(mixed\)](#)
- [Wesley College, Ballinteer, Dublin 16 \(mixed\)](#)

Last updated 14-Apr-2009

email: webeditor

The Dublin Schools Directory is a collection of links to the web sites of private, fee paying, boarding schools in Dublin, Ireland. A range of boarding schools is included. Most cater for secondary school students but some accept both primary and secondary school students. Some schools are co-educational (mixed) while others accept only girls or only boys. This is indicated in the link. Most schools also have some religious orientation with both Catholic and Protestant schools represented. There are also some specialist schools included in the list such as the French or German schools.

The Directory web page has not yet been optimised for search engine placement. Using the description of the web site and referring to the web page and web page source shown above;

- (a) Identify the most important keywords for the website and provide a justification for each of the keywords selected. (14 marks)
- (b) Briefly explain why “keyword selection” is so important when optimising a web site to ensure a high search engine ranking for a particular search term. (4 marks)
- (c) Make recommendations that detail how the web page might be optimised to improve the search engine ranking with respect to the chosen keywords. For each of your recommendations, comment on its relative importance in ensuring a better search engine ranking. (22 marks)
- (d) The optimisations you can make to the web page might not be sufficient to ensure high search engine placement. Write a brief note detailing what other measures might have to be taken, and why, to ensure high search engine placement. (4 marks)
- (e) It has been said that there is an ongoing “war” between spammers and search engines. If you were a search engine manager tasked with identifying attempts to spam the engine briefly outline what you would look for in a web page that would allow you to identify it as spam. (6 marks).

Q2. E-Business, E-Commerce, Web Applications

- (a) Ubiquity, Global Reach, and Information Density are some of the features of e-commerce that differentiate it from other types of technology-based commerce. For each of the features mentioned briefly outline what is meant by the term and describe the benefits that each confers. (9 marks)
- (b) Briefly describe the operation of four of the following business models, giving examples and paying particular attention to the sources of revenue and how the model operates: portals, virtual world environments, online gambling, e-shops, e-payment services, digital content providers. (15 marks)
- (c) Some web sites offer free products or services. Identify, and briefly describe, the means by which these sites might generate revenue. (4 marks)
- (d) The HTTP protocol is a stateless protocol. Briefly outline the problem that this causes for web-based internet applications and identify, and describe, some possible solutions. (12 marks)
- (e) Identify the tiers in a typical 3-tier web application and briefly outline the benefits that accrue from constructing the application in this way. (10 marks)

Q3. E-Advertising

- (a) Web masters are often concerned about the amount of traffic coming to their site. Identify, and briefly describe, a number of ways in which such traffic is measured. (8 marks)
- (b) Nielsen's eye tracking research that shows that web-savvy visitors never even look at web page ads. Identify, and briefly describe, four web-based advertising techniques that seek to combat this “banner blindness” and comment on how effective these new techniques are thought to be in achieving the advertiser’s objectives. (14 marks)
- (c) Briefly describe what is meant by the term “Viral Marketing/Advertising”, outline what makes it so effective, and identify any limitations/drawbacks with this type of advertising. (10 marks)
- (d) Amazon is a merchant that runs an affiliate program that allows other sites to earn money by directing traffic to the Amazon web site. But many merchants do not have the resources to develop or administer their own affiliate programs. For these merchants an Affiliate Network may offer a solution.
 - i. Briefly describe how an Affiliate Network operates. (6 marks)
 - ii. Outline the benefits to both affiliates and merchants of using an Affiliate Network. (12 marks)

Q4. Security

- (a) Wireless networks suffer from a number of attacks which are much more difficult to execute in a wired network environment. Briefly explain how a simple Wi-Fi based man-in-the-middle attack might work. (6 marks)
- (b) HTTPS (Hypertext Transfer Protocol over Secure Socket Layer) allows a web server and browser-based client to communicate over the internet using encrypted traffic.
 - i. Symmetric Key encryption suffers from the problem of how to transmit the key safely while Public Key encryption is computationally expensive. Briefly explain how a HTTPS overcomes these problems allowing it to use Symmetric Key encryption to secure the mass of the traffic transmitted between client and server. (8 marks)
 - ii. Even though HTTPS encrypts the traffic between client and server it might still be theoretically vulnerable to a man-in-the-middle attack. Briefly explain how such an attack might work and how Digital Certificates are used to prevent it. (14 marks)
- (c) In April of 2009 there were numerous news reports describing how Twitter users had been subjected to a number of Cross-Site Scripting (XSS) attacks.
 - i. Briefly describe what is meant by the term “Cross-Site Scripting attack” and explain what makes a web application vulnerable to this kind of attack. (6 marks)
 - ii. Briefly explain how a hacker might exploit a Cross-Site Scripting (XSS) vulnerability in a commercial web site to gain access to the cookies which that site places in the client’s browser. (10 marks)
- (d) Briefly explain what is meant by the term distributed Denial of Service (dDoS) attack, describe how a dDoS attack might be executed, and outline the possible motives for such an attack. Illuminate your answer with some real life examples. (8 marks)