

## **Web Site Implementation and Usability among Selected Malaysian Financial Firms**

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### **ABSTRACT**

*Successful implementation of outwardly targeted corporate business web sites depends on their acceptance by customers. Prior research determined that such acceptance is influenced by a number of variables, including the presence of certain content and design features. However, it was not known whether Malaysian firms in the financial sector incorporated these features into their web sites. This study selected a sample of 65 companies classified under the financial sector in the Kuala Lumpur Stock Exchange (KLSE) main board listings. First, the researchers ascertained whether these firms did indeed have outwardly targeted corporate web sites that were operable. Second, the operable web sites were evaluated according to the Usability Assessment Guide, which was developed based on recognized, research-based standards. Results showed that 35 out of 65 of the firms (54%) had operable web sites, higher than that recorded in the UK, but lower than that found in the US, in similar studies. Rating of the firms' web sites revealed that the overall top scorer was MIDF (78%), followed by Bank Islam and RHB Bank, tied at 75%. Frequency counts of each usability variable revealed, among other things, that 100% of the firms had incorporated eight of the 28 Design variables and two of the 25 Content variables in their web sites. The Usability Assessment Guide can be used by firms in examining the usability of their own web sites, as well as the web sites of their competitors. Web sites that show high usability ratings can serve as benchmarks for others, and those with low ratings can be improved by upgrading them to the usability standards developed.*

### **ABSTRAK**

*Kejayaan pelaksanaan laman web bergantung kepada penerimaan oleh pengguna. Penerimaan pengguna bergantung kepada pelbagai jenis faktor termasuk penyediaan kandungan dan penggunaan reka bentuk yang bersesuaian. Namun demikian, sama ada firma-firma dalam sektor kewangan di Malaysia mengiktiraf faktor-faktor tersebut dalam laman web mereka masih belum diselidiki. Sebanyak 65 syarikat kewangan yang berdaftar di dalam senarai papan utama Bursa Saham Kuala Lumpur (BSKL) telah dijadikan sampel kajian. Pertama, kajian ini mengenalpasti sama ada firma-*

firma tersebut mempunyai laman web. Kedua, laman-laman web syarikat dianalisa menggunakan panduan penilaian keboleh-gunaan yang dibangunkan berasaskan kajian lepas. Kajian mendapati 35 dari 65 syarikat (54%) mempunyai laman web, peratusan yang lebih tinggi daripada yang pernah direkodkan di UK, tetapi rendah jika dibandingkan dengan dapatan kajian yang dilakukan di Amerika Syarikat. Penarapan laman web firma-firma yang dikaji telah mengenalpasti juara keseluruhan keboleh-gunaan ialah MIDF (78%), diikuti oleh Bank Islam dan RHB Bank, seri pada perkiraan 75%. Pengiraan kekerapan setiap variabel keboleh-gunaan mendapati lapan daripada 28 variabel rekabentuk dan dua daripada 25 variabel kandungan mencapai penarapan 100% untuk piawaian keboleh-gunaan. Panduan Penilaian Keboleh-gunaan ini boleh digunakan oleh firma untuk menilai keboleh-gunaan laman web mereka, dan juga laman web pesaing. Laman web yang mencapai penarapan keboleh-gunaan yang tinggi boleh menjadi penanda aras untuk laman web yang lain. Selain daripada itu, laman web yang lemah dapat ditambahbaikkan tahap keboleh-gunaannya berlandaskan piawai keboleh-gunaan yang dibangunkan dalam kajian ini.

## INTRODUCTION

Currently, one of the most popular applications of computer technology in the business world is the web site. Along with related Internet-based innovations, it has become prevalent in almost all industries. Such innovation clusters support the operations of brick-and-mortar companies (those whose operations are confined mostly to traditional building sites closing parentheses (cooked)), enabling them to expand their business into cyberspace (the realm of electronic communication), thereby becoming known as clicks-and-mortar companies. Other companies have come into existence as fully-digitalized from the beginning, using web sites as their sole platform for interacting with the public, including both prospective and actual customers. These are known as clicks-only or virtual business entities.

Companies use web sites primarily for communication, including the promotion and advertising of products and services, and increasingly for the actual conduct of business transactions (e.g. Cheung 1998 and Soh, Yong Mah, Jek Gan, Chew & Reid 1997). Although some organizations—especially very large ones with many employees and perhaps several locations—have implemented *intranets*, which utilize web sites as *internal* management and communication platforms, such web sites were not included in this study. Instead, the focus was on those web sites that have been designed primarily to reach a target audience of outsiders—i.e. customers, other targeted users, or the general public.

Although widespread and growing in use, these externally-focused web sites often suffer from ‘usability’ problems. Among the top ten such problems

are the lack of essential information needed by prospective customers (such as price lists and privacy information) and poor design (such as requiring visiting viewers to scroll from left to right while reading a screen page, or the unanticipated and unwanted transfer of the visitor-viewer to another site when certain hyperlinks are clicked) (Nielsen 2002b). In addition, some web sites have an obvious disadvantage of not being traceable through the most frequently used *search engines*, so that they are not easily found by potential customers. Among other things, these web site problems have been attributed to a lack of relevant technical expertise among business managers, on one hand, and a lack of business exposure among web site designers, on the other hand (Thelwall 2000).

Clemons (1986) classified technologies adopted by organizations according to the ultimate target user groups—being mainly either externally- or internally-focused. Building on his ideas, as well as Cooper and Zmud's 1990 model of Information Systems (IS) implementation, we know that corporate, or business, web sites which are externally-focused have to be first implemented by the organization and then utilized by its targeted audience. A general principle regarding the implementation of externally-focused technologies is that the end user—the customer in most cases—should be the focus of designers and managers of the technology (Khairul Akmaliah 2000). Therefore, the ultimate goal of developing these web sites is to achieve maximum customer impact—including capturing the attention and interest of potential customers/users, engaging them fully in the use of the technologies included in the web site design, and moving them to the actions wanted by the company. Therefore, designing their web site for maximum usability should be a part of any business organization's web site promotion program.

Since effective implementation of a web site requires an organization to perform activities that promote full utilization of the web site by its target audience, business organizations must understand the variables that influence the use of the technology by its customers, and they must see that systems are designed to fit customer needs and preferences. Researchers in the areas of human-computer interaction (HCI), IS implementation, and marketing, have concluded that there are a number of design features and types of content that are necessary in order to obtain the desired maximum impact on the targeted users of corporate web sites. For example, the *URLs* (Uniform Resource Locators— 'addresses' for web sites) must be easily found by using popular search engines, which means the address should clearly connect with the name of the web site's organization (Nielsen 2003a). Web sites must also have a large number of linkages with other web sites in order to increase their possibilities of being discovered by targeted users (Dholakia & Rego 1998). Having a *reasonable downloading time* (Geissler 2001), as well as efficient *menu utility* (e.g., menus in top and left positions that are

accessible continuously) and *hyperlinking capability* (e.g., hyperlinks provided are accurate and optimized to make browsing relatively effortless) (Cox & Dale 2002), are also items that are high on the recommended list of web site essentials.

