What Web Features and Functions Are Used by Australian Corporations in Their Websites? A Conceptual Framework and An Empirical Investigation

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ABSTRACT

While more and more companies are investing money in eCommerce by setting up commercial websites on Internet, different companies normally use different Web-technological features and functions on their websites. What Web features and functions are currently available and used in commercial websites? What Web features and functions have been commonly used in designing commercial websites, and what have been least used? Whether differences of using Web features and functions in commercial websites exist in different industries? What are these differences if they exist? Answers to these questions are important to the design of a successful commercial website. The main purpose of this research is to answer these questions by proposing a framework that can categorise and assess current available Web features and functions. Further, 252 commercial websites of listed Australian companies were sampled to empirically investigate the above-mentioned research issues. The research findings are reported and discussed.

INTRODUCTION

Forrester Research Institute (http://www.forrester.com/Product/CoverageArea/ 0,4674,5,00.html) reported that B2C business over the Internet reached US$518 million in USA in 1996, and in 1997, the B2B transactions reached US$10 billion. The total B2C and B2B transactions will be in the range of US$500 billion and US$3 trillion in 2002.

When more and more companies, even small and medium sized companies, are investing a lot of capital in setting up commercial websites on Internet, their purposes for doing so actually differ, ranging from General Publicity, to Customer Support, On-line Information Exchange, and Internet Sales (Cheung and Huang 2000). They also put different categories of contents on the websites and the thirteen different categories of contents appeared on most commercial websites are: Company overview/information, Products/services, What's new, Search, Employment opportunities, Customer service/assistance, Index/directory, Financial facts, Links to other sites, Online business services/utilities, Guest book, FAQ, Messages from CEO (Liu et al. 1997).

Further, in a study recently completed by Forrester Research Institute (http://www.forrester.com/), 30 business-to-business websites were assessed and all sites failed in the assessment criteria of value, ease of use, and reliability. Each website had problems like missing content, weak functionality, and frequent errors.

Business organisations therefore become more interested in finding out how effective their websites are designed to meet organisational strategic requirements and eventually increase organisational profits. Various measures, assessment criteria, and instruments have been proposed by some prior researchers in order to assess website quality

(Lederer et al. 1999), end-user computing satisfaction (Harry 1998), usability of website design (Nielsen 1999), and service quality (Xie and Wang 1998). However, a comprehensive assessment framework that aims at providing answers to the questions of what Web-technological features and functions are commonly used in current website design and how those features and functions are used in different industrial websites, is still missing. This research tries to bridge this gap.

A good and comprehensive website assessment framework makes it possible to compare different Web features and functions between commercial websites of business companies. It may also provide general guidelines for website designers to design a more effective and attractive commercial website for business organisations.

The next section of this paper will propose a web assessment framework and Section 3 will present how the proposed framework is used to empirically investigate and assess 252 business organisations' websites that are sampled from companies listed in Australia Stock Exchange. The results of the investigation will be presented and discussed in the final Section of the paper.

A FRAMEWORK FOR CATEGORISING WEB FEATURES AND FUNCTIONS

An assessment framework allows the categorisation of Web features and functions, which can be taken as a benchmark or reassessed later in the future when Web technologies change and develop over time.

Our comprehensive assessment framework is proposed drawn upon prior relevant research and successful website design experiences of industrial experts in the field. Nielsen, "The world's leading expert on Web usability" (U.S. News & World Report, http://www.nngroup.com/

worldtour/speakers.html), lists out top issues that should be considered by website designers: Frames, Scrolling text, Complex URL's, Orphan pages (no links), Long scrolling, Lack of navigation, Non standard link colours (for e.g., blue = not visited, red/purple=visited), Outdated information, and Overly Long Download Times.

Coopee et al. (2000) suggest website designers to include a list of essential elements/features into any website: Catalog development, User tracking, Payment processing, Online fulfillment, Website security, Privacy, Business-business sales models, and Business-customer sales models.

Cell (2000) provides some guidelines for creating a customer-friendly website including: Make your company easy to find online, Keep your site navigation simple and clear, Give your customers a reason to visit your site, Make your site visually appealing, Offer a menu of communications options, and Answer e-mail promptly and professionally.

