A Study Into Effective Websites Properties as Defined by the Internet Commerce Evaluation Scale in Taiwan

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A STUDY INTO EFFECTIVE WEB SITES PROPERTIES AS DEFINED BY
THE INTERNET COMMERCE EVALUATION SCALE IN TAIWAN

DISSERTATION
Submitted to the Faculty of the College of Business and Management of
Lynn University in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy

By
Yue-Jer Lin

Lynn University
Boca Raton, Florida
2004
A STUDY INTO EFFECTIVE WEB SITES PROPERTIES AS DEFINED BY
THE INTERNET COMMERCE EVALUATION SCALE IN TAIWAN

Yue-Jer Lin, Ph.D.
Lynn University, 2004

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To all these people I shall be indebted forever.
ABSTRACT

The purpose of this study was to determine the properties shared by effective Web sites in Taiwan. This study applied the Internet Commerce Evaluation Scale (ICES) Web site tool developed by Scheffelmaier and Vinsonhaler in 2002 to assess the quality of commercial Web sites in Taiwan.

This research summarized the studies and research design of properties characterizing successful Taiwanese electronic commerce Web sites. Two Web sites were chosen by the researcher and administered to 100 participants selected from college students aged 18–40 in Taiwan. This study also investigated the correlations between scores. Data analyses were conducted to examine 12 subscales of the ICES, a modified reliability analysis, and examined the satisfaction scale items in addition to the total score. Descriptive, psychometric, and inferential statistical techniques were employed.

The main findings of the research study were as follows: First, the reliability coefficients for the 12 checked items categories were very low, while those from the overall ratings scale, the total score, and the sum of all 68 checked items scales were adequate. This was true for both the High and Low Convenience Web sites, although the coefficients for the Low Convenience Web site were generally higher than those for the High Convenience Web site. Second, the 12 individual ratings and the overall ratings scale were the most valid predictors of Web site satisfaction, while the checked items scales were the least valid in Taiwan.

To summarize, certain scales from the ICES were strongly related to satisfaction with the Web sites. The respondents' ratings of the 12 categories and the sum of these 12 ratings were strongly correlated with the satisfaction items and total satisfaction score.
For the High Convenience Web site, particularly, the Visitor Greeting, Catalog, Shopping Cart, Consistency & Standardization, Efficiency, and Brick & Mortar ratings were all positively correlated with the total satisfaction score. For the Low Convenience Web site, the correlations between the Visitor Greeting, Catalog, and Coherence & Organization ratings scores and the total satisfaction score were all greater than .50, which indicated a high degree of validity for these ratings with respect to satisfaction.
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CHAPTER ONE
INTRODUCTION

Background

This study introduced the properties of effective electronic commerce Web sites in Taiwan. Included are the background of the study, conceptual understanding for the study, and statement of the problem, purpose of the study, research questions, and significance of the study, objectives of the study, delimitations, assumptions, and design control of the study. Definitions of key terms and the structure of the dissertation are followed by the summary.

"E-commerce encompassed more than the buying and selling of products and services" (Noel, 1998) (as cited in Teo & Tan, 2002, p. 260). Corporations must tailor marketing strategies to the unique traits of online marketing in order to conduct business successfully on the Internet. The World Wide Web has become popular as a marketing communication tool with numerous companies creating diverse marketing goals to launch a Web presence (Teo & Tan, 2002).

As e-commerce develops, Web site design becomes a vital success factor for businesses. Web sites are the primary interface between companies and customers. Quality Web site design is significant for businesses with an e-commerce strategy. To ensure the effectiveness of a design, valid evaluation scales are required (Kim, Shaw, & Schneider, 2003). Over the next several years, commerce activity in the online service industry should grow a great deal in Taiwan (International Market Insight Reports, 2000). Internet shopping has become gradually prevalent in Taiwan (Xinhua News Agency - CEIS, 2002).
According to online users demand analyses in Taiwan, Lin (1999) reported the most frequent activities on the Internet were data searching (17%), reading news (14%), communications (12%), online database use (11%), and information browsing (10%). As of 1999, only 10.8% of people in Taiwan had Internet shopping experience (as cited in Chen & Kuo, 2002, p. 161).

The online users in Taiwan tended to browse the Web sites which offered information-searching functions. E-commerce and network marketing has been utilized by most families in Taiwan having Internet access (Wu, 1999) (as cited in Chen & Kuo, 2002).

Data searching, entertainment, interactivity, easy use, presentation styles, and response time were the elements which affected usage behavior (Chen & Kuo, 2002). When people conducted online shopping, Web users were concerned more with the security of Internet trade, reliable corporate reputation, quality customer service, and product quality, than with attractive, dynamic pictures, and "comfy music" on homepages (Yao, 1999) (as cited in Chen & Kuo, 2002).

According to the previous studies that focused on the analysis of customer behavior and online product types and characteristics, design and content were the most important factors in designing a successful Web site. When addressed, these vital design issues created an effective Web site for different types of customer visiting, and provided the content and attractive traits required for a commercial Web site to capture new customers (Chen & Kuo, 2002).

E-commerce has been the subject of research in many standards, and in such a quickly changing field of study, a commonly accepted definition has been difficult (Hasan
According to Kalakota and Whinston (1997), from a communications viewpoint, e-commerce is the distribution of information, products/services, or payments via phone lines, and Internet. From a business viewpoint, e-commerce is the application of technology toward the computerization of business transactions and operations. From a service viewpoint, e-commerce is a tool that addresses the ambition of companies, customers, and management to decrease service costs while promoting the quality of products and customer service, as well as increasing the speed of service delivery. From an online viewpoint, e-commerce offers the capacity of buying and selling products and information online as well as other Internet services (as cited in Hasan & Tibbits, 2000).