With this background in mind, concerning the features of an effective business web site, the researchers in this study sought to answer the question: *To what extent have Malaysian firms incorporated these recommended features in their web sites?* To lay the groundwork for the study, a web site usability assessment guide was first established, based on a search of the research literature. Next, a sample of 65 firms were chosen as objects of the study, all of which were classified under the finance sector in the Kuala Lumpur Stock Exchange (KLSE), in its main board listings ([www.klse.com.my](http://www.klse.com.my)). Then, the researchers in this study determined the current level of web site adoption among the selected firms—specifically, firms with operable web sites were identified. Finally, the usability of the web sites of the respective firms was analyzed, based on whether each web site showed the features and content outlined in the usability assessment guide.

## LITERATURE REVIEW

The background review of relevant research literature that preceded this study covered the following areas:

1. What research had been done regarding the number and kind of firms which had so far adopted web site technology. (This was to get an idea of the general state of web site adoption by companies, as of mid-2003.)
2. How business web site usability—as part of web site implementation—relates to the larger context of technological innovation and IS implementation.
3. What research had been done specifically on the factors that are important to create maximum usability in a web site.

### ADOPTION OF WEB SITE TECHNOLOGY BY BUSINESS FIRMS

A number of researchers had examined the current state of web site adoption, commenting on the sectors that implemented them, and classifying the types of web sites adopted. Among companies that have been most studied in regard to web site implementation are the 'Fortune 500' companies (e.g., Liu, Arnett, Capella & Beatty 1997; Young & Benamati 2000; and Perry & Bodkin 2000). These studies found that Fortune 500 companies have been swift adopters of web sites, but quite slow in supporting purchases online. Liu et al. (1997) found that among the Fortune 500 companies, those in the transportation and communications industries have the highest

percentage of web site adopters. Their study revealed that 64.4% of the studied firms operated web sites, but only 26% of the firms had transactional web sites. More recently, Young and Benamati (2000) discovered that 490 firms (98%) of the Fortune 500 companies had operable web sites. They found that 170 (35%) of those were at that time transactional web sites. Perry and Bodkin (2000) found, in their study of a sample of Fortune 500 firms, that there were significant differences across industries in the types of content and features incorporated in web sites.

Parallel studies done a few years ago in Hong Kong (Cheung 1998) and Singapore (Soh, et al. 1997), respectively, found that corporate web sites in those places mainly served as promotional tools. Very few companies operated web sites that were set up to do e-commerce. Cheung (1998) found that in Hong Kong, web sites were most common among the manufacturing and IT/computing businesses. This finding is similar to the findings of Soh et al.(1997), showing that web sites in Singapore were most popular among companies in the computer/IT industry, followed by the hospitality, manufacturing, and retail industries. Studies by Hart, Doherty and Ellis-Chadwick (2000) on the adoption of web sites among UK retailers, found that only 10% had this presence in cyberspace, and of those, only 3% were equipped with e-commerce systems. While the popularity of the Internet has increased interest among the academic and trade press in publishing articles on the adoption of Internet and Web technologies in Malaysia, we found no empirical research directly related to *web site adoption* by the Malaysian financial sector. (We found one article that focused only on Internet *banking* in Malaysia by Sohail and Shanmugham (2003).)

The part of our literature review on web site adoption rates helped us to begin forming a perspective on the current international scene in regard to business use of web site technology; and it provided some basis for comparison of the Malaysian firms in our study with their counterparts in other countries. Because it also revealed that little actual research had been done on the rate and kind of web site adoption in the Malaysian business world, it confirmed that our study would be a useful contribution.

#### WEB SITE IMPLEMENTATION

*Technological Innovation and Information Systems (IS) Implementation Frameworks* As mentioned previously, application of Web technologies in organizations can be classified according to whether their ultimate user groups are insiders or outsiders (Clemons 1986). Internally-focused applications include use of the Web technologies as an intranetting tool, to support internal operations and communications (e.g. Laudon & Traver 2002: 131). Externally-focused applications include the utilization of Web technologies as a tool for marketing (e.g. Hsieh & Lin 1998), and as a tool for conducting business and networking with other firms who are business

partners—termed extranetting (e.g. Laudon & Traver 2002: 132; Hsieh & Lin 1998).

Previously, the general innovation framework has been applied to explain the implementation of internally-focused technologies (Cooper & Zmud 1990). Subsequently, as an adaptation of Cooper and Zmud's ideas, Khairul Akmaliah (2000) proposed a model that describes the adoption of externally-focused technologies. She contended, based on Clemons' classification of external and internal systems, that such technologies are first adopted by organizations, then launched and promoted to their customers and others who may be in the target audience; and finally—ideally—the targeted users utilize the technologies to the maximum extent possible. In view of that, optimal utilization by the audience/customer, to serve the interests of both the company and the audience, appears to be the ultimate goal of externally-focused innovations.

Applying innovation and IS implementation models to web site adoption, we can see that an organization needs to launch and promote the use of its web site among target users to encourage its full utilization. Researchers such as Nielsen (1999c) had explicitly emphasized that in order to achieve that success, designing for usability should be a part of any web site development and promotion program. For this purpose, Nielsen suggested examining user needs and requirements during the design stage and testing the web site for usability before it is launched (Publish 2003).

The research literature on technological innovation and IS implementation frameworks helped the researchers in this study to form a general perspective regarding the implementation of web sites, and it pointed us next toward the related body of research on web site usability, from which we wanted to learn more about the specifics of effective web site implementation by business organizations.

#### WEB SITE USABILITY

The fact that the incorporation of certain design features and inclusion of essential content are among the important variables for successful web site implementation had been concluded by several researchers (e.g. Abels, White & Hahn, 1997). Researchers have described the characteristics of effective web sites in various ways. For example, Jakob Nielsen (see [www.useit.com/alertbox](http://www.useit.com/alertbox)) developed a list of 'do's and don'ts' for web site development from usability research, while Cox and Dale (2002) developed a list of criteria for effective web sites from a 'quality' perspective. Day (1997) used the term 'customer likeability,' while Hsieh and Lin (1998) proposed web site 'attractiveness' variables. Among all such articles that we found, the concept of usability seemed best described as supporting the execution of user tasks in an 'efficient' and 'pleasant' manner (Battleson, Booth & Weintrop 2001; Nielsen 2003b). To us, that implies that the

ultimate test for a good web site is that the customers who browse through an informational web site, for instance, should be able to find the required information easily, and enjoy the total experience.