Table 1 shows the summary of the proposed assessment framework, and all of the Web features and functions included in the framework are elaborated below. The proposed framework aims to:

- Be easily expandable in the future when web technologies change over time; and
- Provide a relatively stable assessment method because contents/componetns of commercial websites will be frequently changed but the general categories of website contents/components may not.

Web Features and Functions that Speed up User Tasks (e.g., Kalakota and Whinston 1997; Kennedy 2000)

One of the primary advantages of eCommerce is the time-saving. Instead of customers' having to leave their houses to purchase items they can now purchase from their homes. This has redefined the

Table 1: A proposed Website assessment framework

Web Features and Functions	Reference
1. Features that Speed up User Tasks	Kalakota and Whinston (1997) Kennedy (2000) Bacheldor (2000) Cheung and Huang (2000)
2. Establish Multiple Communication Channels	Coopee et al. (2000)
3. Provide Suitable Access to Contacts	Kennedy (2000) Fairley (2000)
4. Make the Site Personal	Kalakota and Whinston (1997) Huizingh (2000)
5. Company Information and Advertising	Cell (2000) Slater (2000)
6. Customer Feedback	Bickers (2000)
7. Allow the User to Control Information Detail	Bacheldor (2000)
8. Tools to Aid User Decisions	Kennedy (2000)
9. Using Multimedia	Sweeney (2000) Huizingh (2000) Yasin (2000)

customer's perception of the amount of time that is needed to be spent on purchasing an item. There exist a variety of features that can be added to a web page to assist users in performing their tasks, such as features designed to primarily speed up user interactions with commercial websites.

Kalakota and Whinston describe several tasks that customers engage in when shopping online (1997). The Table 2 is drawn upon research findings from Kalakota and Whinston (1997), Cheung and Huang (2000), Cheung (1998), and our own experiences of investigating commercial Websites.

Table 2: Web features and functions that speed up user tasks

Task	Example Component
Prepurchase Interaction	- Search for Products - Compare Products - Get a Price Quotation
Purchase Interaction	- Online Payment - Payment Form Layout - Authorise Payment
Product Delivery	- Order Tracking - Delivery Notification
Postpurchase Interaction	- Delivery Confirmation - Email Advertising - Special Offers

Establishing Multiple Communication Channels

The power of the Internet not only lies in its ability to provide information and services, but also in providing these services 24 hours a day and 7 days per week (7x24 service). This is especially important when a website is designed to reach global customers who are located in different time zones. Further, an effective communication between customers and companies can be enhanced by providing multiple communication channels such as phoncall, email, FAQ, online forum, and online chat, as shown in Table 3.

Table 3: Web features and functions that can provide full time customer support

Communication Features and Functions
Email support
Telephone Support
Frequently Asked Question (FAQ) section
Information updated at set times (up to the minute, hour…)
Discussion Forums with both other users and experts
Online chat with company's representatives

Providing Suitable Access to Contacts

A company should always consider its customers first. From a customer's perspective, a good company which she or he is willing to have a long-term business transaction relationship with should always be accessible and contactable. Table 4 describes different access properties, which can also be used to enhance e-loyalty of websites (Frederick and Schefter 2000).

Make the Site Personal

While web pages can provide a company with an enormous customer base many companies have endeavoured to make their web

Table 4: The internal and external contacts on a Website

Company Contacts and Personnel	Related Links (External Contacts)
To serve customers better, a web page must have contactable person (s). Through a single access point a company can make available all staff and company sites.	It is a good practice that a web page provides the most relevant links for its customers as well, which could increase users' dependence on the website. In many cases, a particular web page could become a trusted site directing users to other useful sites when related links are established.

Table 5: Methods of personalising the Web page

Provide customers with customised information.	Send information about specials, promotions, deals or other forms of advertising to user groups to whom it would be relevant.
Allow customers to set up their own web page.	Setting up My-Dot-Com sites where the user decides the links and format of their interface to the company's web page. An example is http://www.MyTelstra.com/).
Allow the system to set up the user profile.	Using Cookie technology that allows a system to monitor a user's click patterns and make personalised recommendations to products that fit the users profile.

pages very personal to attract users and increase e-loyalty. The following table describes some e-commerce personalisation features and functions.