**Conceptual Understanding for the Study**

This research integrated the literature by organizing and describing the properties appearing in the literature, and presented the evidence for the relative significance of Web site properties. This study focused on the properties of a site, which were regarded as positively effecting customer satisfaction and shopping behavior, including the likelihood of initial and purchase again. An effective Web site had properties that sold more products than a site with weak properties. The quality and diversity of products and the comparability of prices was also noteworthy for Internet selling (Scheffelmaier & Vinsonhaler 2002).

According to Scheffelmaier & Vinsonhaler (2002), the most often mentioned property groups consisted of: ease of understanding and usage, enhanced values of the traditional store, customer services beyond expectations, efficiency and access speed, a user-friendly home page, a common design that was applied to all pages, and the ability to buy products easily and quickly.
Scheffelmaier & Vinsonhaler (2002) organized the standard phrases into 12 major property groups, which characterized effective Internet commerce sites and were ordered as follows: (1) Visitor Greeting page, (2) Catalog page, (3) Shopping Cart page, (4) Cash Out page, (5) Security, (6) Coherence & Organization, (7) Consistency & Standardization, (8) Efficiency, (9) Navigation, (10) Style, (11) Value Added, and (12) Brick & Mortar (Figure 1) (p. 27).

Jarvenpaa and Todd (1996-1997) claimed that "the factors which effect customers satisfactory shopping on the Internet (satisfaction measures) were influenced, in order, by product perceptions (variety, price, quality), shopping experience (convenience, comparability), and service quality (responsiveness, tangibility, reliability) of online retailers" (as cited in Kim & Eom, 2002, p. 249). The factors found to be most important were convenient and reliable shopping, retailer trustworthiness, and product perceptions (Kim & Eom, 2002).

The Web has been used in various ways by companies, with some being more dependent on links to entice new users than others. For the entire Web, search engines and directories were obviously the most vital. The tendency in search engines has been toward promoting the quality of results returned from a search, instead of trying to index the whole Web. Business Web sites were especially crucial as a direct source of new customers, and an indirect source, by strengthened search engine quality indices (Thelwall, 2001).

An imperative implication for Web site designers and companies has been the prevalent use of philanthropic links, which has become another means of being linked to a company site. The use of philanthropic links has been accomplished by identifying sites
that include such links and also linked to other sites. Philanthropic sites have been revealed by seeking to industrially or geographically related sites or more directly, by applying the advance search characteristics of search engines, such as HotBot, to find all sites similar to the one designed. Quite apparently, then, corporate Web sites were likely to persist to be broadly interconnected, and that the existing commercial domination of the Web were not undermined the originators’ idea of creating a worldwide interlinked network (Thelwall, 2001).

In fact, links were the primary method for users to navigate around a site, and need to be obvious and to the point (Cox & Dale, 2002). Spool, Scanlan, Schroeder, Snyder, & De Angles (1999) disputed that links should not be entrenched in pages of text that required the visitor to scroll down and locate; in addition, links should not fall onto two lines (as cited in Cox & Dale, 2002).

Furthermore, an important strategy to success has been service quality delivery through Web sites, and even more significant than low price and Web presence. In order to deliver superior service quality, managers of corporations with Web presences needed to recognize how shoppers identify and appraise Internet customer service (Zeithaml, Parasuraman, & Malhotra, 2002).
Effective E-Commerce Web Sites Successful Strategies

Visitor Greeting Page
Attractive and effective home page

Catalog Page
Products are described with attractive pictures

Shopping Cart Page
Easy to use market basket

Cash Out-Page
Buying fast and easy

Security
Assure customer secure purchase

Coherence
Easy to understand and use

Consistency
Common design applied to all pages

Efficiency
Efficient and fast to use

Navigation
Products to be quickly and easily found

Styles
Pages are easy to read

Value Added
Customer services beyond expectancy

Brick & Mortar
Good values of traditional store

Customer Visits

Customer Satisfaction

Decision Buying

Figure 1
Conceptual Framework Model of the ICES 12 Major Properties

Statement of the Problem

This research study attempted to explore Web site design using twelve major properties and factors for consideration. Currently little research has been available regarding the features of effective Web sites, and few empirical studies examined the features and methodologies of developing standardized Web site design (Udo & Marquis, 2002) (as cited in Scheffelmaier & Vinsonhaler, 2002). Most of the literature consisted of subjective statements and was inconsistent in the use of terminology and the ranking of features for effective Web sites with empirical studies. This was a motivating factor to create the ICES standardized evaluation tool for effective Web sites (Scheffelmaier & Vinsonhaler, 2002). Meanwhile, most of the information from the literature lacked a powerful base to evaluate the design of effective Web sites and was deficient in standardized test procedures to ensure validity and reliability.