Jakob Nielsen (see details at <http://www.useit.com/alertbox>) and Spool, J., Scanlon, T., Schroeder, W., Snyder, C., and De Angelo, T.'s [see *Web Site Usability: A Designer's Guide* (1999)] are among those who have helped establish web site usability guidelines that have become widely known and used. Among the guidelines put forth, some have applied generally, to all types of corporate web sites (e.g. Jakob Nielsen), while some others have provided more focused recommendations for web sites serving specific purposes—e.g., buying books from online bookstores (Wan 2000), booking and buying plane tickets, or applying for loans online (Change Sciences Group 2003).

In establishing the guidelines for effective commercial web sites, researchers have utilized various data-gathering techniques. Some have generated data through watching users completing tasks on a web site (Nielsen 1999d), conducting 'focus group' sessions with users (e.g. Abels et al. 1997); doing in-depth interviews of web site designers (e.g. Geissler 2001); combining objective and subjective evaluation of web sites through surveys of web site viewers/visitors (e.g. Dholakia & Rego 1998); conducting evaluative studies of web sites without any surveys of viewers (Bodkin & Perry 2003). Others have created a model based on a detailed literature search, and then validated the model by applying it to a number of web sites (Cox & Dale 2002). In addition, some web site design guides have been established based simply on the designer's experience in developing web sites (e.g. Turner 2002).

This final part of our literature review revealed researchers' efforts on web site usability studies, and by the end of it we thought we had enough background and solid research from which to base a compilation of practical guidelines that we could use to evaluate the web sites in our study—and that could be used also by anyone who was charged with designing, evaluating, or revising a corporate web site. The resulting Web Site Usability Assessment Guide is presented in the following section.

## WEB SITE USABILITY ASSESSMENT GUIDE

The list of recommended design features and content for effective business web sites grew partly out of our findings in the research literature, and partly out of our own experience in teaching about and developing web sites. *Design* refers to the navigational features incorporated in the web site, and *content* refers to the information available on the site (Robbins & Stylianou 2003). Table 1 below provides specific references for the constructs and variables that were adapted from the literature. For the purposes of this

study, only variables that could be measured with a high degree of objectivity were included. That is, variables that were considered to depend to a large extent on subjective perceptions, personal preferences and responses, and background experiences of web site visitors, were intentionally disregarded.

## RESEARCH METHODOLOGY

The names of 65 firms, classified under the finance sector on the main board of the Kuala Lumpur Stock Exchange (KLSE), were obtained from the listing at [www.klse.com.my](http://www.klse.com.my) (accessed February 2003 through June 2003). This section discusses the research methodology that was utilized in addressing our research objectives:

1. To determine whether each company had an operable web site
2. To evaluate the operable web sites according to the usability criteria shown in Table 1

To achieve Objective 1, two methods were used in determining whether the companies had operable web sites: (1) by using the hyperlinks provided on the KLSE web page; (2) by using the search function in the Dogpile web site ([www.dogpile.com](http://www.dogpile.com)). A click on a listed company's name in the KLSE web site would display the company's information page. By clicking on the company's name header, visitors are transferred to the company's web site. However, when hyperlinks were found to be inactive, a second step was taken to check for the company's presence in cyberspace: the name of the company was keyed into the dogpile.com meta-search engine's 'search box', at [www.dogpile.com](http://www.dogpile.com). (See Table 3 for the list of evaluated web sites.)

To achieve Objective 2, the usability criteria developed from the research literature (Table 1) were applied, to measure the degree to which each respective company's web site had incorporated the features of design and content that are deemed most important for an effective business web site. The first usability dimension measured was *visibility* of the web site, by using selected search engines—i.e., to determine whether visitors could quickly and easily find the web site using this conventional Web technology.

To conduct this test, the name of each company was keyed into the 'search box' of each selected search engine, the Yahoo search engine and the Dogpile meta-search engine, [www.dogpile.com](http://www.dogpile.com), plus two local search engines, Bluehyppo and Cari. Those URLs (web site addresses) found within the first 20 of each list of search results were classified as one (visible); otherwise they were classified as zero (not visible) in our statistical tabulations. The Dogpile meta-search engine was chosen over the other meta-search engines (see [www.searchengines.com](http://www.searchengines.com) for details), because its search results are grouped according to the particular search engine by which the web site was found, a feature that greatly facilitates data analysis (for the list of search



engines registered with Dogpile, see [www.dogpile.com](http://www.dogpile.com)). Visibility of the web sites in Bluehyppo and Cari was evaluated because we presumed that viewers in Malaysia are using local search engines as well as the international ones.

In evaluating *site popularity*, our measurements followed a suggestion made by Mateos, Mera, Gonzalez, and Lopez (2001). The number of links to the web sites (from other web sites) were examined, using the calculating programs found in the market position web site, [www.marketposition.com/linkpopularity.htm](http://www.marketposition.com/linkpopularity.htm). When a particular URL is keyed into this website, the results display the total number of links to a web site as calculated by MSN, Lycos/AllTheWeb, and AltaVista search engines. *Linkability* count was taken from Lycos/AllTheWeb only, because it gave the highest link count of the three calculating programs provided in the market position web site. The web sites that had 500 or more hyperlinks were classified as one, while those under that number were classified as zero.

The rest of the usability criteria were analyzed by visiting each of the 35 web sites and asking the pertinent questions for each of the variables examined, most of which could be answered with a Yes, No, or Not Applicable. The Not Applicable designation was given only in regard to two design variables: *the availability of the Go to the Top function* (D12) and *the Under Construction Alert* (D16). In the first case, certain web sites do not require such a function because the web pages are very short. In the second case, when the web site is already fully constructed, of course no alert is needed.

In regard to content variables, a Not Applicable was of course given to all of the five non-holding companies (Malaysian National Reinsurance, Syarikat Takaful Malaysia, Jerneh Insurance, Lonpac Insurance, and Public Finance) on the variables *subsidiary names and locations*, and *corporate structure* (variables C4a, C4b, C5, and C8). Similarly, we would not expect the web sites of investment holding companies to have a product/service section, given the nature of their business. Also, obviously for companies that had no branches, the variable of *branches information* (C6) was rated Not Applicable, so that it had no effect on their scores. Likewise, only those companies that conduct business transactions through their web sites would need to post *security information* (C21), and only those that collect information from customers/viewers would need to post *privacy information* (C22). All of these factors pointed to the need for classifying the overall sample of firms into smaller subgroups in order to enable a more accurate evaluation.

