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ABSTRACT

"When a main street store builds a web site, they open up opportunities to expand their market beyond geographic boundaries. The chances of losing sales from the physical shop are slight, but the potential to increase sales through their web site could be enormous…." [1].

The Internet is world wide virtual world that everyone can access (buy) almost everything they might want in the real world. The web site is the front door of the online store that interacts between the e-tailer and consumers. Setting up the web site seems easy, but to make the site that usable and effective is not so easy. Of the many web sites on the Internet, only a few can survive and make a profit. Thirty New Zealand e-tailing sites were evaluated using a model adapted from that of Hersey. Most sites do a satisfactory job enabling commercial transactions (providing electronic catalogue, online order, online payment and delivery). 70% of those examined are positioned as full e-commerce capability sites. However, they lack a sense of building the consumer's trust, a necessary step towards establishing a relationship. They do not provide the necessary assistance to make it easy for consumers to shop online, nor do they create a consumer community. Only 47% use either pull or push techniques to attract and retain the consumers.

1. INTRODUCTION

The Internet is the fastest-growing technology and it innovates the way that business is conducted. Shopping on the Internet (also known as on line shopping or e-tailing) has a significant effect on the traditional retail format [2]. It is an aspect of business to consumer (B2C) electronic commerce (EC). Thus, it requires a critical understanding by the consumer of their purchase decision because the goods and services cannot be experienced in their reality. Although an on line shop offers the retailer some advantages and cost savings, the electronic retailer faces the difficult question of how to set up (design) the site in order to attract and retain consumers and increase sales. This paper evaluates 30 New Zealand e-tail sites.

New Zealand business Internet presence is growing and New Zealand organisations are conquering Internet-based commerce as it provides them opportunities and competitive advantage (IT Policy Group, [3]). The number of Internet domains registered with .nz has increased rapidly (www.accessnz.co.nz). IDC (cited in [4]) also have forecasted that Internet shopping in New Zealand would be $1,007m in 2001; $ 1,307 per head. Growth in web transactions in business-to-business e-commerce would increase from 69% in 1997 to 84% by 2002 and the web transactions in business-to-consumer trends would increase from 31% in 1997 to 61% during the same period.

2. WEB SITE EVALUATION MODEL

Many researches have tried to analyse web sites and distinguish some differentiation among web sites by looking at their content and their form. For example, awards and prize approach refers to rating the web site and offer them some kind of rewards. The evaluation can be done by either using a selection model (Netguide) or public voting. Content determination is an approach that applies semantic mark-up languages like XML. These languages enhance information retrieval and avoid undesired content. Yahoo (a search engine), directories and meta-indices use this approach. Quality assessments of Internet resources refer to check lists and guidelines for web development. Olsina et al, 1999 (cited in [5]) proposes the web site quality method (QEM). This uses the hierarchical system of web site's attributes. Assessing the business value of web information systems is proposed by Selz and Schubert [6]. The proposed model is used to identify and evaluate successful commercial applications and then the result offers a detailed analysis. A web site evaluation model, developed by Ian Hersey (cited in [7]), is designed to evaluate an e-commerce web site by looking at thirteen elements used for measuring the site.

Usability addresses the relationship between a tool and its user. In order for a tool to be effective, it must allow the intended users to accomplish their tasks in the best way possible. It is concerned with how users interact with computer systems and accomplish what they need to do, rather than about what colour palette is most appropriate. Usability is applied to the quality of a site. Is the product easy to learn, easy to use, easy to remember, error tolerant, and subjectively pleasing. Each web page is a user interface design problem equivalent to that of a dialogue box: you must design a task flow that brings the most important items to the user's attention and design

alternative options to be selected - all the while keeping the meaning of these options clear for novice users.

The analysis model was adapted from Hersey's web site evaluation model (cited in [7]). The model's constructs are easy to operationalise and can measure the overall usability rating of the site The elements used to evaluate the e-tail sites scoring are categorised as: **I**nformation, **T**ransaction **S**ervice, **T**rust, and **N**on-**F**unctional requirements [8]. We evaluated the sites by assigning a 0/1 score based on the presence or absence of the element at the web site. We did not use a five-point Likert scale as used by Hersey, as we want to overcome the problems associated with subjective judgements. A "1" is assigned if the element is present or "0" if absent at the site. If elements that are provided on the site (or their direct links) do not work, an example being a search engine system that is not working where there is usually an error message, a "-1" is scored. We consider that the elements that are present or provided, but are not working, are detrimental to a site. It would be better that such functionality was not present at all, than not working.

