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An Empirical Analysis of Homepage Design in New Zealand

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Abstract. The most important page on any Web site is the homepage. The homepage is the first page most visitors see and it is the page that all visitors use to explore the site. This makes the design of the homepage critical to the success of the Web site. The principal purpose of this study is to determine how well New Zealand's top 50 Web sites are following internationally recognized guidelines in the design of their homepage. The study also identifies New Zealand's best designed homepages. A literature review of homepage design identified 12 significant Web homepage design criteria in three areas – page design, navigation, and usability. Record analysis is used to determine how well NZ homepages comply with these criteria and which homepages contain the highest proportion of these criteria. Banks, telecommunications, and university Web sites rate high on the list of best-designed homepages.

Keywords : Web design, Web navigation, Web usability, homepage, New Zealand

1 Introduction

For more than a decade, the World Wide Web has been widely accepted as a business tool for commercial transactions. Businesses know that competitors are only a mouse click away and they are likely to lose customers if their Web sites cannot attract and hold a visitor's attention. Thus, effective Web site design becomes crucial as the customer has the opportunity and the ease of going elsewhere. It is critical that Web site designers, Web masters and, especially, Web site owners recognize the attributes of good Web site design to ensure Web sites accurately and effectively deliver information or services to customers and other target audiences.

At the heart of effective Web site design is the homepage. A homepage is the gateway for exploration of the Web site and is considered a prominent landmark in a site [27]. Its primary goals are to inform the visitor about the purpose of the Web site [25] and to guide the visitor through the Web site. A homepage tends to set the tone and theme of the Web site [34]. Typically, a homepage receives more page views than any other page on the site and it often contains more links to other pages than any other page on the Web site. While a homepage is not the

only pathway visitors use to enter a Web site (e.g., visitors may enter through other pages from search engines or other Web sites), if visitors are confused or don't find what they want, they will go to the homepage [22]. For all these reasons and more, the homepage is a Web site's most important page and its design is critical to the success of the site.

The principal purpose of this study is to determine how well New Zealand's top 50 Web sites are following internationally recognized guidelines in the design of their homepage in three areas – page design, navigation, and usability. A secondary purpose is to identify New Zealand's best designed homepages. Fifty of New Zealand's most popular Web sites are examined by record analysis to determine the extent to which they comply with 12 criteria for homepage design and which homepages contain the highest proportion of these criteria.

The lessons learned in this study are relevant to any business with a Web site, any Web site designer, and all Web masters. The results will raise the awareness level of Web site owners as to what is good Web page design and encourage them to be more demanding of their Web site designers. This study is also of interest to researchers because similar studies can be easily replicated in other countries (e.g., [8], [28]), industries (e.g., [14], [29], [31]) or communities (e.g., [2], [20]) to produce highly relevant research and gain high visibility of the research effort.

The following section describes the 12 homepage design criteria – in page design, navigation, and usability – that are examined in this study, based on a review of the Web design literature. The methodology section discusses how these criteria were applied in an analysis of New Zealand's top 50 Web sites. The results section summarizes this analysis and identifies New Zealand's best designed homepages. Implications for industry and suggestions for further research conclude this paper.

2 Criteria for Assessing Homepage Design

Studies of Web page design over the last decade or more have revealed common standards and nearly universally accepted guidelines for homepage design, navigation, and usability. Web page designers such as Powell [27], Cato [6], Fleming [11], and Nielsen [24] have authored books on the subject based on commonly accepted practices in the profession. Other studies have offered empirical evidence of successful Web page design criteria from users' perspectives (e.g., [3], [4], [20]) or by expert review (e.g., [14], [25]). Web design assessment such as that undertaken in the current study has been completed for Web sites (e.g., [2], [8], [29]) and homepages (e.g., [14], [28], [31]).