In analyzing the data regarding each firm—as well as for the firms taken both as an aggregate and as sub-groups—ratings were arrived at by adding the total points received for Design and Content variables, respectively, and dividing that with the number of variables rated in each of those categories, to come up with an average score for each grouping. Frequency ratings for

TABLE 1. Web site usability assessment guide

Design Category	Codes	Variable
Visibility (adapted from Thelwall 2000)	D1ai, D1aii	The site can be found via Yahoo search engine (D1aii) and Dogpile meta-search engine web site, www.dogpile.com (D1ai) (adapted from Abels 1997 and Thelwall 2000)
	D1bi, D1bii	Site can be found via Malaysian search engines/portal sites, Cari (D1bi) and Bluehyppo (D1bii) (adapted from Thelwal 2000)
	D2	Popularity of site, as measured by number of linkables from other sites (Dholakia & Rego, 1998; Mateos et al. 2001)
Accessibility (adapted from Thelwall 2000)	D3	Download time of home page within 15 seconds (Nielsen 1996)
	D4	No need to download specific software to access web site (Thelwall 2000; Carrroll 2001; Nielsen, 1999c; Cox & Dale 2002)
	D5	No need to hit "Enter" to access index page (adapted from Mateos et al., 2001)
Readability (Thelwall 2000)	D6	Texts are easy to read (Thelwall 2000)
Navigability - Menu Utility (adapted from Cox & Dale 2002)	D7, D8	Menu available on home page (D7) & all subpages (D8) (Cox & Dale 2002)
	D9ai, D9aai,	2a. Menu appropriately positioned on home page (top) (Cox & Dale 2002)
	D9bi, D9bii	2b. Menu appropriately positioned on home page (left) (Cox & Dale 2002)
	D9ci, D9cii	2c. Menu appropriately positioned on subpages (top) (Cox & Dale 2002)
Navigability - Hyperlinking Capability (adapted from Cox & Dale 2002)	D10	2d. Menu appropriately positioned on subpages (left) (Cox & Dale 2002)
	D11	3. Both graphic and text-based menus are available (Laudon & Traver 2002, p. 212; Turner, 2002) (Cox & Dale 2002; Nielsen 1996)
	D12	4. Home button available on every subpage (adapted from Cox & Dale 2002)
	D13	1. "Go to top" button available on lengthy pages (adapted from Cox & Dale 2002)
Company Name Recognition- (ability to recognize company name upon accessing web site (adapted from Nielsen 1999a)	D14	2. Links change color or otherwise indicate when once used (Cox & Dale 2002; Nielsen 1999b)
	D15	3. Links are accurate (Cox & Dale 2002; Turner 2002)
	D16	4. All pages properly titled (adapted from Cox & Dale 2002; Turner 2002; Nielsen 1999c)
	D17	5. Pages "under construction" are so indicated (Olsina et al., 1999)
	D18	6. Web site map included, showing where customer service info is found (Carroll 2001; Cox & Dale 2002; Mateos et al. 2001; Nielsen 1996; Olsina et al. 1999; Robbins & Styliano 2003; Thelwall 2000)
	D19	7. Search tool included (Carroll 2001; Cox & Dale 2002; Nielsen 2002a; Robbins & Styliano 2003)
Company Name Recognition- (ability to recognize company name upon accessing web site (adapted from Nielsen 1999a)	D20	1. URL address contains company name (adapted from Nielsen 2003a)
	D21	2. Name of company displayed prominently, and seen immediately (adapted from Nielsen 1999a)
	D22	3. Name of company is displayed in all subpages (Nielsen 1999a)
	D22	4. Logo available on home page & all subpages (adapted from Bodkin & Perry 2003; Nielsen 1999a)

TABLE 1: *Continue*

Design Category	Codes	Variable
Contact and Location Information (Adapted from Carroll 2001; Geissler 2001 and Robbins & Sylliano 2003)	C1	1. Availability of contact us section (Geissler 2001)
	C2	2. Contact information and location available for company's main office(s) (Carroll 2001)
	C4a	3. Subsidiary names (adapted from Carroll 2001)
	C4b	4. Contact information and location available for offices of subsidiaries/SBU (adapted from Bodkin & Perry 2003; Carroll 2001; Turner 2002)
	C3, C5	5. Location maps for main offices (C3) and subsidiaries/SBU's offices (C5) (adapted from Bodkin & Perry 2003; Carroll 2001; Turner 2002)
	C6	6. Branches Information (adapted from Carroll 2001)
Investors Relations and Shareholder Information (Adapted from Nielsen 2003a and Bodkin & Perry 2003)	C7	1. Availability of Investor section (Nielsen 2003a)
	C8	2. Corporate structure (including shareholding structure) is shown; and links are provided to web sites (if any) of any partner companies (adapted from Carroll 2001)
	C9	3. Board of Directors information is available (adapted from Bodkin & Perry, 2003; Carroll 2001)
	C10	4. Annual Report is available (Nielsen 2003a)
	C11	5. Pertinent financial information is available, where applicable (Nielsen 2003a)
	C12	6. Inclusion of Mission Statement/Chairman's statement (Nielsen 2003a)
Product/Service Info. (adapted from Bodkin & Perry 2003; Carroll 2001)	C13	1. Availability of product/services section (adapted from Bodkin & Perry 2003; Carroll 2001)
	C14	2. Detailed description of products/services is provided (adapted from Perry & Bodkin 2003; Carroll 2001)
Customer Communication and Support (Ease of communication with web site operator & other user-support personnel) (adapted from Bodkin & Perry 2003; Robbins & Sylliano 2003)	C15a	1. Contact info provided for webmaster dept.and/or other customer service /support personnel (adapted from Carroll 2001)
	C15b	2. Mechanism to gather customer information is available (Day, 1997)
	C16	3. Directory of key personnel is included (adapted from Carroll 2001)
	C17	4. Frequently Asked Questions (FAQ) page (Carroll, 2001; Olsina et al. 1999)
	C18	5. Choice of language is provided (Carroll, 2001; Olsina et al. 1999)
Employment Opportunities (adapted from Robbins & Sylliano 2003)	C19	Employment information and specific job opportunities are posted (Robbins & Sylliano 2002; Carroll 2001; Nielsen 2003a)
Timeliness & Accurateness of Information	C20	Date of last update provided; regular updates made & accuracy checked (Abels et al.1997; Geissler 2001; Mistic & Johnson 1999; Olsina et al 1999; Robbins & Sylliano 2003) )
Security & Privacy Information	C21	1. Security policies for secured transactions described (Geissler 2001)
	C22	2. Privacy policy described (if personal information requested) (Bodkin & Perry 2003;Carroll 2001)
Copyright Protection	C23	Copyright clause/notice provided (where applicable ) (Carroll 2001; Turner 2002)

each separate Design and Content variable were calculated using the SPSS frequency function.

To answer our main research question—"To what extent have Malaysian firms incorporated the essential features in their web sites?"—we conducted two types of analysis. First, the web site of each company was analyzed in terms of the usability variables in our Assessment Guide. Second, each variable was analyzed in regard to its implementation by all the sampled firms.

