DEVELOPMENT OF AN INSTRUMENT FOR EVALUATING
CUSTOMER INTERFACE OF B-TO-C WEBSITES

by

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE IN BUSINESS ADMINISTRATION

in

THE FACULTY OF GRADUATE STUDIES
DIVISION OF MANAGEMENT INFORMATION SYSTEMS
FACULTY OF COMMERCE AND BUSINESS ADMINISTRATION

We accept this thesis as conforming to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

January 2003

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Abstract

This report describes the development of a web feature checklist that evaluates customer interfaces in the context of B-to-C (Business-to-Consumer) business. The associated study concentrated on the interaction between consumers and businesses, and the experimental design adopted as its framework the “7Cs” concept, which represents seven design elements to the customer interface introduced by Rayport, Jaworski, Griffin, and Dosiso in chapter four of “E-Commerce” (2000).

The research was conducted in two phases. In phase one, a 113-item questionnaire pool was created by compiling issues proposed by the original 7Cs concept, in combination with items derived from existing guidelines, checklists and research works. Twelve respondents were then asked to categorize each item from the questionnaire pool into one of the “C” categories, using the card-sorting methodology discussed by Moore and Benbasat (1991). This process of sorting resulted in a 56-item checklist.

In phase two, the checklist was applied to evaluate three websites selected and ranked by www.forbes.com. A non-parametric analysis showed that the ranking among the three websites by twelve respondents using the checklist were consistent with the ranking by Forbes. The test results proved that the checklist developed in this research can be an effective instrument for evaluating customer interface in B-to-C businesses. Limitations of the study and possible directions for future research are also addressed in this report.

Keywords: Web Evaluation, 7Cs Framework, Checklist Development, Card Sorting.
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Acknowledgements

The author wishes to express her gratitude to Professor Izak Benbasat, Jai-Yeol Son and Paul Chwelos for their guidance and help in this thesis. Also, the author would like to acknowledge all the MSc and Ph.D. fellow students for their participation in the surveys. Last but not least, this project would not have been possible without the support of Dr. Susan Lazar and the advice, encouragement and friendship from Rushen Shi, Rachel Jen, Lynn li, Yang li, Hazel Yu, Dongmin Kim and Zhenhui Jiang.
1.0 INTRODUCTION

With the rapid growth of the World Wide Web, shopping online has undergone remarkable acceleration during the past few years. Although the economic down-turn has put an end to many dot-Com companies, successful examples and survivors can still be found in the cyber world. While a company’s success depends on many factors, customer interface is one of the major determinants for dot-com survivors. A website’s interface is the storefront for an online company or organization. Its ability to attract customers’ attention, induce them to complete purchases, and motivate them to return plays a crucial role for the online business.

The current study focuses on the interaction between websites and consumers in the context of business-to-consumer electronic commerce. The objective of this study is to design and test an instrument using Raport and Jaworski’s 7Cs framework (2000) for evaluating the interface of business-to-consumer websites. In this study, business-to-consumer e-commerce is identified as the process in which consumers select products from an e-commerce website, and then purchase those products, usually paying for the goods with a credit card.

The general definition of Information System (IS) success is: “the extent to which a system achieves the goals for which it was designed” (Farhoomand and Drury, 1996, pp.45). In the context of electronic commerce, the success of an interface can be assessed by the ability of a website to provide quick answers to a number of questions that
confront their users, how it can support customers’ decision-making, how the site attracts
target segment customers and repels non-target customers, and how it induces customers
to purchase and come back.

Almost all business-to-consumer e-commerce websites are developed from pre-packaged
modules. The usual process includes online ordering, a shopping cart listing the items the
consumer has selected, a check-out that automatically calculates totals and shipping
costs, and secure encrypted transfer of credit card information to a secure server. Beyond
these functional features, however, successful websites are also designed to provide a
comfortable and enjoyable experience to their potential customers, because the site
should welcome them, not just support their purchases.

During the current study, functional and design features identified in previous studies of
e-commerce interfaces were subjected to a survey using the “card sorting” methodology
described by Moore and Benbasat (1991), and sorted into a variety of categories. The
resultant set of features and categories were then formed into a checklist, intended as an
instrument to measure B-to-C websites.

This paper begins, in Section 2.0, with a literature review and an introduction of the
research framework of this study. Following the explanation of the study’s research
methodology in Section 3.0, the checklist construction process is described in detail in
Section 4.0. Section 5.0 describes the interfaces of three sample websites. The testing
process and results using the developed checklist on the three sample websites are
provided in Section 6.0. Section 7.0 discusses contributions made by this study and limitations to its scope.

2.0 LITERATURE REVIEW AND RESEARCH FRAMEWORK

2.1 Literature review

Website evaluations and usability studies have been an area of substantial research interest in recent years, but not all studies have involved solid frameworks or empirical evidence. A wide variety of "evaluation criteria" and "checklists" has been proposed in the relevant literature. Notably, Nielsen (1994) has designed a checklist of items to consider when developing computer interfaces. These checklist items, referred to as heuristics, are considered to be the standard performance indicators for e-commerce. The items included in the checklist are:

- visibility of system status
- correspondence between the system and the real world
- user control and freedom
- consistency and standards
- error prevention
- recognition rather than recall
- flexibility and efficiency of use
- aesthetic and minimalist design
- help for users to recognize, diagnose, and recover from errors
- help and documentation.

Other individuals have engaged in conceptual discussions concerning what should be evaluated and how it should be evaluated, including "Usability Heuristics for the Web,"
by Instone (1997), who adapts Nielsen’s heuristics for the web environment. Instone’s article expands on Nielsen’s ten usability heuristics and reveals web interface principles.

Microsoft Network has also been conducting usability research, and it has also produced a checklist which designers can use to ensure their web pages are effective (Keeker, 1997).

A large number of other web interface checklists or criteria concentrating on various aspects of web sites, such as “what is reader-friendly” (Sullivan, 1997), “ten things to avoid” (Sullivan, 1996), “Recipe for a successful website” (Shedroff, 1994) or “top ten mistakes in website design” (Nielsen, 1996) can be found both in the literature and on the web.

Although few of these checklists and criteria are backed up by any conceptual models or empirical evidence, they have provided practical tips about how to make a website successful in cyber space.

Aside from web evaluation criteria and checklists, research has also been conducted into how to make an effective web site, with various approaches to the issue. Some studies have directly examined the determining or critical factors of a successful website (e.g. Liu, Arnett, 2000; Gehrke, Turban, 1999); others assess consumer’s purchasing behaviour and investigate consumers’ concerns (Jarvenpaa and Todd, 1997), or how to support consumers’ decision-making processes in the web environment (Helander, Khalid, 2000). Other research has attempted to identify web features that may influence user satisfaction (Zhang, Small, von Dran, Barcellos, 1999; 2000; Zhang and von Dran,
2001), and the application of information technology to business strategies (Ives and Learmonth, 1984).

The above mentioned research, however, focuses either on the perspectives of consumers or on that of businesses, leaving a gap between consumers and businesses. In this study, Jaworski and Rayport’s “7Cs” framework described in “E-Commerce” (2000) is adopted as a research framework. This framework has been selected not only because it provides a theoretical foundation of interface design that addresses the overall aspects of customer interface in the context of electronic commerce, but also because it bridges the gap by exploring the interaction between customer and business.

2.2 Framework of current research

In chapter four of “E-Commerce,” coauthored by Jaworski, Rayport, Griffin and Dosios (2000), a “7Cs” framework is introduced, representing seven major categories of the technology-mediated customer interface design. This 7Cs theory describes the interaction between web users and businesses from seven perspectives: Context, Content, Community, Customization, Communication, Connection and Commerce.

• The Context of a website is “how” it is designed, its over-all look and feel, and the extent to which it focuses on graphics, design features and colours, financial goals, or a combination of these characteristics.
• **Content** is “what” is presented on the website. This includes “the form of the
digital subject matter – text, video, audio, and graphics – as well as the domains
of the digital subject matter, including product, service, and information
offerings.” (Jaworski et. al, 2000, pp.115)

• Some websites provide the means for users of the same site to interact with each
other, sharing their shopping and surfing experiences and their knowledge, and
even to develop friendships. This builds a sense of **Community** in the cyber
world.

• **Customization** is defined as “the site’s ability to tailor itself or to be tailored by
each user” (Jaworski et. al, 2000, pp.115). This is the potential for users to
choose their favourite content and to manage their accounts on-line, and also the
site’s ability to efficiently offer promotions according to each customer’s profile.

• While Community refers to user-to-user relationships, **Communication** refers to
site-to-user communication: it is about how users submit requests to the site and
how the site responds to the users.

• **Connection** is defined as the links to the site from other sites. These include
formal links, affiliated programs, banner ads, etc.
• **Commerce** refers to all the functional features related to the sales and services provided by the site.

The examples and issues related to each of the 7C\textsuperscript{s} categories are described in Table 1 as follows:

**Table 1. General Issues and Descriptions of 7C\textsuperscript{s} framework**

<table>
<thead>
<tr>
<th>7C\textsuperscript{s}</th>
<th>General Issues</th>
<th>Examples and Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td>Overall look and feel</td>
<td>Functional, aesthetic or combined Relevance to the business’s objectives</td>
</tr>
<tr>
<td></td>
<td>Colour and background</td>
<td>Consistent and appropriate Simple enough</td>
</tr>
<tr>
<td></td>
<td>Section breakdown</td>
<td>Clear and well-structured Easy to move back and forth</td>
</tr>
<tr>
<td>7Cs</td>
<td>General Issues</td>
<td>Examples and Descriptions</td>
</tr>
<tr>
<td>-----</td>
<td>----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td><strong>Content</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Search engine</td>
<td>Reasonable and helpful</td>
</tr>
</tbody>
</table>
| | Products and services description | Style of descriptions  
What multimedia is used  
Simple and clear  
Necessary and useful  
It is updated regularly |
| | Business description | How the business, news and customer services are described |
| | Promotion | Something special for the present  
Coupon and discount  
How the message is presented |
| | Functions, information, service | Aids to prioritize needs  
Helpful to make decision |
| | Quality of the content | Complete and accurate |
| **Community** | | |
| | Types of community | Message board/chat room  
Member-built site, etc. |
| | Sense of community | Willing to exchange ideas, get information  
Group identity |
| | Benefit from community | Influential, helpful, supportive and fun |
| **Customization** | | |
| | Login/registration | Keep personal profiles  
Provide free e-mail accounts  
Give personalized recommendations  
Short-cut information |
| | Customized e-mail contact | Customized e-mail contact |
| | Layout and content of the screen | People can chose their preferences  
Customized short-cuts provided |
| **Communication** | | |
| | Ways to communicate | Mass mailing/FAQ/newsletters  
Auto-reply mail  
Track order and delivery status  
Live chat or e-mail response  
Online dialogue |
| | Where to find contact information | Customer service page  
Easy-to-find location |
<table>
<thead>
<tr>
<th>7Cs</th>
<th>General Issues</th>
<th>Examples and Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Efficiency</td>
<td>Delivery updated information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quick reply</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Page-loading time</td>
</tr>
<tr>
<td></td>
<td>Credibility</td>
<td>Personal contact always available</td>
</tr>
<tr>
<td></td>
<td>Link to other pages</td>
<td>Links to sites that have what the customer is looking for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Affiliate programs</td>
</tr>
<tr>
<td></td>
<td>Structure</td>
<td>Under separate frame</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pop-up small frame</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Within original frame</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Easy to move back and forth</td>
</tr>
<tr>
<td></td>
<td>Functions</td>
<td>Login/registration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Store customer information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shopping cart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discounts/coupons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Payment methods</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Delivery options</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Save credit card information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check order and delivery status</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Credit approval</td>
</tr>
<tr>
<td></td>
<td>Security</td>
<td>Security statement</td>
</tr>
<tr>
<td></td>
<td>Customer service</td>
<td>Refund and cancellation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide free service and useful information</td>
</tr>
<tr>
<td></td>
<td>Registration form</td>
<td>Necessary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Excessive information is not required</td>
</tr>
<tr>
<td></td>
<td>Personal contact</td>
<td>Where to contact, in what ways</td>
</tr>
</tbody>
</table>