Company Information and Advertising

It is important to design a website that provides customers with valuable information about the company. Such information includes:
* Core product offerings
* Services available on their website
* Banners and advertisements
* What's New
* Product Information
* Pricing Information
* Special Offers
* Employment information
* Financial facts
* CEO message

Customer Feedback

Customer feedback is important to any effective customer service. To do this a company must provide suitable facilities for the customer to provide feedback. Web features for this purpose include:
* Customer feedback forms
* Comprehensive customer registration information
* Email feedback
* Product Surveys

Allow a User to Control Information Detail

By giving a user the control of the interaction with a website, the user is empowered to configure the appearance and layout of the website to meet his/her perference so that e-loyalty and user satisfaction could be increased.

An example of this Web feature can be found in http://www.nineMSN.com/, a news and information organisation that allows users to browse through summaries of current articles, linking to a specific article in its entirety, clicking on links to other websites mentioned in the article, and finally a link to related articles in the historical archives. The users can easily configure the layout and format of the website displaying on his/her screen.

One of the main Web features that provide such a powerful function to users is filter. The filter acts as an agent of its user to narrow down or expand the information on a particular subject.

Tools to Aid User Decisions

The use of online decision support systems could improve the user's ability to make a purchasing decision on-line. Some current methods commonly used to employ a user decision support system are:
* Comparison tools such as financial calculators
* Performance data based on specific scenarios
* Report generation for specific customer data

Using Multimedia

Using a variety of multimedia technologies can make a website more attractive and users' navigation experience more enjoyable and thus increase users' repeatable accesses. Table 6 describes samples of multimedia features and usages.

Table 6: Samples of multimedia and the research results

Multimedia	Example of Use
Real-Time Video	• Currently used extensively by all web pages, this technology becomes interesting when the user controls the camera angels and what they are viewing.
Image Modification	• Allowing the user to alter colour schemes on an imported image of a building. • Allow the user to add / remove features from a car they wish to purchase
3-dimension Walkthroughs	• Allow clients to remotely view their designs, and allowing architects to create easily modified "virtual" designs as opposed to physical models.

AN EMPIRICAL INVESTIGATION AND THE RESEARCH RESULTS

So far, we proposed a website assessment framework that categorise currently available Web features and functions and discussed for what purposes these Web features and functions can be effectively used in a commercial website. Next, we shall use this assessment framework to investigate commercial websites of Australia listed companies, so that we could have a general picture about what currently available Web features and functions are used and how they are used in different industries of Australia listed companies. The empirical research results may also provide useful insights and suggestions to website designers.

The 252 sample websites used for this study were randomly selected from the listed companies in Australian Stock Exchange (http://www.asx.com.au/). They represent 22 industries. Table 7 presents a summary of the industry categories and the number of websites surveyed in each category.

We used the following scale to access, assess, and score Web features and functions as shown in Table 8. After the assessment scores are collected, detailed discussion of each category of the framework will be presented in a following format: A graphical representation of

Table 7: Number of industry sites surveyed

Industry	Sites Surveyed
Gold	10
Diversified Resources	3
Energy	10
Infrastructure and Utilities	17
Developers and Contractors	10
Building Materials	7
Alcohol and Tobacco	7
Food and Household Goods	12
Chemicals	4
Engineering	10
Paper and Packaging	7
Retail	23
Transport	13
Media	13
Banks	10
Insurance	8
Telecommunications	13
Investment and Financial Services	15
Property Trusts	8
Healthcare and Biotechnology Inde	10
Miscellaneous Industries	19
Tourism and Leisure	17
Total	252

Table 8: Scales used in the analysis

Scale	1…………………………4…………………………7
	Feature not Present Feature Present but Average Feature Exceptional

Figure 1: Features that speed up user tasks
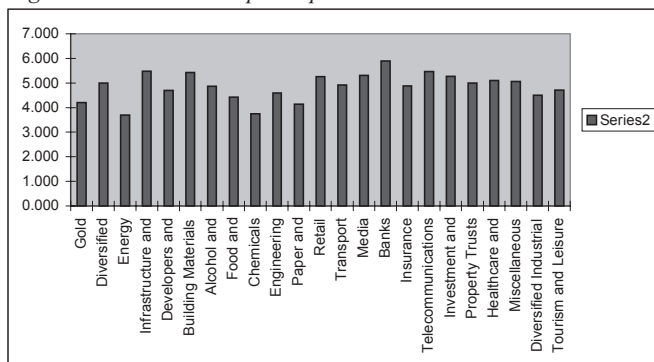
the assessment results is displayed and then a table that summarises the highest and lowest scores and the standard deviation will be provided.