## FINDINGS

### DETERMINING FIRMS WITH OPERABLE WEB SITES

Achieving this objective was not as simple and straightforward as it might first appear. Although we started with 65 companies in our study, we found that only 31 of the 65 had hyperlinks on the KLSE web site ([www.klse.com.my](http://www.klse.com.my)), and of these, one had faulty hyperlinks that led to a web site different from the one indicated. Taking the total list of companies whose web sites had so far not been found (a total of 35), we did further checking by using the Dogpile meta-search engine ([www.dogpile.com](http://www.dogpile.com)) and found an additional nine, which made a total of 44 of the 65 that did indeed have URLs. However, when we tested their URLs for functionality, as earlier researchers had recommended (Thelwall 2000; Carroll 2001), we found four URLs were inoperable. This left us with a total altogether of 40 companies that had operable web sites. Then we found that eight of those web sites were shared by *more than one company*.

The eight firms which operated shared web sites were: Rashid Hussain's family of firms, which included Rashid Hussain Bhd and RHB Sakura Merchant, ([www.rhb.com.my](http://www.rhb.com.my)); the CMSB family of firms, which include Cahya Mata Sarawak and the Utama Banking Group, ([www.cmsb.com.my](http://www.cmsb.com.my)); Hong Leong Credit and HLG Capital, ([www.hongleong.com](http://www.hongleong.com)); and the OSK family web site, which includes OSK Holdings and TCL Premier Holdings ([www.osk.com.my](http://www.osk.com.my)). Examination of each of those four web sites revealed that information about TCL Premier was actually missing from the OSK site, and information about HLG Capital was similarly missing from the Hong Leong Group web site. Furthermore, although RHB Sakura's information was blended with the overall RHB information, and the Utama Banking Group's information was available in its parent's (CMSB) web site, qualifying both of these as shared web sites, most of the important information about them was missing. Therefore, these four companies (TCL premier, HLG Capital, RHB Sakura, and the Utama Banking Group) were dropped from our list of firms with operable web sites.

Another company that was dropped from the list of firms with operable web sites was Gadek Capital. This company shared a web site with DRB Hicom (also a public company, but listed under a different sector—not the financial sector). However, the fact that there was insufficient information on the web site caused us to exclude Gadek from the list of firms with operable web sites. The final result was that the total number of companies studied was 35.

Our URL functionality check also revealed that the hyperlinks provided by the KLSE web site, or by the meta-search engine, in some cases directed visitors to web sites operated by the respective company's subsidiary, although the parent company itself does not operate a web site. In these cases, since the activities of the parent company can be inferred through their respective subsidiaries' businesses, we decided to consider the subsidiary web sites as proxies. As shown in Table 3, eight such proxy web sites were found in use.

Next, those companies operating web sites were grouped according to the specific business/market they are in, and were also categorized into holding and non-holding companies. This was done to enable a more precise evaluation of the variables being examined, so that comparisons made are appropriately confined to each group during analysis of the data. The profile of each firm was identified through reviewing the summaries of their main activities, as published on the KLSE web site. When the information for a given company was found to be incomplete there, we visited the firm's web site to verify its main activities. Those companies that mainly manage their subsidiaries were classified under the 'Investment-holding' group, whereas the remaining firms are categorized as either 'Bank-holding', 'Insurance', or 'Other'. Companies classified in the 'Other' category included a finance company, a development finance company, a postal company, and a venture capitalist company. The groupings of the companies, the number of companies in each group, and their web site URL availability and operability, all are shown in Table 2.

In light of this study, holding companies are those with subsidiaries, while those that did not own subsidiaries, are categorized as non-holding companies. (See Table 3, for a complete list of companies studied and URLs evaluated, grouped according to sub-sector and holding vs. non-holding category, and web site status as of June 1, 2003.)

Out of the 35 web sites evaluated, 27 were informational-only and eight allowed Internet transactions. Seven out of the eight that allowed online transactions were *banks*; the remaining e-commerce page was operated on the web site of an *investment holding* company, K&N Kenanga. However, it was found that the e-commerce part of its business was conducted by its subsidiary.

TABLE 2. Categories of companies with URLs and operable web sites

*Type of Company	Companies that have URLs	Operable URLs	Informational-only web sites	Informational & Transactional web sites
Investment holding	24	17	16	1
Bank holding	7	7	0	7
Insurance companies	7	7	7	0
Others (Finance, Merchant Bank, Development Finance, Postal, Venture Capital)	6	4	4	0
Total	44	35	27	8

Note: \*This classification was made based on information gathered in the KLSE web site and web sites of the firms.

#### EVALUATION OF OPERABLE WEB SITES BY USABILITY VARIABLE

*Analysis of Usability Scores and Patterns Among Subgroups* Scoring highest on our Web Site Assessment Guide in the category of Design were Pacific & Orient (85%), followed by five other firms, all of whom scored 81%: OSK Holdings, K&N Kenanga, Hong Leong Group, Malayan Banking, and Allianz General Insurance. High scorer in the category of Content was RHB Bank at 80%, followed by MIDF with 78%, and Bank Islam with 72%.

Design and Content variables overall top scorer was MIDF, with a score of 78%. Bank Islam and RHB Bank, both scoring 75%, followed it. The overall lowest rating was received by the Arab Malaysian Corporation, which had a score of 35%. Although for overall count, two banks scored more than 70%, with two others having scores below 70%, as a group, the banks scored low because the three low scorers brought down the average—the lowest being Southern Bank, with a score of only 41%.

'Bank' and 'Insurance' subgroups, as well as Public Finance (from the 'Other' category), furnished extensive information about their branches in their web sites. Also, members of the 'Banks', 'Insurance', and 'Other' subgroups—with the notable exception of Malaysian National Reinsurance—all provided specific product/service and description sections in their respective web sites. In addition, these firms also provided updates on their current products and services. (Figure 1 presents a compilation of all scores, by company.)