### 2.3 Application of previous research to 7Cs framework

Most of the issues proposed by previous researchers can be fit into the 7Cs framework, as demonstrated above. For example, by concentrating on experts’ recommendations and
by soliciting the opinions of end-users, Gehrke and Turban (1999) have found five categories of determinants for an effective website, from an e-commerce point of view. Among the five determinants, business content can be classified into “Content,” page loading speed can cover the category of “Connection” and “Communication,” navigation efficiency can be included within the category of “Context” and “Connection,” security can be treated as an issue of “Commerce,” and marketing/customer focus can cover the category of “Communication,” “Community,” “Commerce” and “Customization.” The five determinants from Gehrke and Turban’ research (1999) and the corresponding category within the “7Cs” framework are illustrated in Table 2:

<table>
<thead>
<tr>
<th>Determinants of an effective website</th>
<th>Related 7C categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page loading speed</td>
<td>Connection, Communication</td>
</tr>
<tr>
<td>Business content</td>
<td>Content</td>
</tr>
<tr>
<td>Navigation efficiency</td>
<td>Context, Connection</td>
</tr>
<tr>
<td>Security</td>
<td>Commerce</td>
</tr>
<tr>
<td>Marketing/customer focus</td>
<td>Commerce, Customization, Community, Communication</td>
</tr>
</tbody>
</table>

Liu and Arnett (2000) have conducted a survey of webmasters from Fortune 1000 companies with a research framework derived from previous studies. “A successful website, in the context of EC, is one that attracts customers, makes them feel the site is trustworthy, dependable, and reliable and generates customer satisfaction” (Liu and Arnett, 2000). The research has revealed four factors that are the most significant to website success: information and service quality, system use, playfulness, and system design quality. Table 3 shows these factors and the related 7Cs categories.
Table 3. Liu and Arnett’s critical factors to website success compared to categories within the 7Cs framework

<table>
<thead>
<tr>
<th>Critical factors to website success in EC</th>
<th>Related 7Cs categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information and service quality</td>
<td>Content, Context, Communication, Community, Commerce, Customization, Connection</td>
</tr>
<tr>
<td>System use</td>
<td>Connection, Commerce, Customization</td>
</tr>
<tr>
<td>Playfulness</td>
<td>Content, Context, Community, Customization</td>
</tr>
<tr>
<td>System design quality</td>
<td>Connection, Commerce</td>
</tr>
</tbody>
</table>

Many researchers have attempted to model customers’ behaviour while shopping, and they have investigated their concerns and the factors that can affect computer-users’ decision-making. For example, Helander and Khalid’s essay, “Modeling the customer in electronic commerce” (2000), identifies a set of five decisions that customers make when they go through a website: the decision to visit, the decision to navigate, the decision to buy, the decision to pay and the decision to keep. Helander and Khalid also suggest that “the artificial environment must be designed so that it can support customer decision-making” (2000). According to the five decision-making steps, Table 4 addresses the web features that affect customers’ willingness to purchase, and the corresponding categories within the 7Cs framework.

Table 4. Customer decision process compared with categories within the 7Cs framework

<table>
<thead>
<tr>
<th>Customer decision process</th>
<th>Web features that affect customers’ decisions</th>
<th>Related 7Cs categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>To enter the store</td>
<td>Search engines, e-mail messages, links from the site</td>
<td>Content, Context, Community, Connection</td>
</tr>
<tr>
<td>To navigate</td>
<td>Navigation facilities, content quality</td>
<td>Content, Context, Connection</td>
</tr>
<tr>
<td>To buy</td>
<td>Price, product information, promotions</td>
<td>Commerce, Content, Community, Communication, Community</td>
</tr>
<tr>
<td>To pay</td>
<td>Time to fill on-line form, ease of purchasing, credit card security</td>
<td>Commerce, Customization</td>
</tr>
<tr>
<td>To keep the merchandize</td>
<td>Exchange/return policy, feedback information</td>
<td>Commerce, Communication</td>
</tr>
</tbody>
</table>
Similarly, Jarvenpaa and Todd (1997) have studied consumer reactions to electronic shopping by interviewing 220 e-shoppers, and they have identified product perception, shopping experience, customer service, and consumer risk as major concerns for customers. The factors involved in the identified four categories and the related 7Cs categories are displayed in Table 5.

Table 5. Jarvenpaa and Todd’s consumer’s concern compared with categories within the 7Cs framework

<table>
<thead>
<tr>
<th>Jarvenpaa and Todd’s category</th>
<th>Related factors</th>
<th>Related 7Cs categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product perception</td>
<td>Quality, variety, price</td>
<td>Content, Commerce</td>
</tr>
<tr>
<td>Shopping experience</td>
<td>Effort, compatibility, playfulness</td>
<td>Commerce, Community, Content, Context,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customization</td>
</tr>
<tr>
<td>Customer service</td>
<td>Responsiveness, assurance, reliability,</td>
<td>Content, Communication, Commerce</td>
</tr>
<tr>
<td></td>
<td>tangibility, empathy</td>
<td></td>
</tr>
<tr>
<td>Consumer risk</td>
<td>Economic risk, social risk, performance risk,</td>
<td>Content, Commerce, Community</td>
</tr>
<tr>
<td></td>
<td>personal risk, privacy risk</td>
<td></td>
</tr>
</tbody>
</table>

In addition to earlier studies of consumer shopping behaviour, other researchers have focussed on HCI (human computer interaction) to identify people’s needs and the causes of their satisfaction, with the assumption that a successful website has to give users an enjoyable and comfortable experience, rather than simply compelling users to complete a purchase.

Herzberg’s hygiene-motivational theory (1966) about the workplace has been applied to web environments, to distinguish the features that contribute to the basic functionality of a website from other features that contribute to users’ satisfaction and motivate their return to a website (Zhang, Small, von Dran, Barcellos, 1999; 2000; Zhang and von Dran,
Hygiene factors provide the basic architecture and content of a website, and they make the website useful and serviceable; the absence of these factors will cause dissatisfaction among users. Therefore, hygiene factors are the predominant concern when consumers decide whether to shop electronically. Motivational factors, on the other hand, are the factors that will contribute to user satisfaction. They may add value to the functional aspects of design by appealing to aesthetic, cognitive and emotional preferences of users, and they can play a key role when consumers choose among different electronic stores. Identifying these factors may therefore help the business adopt effective strategies for various environments and different business focuses.

For the hygiene-motivational factors applied to the web environment examined by the empirical research for "A Two Factor Theory for Website Design" and "Websites that Satisfy Users: A Theoretical Framework of Web User Interface Design and Evaluation" (Zhang, Small, von Dran, Barcellos, 2000), the 7Cs categories are seen to overlap each other. Details are shown in Table 6.
Table 6. Web application of Herzberg’s Two-Factor theory compared with categories within the 7Cs framework

<table>
<thead>
<tr>
<th>Factor</th>
<th>Theorized application to the web environment</th>
<th>Related 7Cs categories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First impression or general appearance</td>
<td>Context, Content</td>
</tr>
<tr>
<td>Hygiene</td>
<td>Basic functions/ features that help to complete tasks</td>
<td>Content, Connection, Commerce, Context</td>
</tr>
<tr>
<td></td>
<td>Requirements for tasks</td>
<td>Commerce, Communication</td>
</tr>
<tr>
<td></td>
<td>Feedback or response</td>
<td>Commerce, Communication, Connection</td>
</tr>
<tr>
<td></td>
<td>Access restriction</td>
<td>Content, Commerce</td>
</tr>
<tr>
<td></td>
<td>Privacy and data confidentiality</td>
<td>Content, Commerce</td>
</tr>
<tr>
<td></td>
<td>Credibility of owners/designers and the website: trust and trustworthy</td>
<td>Content, Community</td>
</tr>
<tr>
<td></td>
<td>Web owners/designers’ attitudes and perceptions</td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>Authority and availability of owner/designers</td>
<td>Content, Commerce</td>
</tr>
<tr>
<td>Navigation</td>
<td></td>
<td>Context</td>
</tr>
<tr>
<td>Motivation</td>
<td>Information-seeking tasks</td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>Quality of the information content</td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>Presentation/organization of information</td>
<td>Context, Content</td>
</tr>
<tr>
<td></td>
<td>Task completion</td>
<td>Commerce, Community</td>
</tr>
<tr>
<td></td>
<td>User control</td>
<td>Customization, Content, Communication</td>
</tr>
<tr>
<td></td>
<td>Knowledge or skills gained</td>
<td>Content, Commerce</td>
</tr>
<tr>
<td></td>
<td>Recognition by owners/designers of knowledge and skill levels</td>
<td>Customization, Communication</td>
</tr>
</tbody>
</table>

From the business strategy perspective, Ives and Learmonth (1984) have applied information system technology throughout the “Customer’s Resource Life Cycle” (CRLC) in their work. They identify “the information system as a competitive weapon” to analyze and propose supplier-developed strategic information systems. CRLC is a 13-stage customer resource life cycle model, which customers experience when they acquire an organization’s products or services. This model focuses on a firm’s relationship with its customers and “how this relationship can be changed or enhanced by the strategic application of information system technology” (Ives and Learmonth, 1984). The strategic application of information system technology can provide firms with
competitive advantages. The categorizing of information system applications with each step in the CRLC model can also be classified into the 7Cs category as Table 7 below demonstrates:

Table 7. Information system applications according to the CRLC model, compared with categories within the 7Cs framework