This current study utilizes landmark homepage design research conducted by Jakob Nielsen and Marie Tahir in 2001 [25] to identify 113 guidelines that characterize excellent homepage design. The current study has selected 12 of these guidelines in page design, navigation, and usability. The 100 guidelines not

included in this study tended to be duplicative (e.g., presence of a search box, width of the search box) or not very important or not relevant to the current study (e.g., many Web sites in this study are from non-commercial organizations, so there would be no advertisements or pop-up windows). The selection of the 12 criteria is also based on a preliminary research study [35]. That study included 24 criteria, but 12 of the criteria offered no clear distinction between the 50 sites included in this study, were difficult to accurately assess and/or were not as significant in the literature as the 12 criteria selected for inclusion in this study. Instead, design guidelines/criteria that received significant attention in the literature review (e.g., don't use frames, include a tag line, page length should be 1-2 screens) were included in this study. Two criteria in Nielsen and Tahir's study [25] – background color and text color – were combined. The final 12 criteria for determining New Zealand's best designed homepage are listed and further explained through a literature review in the remainder of this section.

2.1 Page Design

Page design features represent elements that affect how Web sites look and feel. These elements might be text, images, tables, font, color, and layout. The four determining factors of successful homepage page design used in this study are:

Page layout: The entire page should be visible without regard to the horizontal size of the visitor's browser window. Frozen page layout assumes a certain window size and either there will be a large blank spot on the right (window too large) or the visitor must scroll horizontally to see all the content (window too small). Liquid page layout, adjustable according to the size of the visitor's browser window, is best [25].

Frames: Web designers uniformly reject the use of frames because frames can be confusing to users [18], cause usability problems [25], and make the homepage difficult to read by search engine spiders.

Text and background color: Color is an important element in Web page design and should be used to (a) increase readability and usability [16]; (b) inform, entertain, or even evoke subliminal feelings in the visitor [27]; and (c) attract a visitor's attention. However, textual content should be presented using black for body text and white as the background. This combination ensures the maximum possible contrast and the highest possible readability [25].

Tag line: A tag line is a phrase or sentence that clarifies the purpose of the Web site and differentiates the company from its competition [23]. For example, the Wine Searcher Web site declares itself to be "the resource for locating and pricing wines". It is vital to include a tag line on the homepage so visitors know what the company behind the Web site is about.

2.2 Navigation Design

Navigational features guide the Web site visitor in ways that help them achieve their goals for visiting the site. Navigation features should be easily accessible and intuitive in order to insure visitors can find what they want and stay on the site to explore more [21]. Other, general advice for effective navigation is to remain consistent, provide feedback, be easily learned, provide visual aids, and support users' goals and behaviors [11]. The four navigation criteria examined in this study are highly recommended features for homepage navigation from Nielsen and Tahir [25]:

Navigation scheme: There should be a dominant navigation scheme on the homepage that continues throughout the site. For example: navigation bar or tabs across the top [24], a navigation column on the right- or left-hand rail [17] or categories in the middle of the page [25].

Search box: There should be a search box and it should be placed high on the page, preferably in the upper right or left corner.

Footer navigation links: In addition to an overall navigation scheme, there should be a footer at the bottom of the page that provides useful links such as a contact link. This is important because links have been identified as the most important navigation element [32] and if, after reading the page, the visitor hasn't found what he/she is looking for, a footer navigation bar will assist the visitor in knowing where to go next.

Navigational feedback: Most navigation features guide the visitor to where they want to go, but navigation features that tell the visitor where they are (e.g., breadcrumb navigation) is also essential [15].

2.3 Usability Design

The purposes of usability design are to communicate to visitors information can be found, how the site can be used, and what tasks or functions the site provides. From a visitor's perspective, Web usability needs to ensure visitors experience satisfaction instead of frustration [30]. From an organization's perspective, Web good usability results in reduced support costs, higher productivity, and increased profitability from maximizing the potential audience or customer base.

Like navigation, usability can differ in terms of visitors with different knowledge levels, language skills, motivations, and abilities [2], but some Web-wide standards are emerging that satisfy the information needs of most individuals. According to Nielsen and Tahir [25], the following four usability standards apply to the homepage:

Help placement: A "help" link should be available and widely accepted practice, including the ubiquitous Windows Office menu, indicates that most visitors will look for help in the upper right corner.

Page length: Long screens take a long time to load and, like the front page of a newspaper that tries to put essential information "above the fold", one or two full screens is preferred, rarely should a homepage be longer than three screens.