3. E-TAIL SITES EVALUATION MODEL

This analysis model was adopted from Hersey's web site evaluation model (cited in [7]). The elements listed below are used to evaluate the e-tail sites by scoring each web site's content. There are four categories: **I**nformation, **T**ransaction **S**ervice, **T**rust, and **N**on-**F**unctional requirements.

3.1 Information

This category includes information that should be provided to the online consumer. There are three information elements. These are Company, Consumer, and Product information.

Company Information: The web site should provide comprehensive company information as it can reassure the consumer about the organisation with which they deal. Sufficient information about a company that hosts a site should be given because it is the basic information that consumers need to know in order to interact with the organisation.

Consumer Information: In order to do on-line selling, the e-commerce sites require prior registration and consumer information, such as payment details including credit card information. Some consumers might not wish to reveal financially sensitive information as they only want to research (e.g. compare prices) and they might not plan to purchase. However this information is important for the e-tail site, some sites require prior registration, especially sites that allow consumers to order on line. If the site wishes to track and provide say after sales service to the consumer, consumer information is required. This information can also be used for web marketing.

Product information: This element is the theme of an electronic commerce site. Like a traditional shop, if you want to sell something, you should show and tell the consumer what you offer. Applying to the electronic shop, the product information is commonly in the form of an electronic catalogue that is built around a database system. An electronic catalogue is used to present information about the products and service graphically by search or browse function. To attract on line consumers, the electronic catalogue needs to offers something different from the printed one. Revitalising products and services in the catalogue offers an added value to your online package. The electronic catalogue must have a product search or browse system.

3.2 Transaction Services

The category is about the service that should be provided as part of a complete online selling system. There are five elements: Negotiation, Order, Payment, Delivery, and After sale service.

Negotiation: The e-commerce site should allow the consumer to bargain as the real commercial counterpart allows such an operation. The web site allows all the customisation of the product/ price that the user could reasonably expect. Some sites provide some form of negotiation ability with the consumer utilising product auctioning.

Order: The on line order option should be offered to consumers for the site to be a complete e-commerce site. For the web sites that have an ordering system, after the list of the required products/services are shown, the system would allow the consumer to select the desired products and/or services and to proceed to the online payment phase. An enquiry form also is included in this element.

Payment: Typically, the trading cycle includes a payment option. Thus electronic trading should support the on line payment option as well.

Delivery: The web site provides as wide a selection of delivery options as could reasonably be expected that are generally satisfactory, convenient and reassuring. If the product is a digital product such as software, a download option is required.

After sale service*:* the contact option provides such as an e-mail contact information or feedback form. It is included because the element is a service by which the site should allow the consumer to contact them and discuss the product's problems. This includes any suggestion or comment from the consumers to the site.

Help: On the web the consumer wants help as much as they would in a store. They need help with product selection (such as size, colour), contact information for sales representation, shopping system, credit policy, information about shipping and handling cost, guarantees and statements about product quality. Alternatively, FAQ (Frequently Asked Question) items might be represented as an element. They can cover a wide range of commonly asked topic such as "What should I do, if I can not find the wanted item" or "How safe is my credit card information if I give it over the net". Additional, FAQ can make

customer feel at ease during their online shopping and influence consumers' purchase decision [2]. Lohse & Spiller [9] claimed sites that offer a FAQ section had more visits that those without this capability.

3.3 Trust

This category is about building trust by providing the legal policies that the site needs to present to the Internet consumer. Consumers executing transactions via the web site have to make purchasing decisions without physically inspecting produce; therefore the site needs to build trust with consumers. The Legal Disclaimer, Privacy Statement and Security Service should be stated. Although these elements are not involving in web development, you cannot ignore them as they are part of the consumer's concerns [8]. The e-commerce guideline book of Ministry of Economic Development [3] also addresses that they are important elements for electronic business.

Legal disclaimer: It is a statement that informs the user about the conditions for using the site and the legal status of any transaction that is done on the site. It is includes the refund and fee policy for purchased product.