<table>
<thead>
<tr>
<th>Construct of CRLC</th>
<th>Information system applications</th>
<th>Related 7Cs category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish requirements</td>
<td>Provide aids to help customers identify their needs</td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>Display success stories from other customers</td>
<td>Community</td>
</tr>
<tr>
<td></td>
<td>Show the customers what products or services can be provided</td>
<td>Content</td>
</tr>
<tr>
<td>Specify</td>
<td>Product appearance</td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>Product feature description</td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>Contact information</td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>Company history, description and updated information</td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>Alternative vendors if the product is temporarily unavailable</td>
<td>Connection, Commerce</td>
</tr>
<tr>
<td>Select a source</td>
<td>Customers can place an order over the web</td>
<td>Commerce</td>
</tr>
<tr>
<td></td>
<td>The site will acknowledge customers’ receipt of the orders</td>
<td>Communication</td>
</tr>
<tr>
<td></td>
<td>Shopping cart is provided for adding and deleting items</td>
<td>Commerce</td>
</tr>
<tr>
<td></td>
<td>Customers are free to modify their orders before paying</td>
<td>Commerce</td>
</tr>
<tr>
<td></td>
<td>Product availability and delivery date is provided before the completion of the order</td>
<td>Commerce</td>
</tr>
<tr>
<td>Order</td>
<td>The web allows various methods of payment</td>
<td>Commerce</td>
</tr>
<tr>
<td></td>
<td>The site has an instant credit-checking function</td>
<td>Commerce</td>
</tr>
<tr>
<td></td>
<td>Security guarantee</td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>The site explains when the payment will be completed</td>
<td>Content</td>
</tr>
<tr>
<td>Authorize and pay for</td>
<td>Customers can check their order status</td>
<td>Commerce</td>
</tr>
<tr>
<td></td>
<td>The shipment date will be confirmed</td>
<td>Communication</td>
</tr>
<tr>
<td></td>
<td>The site provides a choice of delivery options</td>
<td>Commerce</td>
</tr>
<tr>
<td>Acquire</td>
<td>Customers can try out and test the function of the product before placing an order</td>
<td>Commerce</td>
</tr>
<tr>
<td></td>
<td>Easy return policy</td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>Third party function verification</td>
<td>Content</td>
</tr>
<tr>
<td>Construct of CRLC</td>
<td>Information system applications</td>
<td>Related 7Cs category</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Integrate into and manage inventory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor use and behaviour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upgrade if needed</td>
<td>The site will upgrade its function with customers’ needs</td>
<td>Content</td>
</tr>
<tr>
<td>Maintain</td>
<td>On-line help, or information about how to get support with problems</td>
<td>Communication</td>
</tr>
<tr>
<td>Transfer or dispose</td>
<td>Customers can upgrade the products on-line</td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>The site provides instructions on how to return/replace a product</td>
<td>Commerce</td>
</tr>
<tr>
<td>Account for</td>
<td>The site makes it clear how much is spent on tax, products, shipment and packing</td>
<td>Commerce</td>
</tr>
<tr>
<td></td>
<td>The site provides details of each customer’s account information (including previous purchases, returned/cancelled orders, coupons, free gifts etc.). Free and useful services for the customers</td>
<td>Customization, Content</td>
</tr>
</tbody>
</table>

The 7Cs framework not only merges factors and structures from previous research with the research framework applied in this study, but it also includes pre-existing general guidelines and criteria in the questionnaire to which the websites will be subjected, and determines into which of the seven categories each of the guidelines and criteria can be placed.

A checklist that as extensively as possible covers the range of electronic commerce website features, according to the 7Cs guideline, can be developed by aggregation and analysis of the opinions and findings from previous research and identification of related
issues. This checklist would then provide a more comprehensive view of the interaction between consumers and electronic business tools.

3.0 RESEARCH METHODOLOGY

The goal of this research is to conduct a web feature checklist in the electronic commerce domain according to the 7Cs theory.

This study was conducted in two phases:

*Phase I: Constructing a checklist for website evaluation according to the 7Cs theory*

Through an extensive literature review, 113 web evaluation items (see Appendix 1) were compiled from a number of resources to develop an initial questionnaire, then respondent subjects were asked to sort the items according to the seven categories defined in the 7Cs theory, using the “card sorting” methodology (Moore and Benbasat, 1991).

Card Sorting is a technique for exploring how people group items, by developing structures that maximize the probability of users being able to find items. Normally, it starts with a list of all the items to be sorted, each recorded on separate index cards that are subsequently shuffled into random orders. The user(s) are then given the stack of cards and asked to divide the cards into piles, grouped the way they (the users) best see fit.
The current study did not literally use index cards. Instead, the "card sorting" concept was adopted to design a survey questionnaire form: the items were listed in random order and test subjects were asked to pick one category out of seven into which each of the items should be fit, and items that did not seem to fit into any category were left in the "none of the categories" section.

The result was a shorter list of items representing each category and covering the scope of most web features within a certain length.

*Phase II: Testing the effectiveness of the checklist*

After finishing the checklist design, the instrument's sufficiency and its effectiveness for evaluating websites were tested. Three web sites were selected from [http://www.forbes.com/bow/b2c/main.jhtml](http://www.forbes.com/bow/b2c/main.jhtml) for the evaluation test. These websites were ranked from the highest as "Forbes Favorites," one of the best sites as a "Forbes Best of the Web" pick, to one among the other sites, which have no special classification; in other words, the best, good and normal sites according to Forbes's criteria. Apart from the "Forbes Favorites" site, which was labelled by Forbes as the best website, the other two sites were chosen randomly from their classification. The success of each web site was measured with the checklist to see if the results corresponded to the ranking from the original resource (i.e. Forbes.com).
The two phases are described in detail in section 4.0 Construction of the checklist and section 6.0 Instrument testing.

4.0 PHASE I: CONSTRUCTION OF THE CHECKLIST

The objective of Phase I was to construct a checklist according to the 7Cs framework. A heuristic evaluation was completed to accomplish this. A heuristic evaluation (Nielsen and Molich, 1990; Nielsen 1994) is a type of expert evaluation “for finding the usability problems in a user interface design so that they can be attended to as part of an iterative design process. Heuristic evaluation involves a small set of evaluators examining the interface to judge its compliance with recognized usability principles.” (Nielsen, 1994) Heuristic evaluations are well suited for the web because they can be easy, fast and inexpensive. Therefore, the issues identified in a heuristic evaluation have been used to generate a usability test for the current study.

Construction of the checklist was carried out in two stages:

Stage 1: a list of 113 items was constructed according to the description of the 7Cs framework and other resources.

Stage 2: expert subjects were asked to fit each item into one of the 7Cs categories.

4.1 Stage 1: Survey questionnaire design
A list of 62 items that appeared to fit the 7Cs definitions were first collected as the initial questionnaire.

Existing survey questions from several web checklists and evaluation criteria referenced by previous research (Zhang, Small, von Dran, Barcellos, 1999; 2000; Zhang and von Dran 2001) were also added to the list. The sources included:

- http://webreview.com/97/10/10/usability/sidebar.html
- http://www.useit.com/alertbox
- http://www.pantos.org/atw/35317.html
- http://www.capecod.net/schrockguide/eval.htm
- http://www.nathan.com/thoughts/recipe
- http://www.worldbestwebsites.com

Other issues were extracted from theoretical research sources, according to the following guidelines:

- Assessments of items that affect the decision to purchase electronically and the factors that drive repeated visits. (Helander and Khalid 2000)
- Items derived from five major categories (page loading speed, business content, navigation efficiency, security, marketing and customer focus), extracted from an
extensive literature review, and approved through the results of a consumers’
survey. (Gehrke and Turban, 1999)

• Four major factors associated with website success: quality of information and
service, system use, playfulness and system design quality. (Liu and Arnett, 2000)

• Twelve hygiene and motivational categories and 44 core features. (Zhang, von
Dran, Small and Barcellos, 2000)

• Based on a set of functional guidelines, seventeen factors considered very
desirable or desirable for electronic stores. (Liang and Lai, 2000)

• Five of the most important website quality features (security of data, ease of
navigation, appropriate explanatory text, search tools, product and service price
concerns) in electronic commerce. (Zhang and von Dran 2001)

Items were added and compiled to create an instrument that would effectively cover the
scope of electronic commerce interface, making the list of items a sufficient description
of the subject.

The original items were merged into the first questionnaire by deleting redundancies.
Examples of redundant items are as follows:

• *The load time is appropriate to content, even on a slow dial-in connection.*
  (http://www.pantos.org/atw35317.html)

• *Will people be confused or frustrated by uncertainties regarding page-loading,
  audio loading, or download time?*
A list of 193 items is the result of the compilation and extraction from the above-mentioned resources.

Once the 193-item pool was created, items from various categories were then re-evaluated to merge and refine those which have similar meanings.

Examples of similar and refined items are as follows:

- *The colour of the pages is consistent and appropriate.* (constructed from 7C's definition)
- *The site is moderate in its use of color.* ([http://www.pantos.org/atw/35317.html](http://www.pantos.org/atw/35317.html))

Refined as: *The colour of the pages is consistent, simple and appropriate.*

The initial compilation left the following number of items in each category for a total of 113 items. The remaining items are listed in Appendix 1. The following shows the number of items left in each category:

<table>
<thead>
<tr>
<th>Category</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td>19</td>
</tr>
<tr>
<td>Content</td>
<td>20</td>
</tr>
<tr>
<td>Community</td>
<td>13</td>
</tr>
<tr>
<td>Customization</td>
<td>9</td>
</tr>
<tr>
<td>Communication</td>
<td>20</td>
</tr>
<tr>
<td>Connection</td>
<td>11</td>
</tr>
<tr>
<td>Commerce</td>
<td>21</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>113</strong></td>
</tr>
</tbody>
</table>
4.2 Respondents

Seven MIS (Management of Information System) Masters students and five MIS Ph.D. students were asked to complete the sorting.

A profile of the respondents was designed according to the findings of Bellman, et al.'s report in 1999 concerning consumers' attitudes towards electronic shopping. In this report, five consumer characteristics could predict 45 percent of the buying behaviour:

1. whether they look at product information on the web
2. their years of experience with on-line activities
3. their number of daily e-mails
4. whether they work on-line every week
5. whether they read news on-line at home

The profile of expert respondents from the study are listed in Table 8.

Table 8. Profile of respondents participating in the card sorting

<table>
<thead>
<tr>
<th>Subject</th>
<th>Check product info. on the web (Y/N)</th>
<th>Years of experience with on-line activities</th>
<th>Number of daily e-mails</th>
<th>Work on line every week (Y/N)</th>
<th>Read news on-line at home (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Y</td>
<td>6</td>
<td>10-12</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>2</td>
<td>Y</td>
<td>5</td>
<td>Over 10</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>3</td>
<td>Y</td>
<td>10</td>
<td>Over 10</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>4</td>
<td>Y</td>
<td>5</td>
<td>8</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>5</td>
<td>Y</td>
<td>5</td>
<td>15</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>6</td>
<td>Y</td>
<td>5</td>
<td>3</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>7</td>
<td>Y</td>
<td>5</td>
<td>5</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>8</td>
<td>Y</td>
<td>13</td>
<td>60</td>
<td>Y</td>
<td>Sometimes</td>
</tr>
<tr>
<td>9</td>
<td>Y</td>
<td>5</td>
<td>8-10</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>10</td>
<td>Y</td>
<td>8</td>
<td>6-7</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>11</td>
<td>Y</td>
<td>7-8</td>
<td>50</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>12</td>
<td>Y</td>
<td>6</td>
<td>5</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>
This respondent profiles have been retained for further research and explanation of any unexpected results.