Company information label: A homepage should always have a link that easily directs the visitor to information about the company that owns the Web site, usually labeled "About Us" or "About [name-of-company]."

Alternative text: Alternative text uses the [Alt] tag to provide information about an image, either for a visitor who does not download the graphics or, more commonly, text that appears when a user puts the mouse on top of an image or a picture. Alternative text tags on images and icons are highly recommended.

These 12 criteria in page design, navigation, and usability form the basis for the empirical examination of homepage design in New Zealand. The research method and homepage site selection process is described in the following section.

3 Research Methodology

Observation is the systematic process of recording the behavior of people, objects, and occurrences as they are witnessed, usually in a way that allows some type of learning and/or analytical interpretation [13]. As a research methodology, observation is: (a) used to fulfill a formulated research purpose; (b) is planned systematically; (c) recorded systematically; and (d) subjected to checks or controls on validity and reliability [36].

Observation provides several advantages over other methods of data collection. Observation can improve the quality of data collection and interpretation and facilitate the development of new research questions or hypotheses [9]. Through the use of observation, researchers can collect original data at the time when events occur, and not depend on reports by others. Researchers can interpret and understand the observed behavior, attitude, and situation more accurately, and capture the dynamics of social behavior in a way that is not possible through questionnaires or interviews [13]. Another advantage of observation is that it can capture the whole event as it occurs in its natural environment. Finally, sometimes observation is the only method available to gather certain types of information (e.g., mechanical processes, the study of records, behavior of inarticulate participants such as children) [7].

As a research methodology, observation can be quantitative or qualitative, depending on what is being observed and recorded. Participant observation is a qualitative research technique commonly used in the social sciences [5] and observing user reactions and use of Web sites would reflect a qualitative approach [12]. In this study, record analysis, a non-behavioral quantitative observation technique

is used – either the criterion will be present on the homepage or it will not.

Specifically, in this study an observer records whether each of the 12 Web design criteria identified in the previous section are represented on New Zealand's top 50 Web sites. The observational methodology is well suitable to collect data for this research because: (a) all information required to conduct the analysis is available from the 50 Web site homepages; (b) direct observation is an efficient and effective way to record the desired information; (c) first-hand information can be collected in a natural setting (i.e., Web browser on a typical personal computer); and (d) Web design features on Web sites do not require inference to be identified. In this study, observation provides a "written photograph" of the situation under study, a key description of the application of observation as a research methodology [10].

3.1 Homepage Selection Procedure

The 50 New Zealand Web homepages analyzed in this study are selected from the Top 100 list of New Zealand Web sites from www.ranking.com. Ranking.com determines Web site ratings by measuring traffic metrics such as unique visitors, page views, and link popularity of a Web site [1]. Thirty-nine of the Web sites are from the Top 50 list at ranking.com (eleven sites in the Top 50 list were duplicative of other sites and so were excluded). To make up the difference, eleven additional sites were selected from the Top 100 because they represent a well-known New Zealand company or represent a certain type of Web site (e.g., www.search.co.nz is a well-known search engine site). Table 1 shows the name, URL, and type of site for all homepages examined in this study.

Table 1. New Zealand's top 50 Web sites

Name	Homepage URL	Type of Site
Air New Zealand	www.airnewzealand.co.nz	Airline
ANZ National Bank	www.nationalbank.co.nz	Bank
ASB Bank	www.asb.co.nz	Bank
Bank of New Zealand	www.bnz.co.nz	Bank
ClearNet (TelstraClear)	www.clear.net.nz	Internet service provider
Courier Post	www.courierpost.co.nz	Courier
Dick Smith	www.dse.co.nz	Electronics retail
Enternet Online	www.citynews.co.nz	Online press
Findsomeone	www.findsomeone.co.nz	Dating
Geekzone	www.geekzone.co.nz	IT service
Global Home Loans	www.globalhomeloans.co.nz	Loan company
Harcourts International	www.harcourts.co.nz	Real estate sales and rentals
Holiday Homes Plus	www.holidayhomesplus.co.nz	Tourism