Competition among the Taiwanese businesses with commercial Web sites has primarily focused on product variety and the value of quality customer-service, instead of the price of products. Consumers tended to be young adults with a high degree of education. Consequently, traits of “saving time,” “offering plentiful information,” and “providing intelligent personal information systems” were the main motivations to attract customers (Chen & Kuo, 2002). Moreover, different kinds of Internet services, such as, e-papers, free mailboxes, chat rooms, etc., were not offered by each Web site. Therefore, prior to creating a Web site, the designer needed to appraise the Web site and decide appropriate services, instead of adding new services that might needlessly increase costs (Chen & Kuo, 2002).
Competition for online customers has become intense even though only 30% of "brick-and-mortar" retailers have set up a Web site to introduce online shopping into marketing strategies. Taiwan has been following a similar path as the United States, where brick-and-mortar shop owners have been slowly increasing online business. The growth of business-to-business (B2B) e-commerce has been much slower than business-to-customer (B2C) online shopping. People have taken a "wait-and-see" attitude, following the slowing of e-commerce enthusiasm. Although numerous online customers were only slowly increasing, there has been a noteworthy growth in the number of businesses offering online services (Lin, 2002).

As e-commerce has grown in size and significance, marketing and consumer researchers have dedicated more time and energy in studying consumer behavior. In addition, researchers have investigated how customers have made the Internet a part of lives that include the need to make purchases in a timely manner (Peterson, Balasubramanian, & Bronnenberg, 1997; Cowles & Kiecker, 2000) (as cited in Goldsmith, 2002). Business needed to recognized why customers purchase online, in order that marketing strategies could be developed to promote potential customers to access corporate Web sites to buy products and services (Aldridge, Forcht, & Pierson, 1997; Wysocki, 2000) (as cited in Goldsmith, 2002).

The evidence has undoubtedly revealed that satisfied shoppers were expected to return to a Web site and make additional purchases, while frustrated shoppers looked to another site for services. Thus, Web sites and order performance efforts concentrated on promoting consumer satisfaction. Online shoppers continued to be more inventive in using e-commerce than the majority of customers (Goldsmith, 2002).
Online customers are considered impatient due to valuing time and efficiency; therefore, capturing the user’s attention has become increasingly essential. Businesses tended to be concerned about the amount of time (5-30 seconds) involved in capturing a consumer’s attention. The content and design of the home page were important, as well as download speed, which persisted in an imperative concern to customers. Time-consuming graphics and unnecessary text needed to be avoided (Geissler, 2001).

Customers used the Internet for fast access to information, therefore, graphics should be small and related, as well as being easily viewed. On the other hand, placing large graphics onto Web pages slowed access to the page, and could discourage the customer into rejecting the site (Foremski, 2000; Holt, 2000; Vassilopoulou & Keeling, 2000) (as cited in Cox & Dale, 2002). Holt (2000) suggested that color was another significant component of an enticing Web site. A dreary Web site would most likely dissuade customers, due to the projection of a negative image (as cited in Cox & Dale, 2002). Constantine and Lockwood (1999) indicated that animation should not sidetrack users from the content of the page and the information that was sought (as cited in Cox & Dale, 2002). A well-designed site provided an option to users as to whether or not the consumer wanted to download software that caused the site to be more interactive and animated. Offering such an option accommodated impatient users who merely wanted to access desired information rapidly (Cox & Dale, 2002).

According to Berthon, Pitt, and Watson (1996), Web sites have been used to guide customers and expectation through the purchasing process (as cited in Teo & Tan, 2002). Corporate managers faced numerous challenges in implementing the Internet in marketing efforts, and creating successful online marketing strategies to generate a winning product
line (Smith, Bailey, & Brynjolfsson, 1999) (as cited in Teo & Tan, 2002). A key issue for business has been the method by which prospective customers located the Web site. This continued to be an essential issue for business, since the effectiveness of an online initiative has been dependent upon the number of potential consumers that accessed the site. A visitor arrived at a site in several means such as being told the online address in a magazine advertisement (Pardun & Lamb, 1999) (as cited in Thelwall, 2001), an e-mail, an Internet discussion forum, or by following a link from another Web site (Thelwall, 2001).

**Purpose of the Study**

The purpose of this study was to identify the common properties that effective Web sites have in common in Taiwan. This study applied the ICES Web site tool (Scheffelmaier & Vinsonhaler, 2002) to decide whether or not the ICES was a reliable and valid measure for assessing the quality of commercial Web sites in Taiwan. By addressing this purpose, the researcher planned to explore how to develop a "well-designed" Web site for businesses and consumers. The 12 major properties established by Scheffelmaier & Vinsonhaler (2002) were the most frequently mentioned by customers as successful Web site elements. In other words, this research attempted to investigate the correlation between 12 major properties and Web site effectiveness. In the increasingly competitive Internet marketing, businesses should strengthen Web site design and customer retention marketing strategies.

This research was based on Scheffelmaier & Vinsonhaler (2002) and fifty-one studies of properties frequently revealed in the literature as characterizing effective Internet commerce Web sites. These studies were used to develop the Internet commerce evaluation scale (ICES), which synthesized the available research literature of features for
successful Web site design. Thus, this study tested whether or not the ICES scale was valid and reliable as an effective tool in Taiwan. Finally, this research study also tested selected Web sites with High and Low-convenience scores for evaluating the sites on the basis of customer satisfaction and time used to finish the purchase.

**Significance of the Study**

A systematic model describing the topics contained in this research was presented in a Conceptual Framework Model of the ICES 12 Major Properties (Figure 1). According to Scheffelmaier & Vinsonhaler (2002), a successful site must have all of these qualities. Web sites need to be designed for functional user interfacing and easy usability. There were no previous studies available that have developed a standard evaluation tool for Web site effectiveness, such as ICES. The ICES was created through a compilation of all the elements of successful Web sites found in the earlier studies. This research study addressed the properties of effective e-commerce Web sites in attracting Taiwanese customers to shop online.