4.3 Stage 2: Sorting

The goal of sorting was to construct seven categories for items, according to the 7Cs framework. From the original study of Moor and Banbasat (1991), there were two ways to do the sorting: One was to give the sorting judges clear labels of which constructs the items should be fit into; the other way was to ask the judges to provide their own labels for each construct. Since there were 113 items in the sorting questionnaire, it would have been difficult for the sorting respondents to create constructs if the construct labels were not provided. In this study, 7Cs categories were clearly defined before the sorting. The basic procedure was to ask the experts participating in the study to sort the items from the initial pool into separate categories. Items which had the most “inconsistent opinions” and which did not seem to fit into any of the categories were eliminated. Items were then examined and ambiguous items were eliminated. The final items left after the sorting clearly fit into particular categories, and formulated the checklist according to the 7Cs framework.

The items were placed into a random order in a 113-item-survey. The survey was designed as a multiple-choice questionnaire, asking test subjects which category each item should be fit into. The latter included eight choices, seven of which were the 7Cs categories, and one denoted as “none of the categories.”
Each respondent was asked to complete the questionnaire independently from the other subjects. At the end of the survey, an “additional opinions” section was provided for testers to express their special ideas and to suggest interface features that had been excluded from the list but which could be important to the commerce of the website.

Prior to sorting items on the survey, test respondents read the standard definition of each category of the 7Cs from the original text of Rayport and Jaworski (2000), detailed descriptions of what each C encompasses, with examples, to ensure that the respondents fully comprehended the distinctions between the categories.

### 4.4 Creation of the checklist

After the list of criteria for e-commerce web sites were sorted in Phase I of this study, the answer sheets from the twelve participating judges were examined. The analysis of each judge’s answers is outlined in the following table in the example of items A and B listed below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Context</th>
<th>Content</th>
<th>Communication</th>
<th>Connection</th>
<th>Commerce</th>
<th>Community</th>
<th>Customization</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>B</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>

After collecting the raw data, particular items were eliminated if there was a high level of agreement among the judges, identifying the items as belonging to “none of the categories.” Because there are no established guidelines for determining a “good” level of agreement, the definition of “high agreement level” was set as eight identical
responses out of twelve opinions. It must also be emphasized that this procedure is more like a qualitative analysis than a strictly quantitative procedure.

Examples of the items placed in the “none of the categories” list are given below.

*People will find new challenges as they gain experience.*

<table>
<thead>
<tr>
<th>Context</th>
<th>Content</th>
<th>Communication</th>
<th>Connection</th>
<th>Commerce</th>
<th>Community</th>
<th>Customization</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

*Customers will gain confidence during transactions.*

<table>
<thead>
<tr>
<th>Context</th>
<th>Content</th>
<th>Communication</th>
<th>Connection</th>
<th>Commerce</th>
<th>Community</th>
<th>Customization</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>

For the items that elicited differing responses regarding which category they should fall into, three factors can explain the disagreement:

a. The description of the item is not clear enough

b. The item was not clearly defined as belonging to any of the categories

c. The item tends to cover more than one area

Since the instrument being developed is a checklist within the 7Cs framework, items that do not clearly belong to any category within the framework are beyond the scope of the current research. In other words, items that have disagreement (less than eight identical responses out of twelve opinions) for any of the above mentioned reasons are beyond present research considerations.
The items with a high level of agreement (more than eight identical responses out of twelve opinions) from the judges on a particular category were kept. Examples are as follows.

**Customization**: Web users can personalize the layout and content of their page and make their personal settings.

<table>
<thead>
<tr>
<th>Context</th>
<th>Content</th>
<th>Communication</th>
<th>Connection</th>
<th>Commerce</th>
<th>Community</th>
<th>Customization</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>

**Context**: The colour of the pages is consistent, simple and appropriate

<table>
<thead>
<tr>
<th>Context</th>
<th>Content</th>
<th>Communication</th>
<th>Connection</th>
<th>Commerce</th>
<th>Community</th>
<th>Customization</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>

**Content**: The site provides a clear description of the product

<table>
<thead>
<tr>
<th>Context</th>
<th>Content</th>
<th>Communication</th>
<th>Connection</th>
<th>Commerce</th>
<th>Community</th>
<th>Customization</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>

Based on the results of analysis, a list of 53 items that have high agreement regarding the category to which they belong was identified.

Table 9 shows the original number of items in each category, and the total quantity after the items were sorted:
Table 9. Sorting results

<table>
<thead>
<tr>
<th>7Cs</th>
<th>Original length</th>
<th>Reduced length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>Content</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Community</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Customization</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Communication</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>Connection</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Commerce</td>
<td>21</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>113</td>
<td>53</td>
</tr>
</tbody>
</table>

After they were sorted, the resulting items were compared with the definition and description of 7Cs in the original text, to discern if any important item had been overlooked on the new list. This was done to ensure the development of a list that can fully cover the scope of the 7Cs and best represent the assessment of these websites according to the concepts used in the 7Cs theory.

After further examination, three items that are clearly defined in the text (e-Commerce, 2000) were found to be missing. The omissions consisted of one item within the category of Context and two items from Communication. Descriptions of the items are listed below, with the results of sorting.

**Context:**

*The links are logically grouped and easy to move back and forth*

<table>
<thead>
<tr>
<th>Context</th>
<th>Content</th>
<th>Communication</th>
<th>Connection</th>
<th>Commerce</th>
<th>Community</th>
<th>Customization</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>
Communication:

The site offers FAQs

<table>
<thead>
<tr>
<th></th>
<th>Context</th>
<th>Content</th>
<th>Communication</th>
<th>Connection</th>
<th>Commerce</th>
<th>Community</th>
<th>Customization</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>

The load time is appropriate to content, even on a slow dial-in connection

<table>
<thead>
<tr>
<th></th>
<th>Context</th>
<th>Content</th>
<th>Communication</th>
<th>Connection</th>
<th>Commerce</th>
<th>Community</th>
<th>Customization</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>12</td>
</tr>
</tbody>
</table>

After this inspection, the final sorting result of this research was conducted (see Appendix 2) and the number of items in each category is as follows.

Table 10. Number of items of each category in the final checklist

<table>
<thead>
<tr>
<th>7Cs</th>
<th>Original length</th>
<th>Reduced length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td>19</td>
<td>9</td>
</tr>
<tr>
<td>Content</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Community</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Customization</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Communication</td>
<td>20</td>
<td>9</td>
</tr>
<tr>
<td>Connection</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Commerce</td>
<td>21</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>113</td>
<td>56</td>
</tr>
</tbody>
</table>

5.0 DESCRIPTIONS OF THE THREE WEB SITES.

Three websites were selected from http://www.forbes.com/bow/b2c/main.jhtml as evaluation objects for phase II of this study.

A detailed description of each site within the framework of 7Cs follows.
5.1 Description of www.redenvelope.com

www.redenvelope.com is ranked as the favourite site according to Forbes.

The analysis with the 7Cs framework of this site is described below.

**Context:**

RedEnvelope.com is designed to sell gifts varying from candles, kitchenware and flowers to jewellery and cigars. It combines aesthetics and functionality. On the aesthetic side, RedEnvelope.com is a highly visual site, with lots of photographs of products. On the functional side, it focuses on its core offering – gift selling.
A wide variety of products is crucial in this business. The website has to make people feel that there must be something that suits them. RedEnvelope.com’s top level of options include “occasion,” “recipient,” “lifestyle” and “shops,” under which are listed subcomponents of “for her,” “for him,” “birthday,” “romantic,” etc.

Each of the sections is very well organized and structured. The top-level categories are at the top of every page; customers therefore find it very easy to move back and forth. The links of policy, seasonal products, company information and customer service are clearly displayed on the home page and on every other page. When browsing, a description of the section breakdown is included on top of the left side, making the customers’ current location very clear.

The background colour is white, and colourful pictures of every product are provided. The layout of each page is consistent, clean and simple. The site provides reasonable speed and reliable downloads of graphic information.

**Content:**

RedEnvelope.com is an online store for gifts. The site content focuses primarily on the company’s products. Besides the colourful pictures of the products, the site also provides text information. There are no other multimedia descriptions of either the products or the services.
“Gift Reference” is provided in the “occasion” page to help customers make their decisions. For example, the explanations of “birth stone,” “anniversary” and “birth flowers” give customers ideas about how to choose gifts for certain occasions.

Beyond the product classifications on top of every page, there is also a shopping alternative in the option, “shop our catalogue,” which allows customers to choose items from the full catalogue.

Seasonal products are listed on the home page in a very distinctive area. They are updated from time to time.

The search box is located at the top of right side of every page. If people know the product number, they can find the product directly, or alternatively they can go to the “refined search” page. In this page, people can search products by keyword, category, source code or price range.

A link to the business description “about RedEnvelope” is located at the bottom of the homepage. Company information, including its history, contact information and policies, is described in plain text on that page.
A link to the customer service page can be found in every other page. Besides the contact information, there is a very organized table with a list of links concerning the assistance the page offers to customers.

**Communication:**

People can find the customer service link on top of every page, and contact information is provided on the service page. The customer service is available 24 hours a day, seven days a week.

A chat room is provided within the customer service page, where customers can participate in a live chat if they have any questions while shopping. A help icon called “Personal Shopper” is also listed in the customer service page. When customers need help, they can simply click on that icon and use the pop-up window to chat. The live help service is provided any day of the week, 6 a.m. to 6 p.m.

No FAQ can be found on this site.

The site provides a “Gift Reminder” function in customers’ personal accounts, which will automatically remind customers of their special occasions 14 days earlier.

RedEnvelope.com keeps contact with customers mainly via e-mail. The site sends out a welcome e-mail soon after a new customer’s registration is received, to confirm their
account ID and password. Also, there is an option while registering for customers to subscribe to the company’s e-mail newsletter.

In the customer service page, which can be found through the link on every page, RedEnvelope.com provides a contact e-mail address, a fax number, a physical address and a telephone number.

*Connection:*

RedEnvelope.com presents links to users as underlined and highlighted words and pictures.

Affiliated programs can be found in the customer service page for those who are interested in joining the program. Registration and login pages are also provided.

The links on the site are fast and correct. In the course of this study no system crash was found from the user’s screen.

*Commerce:*

RedEnvelope.com provides login/registration functions for customers. It stores information for both the customer and the gift recipient. Credit card information and billing addresses are also saved.
The shopping bag is always at the top of every page. It is easy to locate and check, and to delete and add items.