ihug	www.ihug.co.nz	Internet service provider
iSERVE	www.iserve.co.nz	Web services
Job Stuff Online	www.jobstuff.co.nz	Job seeking / recruitment
Kiwi Bank	www.kiwibank.co.nz	Bank
Loyalty New Zealand	www.flybuys.co.nz	Loyalty card / incentive buying
Massey University	www.massey.ac.nz	University
New Zealand City	www.nzcity.co.nz	Online press
New Zealand Government	www.govt.nz	National government
New Zealand Herald	www.nzherald.co.nz	Newspaper
New Zealand Lotteries	www.nzlotteries.co.nz	Lottery gambling
New Zealand Post	www.nzpost.co.nz	Postal service
New Zealand Racing Board	www.tab.co.nz	Sport gambling
New Zealand Tourism	www.tourism.net.nz	Tourism
NZgirl	www.nzgirl.co.nz	Online community
Old Friends	www.oldfriends.co.nz	Online community
Orcon	www.orcon.net.nz	Internet service provider
PN Personnel	www.pnpersonnel.co.nz	Job seeking / recruitment
Rental Home	www.rentalhomesplus.co.nz	Real estate, rentals
Scoop Media	www.scoop.co.nz	Online press
SearchNZ	www.searchnz.co.nz	Search engine
Seek	www.seek.co.nz	Job seeking / recruitment
Smile City	www.smilecity.co.nz	Loyalty card / incentive buying
Stuff Online	www.stuff.co.nz	Online press
Telecom	www.telecom.co.nz	Telecommunications
Telecom White Pages	www.whitepages.co.nz	Directory service
Telecom Yellow Pages	www.yellowpages.co.nz	Directory service
Television New Zealand	www.tvnz.co.nz	Television
Trade & Exchange	www.te.co.nz	Classified ads
TradeMe	www.trademe.co.nz	Auction
UBD Directories	www.ubd.co.nz	Directory service
University of Auckland	www.auckland.ac.nz	University
University of Otago	www.otago.ac.nz	University
Vodafone New Zealand	www.vodafone.co.nz	Telecommunications
Wairarapa Times-Age	www.times-age.co.nz	Newspaper
Westpac	www.westpac.co.nz	Bank
Wine Searcher	www.wine-searcher.com	Search engine
Xtra	www.xtramsn.co.nz	Internet service provider

The homepages of these 50 sites were viewed, measured, and downloaded for subsequent analysis on 17 September 2006. The 12 Web design criteria highlighted in the literature review were applied to each homepage, as described in the next section.

4 Analysis of Homepage Design

The results presented in this section analyze the Web page design according to the criteria outlined above. Space limitations prevent the inclusion of the site-specific data here (the entire evaluation matrix is 50 rows and 12 columns), but these are available from the authors upon request. Comments in Table 2 make reference to the "international study" conducted by Nielsen and Tahir [25] as they applied these 12 criteria to 50 international, well-known commercial homepages (e.g., Amazon.com, Asia Cuisine, BBC, IBM, Wal-Mart) in their landmark study.

Table 2. Homepage design in New Zealand's top 50 Web sites

Criteria	Summary results
Page design	
Page layout	90% of NZ homepages used frozen layout, 10% used liquid layout. Although this is the norm in NZ and internationally (82% used frozen layout), liquid layout is preferred to accommodate different-sized screens of users.
Frames	86% did not use frames. Frames were used on 14% of NZ homepages, much higher than in the international study (4%) and disregarding almost unanimous advice in the Web design community to avoid frames for numerous reasons.
Text/ background color	78% used black for text, 14% used blue, 4% used white, 4% used others; 86% used white for background, 8% used blue, 4% used brown, 2% used black; 72% featured black text on white background, the preferred combination and exactly matching the international study.
Tag line	60% had a tag line, 40% did not have a tag line; horizontal placement varied considerably but all included the tag line in the upper third of the first screen, as recommended.
Navigation	
Navigation scheme	50% used tabs for navigation (30% internationally), 38% used a left-hand rail (30% internationally), 12% used another scheme.
Search box	A search box is nearly a necessity, according to Nielsen and Tahir [25], and 16% of NZ homepages don't have one (14% internationally). Search box placement (68% in upper portion of the page) is recommended practice and consistent with international practice (67% in upper portion of page). (Placement detail: 28% put the search box in upper right corner, 22% put the box in upper left, 18% put the box in upper middle, 16% put the box in the lower right or left corner.)