The arrival of the World Wide Web has led to the establishment of a new type of business operation process, e-commerce. This new operational process has significantly transformed the way company has been accomplished through traditional marketing and delivery systems. The Internet has transformed the way businesses appeal to consumers and retain existing customers. Businesses could give customers the option of how and when to purchase products in “real-time.” This online shopping tool has authorized customers to take on the role of being a retail buyer. Consumers have become able to order directly from the manufacturer, and remove the need for a “middleman” in the delivery process, which has led to customers receiving better-quality service and superior
product prices. However, along with the new “cutting edge” of e-commerce come primary concerns about security and privacy. E-commerce has been predicted to continue developing, with marketing strategies and delivery methods being permanently transformed (Erdem & Utecht, 2002).

To be successfully competitive through online marketing, businesses need to take action by

1. welcoming the customer when visiting the Web site;
2. keeping the customer at the Web site once arriving;
3. attracting the customer to return to the Web site;
4. making a decision to buy;
5. following up and promoting repeat business by trying to cause the second and third sale (Balanko-Dickson, 2003).

The most imperative issue has been finding the marketing tools and strategies to boost competitive force. Many corporations created Web sites seeking to gain tremendous profits. Numerous studies pointed out that content was the primary component of a winning Web site (McCarthy, 1995; Angehrn, 1997) (as cited in Chen & Kuo, 2002). An analysis and discussion of the quality of Web sites by different industrial types could be created, by observing the content and design structure of the commercial Web sites in Taiwan. Moreover, analysis of the habits and needs of principal customer groups enabled sellers to include the most effective marketing strategies in Web site design (Chen & Kuo, 2002).

Businesses of any size and in any segment could profit from the Internet. Understanding what customers businesses sought to access, as well as consumer prospects,
were important factors in the consideration of the practicability of developing an Internet Web site for the business. Businesses must realize how to apply the potential of the Internet and how to assess the performance of the Internet Web site (Bell & Tang, 1998).

On the other hand, a Web site should create a wide-ranging system to protect individual information. Such a system should include education and training instruments to enable staff members to acquire legal knowledge, ethical judgment, and technical expertise. Business should sign private contracts to strengthen customer’s privacy. The corporate policy on information usage of a Web site should be formulated appropriately to gain customers’ trust (Yang & Chiu, 2002).

Converting Web site visitors to customers and repeat customers has been encouraged by actively integrating marketing and communication strategies. The introduction of a Web site could contain the use of other media and corporate correspondence to improve the Web site. Business must dynamically assist consumers in locating the sites via search engines, as well as through key words easily identified with the corporate products. Business also must request feedback, respond to questions, and guide consumers to develop trust in the online purchasing process (Geissler, 2001).

**Research Questions**

This research study addressed the properties of effective e-commerce Web sites in attracting Taiwanese customers to shop online. The goal of this study was to understand the validity and reliability of ICES on measuring the quality of Web sites and the degree to which ICES was linked to customer satisfaction.
The research questions of this study were:

(1) Do scores from the ICES predict satisfaction with commercial Web site in Taiwan?

(2) If ICES scores predict satisfaction with commercial Web sites, which of the scales were most highly correlated with commercial Web site satisfaction in Taiwan?

The data were analyzed applying the appropriate Statistical Package for Social Science (SPSS) 11.0 procedures to answer research question according to independent variables:

(1) visitor greeting page,
(2) catalog,
(3) shopping cart,
(4) cash out,
(5) security,
(6) coherence & organization,
(7) consistency & standardization,
(8) efficiency,
(9) navigation,
(10) style,
(11) value added,
(12) brick & mortar,
(13) total checklist score, and
(14) total ratings score.
The dependent variables were:

1. use again item,
2. level of frustration item,
3. general evaluation item, and
4. total satisfaction score.

Descriptive (means, standard deviations, and distributional examinations), psychometric (reliability), and inferential (validity) statistical data analysis techniques were employed in the research study. The statistical significance of this research for all analyzes was 0.05.

**Objectives of the Study**

The Internet is a greatly significant information technology. Use of the Internet persists in developing at a volatile rate. While recreation, education, and communication play as vital utilizations of the Internet, e-commerce maintains to evolve as an increasingly noteworthy business trend (Sexton, Johnson, & Hignite, 2002).

E-commerce is predicted to continue and as an electronic business trading vehicle, e-commerce will establish immense changes in the way worldwide business is accomplished. Undoubtedly, e-commerce trading has revolutionized the marketing industry. Given that certainty, the practical corporate executive must exploit the Internet to take advantage of the opportunities that are accessible today, and developing tomorrow (Pronet Designs, 2000).

The quick increase in e-services established a challenge for business as to what combination of characteristics should be provided to satisfy customers while considering operational and financial concerns. Consumer favorites for features of e-services differed
between offline and online shoppers. Moreover, with the increased rate of customer usage, interesting tendencies when regarding the significance for features must be considered. Similarities also existed in customers preferences between different groups of online shoppers based on the frequency of usage (Iqbal, Verma, & Baran, 2003).

The objectives of this study were to:

1. Determine whether or not the ICES was a reliable and valid measure for assessing the quality of commercial Web sites in Taiwan;
2. Explore how certain Web site characteristics impact Web site effectiveness in Taiwan;
3. Provide research results to help businesses understand what kind of Web site design was the most effective in online shopping in Taiwan;
4. Understand the relationship between customer satisfaction and Web site design in Taiwan.