Features that Speed Up User Tasks

Table 9 will be used to summarise the descriptive statistics of the investigation results.

Table 9: Summary of features that speed up user tasks

Features that Speed up User Tasks	
Average Score	4.853
Ranking in All Categories	4
Most used in	Banks (5.90)
Least used in	Energy (3.70)
Standard Deviation	0.555

Examples of better designed websites in this category include the "Macquarie Bank" in the banking industry (http://www.macquarie.com.au/) and "Arcnet" (http://www.cdktectonics.com.au/) and "Villa World" (http://www.villaworld.com.au/) in the developers and contractors industry. They provided the users with features like comprehensive searches, online purchasing, and even some fly throughs.

The standard deviation is slightly above 0.5, indicating only a small variation of using these features and functions across different industries in Australia listed companies.

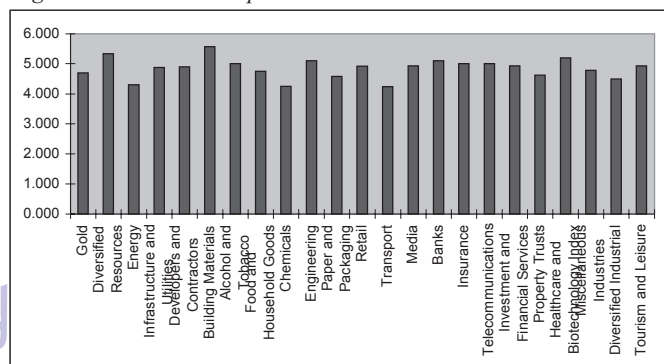*Figure 2: Establish multiple communication channels*

Table 10: The summary

Establish Multiple Communication Channels	
Average	4.848
Ranking	5
Most used in	Building Materials (5.571)
Least used in	Transport (4.231)
Standard Deviation	0.332

A bit surprisingly, the building materials industry takes the lead of this category. The transport industry was scored as the lowest, mainly because they only provide static information to customers in the forms of maps or timetables. "Interaction changes the nature of advertising from persuasion to relationship" (Philport 1997). The building of this relationship may be slowly realised through online chats with company's representatives. In all the websites surveyed there were no 24-hour online chats, but in the media and infrastructure industries there were special guests who would be online for a designated question period.
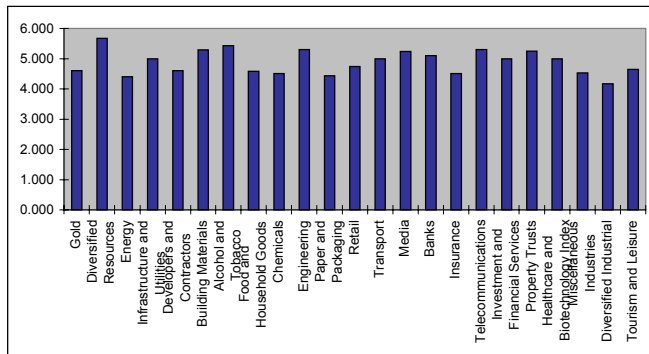
Figure 3: Provide suitable access to contacts

Table 11: Provide suitable access to contacts summary

Provide Suitable Access to Contacts	
Average	4.881
Ranking	3
Most used in	Diversified Resources (5.667)
Least used in	Diversified Industrial (4.167)
Standard Deviation	0.398

Providing Suitable Access to Contacts

Although the Diversified Resources industry scored the highest, websites in all industries surveyed provided suitable access to contacts. The majority provided at least:
- Contacts to the company regarding general enquiries
- Links to other related websites and services
  Some of the more comprehensive websites also provided:
- Specific contacts for specific problems
- Full employee and service directories with email and telephone access

Websites that provide excellent access to contacts include Norwest (http://www.norwestenergy.com.au/) and SPP/CPM (http://www.sppcpm.com/) and AGL (http://www.agl.com.au/) in the energy industry and the Raptis Group (http://www.raptis.com/) and James Hardie Industries (http://www.jameshardie.com/) in the building industry. All of these sites cover almost all the contacts for customers including help contacts, staff contacts and related links.