Privacy statement: Outlines the reason why the consumer information is collected, and the uses, if any, of the information, including access to it and divulgence to third parties. Bohmann et al [10] claim that consumer's privacy need to be stated for their satisfaction. Ideally, sites should also specify whether or not they use cookies. In practice, a site might have only a sentence to identify that this information will not be passed to a third party.

Security: Outlines the security used to transmit the consumer information. People are often concerned about sending credit card information across the Internet. This is particularly relevant if credit card information is used on-line to pay for services. The site might use a third party to support and validate their site security such as SSL, RSA, or 128 bit.

3.4 Non-functional Requirements

This category is about the performance of the Internet site. In software engineering terms requirements may be functional, that is it describes a system service or function, or non-functional, that is, a constraint on the system [11]. There are four measurements: Aesthetic effect, Ease of use, Innovation and Community. These are modelled on the 'pillars' supporting the e-commerce process as depicted by Hersey.

Aesthetic Effect: This is to measure that the site is using colour, graphics and text to enhance site attraction.

Ease of use: it is a measurement for the performance of the site. It is measured by clicking and linking to the associated information. The links on the site must perform. The site should provide a good response, no dead links or error messages such as "This page cannot be found". If the link is not dead, a score of "1" is given. If the site has a search system, it must work and produce a result, not error messages. Conversely if the site does not provide any links, but resembles an advertised poster we consider it as 'easy to use' if you can understand quickly what it is displaying.

Innovation: This measurement gauges whether the travel agent develops their site to provide an innovative service using more advanced functions to improve its effectiveness and usability.

Community: The web site is excellent at fostering community among its consumers. "The site should help to establish a relationship among consumers on the one hand and between consumer and the company on the other hand." [6]. Therefore, the site should provide some sort of facility to establish a community of people sharing a common interest, for example a bulletin board or consumer review. Word of mouth is a very powerful influence on people especially in coming to a purchasing decision. Alternatively, the facilities may give the site a chance to interact with the consumer. In order to build a consumer relationship, there are two different applied techniques: push and pull. Using the push technique the site supplies the consumer with information. Either the consumer chooses to receive specific updates of information or the site sends unsolicited information that might be of interest to the consumer. For example, a newsletter or information mailed on updated products. The consumer who seeks information and retrieves this information at his/her own need uses the pull technique. Discounts or advertisements are example of the pull technique.

4. RESULTS

We examined thirty New Zealand e-tailing web sites. Donthu & Yoo [12] classified the retail industry into six models. We focused on the brick and mortar sites in which physical stores make their retail products available on the web and manufacturer's sites that directly sell their products to consumers online.

We evaluated the sites by assigning a 0/1 score based on the presence or absence of the facility at the web site. We did not use a five-point Likert scale as used by Hersey, because we want to overcome the problems associated with subjective judgements. A "1" is assigned if the element is present or "0" if absent at the site. If elements that are provided on the site (or their direct links) do not work, an example being a search engine system that is not working where there is usually an error message, a "-1" is scored. We consider that the elements that are present or provided, but are not working, are detrimental to a site. It would be better that such functionality was not present at all, than not working.

The following section is the summary of each element that is present on the New Zealand e-tailling sites (30). The descriptions of the results for the elements are in the order that they were presented in the earlier section.

4.1 Information

Twenty-two (74%) sites provided all three types, (company, consumer, and product) of information, seven (23%), sites have provided two types, and one site, (3%), has provided only one type of information.

Company Information: Most web sites have provided company information, (25 out of 30). Web sites that do not include, are Antique-nz, Blue Star, Digital cameras, Ezibuy, and Software centre. Unlike the other three, Blue Star and Ezibuy have well-established brick-and-mortar operations in the New Zealand retail Industry. However, some sites like Digital camera, target the national and international market. Therefore it is important to provide some company information on the site to tell the consumers, (national and world wide), about the organisation and the services they provide. No one wants to deal with anonymous web sites, especially considering transaction security involving online selling.

Consumer Information: Consumer's personal information is important for retail sites. This is especially so when dealing with complete on line selling that requires the consumer's personal and credit card details. Twenty-seven sites out of thirty sites require consumer information for inquiring, ordering or purchasing.