Delimitations, Assumptions, and Design Controls

The delimitation of this study was that the survey was conducted only at one college located in Taipei, Taiwan. The following were some of the limitations of this study: the Web sites were accessed through the Internet using the college server; the modem speed was set by the college; only a selected number of limited products from numerous products were available, and only specific Web sites from many potential ones were selected.

This study primarily focused on the effectiveness of Web site design on the business-to-consumer (B2C). For other business styles, such as, business-to-business (B2B), results will not be found in this study. Restricted sample size influenced the
precise results, such as sampling bias & error, and simplification. Finally, an insufficient number of computer labs were available, which lead to an inadequate amount of time to visit all Web sites and answer the questionnaire. Therefore, these limitations lead to the inadequate generalization.

The assumption underlying this research was that business can achieve customer satisfaction and enhance online purchasing as long as the Web site design meets the 12 property groups - 68 standardized phrases (Table 1).
<table>
<thead>
<tr>
<th>Visitor</th>
<th>Consistency / Standardization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describes Site or its Content</td>
<td>Has a Simple Uncluttered Page Design</td>
</tr>
<tr>
<td>Has Navigation Bar</td>
<td>Do All Applications Look the Same</td>
</tr>
<tr>
<td>Has contrasting colors</td>
<td>Has the Same Shopping Cart Icon</td>
</tr>
<tr>
<td>Eliminating Scroll Down Option</td>
<td>Has Partnership Icons</td>
</tr>
<tr>
<td>Has Intranet Links</td>
<td>Has Consistent Information</td>
</tr>
<tr>
<td>Uses Subject Tags</td>
<td>Has Consistent Format</td>
</tr>
<tr>
<td>Has Shopping Cart Icon</td>
<td>No Scroll Down Option</td>
</tr>
<tr>
<td>Provides Human Contact</td>
<td></td>
</tr>
<tr>
<td>Has an Intranet Search Engine</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Catalog</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides Thumbnail photos</td>
<td>Provides Quick Download Time</td>
</tr>
<tr>
<td>Provides Product Description</td>
<td>Has Descriptive URL Address</td>
</tr>
<tr>
<td>Provides Product Price</td>
<td>No Unnecessary Graphics</td>
</tr>
<tr>
<td>No Unnecessary Graphics</td>
<td>No Orphan or Dead-end Pages</td>
</tr>
<tr>
<td>Provides Shopping Cart Access</td>
<td>Requires Few Clicks to Locate Product</td>
</tr>
<tr>
<td>Provides Links to Related Products</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shopping Cart</th>
<th>Navigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays a Return Policy</td>
<td>Provides Buttons</td>
</tr>
<tr>
<td>Provides S &amp; H Charges</td>
<td>No Orphan or Dead-end Pages</td>
</tr>
<tr>
<td>Allows Buyer to Return to the Catalog</td>
<td>Has a Site Map</td>
</tr>
<tr>
<td>Provides an Express Cash Out</td>
<td>Has an Intranet Search Engine</td>
</tr>
<tr>
<td></td>
<td>Has a Help Menu</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cash Out</th>
<th>Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has One Time Credit Card Registration</td>
<td>Easy to Read Font</td>
</tr>
<tr>
<td>Has One Time Shipping Address</td>
<td>Uses 12 - 14 Font Size</td>
</tr>
<tr>
<td>Provides Human Contact</td>
<td>Use of Bold and Italic Text</td>
</tr>
<tr>
<td>Provides Link to the Shipping Carrier</td>
<td>Has All Text Align Left</td>
</tr>
<tr>
<td>Provides E-mail Verification Shipping</td>
<td>Uses 40 - 60 Characters Per Line</td>
</tr>
<tr>
<td>Provides One Time Account Creation</td>
<td>No Unnecessary Graphics</td>
</tr>
<tr>
<td>Provides Deliver Information</td>
<td>Provides Discriminate Links</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Security</th>
<th>Value Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides Transaction Security</td>
<td>Delivers an Unexpected Experience</td>
</tr>
<tr>
<td>Provides Payment Options</td>
<td>Creates a Positive Sensory Experience</td>
</tr>
<tr>
<td>Provides Electronic Signature Option</td>
<td>Provides an Attractive Product Display</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coherence &amp; Organization</th>
<th>Brick &amp; Mortar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does Each Page Serve a Single Purpose</td>
<td>Provides Good Customer Service</td>
</tr>
<tr>
<td>Lists the Important Information First</td>
<td>Provides Back Office Assistance</td>
</tr>
<tr>
<td>Has an Hierarchical Menu</td>
<td>Provides a Physical Address</td>
</tr>
<tr>
<td>Provides Easy Access to the Product</td>
<td>Provides Telephone Numbers</td>
</tr>
<tr>
<td>Uses Common Language</td>
<td>Provides Current Site Information</td>
</tr>
<tr>
<td></td>
<td>Provides Quality Products</td>
</tr>
<tr>
<td></td>
<td>Provides Competitive Pricing</td>
</tr>
</tbody>
</table>

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Definition of Key Terms

*Internet Commerce Evaluation Scale (ICES)*: A standardized tool for evaluating Web sites. The ICES was based on 68 phrases most commonly mentioned in the literature as important features of successful Internet commerce Web sites (Scheffelmaier & Vinsonhaler, 2002).

*Effective Web site design*: “…is the result of diverse elements. All aspects of page presentation must work together to showcase the site’s content in the very best light. The selection and coordination of available components to create the layout and structure of a Web page” (Web Design Guide, 2003, ¶ 1).