*Analysis of Each Usability Variable in Terms of Frequency of Implementation* Frequency counts of each usability variable, according to implementation ratings of our sampled firms, revealed that out of the entire set of usability variables tested, eight Design variables and two Content

TABLE 3. List of companies studied, and URL evaluated, grouped according to sub-sector and holding vs. non-holding category, and web site status

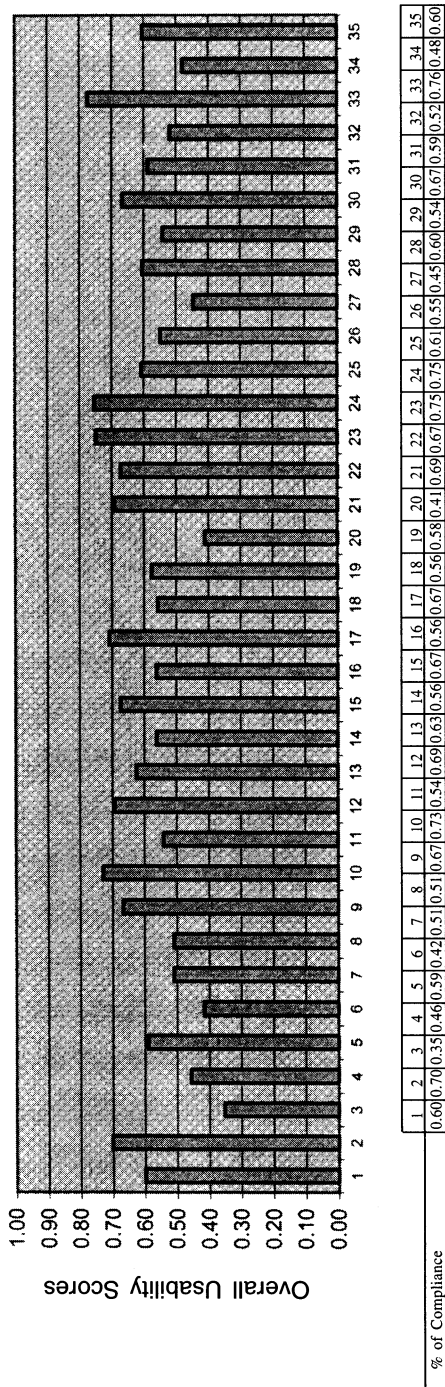
*Sub-sector	No.	Names of Company	*Types of firms (holding vs. non-holding)	URL evaluated
Investment holding	1	Cahaya Mata Sarawak Bhd	Holding	www.cmsb.com.my
	2	Amanah Capital Partners Bhd	Holding	www.amanah.com.my
	3	Arab-Malaysian Corporation Bhd	Holding	www.amcorp.com.my
	4	Berjaya Capital Bhd	Holding	www.berjaya.com.my
	5	Commerce Asset-Holdings Bhd	Holding	www.commerz.com.my
	6	Hwang-DBS (Malaysia) Bhd	Holding	www.hdbs.com.my
	7	Insas Bhd	Holding	www.insas.net
	8	Kumpulan Fima Bhd	Holding	www.fima.com.my
	9	O.S.K Holdings Bhd	Holding	www.osk.com.my
	10	Pacific & Orient Bhd	Holding	www.pacific-orient.com
	11	Pacificmas Bhd	Holding	www.pacificmas.com.my
	12	Rashid Hussain Bhd	Holding	www.rhb.com.my
	13	TA Enterprise Bhd	Holding	www.ta.com.my
	14	MAA Holdings Bhd	Holding	www.maa.com.my
	15	K & N Kenanga Holdings Bhd	Holding	www.kenanga.com.my
	16	CIMB Bhd	Holding	www.cimb.com.my
	17	Hong Leong Group <i>proxy</i> for Hong Leong Credit Bhd	Holding	www.hongleong.com (proxy)
Bank holding	18	Hong Leong Bank Bhd	Holding	www.hlb.com.my
	19	Public Bank Bhd	Holding	www.publicbank.com.my
	20	Southern Bank Bhd	Holding	www.sbbgroup.com.my
	21	Malayan Banking Bhd	Holding	www.maybank2u.com
	22	AM Bank <i>proxy</i> for AMMB Holdings Bhd	Holding	www.ambg.com.my (proxy)
	23	Bank Islam <i>proxy</i> for BIMB Holdings Bhd	Holding	www.bankislam.com.my (proxy)
	24	RHB Bank <i>proxy</i> for RHB Capital Bhd	Holding	www.rhbbank.com (proxy)

TABLE 3. *Continue*

*Sub-sector	No.	Names of Company	*Types of firms (holding vs. non-holding)	URL evaluated
Insurance companies	25	Allianz General Insurance Malaysia Bhd	Holding	www.allianz.com.my
	26	John Hancock Life Insurance (M) Bhd	Holding	www.jhancock.com.my
	27	Malaysian National Reinsurance Bhd	Non-holding	www.malaysian-re.com.my
	28	Syarikat Takaful Malaysia Bhd	Non-holding	www.takaful.com.my
	29	Jerneh Insurance <i>proxy</i> for Jerneh Asia Bhd	Non-holding	www.jerneh.com.my (proxy)
	30	Lonpac Insurance <i>proxy</i> for LPI Capital Bhd	Non-holding	www.lonpac.com.my (proxy)
	31	MINI Insurance <i>proxy</i> for MNI Holdings Bhd	Holding	www.mni.com.my (proxy)
Postal Holding company	32	Pos Malaysia <i>proxy</i> for Pos Malaysia & Services Holdings Bhd	Holding	www.pos.com.my (proxy)
Development finance holding company	33	Malaysia Industrial Development Finance Bhd	Holding	www.midf.com.my
Venture capital holding company	34	Pica (M) Corporation Bhd	Holding	www.picacapital.com
Finance company	35	Public Finance Bhd	Non-holding	www.publicfinance.com.my

*Note:* \*These classifications were made based on the information gathered in the KLSE web site and web sites of the firms.





Financial Firms

Note: Company names are provided in Table 3.

FIGURE 1. Overall usability scores of firms' web sites

variables showed as present on the web sites of 100% of the companies. The Design variables were *Visibility*—via Dogpile (a meta-search engine that incorporates multiple search engines, including the highly-rated Google) and the Yahoo search engine (D1ai, D1aai); ‘No need to download specific software to access web site’ (D4); *Readability* (D6); ‘Availability of menu on home page’ (D7); ‘Links are accurate’ (D14); ‘All pages properly titled’ (D15); and ‘URL address contains company name’ (D19).

Four other Design variables showed a rating from 90-99%: ‘No need to hit Enter to view home page’ (D5); ‘Availability of menu on all subpages’ (D8), ‘Name of company is immediately seen upon page downloading’ (D20); and ‘Logo availability on home page and all subpages’ (D22).