The site has security and privacy statements under the customer service page. It uses a secure server (SSL) to encrypt all of the customers' personal information. The strong security measures prevent the loss, misuse and alteration of customer information once it is in the records.

The site accepts various shopping and payment options. Customers can place orders online or over the phone, and they can pay by American Express, Visa, Mastercard and the Discover credit card, and by debit cards with a Visa or MasterCard logo. RedEnvelope.com has instant credit approval functions to check if the credit card is valid.

The inventory is constantly updated in real time. When an item is ordered, customers will find instantly on the product information page whether or not it is in stock, and if not, when it will be.

An order summary of tax, shipping and the item is calculated into a subtotal before check-out.

After ordering, a customer receives two e-mail confirmations from RedEnvelope. First, the site confirms receipt of the order within a few minutes of ordering. Second, the customer is notified when the order ships.

RedEnvelope.com offers three delivery options: FedEx, UPS and Airborne Express.
Customers can check their order history and delivery status via their personal accounts.

Customer satisfaction is guaranteed by RedEnvelope.com. If, for any reason, a customer wants to exchange or return their purchase, the company will replace it with another selection or make a refund to the credit card used for the purchase. If the gift is returned because it is damaged, defective or not the correct product, RedEnvelope.com provides a prepaid USPS return label.

**Community:**

There are no special functions for community such as a "users' club," a "group chat room" or any kind of bulletin board. However, in the text description of goods and pictures of models, RedEnvelope.com presents a strong sense of lifestyle ranging from romantic to sports enthusiast, from daily life to special occasions. These identifiers could be interpreted by customers as a sense of community.

**Customization:**

RedEnvelope.com provides personal accounts for members. Members' profiles and gift reminders are included in each account.

Members can log in to their account any time while they are browsing. They can check their order history and delivery status via their account records.
No customized page layout is provided. The website’s “Personal shopper” function can give customers live recommendations while they are shopping.

5.2 Description of www.tiffany.com

Figure 2. homepage of www.tiffany.com

www.tiffany.com is ranked as one of “Forbes Best Web Picks.” The analysis of this site using the 7Cs framework is described below.

Tiffany is a brand name; the store has been running since 1837. The company’s focus on selling high-valued jewellery, luxury and romantic atmosphere is very important for this site.
Context:

The Tiffany.com homepage consists of two versions, one in HTML and the other in Flash. The Flash version is recommended as an "enhanced" version of HTML. The Flash features pop up once the page starts. The design of the Flash page is more fancy, and it enables users to view the product picture and to zoom in and out to see every detail of the jewellery from different angles. Pictures from the flash site have better quality, making the site more elegant and luxurious, but the loading speed is slow.

Both the site and the picture background are white, making the graphics of the jewellery very distinctive. The grey header complements the pattern well. The layout is consistent from page to page.

The top level of the structure consists of links to a business description "About Tiffany," a guide to choose and care for jewellery, "Jewellery Expertise" and a design collection, "Tiffany Style."

A site index is at the bottom of each page, giving a map of the structure of the whole website. However, some pages don’t have a site map or "go back" link to locate the current position. It is not always easy to go back to the previous page or move to any other page as desired.

Content:
Tiffany.com is a specialty store that focuses on the jewellery business. It doesn’t offer any discounts or promotions under any circumstances. The jewellery pictures appearing on the homepage are changed from time to time to show different styles.

The site starts with the introduction of Tiffany, and a link to the site’s shopping channel is listed on top of the homepage and all the other pages. A business description, “About Tiffany,” is listed at the bottom of each page.

Some extraordinarily expensive jewellery is also presented, though it is not available for on-line shopping. Tiffany.com displays those items with high quality pictures and with a contact number listed below to attract people’s attention and to encourage purchases by other means.

The search engine is found on the “shopping” page. The search criteria include categories and keywords. It is easy for customers to locate the products they are looking for.

Besides the high quality graphics of the products on the consistently white background, there is a simple and clear text description and the product price for each item.
“Jewellery expertise” is aimed at teaching customers how to choose diamonds and pearls, and how to take care of the jewellery. This is a value-added service and can help customers to make decisions.

A customer service link is found at the top of every page. FAQs and a customer on-line account is located through this page.

Community:

There is no “message board,” “chat room” or any kind of member-build site provided in Tiffany.com. However, the luxury environment gives people a strong group identity. Customers’ initial registration can also be made by phone or by visiting a registry consultant at a Tiffany store. This gives people the feeling that they are special and well cared for.

Tiffany has its own credit bureau; people can apply for a Tiffany & Co. credit card. This may provide a strong sense of community and increase customer loyalty.

Customization:

Tiffany.com includes cookies to save users’ information. Orders placed on Tiffany.com are limited to shipments within the U.S. and the U.K. People living outside these two countries cannot even browse the “shopping pages” once they specify their location the first time they browse the site.
Customers can set up their own online accounts when they make a purchase on Tiffany.com. The account information can subsequently be checked when a customer logs in with a registered e-mail address and password. The account retains records of the customer's complete order history and all of the items they were have ever been interested in online. No customer-personalized layout or content is provided in Tiffany.com.

Tiffany.com sends an automatic reply to people who e-mail comments and suggestions to the site.

**Communication:**

A link to the customer service page is located at the bottom of each page. It is very easy to find. On the customer service page, there is a form to allow people to send their feedback to the site, which is convenient and easy for the user. Customers can also leave their names and e-mail addresses to be contacted directly. E-mail questions will solicit e-mail replies. There is also a link to FAQs from the customer service page. No mass-mailing is provided from the site. Except to confirm an online order or response to a sender's e-mail query, Tiffany.com does not contact visitors via their e-mail addresses.
The company contact number is a 1-800 number, posted at the bottom of each page. It is obvious and convenient. The service is available 24 hours a day, seven days a week. This gives the site an excellent level of company credibility.

**Connection:**

The links on the site are fast and correct. In the course of this study no system crash was found from the user’s screen.

If people choose an “enlarged view” of a particular product, a separate frame is popped up with a bigger picture. Because some product pictures are designed in Flash, browsers require high-speed connections for high quality pictures.

There is no affiliation program within Tiffany.com.

**Commerce:**

Tiffany.com provides login/registration functions for customers. It stores customer information such as names, titles, e-mail addresses and phone numbers.

On the customer service page, there is a link to a list of web policies, including statements regarding privacy and returns.
People must register and set up their own account before they can make online purchases at Tiffany.com.

The estimated time of delivery is displayed once the product is selected. Every purchase can be accompanied by a gift card. Customers who want to buy a product as a gift can add their message to the card. There are two shipping options: “ground” and “express.”

The subtotal of shipping, tax and product price is calculated before checking out. Besides Visa, Master, American Express, customers can also pay for their purchases using a Tiffany credit card. Tiffany.com has an instant credit approval function, and the credit card information, in addition to the customer’s shipping and billing addresses, are all stored by the site.

5.3 Description of www.spawish.com

Figure 3. homepage of www.spawish.com
SpaWish.com is designed to sell spa certificates across the United States. The buyer simply needs to decide how much money they want to spend, and the recipient will receive a personalized SpaWish certificate elegantly packaged in a silver envelope, along with a gift card and a printed directory of nationwide participating day spas. Then the recipient can choose any day, any spa and any kind of service or gift they desire.

_Context:_

Apart from its home page, which uses a simple purple tone on a white background, SpaWish.com has more than six colours in its menus bars, logos, forms and text. Various fonts and colours are also used in the site’s text.

Most links and services are listed on the left side of the pages, and the layout is consistent from page to page. However, although the menu bars and logos are at the same position on every page, the length of each page differs significantly. For example, the page titled “Drop A Hint” has a rather short layout, while the page for “Price, Services & Holidays” has five times the length and consists of long service descriptions and forms.

The structure of this site is rather simple. There are altogether four sections on the home page: shopping, customer service, business partnerships, and membership programs. All four sections are listed in a menu bar on each page.
Content:

The main commodity that SpaWish.com sells is gift certificates. Rather than searching for products, the search engine on this site is designed to locate participating spas within the U.S.; results can be sorted by spa name, city and zip code. The search box is at the top left of every page.

Besides gift certificates, SpaWish.com also provides gift bundles, but there is no way to search for a bundle. All the gift bundles are displayed with pictures and prices on the "gift bundles" page.

The company founder's picture is posted at the bottom of the homepage. There is no clear description of the company except the founder's short story about how she got the idea.

SpaWish.com has different featured bundles on its homepage from time to time, but these do not necessarily have anything to do with seasonal promotions. There are also lists of "Gift Giving Occasions" and "Popular Services at Day Spas" to remind people when it is "time for a gift" and "what to give."

Community:
“SpaWish loyalty rewards” is a membership program to accumulate points from purchases, which can be redeemed for free gifts. The site sends out bonus points to customers via e-mail during the holiday seasons.

Apart from the “Testimonials” from some specific users on the homepage, there is no message board or chat room provided on this site. Users at the same site get very little contact among each other and the community influence is limited.

**Customization:**

SpaWish.com offers site visitors the opportunity to log-in and register themselves, but there are no customized lay-outs for each individual.

Customers can check their order history via their account; it takes about four to six weeks for the website to update that information.

No personalized recommendation is provided.

**Communication:**

There are a lot of forms to fill out in order to communicate via e-mail with the site. The design of the form is very detailed and people have to provide a substantial amount of
information, for example their specific needs and the particular occasions for which they are shopping.

All the company information is gathered on the “Company Contact” page, which lists the contact number, company address, fax, office hours, FAQs, etc.

Users who register as members of this site get promotional letters via e-mail from time to time.

Connection:

SpaWish.com has a lot of interest in establishing business with others. All the partnership programs and affiliate sales programs are offered in the “Business Service” page. People interested in joining the business can contact the company by filling out a form and submitting the information through the web.

SpaWish.com has links to the websites of most participating spas. Under the “Spa Owners – Get listed” page, a form invites Spas that meet a certain standard to join the network.

The company has also partnered with www.growerflowers.com. The link is a picture of a flower, displayed conspicuously on every page and leading to another separate website, which sells flowers.
Technically speaking, the connection link is fast and accurate; no system crash has been found.

**Commerce:**

Only members can purchase via SpaWish.com. Registration is required for each member. The registration form is very detailed, including company information, date of birth, gender, occupation, address and martial status etc. and each field of information is compulsory.

Besides the registration form for members, SpaWish.com offers quite a few other forms such as a “Bridal Gift Questions” form, a “Business Gift Need” form, a “Gift Required Fields” form, a “Loyalty Program Registration” form, a “checkout” form etc.

When people want to order, they have to go through the shopping cart page to view their orders, and they must click the link of “take me to the order form” to fill out another form. The order form is long and complicated. Although the shopping cart is on the top of every page, making it every easy to locate and check, people always have to complete the form before they can add or delete anything from the shopping cart. There are six choices of shipping methods, and each has a different price.