*E-commerce*: Transactions and communications were thus created via computers, instead of being performed through traditional stores (Rayport & Sviokla, 1994) (as cited in La & Kandampully, 2002). E-commerce characterized the way in which transactions occur over networks, mainly the Internet. This included the process of electronically buying and selling products, services, and information (Turban & King, 2003).

*Customer satisfaction*: …is the state of mind that shoppers have about a corporation when the prospects have been met or surpassed over the lifetime of the product or service. The achievement of customer satisfaction results in corporation loyalty and merchandise repurchase (Cacioppo, 2000).

*Internet marketing*: A manner of marketing that integrates traditional marketing with the interactive qualities of the Internet. The goal is to distribute products and services to satisfy customers. Online marketers develop plans and campaigns to entice consumers to a Web site and encourage the potential customers to register and/or purchase products (SoundVentures, 2003). Internet marketing is an online marketplace
where buyers and sellers meet to deal products, services, money, or information (Turban & King, 2003).

*Features (Standard Phrases):* "A combination from the synthesis of literature (e.g., easy to read font, fast download time, human contact, short URL address, transaction security, and no unnecessary graphics)" (Scheffelmaier, 2003, p. 6).


1) *Visitor Greeting Page:* The attractive first or home page of the Web site.

2) *Catalog Page:* A obviously described product, including pictures, description, and price of the products so buying decisions were direct forward, and thus allowed the customer to place products in the “shopping cart.”

3) *Shopping Cart Page:* The site included an effective, easy-to-use list of intended purchases, and offered the user the option of continuing to shop or going to the cash out page to actually order products.

4) *Cash Out Page:* The cash register page enabled fast and easy buying of products, provided users the ability to actually pay for and order the products.

5) *Security:* The site certain the customer a secure purchase, determined the security of the customer’s information, and typified the entire site.

6) *Coherence & Organization:* The site was easy to understand and use, and referred to how well the site was prepared and organized.

7) *Consistency & Standardization:* The site pages were structured with a common layout, making the content easier to learn and use, as well as referred to how consistent the
format was as one moved from page to page.

8) **Efficiency:** The site was well-organized, and referred to how quickly and easily user could move from page to page.

9) **Navigation:** The site products were quickly and easily found, and how simply the user could find pages including the desired functionality.

10) **Style:** Pages were easy to read, and concerned the formal style used on all pages.

11) **Value Added:** The site had customer services beyond that expected, and referred to adding or creating something extra to the site that other sites did not offer.

12) **Brick & Mortar:** The site contained the values of the traditional store (Scheffelmaier, 2003, p. 6-7).

**Contribution of the Study**

This research study focused on factors that were extremely important from both subjective and empirical perspective. The researcher proposed a conceptual framework based on a modified theory of Scheffelmaier & Vinsonhaler (2002) that was organized into 12 property groups containing 68 standard phrases (Table 1) to investigate the influence on Web site effectiveness and customer satisfaction in Taiwan. The study was helpful because this research offered the ability to understand the relationship between 12 major properties of effective Web sites and customer satisfaction for the business Internet marketing model.

This study integrated the subjective and empirical studies of properties characterizing effective Internet commerce Web sites. Statements about properties from the literature were coded into standard property phrases. The findings of this study could
be referred to in order to further research the implementation of the ICES evaluation tools with different populations. Meanwhile, such findings could aid businesses to design dynamic Web sites in the competitive Internet market, develop supplemental discussions and references.

The results of this study were expected to be vital to E-business, customers, and researchers. Web site designers, online customers, and Internet enterprises gained a significant advantage from this quantitative research. Taiwanese business could develop useful Internet marketing strategies to improve the Web site weakness with these findings. With the results, business could realize which one specific property was the most important or how many specific properties were more significant on Web site success. The contribution of this study could help businesses to identify Web customers’ requirements, satisfaction and provide high quality, dynamic Web sites in Taiwan.

The goal of this study was to collect, create and present the results for Web site effectiveness in Taiwan. Through analyzing the correlation between 12 major properties (ICES) and effective Web sites, this research study contributed not only to acquiring more information about online customer requirements, but also improved the ease in achieving competitive advantages in the digital economy.
Summary

This research focused on the importance of effective Web site design, and applied the ICES instrument to assess the characteristics of successful commercial Web sites in Taiwan. This assessment tool provided a list of properties and asked Web users to rate the importance of each, regarding satisfaction, re-visiting or purchasing. The results of this research facilitated businesses to understand and analyze the impact of Web site designs on decision buying and customer satisfaction for online buyers in Taiwan. This dissertation was organized as follows:

Chapter One introduced the study into the effective electronic commerce Web sites among online shoppers in Taiwan and presented the evaluation instruments of Web sites-Internet Commerce Evaluation Scale (ICES). According to Scheffelmaier & Vinsonhaler (2002), Web sites on which consumers could easily find and buy products, and engaged the user for a minimum amount of time, produced more income. This chapter began to describe the background, conceptual understanding of the study, identified research questions, and the purpose, objective, and significance of the study. Chapter One also included the definition of key terms, assumption, delimitation, and design controls of the research study.

Chapter Two provided a review of the literature of key concepts in this research. The primary gap was that there were few empirical studies to examine the features and methodologies of developing a standardized evaluation tool for Web site effectiveness.

Chapter Three discussed the research questions and design. This chapter contained a sampling plan (including selected products and Web sites), instruments,
procedures and data collection approaches, the ICES study, validity and reliability of the research, and methods of data analyses.