Make the Site Personal

It is clear from the above Figure that the companies involved in Diversified Resources and Transport industries were the most domi-
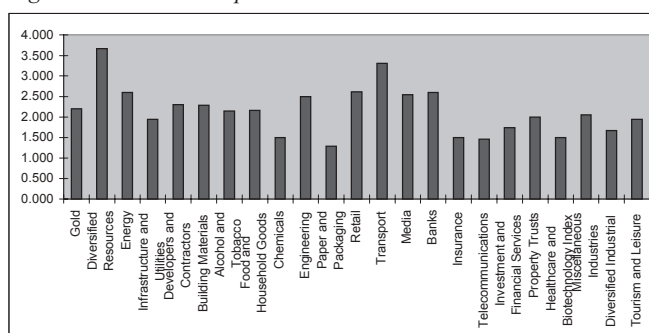
Figure 4: Make the site personal

Table 12: Make the site personal summary

Make the Site Personal	
Average	2.152
Ranking	9
Most used in	Diversified Resources (3.667)
Least used in	Paper and Packaging (1286)
Standard Deviation	0.587

nant in this category. The average score for this feature was slightly above 2, which is quite low.

This area does provide the company with the opportunity to send tailored advertising through cookie technology, with a potential of doing one-on-one marketing. Besides the cookie technology, a push technology such as PointCast (http://www.pointcast.com/) allows information and services to be specifically tailored to meet the needs and interests of an individual user.

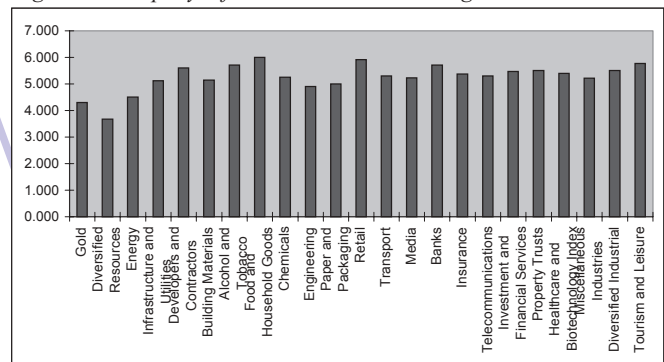*Figure 5: Company information and advertising*

Table 13: Company information and advertising summary

Company Information and Advertising	
Average	5.255
Ranking	1
Most used in	Foods and household Goods (6.000)
Least used in	Diversified Resources (3.667)
Standard Deviation	0.531

Company Information and Advertising

A major advantage for a company to create a web presence is the cheap and efficient advertising over Internet. For this reason it is no surprise that this category received the highest overall score. The Diversified resources industry had the lowest score. BHP had an outstanding website against this category (http://www.bhp.com.au/), with an average score of 6.0. Orogen (http://www.orogen.com.au/) received an average score of 4.56 and Rio Tinto (http://www.riotinto.com/) had the lowest score of 3.33

The websites that have done well in advertising their products and services are Stadium Australia (http://www.stadiumaustralia.com.au/) that was in charge of the 2000 Olympic stadium and Billabong (http://www.billabong.com/) , a surf clothing retail store.

Figure 6: Customer feedback
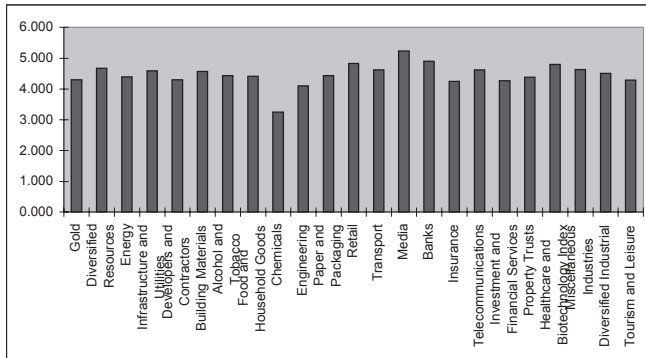
Table 14: Customer communication summary

Customer Communication	
Average	4.468
Ranking	6
Most used in	Media (5.231)
Least used in	Chemicals (3.250)
Standard Deviation	0.367

Customer Feedback

The media industry headed up the customer feedback category, with an average score of 5.231. The lowest score went to the Chemical industry, with an average score of 3.250.