Footer navigation links	Three-quarters (76%) of homepages have footer navigation links (80% internationally), which are highly recommended.
Navigational feedback	Only half (50%) of NZ homepages provided navigation feedback, which is highly recommended to tell visitors where they are in the Web site.
Usability	
Help placement	Most (56%) NZ homepages do not offer help to visitors. International practice suggests that help is essential if the site offers a number of advanced and complex features, which reflects most sites in this study. More significantly, most sites that offered help (63%) did not put "help" in the upper right corner, which is international practice in most desktop applications and dialogue boxes. (Placement detail: 16% put "help" in the upper right corner, 8% put "help" in the upper left corner, 8% put "help" in the upper middle, 12% put "help" elsewhere.)
Page length	72% had homepages 1-2 screens long, 10% were 2-3 screens, 4% were 3-4 screens, 14% were more than 4 screens; The good news is that 72% of NZ homepages were no more than 2 screens, which is the maximum length by international practice. The bad news is that 14% were longer than 4 screens, almost an acceptable practice according to standards.
Company information	Two-thirds (66%) of NZ homepages included a company information label, compared to 84% in the international study. Furthermore, only 22% used the "About [company name]" label, which is the recommended standard. (Details: 38% used "about us", 22% used "about [company name]", 4% used "about", 2% used "company information".)
Alternative text	Three-quarters (76%) of NZ homepages used alternative text with their images, which is recommended practice.

From the results in Table 2, one can extrapolate that a typical homepage in a New Zealand Web site would use frozen layout, black text on white background, footer navigation links and alternative text. In some cases New Zealand homepages meet or exceed international standards or practice (e.g., tag line, navigation scheme, use of alternative text) but need improvement in other areas (e.g., page layout, frames, help).

5 New Zealand's Best Designed Homepages

Popular interest in this study's results is most likely to focus on "league tables" – which homepage is the best? To address this question we compiled a score for each of the 50 Web sites. The score is based on the "grading criteria" listed in Table 3 in which a 1 is a positive mark, 0 is a negative mark, and 0.5 falls somewhere in between.

Table 3. Score sheet for determining New Zealand's best designed homepages

Criteria	Scoring
Page design	
Page layout	1 mark for liquid layout; 0 marks for frozen layout
Frames	1 mark for not using frames; 0 marks for frames
Text/background color	1 mark for black text on white background; 0 marks for any other combination
Tag line	1 mark for including a tag line; 0 marks for no tag line
Navigation	
Navigation scheme	1 mark for tabs or left-hand rail; 0 marks for any other or no navigation scheme
Search box	1 mark for a search box in upper portion of page; 0.5 mark for a search box anywhere else on the page; 0 marks for no search facility
Footer navigation links	1 mark for including footer navigation links; 0 marks for no footer navigation
Navigational feedback	1 mark for providing navigation feedback; 0 marks for no navigation
Usability	
Help placement	1 mark for help placement in upper right corner; 0.5 marks for help placed anywhere else; 0 marks for no help
Page length	1 mark for a homepage 1-2 screens in length; 0 marks for more than 2 screens
Company information	1 mark for an "About [company name]" label; 0.5 marks for a company information link with any other title; 0 marks for no company information
Alternative text	1 mark for use of alternative text with images; 0 marks for no alternative text

All fifty homepages were marked on these criteria and New Zealand's best designed homepages are shown in Table 4.