Product information: There are only three e-tailing sites (10%) that do not present an electronic catalogue. Instead they ask the customer to fill in the enquiry form and send it to them. Some web sites might provide other product information. Those sites that provide an electronic catalogue offer search functions on their sites that allow consumers to search their product catalogues and they perform well. Search engine quality can differ between retail sites because a small store site might provide a search as a simple function like searching what is stocked, whereas a big store like The Warehouse or Sony might provide more complex functions. Some sites such as Digital Camera provide an external link to the product's official site, such as Kodak or Sony for product specification details, or link to a site that provides reviews on particular products. Some sites do not update frequently and ask the customer to contact them for updated stock information.

4.2 Transaction Services

Negotiation: only the Monotapu site displays an item called "Bargain" that allows the consumer to negotiate with the store, but it is not active at the at the time of writing.

Order: 93% of the New Zealand e-tailing sites (28 out of 30) have included this element for online selling. Some sites that provide the shopping system have extended the electronic catalogue to include order functions whereas some sites provide an enquiry form only.

The most common order process is after the customer obtains the search result from the electronic catalogue, at the product description page, (name and price), there is at the bottom an icon called "Add to Cart" or "Buy". After clicking, the site will bring up the shopping list invoice that displays all the products that customer has selected to buy and the total amount of the order. If the customer makes a mistake or changes his/her mind, they simply click on delete and the system will re-calculate the total. If the consumer checks the list and accepts that the items are correct, they can continue to the payment (check out) option (next element). Alternatively, the sites that do not provide an online shopping system would inform the consumer to contact the store by e-mail or provide with a phone number for further assistance and then the site would get back to them either by mail or phone.

Payment: 73% of the thirty New Zealand retail web sites at the time of writing offer online payment, (via the Internet), that is a part of shopping system or independent payment form. The most common online payment option is by credit card.

Delivery: 73% of thirty sites provide this option. The delivery, (shipping), is not free; it is charged depending on the destination. The store's delivery team or a courier can do the delivery. The expected delivery date is also advised.

After sale service: Most web sites (70%) give their contact option to their consumer by email or by phone in response to the customer enquiry. New Zealand sites typically provide a page called "contact us" or "feedback" for the customer to contact them. More that half of thirty, state their after sale service, such as refund policy, return policy or damaged item. Even if it is the same as their typical street policy; it is a valuable statement to tell the consumer how they their handle the transaction.

Help: Only eleven sites, (37%), out of thirty sites provide this element. Nine sites represent it in FAQ format.

The transaction capability of the sites is summarised in Figure 1.

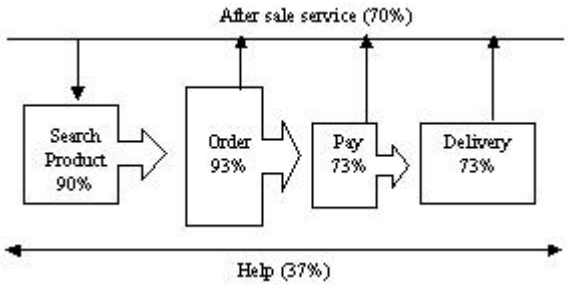

Figure 1: E-commerce (Transaction) Capability

4.3 Trust

Eight (27%) sites have provided all three legal policies (legal disclaimer, privacy, security). Six, (20%) sites provide two statements. Four, (13%), sites have provided one statement and twelve, (40%), sites have not provided any legal polices.

Legal disclaimer: There are only eight e-tailing sites, (27%), that state the conditions and terms of their service on the site. Some of those sites state their refund or return

policy. However, some of the sites' legal disclaimer statements are a typical commerce policy applied to the online transaction, but they are not covering the term and conditions of use of the site- the customer's rights. Only at the Dell site are both stated clearly: one is the terms and conditions of site use, and another is the terms and conditions of the sale. However, the words on the statement protect only the site's right, not the customer's.

Privacy statement: Fifteen sites, (50%), have a privacy statement whereas twenty-seven sites collect customer information. Those fifteen sites also inform the consumer that they are using cookies, why they use one, and how the consumer's information will be treated.

Security: Seventeen, (57%), e-tailing sites state the security of their transactions whereas twenty-two, (73%), of travel sites that use online payments state their transaction security mechanism. There are thirteen sites that do not provide the security statement. Secure Sockets Layer is the common used encryption systems. Six sites use a third party to support and validate the site security. Flying pig, Mitre10 and The Supermarket use the Verisign certificate to validate the site security while Ascent, Game zone, and Soundnz use ThaWte. Alternatively, Flying pig site also uses Bank of New Zealand Credit Cards NetPledge and NetPromise that guarantee safe shopping on the Internet.