There is a confirmation page with a description of the order before checking out.
Payment can be made either with a credit card or a “GiveAnything.com gift certificate.”
In addition to the credit card information on the payment page, the company requests very detailed information on the card holder, including their occupation and information in a short survey about “how did you learn about SpaWish.”

An order confirmation is sent by e-mail to customers after they complete an order. The return policy is only offered in the FAQ page, stating that customers can only receive credit instead of cash refunds.

SpaWish.com uses Thawte SSL Web Server Certificates to offer secure communications by encrypting all data to and from the site.

6.0 PHASE II: INSTRUMENT TESTING

6.1 Checklist testing design

The object of Phase II was to test the usability of the checklist created from Phase I. According to the sorting results, a shorter list of 56 items was created (see Appendix 2), within which every item had a high level (eight out of twelve opinions) of consistency in the category it was attributed to by test respondents. A close examination of each item was also taken to make sure that no ambiguous or redundant items were included.
A testing questionnaire of the checklist was designed subsequently (see Appendix 3). Each item on the list invited assessments on a seven-point scale ranging from "extremely disagree" to "strongly agree," with point one "strongly disagree" and point seven "extremely agree," while making a field evaluation on live websites. The point of the scale was also the score of each item.

Since no evidence was attributed for assigning different weights of importance to each item, the mean score of each question was used as the category score, and the sum of seven categories’ score was used as the final score of the evaluation.

6.2 Evaluators

Twelve of the study’s participating MSc and Ph.D. students who had more than five years on-line activities experience were asked to be the evaluators of the usability testing. Among the evaluators, four were Ph.D. students and eight were MSc students. They were asked to indicate the degree of their agreement with each item through the checklist while they browsed and evaluated the sample websites. The information of the evaluators is listed in Table 11.
Table 11. Profile of web evaluators

<table>
<thead>
<tr>
<th>Subject</th>
<th>Check product info. on the web (Y/N)</th>
<th>Years of experience with on-line activities</th>
<th>Number of daily e-mails</th>
<th>Work on line every week (Y/N)</th>
<th>Read news on-line at home (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Y</td>
<td>6</td>
<td>10-12</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>2</td>
<td>Y</td>
<td>5</td>
<td>Over 10</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>3</td>
<td>Y</td>
<td>7</td>
<td>15</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>4</td>
<td>Y</td>
<td>5</td>
<td>8</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>5</td>
<td>Y</td>
<td>5</td>
<td>10</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>6</td>
<td>Y</td>
<td>5</td>
<td>Over 10</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>7</td>
<td>Y</td>
<td>5</td>
<td>5</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>8</td>
<td>Y</td>
<td>13</td>
<td>60</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>9</td>
<td>Y</td>
<td>5</td>
<td>8-10</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>10</td>
<td>Y</td>
<td>8</td>
<td>6-7</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>11</td>
<td>Y</td>
<td>5</td>
<td>20</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>12</td>
<td>Y</td>
<td>6</td>
<td>5</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

6.3 Testing objects

The checklist testing questionnaire was distributed to the twelve evaluators to evaluate three live websites:

www.redenvelope.com

www.tiffany.com

www.spawish.com

The three websites were selected from http://www.forbes.com/bow/b2c/main.jhtml.

Forbes reviews over 3,500 sites in www.forbes.com. Editors of Forbes rate sites according to five criteria: Content, Design, Speed, Navigation and Customization. The purposes of these websites range from stock picking, obtaining mortgages, and pursuing passions like scuba diving or golf, to online shopping for ordinary commodities.
The three websites selected were all from the sub-division of “Gift,” under the directory of “Luxury Shopping.” According to Forbes’s criteria, www.redenvelope.com is ranked the highest as a “Forbes Favourite,” www.tiffany.com is ranked as one of the best sites as a “Forbes Best Web Pick,” and www.spawish.com is among the other sites, which have no special classification.

6.4 Test instruction

In the testing, evaluators were asked to browse each of the three websites for half an hour before answering questions. The order of the websites visited was randomly assigned to each participant. After visiting each website for half an hour, participants were asked to mark their answer on the checklist item-by-item while browsing the web page continually. To ensure consistent standards, evaluators were asked to do the three websites’ evaluations consecutively one after another.

To avoid influential bias, the rank of the websites from Forbes.com was concealed and every evaluator performed the evaluation independently from others.

6.5 Testing Results

The average score resulting from the checklist designed in Phase I of this study is one system of measurement applied to these three websites, and a non-parametric analysis
was also conducted to test for any difference in effectiveness among these web sites. The evaluation results from the checklist were compared with the rankings by the third party (Forbes.com) to see if the checklist could be a fair instrument to measure the usability of electronic commerce websites.

6.5.1 Comparison of the average scores among evaluators

The average scores of each C and total of the three websites among the twelve evaluators are listed below:

<table>
<thead>
<tr>
<th>7Cs</th>
<th>RedEnvelope.com</th>
<th>Tiffany.com</th>
<th>SpaWish.com</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td>5.73</td>
<td>5.39</td>
<td>4.07</td>
</tr>
<tr>
<td>Content</td>
<td>5.91</td>
<td>5.05</td>
<td>3.74</td>
</tr>
<tr>
<td>Communication</td>
<td>4.66</td>
<td>4.03</td>
<td>4.14</td>
</tr>
<tr>
<td>Connection</td>
<td>5.10</td>
<td>4.75</td>
<td>5.15</td>
</tr>
<tr>
<td>Commerce</td>
<td>5.08</td>
<td>4.38</td>
<td>4.43</td>
</tr>
<tr>
<td>Community</td>
<td>3.20</td>
<td>2.56</td>
<td>2.58</td>
</tr>
<tr>
<td>Customization</td>
<td>2.92</td>
<td>2.42</td>
<td>2.05</td>
</tr>
<tr>
<td>Total</td>
<td>32.60</td>
<td>28.57</td>
<td>26.16</td>
</tr>
</tbody>
</table>

From the table above, RedEnvelope.com has the highest total score (32.60), compared to Tiffany.com, whose score is in the middle (28.57), and SpaWish.com, which has the lowest total score (26.16). Regarding particular Cs, the average scores of “Context,” “Content,” and “Customization” of the three websites are still in the same order while “Communication,” “Commerce,” “Connection” and “Community” are in different orders.
6.5.2 Non-parametric test result

Since only twelve subjects participated in the test, a non-parametric test was applied to identify any significant differences among subjects' responses according to the 7Cs criteria towards the three websites.

Because the same respondents rated each of the websites, the samples are not independent. The “Friedman Test” was therefore conducted, with calculations based on ranks within each case. The score for each variable is ranked, and the mean ranks for the variables are compared.
In the current study, the Friedman test was used to test the null hypothesis that there is no difference among three of the websites. The alternative is that some websites tend to be preferred over others. If the significance level is lower than 0.05, the null hypothesis can be rejected. The test was performed for the total score of each of the three websites, as well as for each of the 7Cs.

To determine the rank of the total score of each website, each subject’s responses for all three sites were ranked, and the mean ranks were compared. The same operation was performed for the scores in each of the 7Cs.

Table 13 displays the ranking result of both the total scores and each C of the Friedman test for each of the three websites.
<table>
<thead>
<tr>
<th></th>
<th>0.002</th>
<th>0.006</th>
<th>0.024</th>
<th>0.045</th>
<th>0.097</th>
<th>0.127</th>
<th>0.200</th>
<th>0.330</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.367</td>
<td>3.92</td>
<td>1.71</td>
<td>1.86</td>
<td>1.87</td>
<td>1.89</td>
<td>1.90</td>
<td>1.90</td>
<td>1.90</td>
</tr>
<tr>
<td>3.000</td>
<td>2.75</td>
<td>2.80</td>
<td>2.80</td>
<td>2.91</td>
<td>2.91</td>
<td>2.91</td>
<td>2.91</td>
<td>2.91</td>
</tr>
<tr>
<td>2.450</td>
<td>2.63</td>
<td>2.63</td>
<td>2.63</td>
<td>2.63</td>
<td>2.63</td>
<td>2.63</td>
<td>2.63</td>
<td>2.63</td>
</tr>
</tbody>
</table>

Table 13: The mean rank of the total score and each of the 7G score among the three websites.
For the total score, RedEnvelope.com has the highest mean rank of 2.67, indicating that it is the best website according to the 7Cs criteria. SpaWish.com is the worst, with a mean rank of 1.33, and Tiffany.com is in the middle with a rank of 2.00. The value of the chi-square statistic is 10.667, with a significance of 0.005. Therefore, the null hypothesis that there is no difference in the total score among the three websites can be rejected.

Besides the analysis of the total score of each website, the Friedman Test was performed on the websites for each of the seven Cs. For Customization, Community, Connection and Communication, the differences among RedEnvelope.com, Tiffany.com and SpaWish.com are not significant. However, concerning the Context, Content and Commerce, the difference is significant (significance value lower than 0.05). The “Context” score for RedEnvelope.com (2.50) was the highest among the three, and Tiffany.com (2.42) was greater than that of SpaWish.com (1.08) [significant at 0.001]. From the test results for “Content,” it is evident that there are strong differences in levels of preference among RedEnvelope.com, Tiffany.com and SpaWish.com, with a significance of 0.001. The score of RedEnvelope.com is the highest (2.75), SpaWish.com is the lowest (1.17), and Tiffany.com is in the middle (1.17). The score order of “Commerce” is the same as the test result of “Total,” ”Context” and “Content,” with RedEnvelope.com scoring 2.63, Tiffany.com at 1.75 and SpaWish.com earning 1.63 [significant at 0.024].

Friedman tests between each two websites were also performed for Customization, Community, Connection and Communication to see if there is any difference between
any two of the websites in these categories. Result shows no significant difference between any pairs.

Reliability analysis was also conducted for each 7C category (see Appendix 4). Cronbach Alphas for the dimensions of Context, Content, Community, Customization and Commerce are 0.9079, 0.8968, 0.9516, 0.9648 and 0.7217 respectively, with all above well-acceptable level, i.e., 0.7 (Barclay, Thompson and Higgins, 1995). Cronbach Alphas for Communication and Connection are lower than 0.7, at 0.6173 and 0.6742, but still acceptable.

An inter-item correlation test shows that some items are not significantly correlated. This can be explained by low variances among the responses to these items. For example, the correlations between three items (i.e., a. the site provides contact information on each page; b. the site provides customer service through e-mail contact; c. the site offers FAQ) and all other items within “Communication” category are very low. The reason could be that the three items are all “Yes or No” questions. Since all the three websites have those features, subjects tended to choose the same answers. While for other items, there exists a much larger variation. Therefore, the correlations between these items and other items are reportedly low.

6.6 Summary of the findings
The total scores show that RedEnvelope.com is the best website among the three, and Tiffany.com tends to be preferred over SpaWish.com. This result concurs with the ranking by Forbes.com. This indicates that the checklist developed in this study can be a potential measurement for website evaluation in B-to-C electronic business.