The websites being good examples of customer feedback are Union Capital (http://www.unioncapital.com.au/) whose main businesses are involved in mineral exploration in Australia, PNG, Vanuatu, Guinea, Sierra Leone and Iran; as well as investment in information technology organisations, and Envestra (http://www.envestra.com.au/).

Allow a User to Control Information Detail

Telecommunications provided users with more control of access to information, mainly in the form of technical specifications and

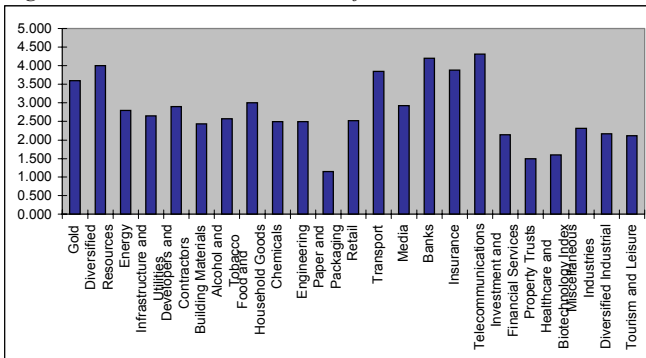*Figure 7: Allow the user to control information detail*

Table 15: Allow the user to control information detail summary

Allow the User to Control Information Detail	
Average	2.765
Ranking	8
Most used in	Telecommunications (4.308)
Least used in	Paper and Packaging (1.143)
Standard Deviation	0.866

phone/internet plans and packages. Another industry allowing the users to control their information details is the airlines, which allows users to control the use of travel planners over Internet.

Many of the airlines websites provide the user with different levels of information detail regarding itineraries. The Web features and functions in these sites guide a user through the different levels, or provide searches on all levels of detailed contents, and the provisions for the user to control the level of information detail are also possible. The Qantas Online Itinerary Planner (http://www.qantas.com.au/) is a good example.

Figure 8: Tools to aid user decisions
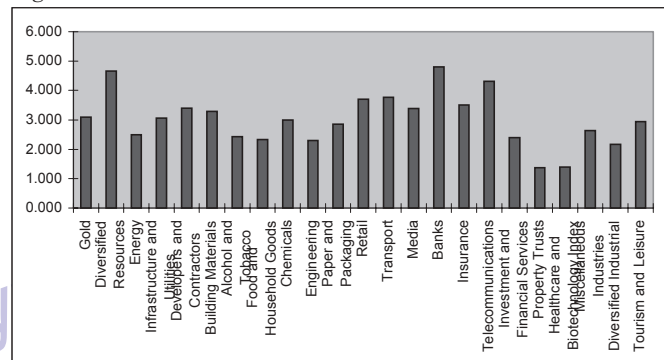
Table 16: Tools to aid user decisions summary

Tools to Aid User Decisions	
Average	3.013
Ranking	7
Most used in	Banks (4.80)
Least used in	Property Trusts (1.375)
Standard Deviation	0.889

Tools to Aid User Decisions

Including tools to aid user decisions on a website can facilitate the purchasing decision making for on-line shoppers. Allowing the users to preview what an outfit will look like and preview a design by generating a 3-dimension model could help customers feel satisfied with the products and/or services and thus enhance a company's on-line business transactions.