Table 4. New Zealand's best designed homepages

Web site homepage	Final score	Web site homepage	Final score
ASB Bank	11	Air New Zealand	7
Telecom	10	ANZ National Bank	7
Vodafone New Zealand	10	Dick Smith	7
TradeMe	9.5	Massey University	7
University of Otago	9.5	New Zealand City	7
Bank of New Zealand	9	New Zealand Government	7
Job Stuff Online	9	New Zealand Tourism	7
Kiwi Bank	9	NZgirl	7
New Zealand Lotteries	9	Old Friends	7
Stuff Online	9	Wine Searcher	7
University of Auckland	9	Xtra	7
Courier Post	8.5	Global Home Loans	6.5
New Zealand Post	8.5	Harcourts International	6.5
SearchNZ	8.5	New Zealand Herald	6.5
Seek	8.5	Television New Zealand	6.5
ClearNet (TelstraClear)	8	UBD Directories	6.5
ihug	8	Westpac	6.5
PN Personnel	8	Enternet Online	6
Telecom White Pages	8	Wairarapa Times-Age	6
Trade & Exchange	8	Findsomeone	5
iSERVE	7.5	New Zealand Racing Board	4.5
Loyalty New Zealand	7.5	Rental Home	4
Orcon	7.5	Geekzone	3
Scoop Media	7.5	Holiday Homes Plus	3
Smile City	7.5		
Telecom Yellow Pages	7.5		

According to the results from this study, the ASB Bank is considered to be New Zealand's best designed homepage, scoring 11 marks. The missing mark is for page layout – ASB Bank uses frozen page layout, not the recommended liquid format. New Zealand's dominant telecommunications companies – Telecom and Vodafone – tie for second, both missing points for frozen page layout and no tag line. Two of the three universities in this study also appear in the top 11.

One aspect of homepage design not explicitly addressed by Nielsen and Tahir in their 2001 study was Web accessibility – the ability of people with physical disabilities to view and use the Web [33]. However, Web accessibility is implicitly addressed in at least three of the 12 criteria examined in this study. First, alternative text provides blind or poor-vision users with information about an image that isn't visible to them. Alternative text is both a key requirement for Web accessibility and one of the easiest to provide [26]. In this study, 19 of the 20 best designed homepages used alternative text, which is a positive indicator of the capability of New Zealand's best designed homepages to serve the needs of the visually disabled. A second important criterion for Web accessibility is liquid layout – the ability of the homepage to adjust according to the size of the user's browser window. Liquid layout is important because screen readers (convert screen text to spoken language) and screen magnifiers (enlarge screen text) work best with liquid layout. Indeed, problems with page layout was identified as the principal source of frustration in a study of blind users [19]. Overall, most New Zealand Web pages do not use liquid layout, but all five sites that do so were in the top 15 best designed Web sites. Third, as noted earlier, frames create confusion and usability problems for all users. This is especially true for users with visual disabilities. All of the top 20 best designed homepages do not use frames, another positive indicator for use of New Zealand homepages by disabled users.

A final observation is that when interpreting the results of this analysis the reader needs to consider homepage considerations in terms of usability for the target audience. Specifically, homepages for different sectors – retail stores, universities, banks, government – will differ in their usability because they support different users who visit the site to perform different tasks. The generic nature of the criteria used in this study makes the comparison in Table 4 possible and valid, but differences in usability means one cannot conclusively say that a homepage in one sector serves its users better than another homepage in a different sector.

6 Conclusion

The principal purpose of this study – to examine how well desirable and internationally recognized Web design features are incorporated into the homepages of New Zealand's top 50 Web sites – has been fulfilled by both the objective results and subjective analysis in Table 2. The second purpose, identifying the homepages that include the most important desirable and internationally recognized

Web design features in their homepage is fulfilled in Table 4.

The target audiences of this study – Web page designers, Web masters, business owners, and university researchers – have also benefited in several ways. First, every reader is now better informed about the characteristics of excellent homepage design (the literature review) and what are New Zealand's top 50 Web sites (Table 1). Second, almost every designer and business owner will be rushing to their Web site to examine how well their homepage compares in these design criteria, and looking to make improvements for the benefit of their customers and their organization. Third, university researchers and students are now aware of a stream of research that is relatively easy to do, has high relevance for the business community, and will be of interest to the business and popular media. This study has examined New Zealand's top 50 Web sites, but comparable studies can be done in different countries, regions, industries, and communities.

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