Also, for all the significant differences found in the Friedman test for each of the seven “Cs,” which include Context, Content and Commerce, the order is the same as that of the total score rank among the three sample websites. This demonstrates that RedEnvelope.com is the best, SpaWish.com is the worst and Tiffany.com is between the others, according to these three aspects. It is also worth to mention that RedEnvelope.com had the highest score in all the categories.

It is noticed that Forbes doesn’t have the criteria of Commerce and Community to rate websites. This is the possible explanation about the insignificance in the Community difference among the three sample sites. Differences are not significant for the categories of Connection, Communication and Customization among the sites as well. However, the theoretical separation of the seven dimensions doesn’t mean that three websites should perform significant differently in every dimension.

In the average test, the score rank of “Customization” among the three samples is in the same order as above, but this difference was assessed as being less significant [at 0.202], by the Friedman test. Also in the average test, SpaWish.com has a slightly higher average score (4.43) in “Commerce” than that of Tiffany.com (4.38); however the mean
rank order of the two is different in the Friedman test. This can be explained by an extraordinary low score given by one of the evaluators to Tiffany.com.

7.0 DISCUSSION

7.1 Contribution

The major contribution of the study reported here is that it offers a 56-item-evaluation checklist which proved to be an effective measurement of B-to-C websites. This instrument development study consisted of two processes. The first created the instrument and the second tested it and got the desired results. The creation process included creating items according to the “7Cs” concept (Rayport and Jaworski, 2000), surveying known existing checklists, guidelines, research results, and compiling and extracting items from previous research into this “7Cs” framework. Compared to previous measurement instruments, this checklist was not only based on a strict framework, but it also intended to cover the overall range of customer interface perspectives in the context of B-to-C electronic commerce.

Also, this checklist is classified into seven categories. When people evaluate websites with this instrument, it is very easy to identify the performance of the website in each perspective. If it is coordinated with the business strategy, this checklist can help companies analyze the advantages and weak points of their customer interfaces, and where and how to improve them.
7.2 Limitations

This paper began with two surveys, each of which contains limitations. The main contribution of the first survey is to identify a group of items (see Appendix 2) belonging to each of the seven 7Cs categories. However, this is a conceptual result rather than a quantitative one. Twelve subjects have completed this survey, and the cut-off level has been set at eight out of the twelve. In other words, for each item, if eight out of the twelve respondents select the same category, the item is assigned to the category. Items below this cut-off level have been eliminated.

The calculation method has a primitive limitation: the sum of seven categories' score was used as the final score of the evaluation. However, there is no theoretical justification for summing the score of each category to determine the final score. Different weight might need to be assigned to each category in order to give a more accurate measurement.

The aim of the second survey is to test the checklist to see if it is an effective measurement instrument. A field test was conducted among twelve evaluators. Evaluators specified their opinion about each item on the list in relation to three websites. The three commercial websites used in this study were chosen from a ranking list of www.forbes.com because Forbes was a generally recognized research company. The validity of the 7C model was therefore tested by comparing our results with their ranking. However, it could be argued whether their ranking could reflect the true quality of websites. In this sense, our results is under challenge. The other limitation of the field
test is that because all the three sites are real commercial websites, evaluators were not able to make complete and accurate answers to some of the questions (e.g. "customer can track their order and delivery status") without making real purchases.

Another limitation about this survey is that only twelve people participated in the test. Provided future resources are available, a study with a larger sampling can generate a more accurate assessment of the evaluation method.

It has to be pointed out that although the checklist developed in this research is designed to evaluate all kinds of business-to-consumer websites, the analysis must be conducted under various business conditions. Theoretically, a website which includes more items from the checklist would have been the better website, but given the understandable reality that businesses have different sizes, operate in different marketing segments, and have different product lines and different marketing strategies, different aspects will be emphasized.

7.2 Suggestions for future studies

As indicated above, the conclusions of the study are based on the responses of 12 subjects. Therefore, a survey with a larger sample size is expected to better prove the validity of the instrument. Also, comparing survey results with the opinion of more authorities with wider range of ranking criteria and focus is another way to improve the experimental design.
Furthermore, from the sorting process of our study, there were items that did not fall into any of the seven categories. Do they have any impact on the customer interface and in what way, under what circumstances? Would these items from some other constructions? Would those constructions function in parallel or in different hierarchy with the 7Cs construction? These are the questions expected to be answered in future studies.
References


Appendix 1. Card Sorting Questionnaire

Instruction

Thank you for your participation in this survey. We have all together 113 questions in this questionnaire. All the items are descriptions of the features you can find on most e-commerce websites.

Our subjects are going to be asked to make multiple choices on each of our questions. There are 8 choices:

1. Context
2. Content
3. Community
4. Customization
5. Communication
6. Connection
7. Commerce
8. None of the above

Please to mark the answer for it the category that the item can be best fitted into.

Before we start the survey, please read carefully about the definition of the 7Cs. The concept of each category is defined by B. Jaworski, J. Raport, L. Griffin and Y. Dosios.

Context. The context of the website captures its aesthetic and functional look-and-feel. Some sites have chosen to focus heavily on interesting graphics, colours and design features, while others have emphasized more simple utilitarian goals, such as ease of navigation.

Content. Content is defined as all digital subject matter on the site. This includes the form of the digital subject matter—text, video, audio, and graphics—as well as the domains of the digital subject matter, including product, service, and information offerings. While context largely focuses on the “how” of site design, content focus on “what” is presented.

Community. Community is defined as the interaction that occurs between site users. It does not refer to site-to-user interactions. User-to-user communication can occur between two users or between on user and many.

Customization. Customization is defined as the site’s ability to tailor itself or to be tailored by each user. When the customization is initiated and managed by the firm, we term it tailoring. When the customization is initiated and managed by the user, we term it personalization.
Communication. Communication refers to the dialogue that unfolds between the site and its users. This communication can take three forms: site-to-user communication, user-to-site, or two-way communication.

Connection. Connection is defined as the extent of the formal linkages between the site and other sites.

Commerce. Commerce is defined as the sale of goods, products, or services on the site.

Before we start the survey, please answer briefly the following questions about yourself:

Name: ________________________________

6. Do you get used to looking at product information on the web?

7. How many years of experience with on-line activities do you have?

8. Approximately, how many e-mails you have everyday?

9. Do you work on-line at work every week?

10. Do you read news on-line at home?
1. The search criteria designed reasonable and easy to find the product interest you

Context □  Content □  Community □  Customization □  Communication □

Connection □  Commerce □  None of the category □

2. The site design fits the stated scope, purpose, core activities and audience.

Context □  Content □  Community □  Customization □  Communication □

Connection □  Commerce □  None of the category □

3. The site provide free e-mail account

Context □  Content □  Community □  Customization □  Communication □

Connection □  Commerce □  None of the category □

4. The site clearly tell people when and how often content is updated

Context □  Content □  Community □  Customization □  Communication □

Connection □  Commerce □  None of the category □

5. The site makes all objects accessible at all times

Context □  Content □  Community □  Customization □  Communication □

Connection □  Commerce □  None of the category □

6. If the resource is to be removed, the site will state where it will be available

Context □  Content □  Community □  Customization □  Communication □

Connection □  Commerce □  None of the category □

7. People will be able to find out about others easily

Context □  Content □  Community □  Customization □  Communication □

Connection □  Commerce □  None of the category □

8. The site e-mail subscribers about change, new features and letters from other subscribers

Context □  Content □  Community □  Customization □  Communication □

Connection □  Commerce □  None of the category □
9. Is there a system of "help" for those requiring it?

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

10. The document will stimulate the user’s creativity or thinking

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

11. Users should be in control with proactive assistance

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

12. The links are well labelled and accurate

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

13. When appropriate, each audience member can control the pace of sequences (for example, skip or replay sequences)?

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

14. The site let user input their information in the integral part of the content

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

15. The links to other site are useful and helpful

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

16. The colour of the pages is consistent, simple and appropriate.
17. The site offers FAQ

18. The site provides shopping cart

19. The site offers discounts, freebies, coupons and other incentives

20. The layout is consistent from page to page.

21. There is a link back to the main page on each supporting page

22. There is no "Under Construction" or any other similar signs during browsing

23. The portion between multimedia or visual elements and textual information of this website is reasonable and suitable for the goal of the business

24. The graphic, icons and/or multimedia part of the website is necessary and will strongly support the business activity
25. The links are logically grouped and easy to move back and forth.

26. Is it accessible to readers with physical impairments?

27. Are there indications of careless or hasty preparation, such as spelling or grammatical errors?

28. The website overall is very appealing by its look and feel.

29. The button linking to other pages is very distinctive.

30. Customers can check their order history.

31. How helpful is the "help" system?
32. The interface supports the social goals people will have while experiencing the site.

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

33. Is the design so complex that it detracts from the content?

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

34. People will find new challenges as they gain experience.

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

35. There are charming and creative features to attract customers and to help them enjoy the visit.

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

36. The level of challenge found in the site’s content is appropriate for the core audience.

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

37. Keep the customer aware of promotions.

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

38. The homepage includes a “search input” box.

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

39. The site provides a clear description of the product.

Context □  Content □  Community □  Customization □  Communication □
40. Customers can check the delivery status

41. The site provide various kind of delivery options

42. The site provides clear and concise text information to describe the business, news and customer service

43. The homepage groups all Corporate Information in One Distinct Area

44. The homepage offer users a clear starting point for the main tasks they’ll undertake when visiting the site

45. The site use (approximately) standard link colors.

46. The site suggests many payment alternatives

47. The page length is appropriate to site content.
48. Customer has the sense of control in the process of transaction

49. The site has mass mailing

50. People can go into greater depth about topics if they desire.

51. Information presented on each page is sufficient but not too much

52. Page headings help people understand where they are located

53. The home page shows some of the best or most recent content.

54. Generate a confirmation page after consumers make purchases.

55. The site provides login/registration function for the customer
56. There is a text alternative to the images

57. The products and services offered by the site is updated

58. The site provides some functions that can help users make the decision (price comparison, discounts, coupons and specials etc.)

59. The site focus on products that have low delivery cost.

60. Actions are reversible

61. There are no obvious errors or misleading omissions in the document.

62. The site give users a sense of group while they are participating in the shop
63. Opinion of the group will influence user's life or decisions

64. Provide no-cost/no-hassle return policy.

65. The site provides contact information on each page

66. Limit registration forms and the amount of requested information on them

67. The structure enables the addition of new information

68. The site is designed to meet individual audience needs (multiple developmental levels)

69. Users will go for help to the web group community if they have any problems

70. The purpose of the website is clear.
71. The site will give people something to talk about (for example, MSNBC has a daily chat about a specific news topic).