An effective financial calculator can be found on Macquarie Bank's website (http://www.macquarie.com.au/). There are various options laid

out and the text is in an informal conversation format. All these can help enhance the relationship between customers and the company, which could eventually lead to e-loyalty (Reichheld and Schefter 2000).
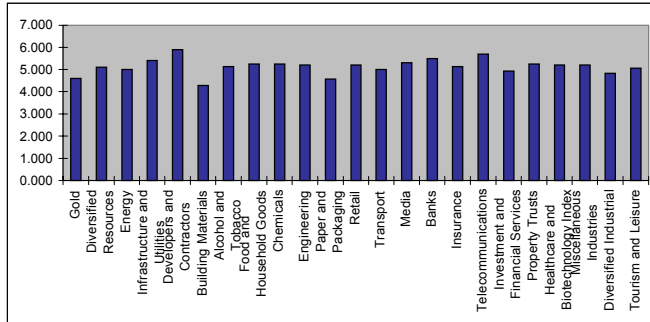
Figure 9: Using multimedia

Table 17: Using multimedia summary

Using Multimedia	
Average	5.231
Ranking	2
Most used in	Developers and Contractors (5.90)
Least used in	Building Materials (4.286)
Standard Deviation	0.350

Using Multimedia

The results depict a fairly even spread of multimedia throughout all industry, with a small standard deviation value of 0.350. The Building Materials industry received the lowest score in this category. On the other end of the spectrum the Developers and Contractors industry headed the list with an average score of 5.90. Its website displayed integrated image, sound and video in the form of user controlled walk/fly throughs. The main technology used to do this was Shockwave Macromedia (http://www.shockwave.com/). Websites that provide exceptional user controlled walk throughs are Villa World (http://www.villaworld.com.au/) and Austal Ships (http://www.austal-ships.com.au/), both of which provide full multimedia presentations of their products and services.

Summary

Listed below is a summary of the Web features and functions and their assessed scores.

The top 6 items in the Table 3.11 are fairly common ones found to be used in most websites. The last three represent the next wave of Web features and functions, only being used in some websites of a few industries.

The industry rankings in terms of the extent of using currently available Web features and functions are shown in the following table.

CONCLUSION

The purpose of this paper is to propose a Web assessment framework that structures Web features and functions being commonly used in current commercial website design, which also presents a general picture of what and how Web features and functions are currently used. Further, the framework was used to investigate the current status of using the Web features and functions in commercial websites of the listed companies of Australia.

Table 18: Web feature and scores

Features	Score
1. Company Information and Advertising	5.255
2. Using Multimedia	5.132
3. Provide Suitable Access to Contacts	4.881
4. Features that Speed up User Tasks	4.853
5. Establish a Full Time Communication Service	4.848
6. Customer Communication	4.468
7. Tools to Aid User Decisions	3.013
8. Allow the User to Control Information Detail	2.765
9. Make the Site Personal	2.152

Table 19: Industry rankings

Industry	Score
Banks	4.867
Diversified Resources	4.641
Telecommunications	4.607
Media	4.453
Transport	4.444
Retail	4.411
Developers and Contractors	4.289
Building Materials	4.254
Infrastructure and Utilities	4.235
Insurance	4.222
Alcohol and Tobacco	4.190
Food and Household Goods	4.102
Engineering	4.056
Miscellaneous Industries	4.047
Tourism and Leisure	4.046
Investment and Financial Services	4.015
Gold	3.956
Healthcare and Biotechnology Index	3.911
Property Trusts	3.875
Energy	3.800
Diversified Industrial	3.778
Chemicals	3.694
Paper and Packaging	3.603

The investigation results report that the most commonly used Web feature by Australia listed companies was the company information and advertising. There were various ways in which this was achieved, ranging from simple photos to an interactive video presentation. Multimedia was the second highest-ranking Web feature, which was not only used for advertising but also found its usage in other areas such as menu navigation and user interaction. The next Web feature to be commonly used in websites was providing suitable access to contacts, which allows the company to become accessible and contactable from its customers. The Web feature of speeding up user tasks was ranked fourth, which includes elements such as search engines and online purchasing information. Establishing multiple communication channels and providing customer feedback, both aiming to serve customers better, were ranked fifth and sixth. All of these Web features were commonly adopted by current website designers. But the Web features and functions to aid user decisions and to allow a user to control information and/or configure the appearance of website, were least used by current website designers. However, these least used Web features and functions could be very important to relationship marketing in the 21st century (Kahn 1998; Kotler 1991) and customers' final purchasing decisions. Therefore, this research finding may provide another clue of why on-line eCommerce transactions have not been so successful as expected. Future commercial website design should pay more attentions to these least used but important Web features and functions to enhance eCommerce for corporations.

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