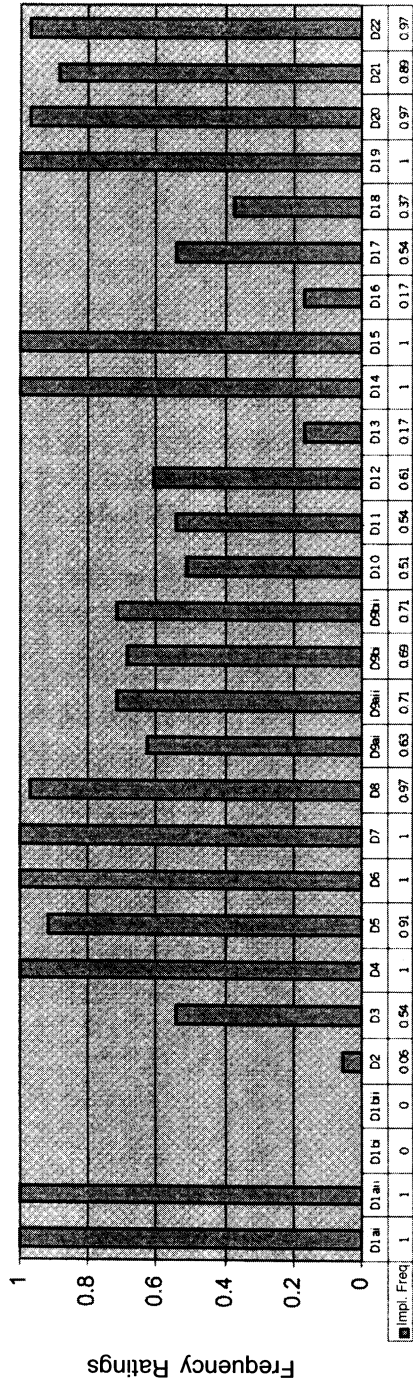
Two Content variables showed a rating of 100% frequency: 1) ‘Information about branches’ (for companies that serve customers through branches, which included all banks and insurance companies, plus the one finance company (C6)); and 2) ‘Information that enables customers to communicate with firms’ (C15a). Types of contact mechanisms utilized by the firms varied—e.g., feedback forms, direct email, customer contact request forms, guest books, customer questionnaires, and contact web master.

Three Content variables showed a frequency rate of use at 90% or above: ‘Contact information for company’s main offices’ (C2); ‘Availability of products and services section’ (C13); and ‘Detailed descriptions of the products/services’ (C14). The contact information for company headquarters/main offices was provided on all web sites except AM Bank, resulting in a 97% frequency rating for that variable. All companies that served direct-end customers had specific sections on their web sites for listing products/services, along with descriptions, (with the exception of Malaysian Reinsurance), resulting in an overall 94% rating for the total group of firms.

Two Design variables showed frequency ratings of zero: ‘Visibility in Malaysian search engines Cari and Bluehyppo’ (D1bi, D1bii); and three Content variables showed ratings of less than 10%: ‘Subsidiary location map’ (C5); ‘Directory of Key Personnel’ (C16) and ‘Choice of language’ (C18). Figure 2 and 3, respectively, provide a compilation of frequency ratings for all Design and Content variables.

## DISCUSSION

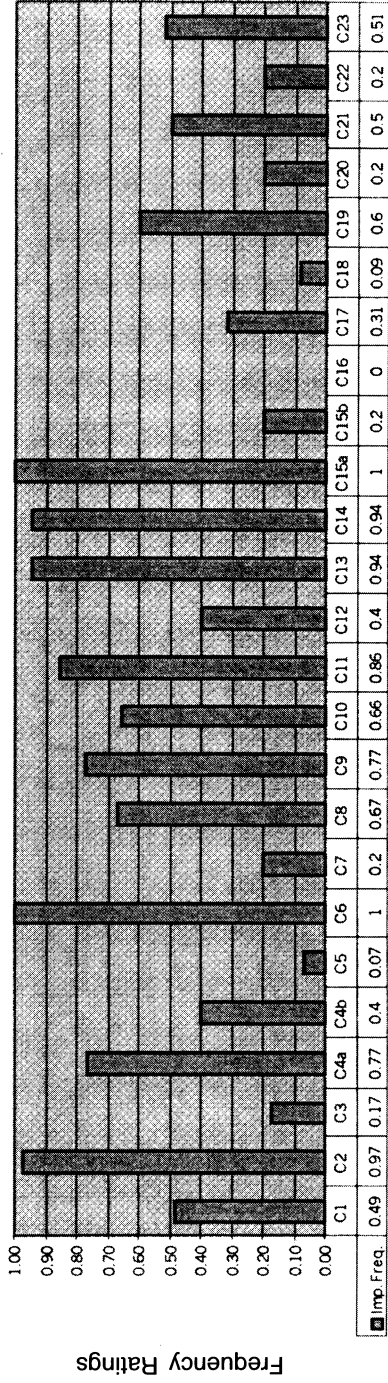
More than half of the sampled companies were operating web sites, a result which is comparable to the findings of Liu et al. (1997) in studies on the financial sector of the Fortune 500 companies. Eight out of 35 web sites (23%) in our sample were *transactional*, a high percentage in comparison to the ones reported in a previous research study in the UK (Hart, Doherty &



**Design Variables**

Note: Description of the codes for Design Variables is provided in Table 1.

FIGURE 2. Implementation frequency of design variables



**Content Variables**

Note: Description of the codes for Content Variables is provided in Table 1.

FIGURE 3. Implementation frequency of content variables

Ellis-Chadwick 2000), but lower than the numbers recorded for Fortune 500 companies (Young & Benamati 2000).

Seven out of eight adopters of *e-commerce systems* in our sample were banks. With the exception of insurance companies, the low use of e-commerce systems among the other subgroups of firms in this study would be expected, because of the nature of the businesses conducted. First, about half were investment holding companies—in the business of managing their subsidiaries. For this type of company, one that has no end products, web sites need only be used for communicating with their intended audience. (The one online trading service that operates from the web site of an investment holding company, Kenanga, turned out to actually belong to its subsidiary.) Second, among the remaining six companies, all in the ‘Other’ category, two serve corporate customers, and their businesses involve large-scale, low volume transactions. For these, extranet technologies are more suitable to support their communications and transactions with customers. The finance and the postal companies—which do cater to both retail and corporate customers—are the only ones for which we know of no reasons for them not to use their web sites for e-commerce. (It is important to note that the types of e-commerce systems being evaluated here are only those obvious to outsiders, e.g., online channels or online purchase of services. This study did not examine whether these companies may have adopted intranets or extranets, which could be implemented under URL platforms separate from their corporate web sites.)

In the case of *insurance companies*, their lack of e-commerce adoption is consistent with studies in the US (Laudon & Traver 2002: 591; 609-610). We can speculate that these companies may hesitate to adopt e-commerce systems because they are trying to avoid undermining their sales agents. Worth noting though, is the fact that some of the insurance company web sites did show signs of an intranet form of communications with their agents. However, these appeared to take place via pages that required the agents to provide names and access codes, and thus were hidden from the public eye and could not be assessed by these researchers.