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

72. Web users can personalize the layout and content of their page and make their personal settings

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

73. Are there dead links? Broken CGI scripts? Functionless forms?

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

74. The site provides a particular site for members or member-generated site

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

75. The web can track and gather data in order to give appropriate recommendations

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

76. The site dynamically adjusts content with various design layout according to my response

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

77. Web users can benefit from being a member of the web group

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □
78. The value proposition (what’s the relevance for me?) is clearly conveyed

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

79. People will be able to represent themselves to others in their preferred way

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

80. The site provide customer service through e-mail contact or live chat

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

81. It is possible for users to communicate with people through the web community to develop friendship or individual interaction

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

82. The site broadcast the news and event

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

83. Users are willing to participate in the web group

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □

84. The site provides message broods, chat room or instant messaging for the members

Context □  Content □  Community □  Customization □  Communication □
Connection □  Commerce □  None of the category □
85. Customer can track their order status

86. The site promotes a sense of group identification

87. The load time is appropriate to content, even on a slow dial-in connection

88. The domain name is easy to remember.

89. There is no system crashes or “incorrect” message displayed on the users’ screen

90. The site provides feedback whenever possible.

91. People will have an opportunity to learn?

92. The site responds to each person as an individual
93. Is the site English only or can speakers of other languages access the site in their languages?

Context □  Content □  Community □  Customization □  Communication □  
Connection □  Commerce □  None of the category □

94. It is easy to go back to the main page from the linked page

Context □  Content □  Community □  Customization □  Communication □  
Connection □  Commerce □  None of the category □

95. There is a convenient, obvious way to manoeuvre among related pages, and between different sections.

Context □  Content □  Community □  Customization □  Communication □  
Connection □  Commerce □  None of the category □

96. The terms (especially the site’s title and sections) adequately communicate the consequences of selection or action.

Context □  Content □  Community □  Customization □  Communication □  
Connection □  Commerce □  None of the category □

97. It is easy to locate a particular page from any other page

Context □  Content □  Community □  Customization □  Communication □  
Connection □  Commerce □  None of the category □

98. Essential instructions will appear before links and other interactive portions

Context □  Content □  Community □  Customization □  Communication □  
Connection □  Commerce □  None of the category □

99. Users are informed of the type of file they are linking to (e.g., video, sound, text, etc.)

Context □  Content □  Community □  Customization □  Communication □  
Connection □  Commerce □  None of the category □
100. The links are very reliable (are there inactive links or references to sites that have moved)?

Context □ Content □ Community □ Customization □ Communication □
Connection □ Commerce □ None of the category □

101. It is easy to put, delete and check your items in the shopping cart

Context □ Content □ Community □ Customization □ Communication □
Connection □ Commerce □ None of the category □

102. The site provide a sense of security, you’ll trust they will not give your information to any unauthorized parties

Context □ Content □ Community □ Customization □ Communication □
Connection □ Commerce □ None of the category □

103. The site offer instant credit approval so that you can shop right away

Context □ Content □ Community □ Customization □ Communication □
Connection □ Commerce □ None of the category □

104. The site offers customized layout and content according to some other similar people’s profile

Context □ Content □ Community □ Customization □ Communication □
Connection □ Commerce □ None of the category □

105. Links provided primarily to resources rather than just lists of resources

Context □ Content □ Community □ Customization □ Communication □
Connection □ Commerce □ None of the category □


Context □ Content □ Community □ Customization □ Communication □
Connection □ Commerce □ None of the category □
107. There is an image map, index or table that can be used to navigate within the document.

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

108. Trial purchase without being a member

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

109. Customer will gain confidence during transaction

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

110. The site store customer information such as credit card information, shipping address etc.

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

111. Customer can also order from the affiliate program of other websites.

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

112. The site can automatically response to user’s request.

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □

113. People will be able to express themselves freely (that is, safely and appropriately)

Context □ Content □ Community □ Customization □ Communication □

Connection □ Commerce □ None of the category □
Appendix 2. Sorting result--Checklist

**Context**

CTXT1. The colour of the pages is consistent, simple and appropriate.

CTXT2. The layout is consistent from page to page.

CTXT3. The portion between multimedia or visual elements and textual information of this website is reasonable and suitable for the goal of the business.

CTXT4. The website overall is very appealing by its look and feel.

CTXT5. The design is not so complex that it detracts from the content.

CTXT6. There are charming and creative features to attract customers and to help them enjoy the visit.

CTXT7. The site use (approximately) standard link colors.

CTXT8. The page length is appropriate to site content.

CTXT9. The links are logically grouped and easy to move back and forth.

**Content**

CTNT1. The search criteria designed reasonable and easy to find the product interest you.

CTNT2. The homepage includes a “search input” box.

CTNT3. The site provides a clear description of the product.

CTNT4. The level of challenge found in the site’s content is appropriate for the core audience.

CTNT5. The home page shows some of the best or most recent content.

CTNT6. There are no obvious errors or misleading omissions in the document.

CTNT7. The purpose of the website is clear.
CTNT8. The products and services offered by the site is updated

**Communication**

CMCA1. The "help" system is very helpful
CMCA2. The site provides feedback whenever possible
CMCA 3. The site has mass mailing
CMCA 4. The site provides contact information on each page
CMCA 5. The site broadcast the news and event
CMCA 6. The site provide customer service through e-mail contact or live chat
CMCA 7. The site can automatically response to user’s request.
CMCA 8. The site offer FAQ
CMCA 9. The load time is appropriate to content, even on a slow dial-in connection

**Connection**

CONN1. The links to other site are useful and helpful
CONN 2. There is a link back to the main page on each supporting page
CONN 3. It is easy to locate a particular page from any other page
CONN 4. The links are very reliable (there are no inactive links or references to sites that have moved)

**Commerce**

CMCE 1. The site provides shopping cart
CMCE 2. The site offer discounts, freebies, coupons and other incentives
CMCE 3. The site suggests many payment alternatives
CMCE 4. The site will generate a confirmation page after consumers make purchases.
CMCE 5. Provide no-cost/no-hassle return policy.

CMCE 6. The site focus on products that have low delivery cost.

CMCE 7. It is easy to put, delete and check your items in the shopping cart.

CMCE 8. The site provide a sense of security, you’ll trust they will not give your information to any unauthorized parties.

CMCE 9. The site offer instant credit approval so that you can shop right away.

CMCE 10. The site offer trial purchase without being a member.

CMCE 11. The site store customer information such as credit card information, shipping address etc.

CMCE 12. Customer can track their order and delivery status.

**Community**

CMMU1. The site give users a sense of group while they are participating in the shop.

CMMU 2. Opinion of the group will influence users’ life or decisions.

CMMU 3. Users will go for help to the web group community if they have any problems.

CMMU 4. Web users can benefit from being a member of the web group.

CMMU 5. It is possible for users to communicate with people through the web community to develop friendship or individual interaction.

CMMU 6. The site will give people something to talk about (for example, MSNBC has a daily chat about a specific news topic).

CMMU 7. Users are willing to participate in the web group.

CMMU 8. The site provides message boards, chat room or instant messaging for the members.

CMMU 9. The site promotes a sense of group identification.
Customization

CUTM1. The site dynamically adjusts content with various design layout according to my response

CUTM 2. Web users can personalize the layout and content of their page and make their personal settings

CUTM 3. People will be able to represent themselves to others in their preferred way

CUTM 4. The site offers customized layout and content according to some other similar people’s profile

CUTM 5. The site responds to each person as an individual
Appendix 3. Checklist testing questionnaire

Context

1. The colour of the pages is consistent, simple and appropriate.

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

2. The layout is consistent from page to page.

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

3. The portion between multimedia or visual elements and textual information of this website is reasonable and suitable for the goal of the business

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

4. The website overall is very appealing by its look and feel.

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

5. The design is not so complex that it detracts from the content

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

6. There are charming and creative features to attract customers and to help them enjoy the visit.

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

7. The site use (approximately) standard link colors.

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

8. The page length is appropriate to site content.

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
9. The links are logically grouped and easy to move back and forth

Do you agree with this statement?
Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

**Content**

10. The search criteria designed reasonable and easy to find the product interest you

Do you agree with this statement?
Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

11. The homepage includes a “search input” box.

Do you agree with this statement?
Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

12. The site provides a clear description of the product

Do you agree with this statement?
Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

13. The level of challenge found in the site’s content is appropriate for the core audience

Do you agree with this statement?
Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

14. The home page shows some of the best or most recent content

Do you agree with this statement?
Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

15. There are no obvious errors or misleading omissions in the document

Do you agree with this statement?
Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

16. The purpose of the website is clear.

Do you agree with this statement?
Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

17. The products and services offered by the site is updated
Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Communication

18. The "help" system is very helpful

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

19. The site provides feedback whenever possible

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

20. The site has mass mailing

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

21. The site provides contact information on each page

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

22. The site broadcast the news and event

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

23. The site provide customer service through e-mail contact or live chat

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

24. The site can automatically response to user’s request.

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

25. The site offer FAQ

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
26. The load time is appropriate to content, even on a slow dial-in connection

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Connection

27. The links to other site are useful and helpful

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

28. There is a link back to the main page on each supporting page

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

29. It is easy to locate a particular page from any other page

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

30. The links are very reliable (there are no inactive links or references to sites that have moved)

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Commerce

31. The site provides shopping cart

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

32. The site offer discounts, freebies, coupons and other incentives

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

33. The site suggests many payment alternatives

Do you agree with this statement?
34. The site will generate a confirmation page after consumers make purchases.

**Do you agree with this statement?**

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

35. Provide no-cost/no-hassle return policy.

**Do you agree with this statement?**

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

36. The site focus on products that have low delivery cost.

**Do you agree with this statement?**

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

37. It is easy to put, delete and check your items in the shopping cart.

**Do you agree with this statement?**

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

38. The site provide a sense of security, you'll trust they will not give your information to any unauthorized parties.

**Do you agree with this statement?**

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

39. The site offer instant credit approval so that you can shop right away.

**Do you agree with this statement?**

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

40. The site offer trial purchase without being a member.

**Do you agree with this statement?**

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

41. The site store customer information such as credit card information, shipping address etc.

**Do you agree with this statement?**

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

42. Customer can track their order and delivery status.
Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Community

43. The site give users a sense of group while they are participating in the shop

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

44. Opinion of the group will influence users' life or decisions

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

45. Users will go for help to the web group community if they have any problems

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

46. Web users can benefit from being a member of the web group

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

47. It is possible for users to communicate with people through the web community to develop friendship or individual interaction

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

48. The site will give people something to talk about (for example, MSNBC has a daily chat about a specific news topic).

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

49. Users are willing to participate in the web group

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

50. The site provides message boards, chat room or instant messaging for the members
Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

51. The site promotes a sense of group identification

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Customization

52. The site dynamically adjusts content with various design layout according to my response

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

53. Web users can personalize the layout and content of their page and make their personal settings

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

54. People will be able to represent themselves to others in their preferred way

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

55. The site offers customized layout and content according to some other similar people’s profile

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

56. The site responds to each person as an individual

Do you agree with this statement?
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
Appendix 4. Inter-item Correlations within each 7C category

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