4.4 Non-functional Requirements

Aesthetic Effect: New Zealand e-tailing web designs range from simple to complex. Some web sites simply contain product catalogue, company information and contact information, e.g. Macpac. All sites use basic design by using a variety of fonts and colours to layout the site. Alternatively, some sites such as Sony, Soundnz, use fancy graphics, animation and audio, (e.g. mp3 and flash), to make their site more attractive. This element is quite hard to judge because it depends on the organisation, their industry sector and what product they are selling. For example, Sony is leader in IT; thus the site should consist of animation graphics and audio systems. Creating a web site presents a company's image as well. Therefore, the company cannot just simply represent the site with product information as "unanimated photos"; it would not satisfy the consumer's expectation. This also applies to Soundnz, which is in the music industry, thus the site should consist of a fantastic sound system. In contrast, sites like Warehouse or Farmers, contain company information, electronic catalogue with dumb photos. They do not need a complex design to sell their product. The customer visits the site, finds what they want and buy it. Is this sufficient though? Usability is important here. The site should be easy to learn, easy to use, easy to remember, error tolerant, and subjectively pleasing.

Ease of Use: Twenty-nine out of thirty, (96%), web sites have good performance and no dead links, nor produce error messages. Soundnz has a good system and site performance; however, there are some dead links on the page.

Innovation: When the e-tailing sites were studied, seventeen of the web sites present innovations in their design. That is, the site's design is better than expected, particularly regarding their industry sector and the organisation's structure. For example Pumkin Patch was well designed with a good layout and system while it is in the relatively low technology fashion industry.

Community: Twelve sites, (40%), use the pull technique by offering discounts or special price options, while two sites, e.g. Ezibuy and Soundnz use competitions as a technique to entice browsers. Eight sites, (27%), use the push technique, a newsletter or mail list for informing about product updates. Six sites, (20%), Digital cameras, Farmer, Flying pig, Mitre 10, Monotapu and Pumpkin patch use both techniques. For example, the Pumpkin patch web site provides a discount program under the On Sale option.

Web Site	I	TS	T	NF	Total Score
Flyingpig	3	5	3	4	15
Woolworth	3	5	3	4	15
Ascent	3	5	3	3	14
Dell	3	4	3	4	14
GameZone	3	5	2	4	14
Mitre10	3	4	3	4	14
Sony	3	5	3	3	14
The supermarket	3	5	3	3	14
Camerawarehouse	3	4	2	4	13
Pumpkin Patch	3	4	2	4	13
SoundNZ	3	4	2	4	13
AirportShoppers	3	4	3	2	12
DSE	3	4	2	3	12
Iqtoys	3	4	1	4	12
Monotapu	3	4	2	3	12
Farmers	3	3	0	4	10
Pathfinder	3	4	1	2	10
Warehouse	3	4	0	3	10
Antique-nz	2	4	1	2	9
BCL	3	2	0	4	9
Ezibuy	2	3	0	4	9
Bluestaroffice	2	4	0	2	8
Decade	3	2	1	2	8
Digitalcameras	2	3	0	3	8
Campus it	3	1	0	3	7
Textbook	3	2	0	2	7
Macpac	2	2	0	2	6
Bmn	2	1	0	2	5
Software centre	2	1	0	2	5
Deka	1	1	0	2	4

Table 1: Web Site Summary

5. CONCLUSION

The purpose of this paper was to evaluate thirty New Zealand electronic e-tailing web sites. The web evaluation approaches were reviewed. In order to evaluate the sites,

an instrument as web evaluation model was developed to measure the effectiveness and usability of the sample sites. After examining those thirty web sites, we found that 70% of New Zealand e-tailing web sites are positioned as full e-commerce capability sites. However, merely providing the commerce elements e.g. electronic catalogue, online order, online payment and delivery, does not guarantee that the sales will increase. They need to be more concerned with building trust with the consumer. The study showed a lack of elements in this category. The sites demonstrate a lack of awareness of the non-functional requirements such as innovation and community. However, the generalisation of this study is limited by the small (30) sample size of web sites. We cannot conclude that the result is representative of New Zealand e-tailing sites. Moreover, the e-tailing web sites continue to update their web sites and features noted in this project will not necessary be presented in the version currently in use.

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