In regard to the sharing of web sites, which appears to be an appropriate strategy for a family of firms, there may be problems in regard to content, especially when it comes to keeping information accurate and up-to-date. A shortage of information was the reason five companies with shared web sites were dropped from our lists of those having operable web sites. This points to a need for companies that share a web site to ensure that the site serves each company equally well. Such things as missing corporate information (for example, RHB Sakura’s in [www.rhb.com.my](http://www.rhb.com.my)), and ‘confusing Home Page buttons’, are typical of the problems that were observed (e.g., “What and where is ‘Home’?” or “Whose Home is this, anyway?” Visitors who want to go to one company’s Home page may be transferred instead to the

Home page of another company that shares the site.) An exemplary shared web site was that of OSK Holdings ([www.osk.com.my](http://www.osk.com.my)). Among the impressive design features in this huge site were permanent menus for the designated pages of all subsidiaries. Moreover, the Home Page for the whole OSK domain was clearly distinguished from the home pages of subsidiaries.

The proxy web sites in our sample, also a type of shared site, appeared to be serving their target audience better, because they did well at providing information about both the host company and its parent company. The Bank Islam web site was a good example of this type. It provided information about both itself and its parent company, thus serving well its end customers, shareholders, and the general public. Uppermost in mind should be the fact that customers do not care if the web site is a shared one, or a proxy; what is important to them is simply the effectiveness of the web site in providing the information and services they seek.

As reported, among the subgroups, the banks not only utilized web sites to provide information to their stakeholders and to allow subscriber customers to perform transactions, but they also appeared to be the most advanced in utilizing web advertising as *sales promotion tools*. (This may be due to the high level of competition they face.) These findings are not consistent with findings on financial firms of the Fortune 500 companies, where web sites mainly focused on promoting the company only (Perry & Bodkin 2000).

In general, the companies studied have problems in the area of web site visibility, which has been reported elsewhere as one of the most common problems for corporate web sites (Thelwall 2000). While a company's web site might be found via use of well-known international search engines, it is often not visible on local search sites. Such problems may be related to a lack of awareness among the web site managers regarding the importance of listing their URLs in local search sites; the problems could also be caused by inferior technology used by the local search engine companies, and/or by poor management of their systems.

Another general problem is that linkages from other web sites were often found to be lacking. Again, this may be related to the lack of awareness among site managers regarding the importance of having many linkages from other web sites in order to increase the possibility of the sites being found by the targeted users. Effort in increasing the number of linkages to a firm's web site will necessitate networking, a 'side effect' that may or may not be welcomed, but could be turned into an advantage for the company.

The web sites studied scored well on 'accessibility' and 'navigability' factors—such as not needing to download specific software in order to read the site content (100%), and such details as having convenient-to-use menus, and not requiring the site visitor to hit the 'Enter' key to get to the Home page containing the index (91%). One could surmise that the web designers

are aware of the “impatient customer” syndrome, and are doing some things to meet the expectations of that kind of customer. Or perhaps the web designers simply have high empathy for web site visitors in general, and wish to make web use easier for them.

Although we believe that all web sites that offer transactional services should have written security policies on their sites, we found that only four out of eight (50%) published such information. However, this result may be misleading, because we know that all banks, for example, whose operations are highly regulated, have these policies, but the pages may be hidden from the general public’s eye.

While communication with customers was supported by all web sites studied, the providing of a ‘directory of key personnel’ (3%), ‘a subsidiary location map’ (6%), and ‘language choices’ (8%), respectively, was minimal. The lack of information on key personnel may indicate that the use of web sites as a means of communication with outsiders has yet to spread among employees other than those who are directly connected with operations tied to the web site, such as webmasters and customer service/marketing personnel. If a customer wanted to identify the appropriate personnel in order to address a specific concern, a directory of key personnel would certainly save time, avoiding the often-experienced ‘run-around’, but companies may be purposely shielding busy employees from this kind of contact.

Given that 40% of the companies did provide the addresses of their subsidiaries, the additional provision of a subsidiary location map may have simply been seen as unnecessary. As for providing choices of language, all web sites were in English, and 98% did not provide another choice. Because English is today widely considered to be the common international language for doing business, the need to provide other choices probably did not seem strong enough to be worth the extra expense and effort.

The researchers of this study are aware that some of the content and design variables included in this study may be considered to carry much more weight/importance than others. Because it was beyond the scope of the study to rank the variables according to importance and to somehow adjust scores accordingly, it would be unjust to conclude that in all cases the data accurately reflects the awareness of end-user needs on the part of any given company or sub-group of companies. Some firms with low ratings in either or both sets of variables— design and content—may well have incorporated the most important of the recommended usability features, but have forgone some ‘extras’. Thus, the overall scores are of general interest, but should not be overly valued, because of the information that is ‘lost/left out’ in arriving at the percentage scores. Accordingly, the Web Site Usability Assessment Guide is more useful for evaluation purposes when applied to a specific site, rather than in making comparisons of sites based on the scores.

## CONCLUSION

Thirty-five out of 65 public-listed companies in the Malaysian financial sector were using web sites for general communication, general advertising, and for specific promotion and marketing of products and services, to targeted customer audiences, to shareholders and to the general public. A smaller number (8 out of 35 firms) also used their web site for actual business transactions with customers. For *investment holding* companies, the web site mainly serves as an information platform for its subsidiaries. For banks, insurance companies, and others, their web sites serve both to provide information to shareholders and the general public, and to serve end customers.

Analysis revealed that only six out of 35 of the web sites studied scored below 50% on the Web Site Assessment Usability Guide, and thus were significantly lacking in the usability features—content and design features—previously determined by research as essential or important to achieve effectiveness. This suggests that most managers of these public-listed service firms were aware of the features needed to make their web sites accepted by, and useful to visitors.

Analysis of each usability variable revealed that eight of the design features and two of the content features were found on 100% of the web sites. The features most often missing/lacking were visibility of the web site in Malaysian search engines sites, and information on the last update of the site.

Among the subgroups, the banks appear to be the most advanced in adopting e-commerce technologies and in utilizing Web advertising as sales promotion tools.

The findings suggest the need for managers to keep abreast of the content and design features recommended as most important for web site effectiveness. In addition, they need to frequently test their company's web site for usability and effectiveness.

As web sites of Malaysian firms are not so likely to be visible in local search engines, web users are advised to utilize the two popular international search engines, Yahoo and Dogpile, to find them. Because the number of links from other web sites also influences how easy or difficult it is for the target audience to find the sites, these Malaysian financial firms should give more attention to establishing highly linkable sites. Furthermore, since companies today exist within a complex network of other business entities, they need to be aware of problems that others in their network may be having with web site technology, because those problems may have far-reaching effects. For example, in our study it was found that the KLSE needs to check its web site to ensure that all hyperlinks to board-listed members' web sites are operable and accurate. Similarly, all listed companies themselves need to periodically check the KLSE web site as well as their



own, to ensure that both provide accurate hyperlinks to each other's web sites.

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