Chapter Four disclosed the findings and results of the statistical analysis of the survey instrument (questionnaire). All findings and results of the study were indicated in proper tables, figures, and graphs.

Chapter Five summarized the research findings and provided the conclusion, and recommendations for further research. This concluding chapter included the implication of the results for further study. Strengths and limitations of the research study were analyzed and discussed.

The appendices presented the form of ICES, and the data collection and references demographic questionnaire, forms for evaluating a Web site, and site review protocol, informed consent statement for the participants, and institutional review board approval.
CHAPTER TWO
THE REVIEW OF LITERATURE

Introduction

Chapter Two presented a review of the literature of features for effective Web sites. Business-to-consumer (B2C) e-commerce has become widespread in most countries, including Taiwan. E-commerce deals with buying and selling on the Internet, communicating with business partners, servicing customers, and conducting electronic dealings between companies (Kim & Eom, 2002). Online shopping can offer convenience, competition, information, and new marketing models. E-commerce provides opportunities for both business managers and customers (Turban, Lee, King, & Chung, 2000; Wang, Head, & Archer, 2000) (as cited in Wang & Head, 2001). The successful Web site design played the most crucial roles in whole process.

This chapter presented a conceptual framework to synthesize the data that has been published about features of effective Web site design and to determine which features were necessary to increase customer satisfaction. The literature review combined the research findings from both Web site design and Internet marketing research in the context.

Chapter Two began with a history of e-commerce and development, which included a relevant literature review of the subjective and empirical studies, ICES development, Web site design strategies, success in Web Site, Web site analysis, key issues of Web design, and models of Web site effectiveness. Next, this chapter discussed the e-commerce, online shopping markets, Internet penetration & issues in Taiwan, the population and demographics, and infrastructure. Finally, several literatures were studied along with successful e-commerce criterion. These included customer management,
support, satisfaction, and issues of privacy and disclosures in Web sites. Promoting the Web site was vital, Web Site optimization and positioning strategies & techniques, and assessment targets were also mentioned.

**History of E-Commerce**

Weisman (2000) reported that as early as 1968, Electronic Data Interchange (EDI) permitted various corporations to achieve electronic dealings with one another. There was no guarantee that corporations in communication with one another had the same transactions capacities. However, by 1984, when the ASC X12 standard was established, this phenomenon now existed. The year 1984 was a huge turning point in e-commerce history. In 1992, people started conducting the establishment of Mosaic the browser, which permitted point-and-click access to the Web.

“In May of 1998, DSL extended across California. This technology provided users to connect at 50 times that speed. SBC Communications provided 200 communities in California with high-speed Asymmetrical Digital Subscriber Line (ADSL)” (Weisman, 2000, ¶ 4). In the end of 1998, people were celebrating the achievement of Internet corporations, such as, Amazon.com. Amazon.com created over $1 billion US in sales every year. E-commerce was becoming an exciting marketing tool (Weisman, 2000).

In August of 1999, Linux, an operating system, was becoming very prevalent, and even gave Microsoft competition. Until 1999, Microsoft had been the leader of all operating systems (Weisman, 2000). The following “rising star” in e-commerce was Napster. Napster provided users the free downloadable music from the Internet (Weisman, 2000).
In the beginning of 2000, AOL and Time Warner announced a corporate merger. AOL’s ability to relocate material and information from Time Warner, with 24 million customers, would grant both companies to enhance e-commerce engine capabilities (Weisman, 2000).

In February of 2000, computer hackers attacked many major investors in the e-commerce market, such as yahoo.com, amazon.com, and ebay.com. Online companies must learn how to provide Web site protection (Weisman, 2000).

In May of 2000, the United States government expanded the moratorium on Internet-specific taxes for an extra five years. Industry analysts believed these issues would not be resolved easily. Many people felt that e-business industry was so vulnerable; the government should allow growth without being hampered by taxes. In addition, in May of the same year, boo.com closed down online. This failure was a reality check for all online investors and has been added to a growing list (Weisman, 2000).

Subjective Studies

The following a list of subjective and empirical studies was summarized from part of literatures of Scheffelmaier and Vinsonhaler (2002). In subjective studies, experiences in developing Internet commerce Web sites were summarized and included discussion of the properties considered most significant. Few studies included empirical data, collected from Internet users, which provided supporting judgments of the significance of the properties of customer purchasing behavior (Scheffelmaier & Vinsonhaler, 2002).
Nielsen (1996) published one of the first lists of Internet commerce site properties as the “Ten Mistakes in Web Design.” The severity of the mistakes was ranked as ‘very severe’, ‘severe’, ‘medium’, and ‘small problem’:

1. frames (medium), frame design prevents the user from printing or e-mailing,
2. technology (very severe), slow speed, Java script errors, plug-ins required,
3. scrolling text and looping graphics (very severe), creating difficult scrolling and navigating,
4. complex & meaningless URL’s (severe),
5. orphan pages (medium),
6. scrolling navigation pages (small problem), since users want everything on the page,
7. lack navigation support (severe), individual pages should be linked to all other pages,
8. non-standard link colors (severe), using blue first, purple when activated by clicks,
9. outdated information (very severe),

Detweiler and Omanson (1996) published the article which emphasized five properties:

1. accessibility: downloading time should be short;
2. organization: pages should be logically organized with headers, content and navigation tools in the same place on every page. All pages should be simple
and uncluttered;

(3) navigation: no dead-end pages, no long scroll down pages an internal search engine allowing keyword search;

(4) aesthetics: avoid visual clutter, flashing text, and confusing or ambiguous text;

(5) miscellaneous: avoid illegible text due to poor contrast, provide instructions for download, and give download times in advance (as cited in Scheffelmaier & Vinsonhaler, 2002, p. 24).

With the increasing popularity of e-commerce, a list of properties has developed for dynamic Web sites based upon the need of the buyer to navigate effectively on the site. The following major properties were listed by Lynch and Horton (2001):

(1) no scroll downs, full page should fit on the screen,

(2) small chunks of information should be used,

(3) organize the pages into logical units with all information for a given product on the same page,

(4) use a uniform format on all pages, e.g., place the company logo in the upper left corner of all pages,

(5) organize content logically with the most important first,

(6) test the site with real users, and

(7) organize the pages into a main sequence with links to pages that provide additional information (as cited in Scheffelmaier & Vinsonhaler, 2002, p. 24).

Research recommended a basic design that stressed making navigation easy to reduce visitor frustration. The following properties were proposed by Bevin (2003):
(1) do not gather individual information until the user has a chance to visit the site,

(2) design should be simplistic and significant to the user, avoiding technical terms, using common language,

(3) use clear labels to display the product,

(4) in search facilities using familiar terms, ordering search results in a rational order,

(5) offer a completed text description and photo for products,

(6) employ the same basic format for all pages,

(7) present information on whether purchase can be made online and the other choice,

(8) permit shoppers to view the existing order in the shopping cart from any page, presenting prices and shipping rates when items are placed in the cart,

(9) offer user access to the address and phone number for customer service,

(10) stress security and privacy of consumer information,

(11) attempt to offer value added through including services not obtainable in a brick-and-mortar store (as cited in Scheffelmaier & Vinsonhaler, 2002).

Waller (2000) published “Keep It Simple” based on subjective data for Black Enterprise. The following list of 10 hints to keep buyers on the site was offered to the reader:

(1) Know your audience.

(2) Keep paragraphs short and conversational.

(3) Include effective hypertext links.
(4) Validate your site.

(5) Use graphics sparingly.

(6) Include contact information on your site.

(7) Include surveys, coupons, and question and answer sections.

(8) Avoid click-and-scroll syndrome.

(9) Make sure Web pages have clear messages.

(10) Have a crisis intervention plan (p. 64).

Keeker (1997) published guidelines for the best of Web criteria, studies on usability, and reviews of Web site design criteria. The decisive factor was for the prospective customer to make repeat visits to a Web site. The guidelines emphasized the following general principles:

1. appropriate and high quality content,
2. ease of use,
3. front-end and rear-end usability,
4. present an exclusive experience, and

To summarize, the research mentioned above discussed the properties shared among successful Web sites. This includes such qualities as “fast download, page standardization, ease of locating the product, page design simplicity, and detailed product description with pictures” (Scheffelmaier & Vinsonhaler, 2002, p. 24).

**Empirical Studies**

In empirical studies, quantitative evidence was presented as to the significance of the properties studied, in terms of customer judgment or purchasing behavior. Forrester
Research (2000) established an online questionnaire to assess the quality of Web sites, so that customers could provide personal feedback on a Web site. The questionnaire included the following properties:

1. ability to navigate around the site,
2. ability to check on an order,
3. depth of products available,
4. depth of product information,
5. site tools to help selection,
6. quality of products,
7. speed of arranging payment,
8. speed of finding the desired product,
9. quality of gift registry,
10. responsiveness to e-mail,
11. speed and ease in contacting telephone help,
12. helpfulness of telephone assistance,
13. fairness of prices,
14. fairness of shipping costs,
15. speed of page loading,
16. presence of broken links,
17. breadth of delivery options, and
18. ease of returning products

The survey developed by Udo and Marquis (2002) determined which properties e-commerce users judged to be the most important in terms of repeated buying on a particular Web site. The properties included in the questionnaire were as follows:

1. User friendly - keeping the user in mind,
2. Cohesiveness - all of the information on a page was related,
3. Consistency - overall layout the same for all pages, e.g. company logo, colors,
4. Navigation - same navigation bars in the same location all pages. User was able to go anywhere from anywhere,
5. Interactivity - good customer service, contact information physical street address, telephone numbers and e-mail for company,
6. Graphics - limited graphics to yield fast download time,
7. Download time - time to download any page was short,
8. Limited advertisement - few advertisements or banners which took the customer to some other site, and

Udo (2002) found of the nine properties, four were meaningfully dealt with site quality: “download time, navigation, graphics, and interactivity” (as cited in Scheffelmaier & Vinsonhaler, 2002, p. 25). Cohesiveness and consistency were rated high but were deemed insignificant. Udo (2002) suggested that this was because of misunderstanding on the definition of the two words (as cited in Scheffelmaier & Vinsonhaler, 2002).
Bagozzi (1998) has proposed applying economics and marketing theory to Web shopper decision making (i.e., the Digital Economy). Bagozzi’s research has investigated the source of customer satisfaction and the character of the exchange on the Web. Bagozzi indicated that customer satisfaction was due more to the whole experience of interacting with the site than the real purchase (as cited in Scheffelmaier & Vinsonhaler, 2002).

Roldan’s (2001) study proposed that Web site satisfaction depended on identifying the type of buyer. Most Web customers were included in two or more of these category descriptors:

1. Recreational customers shopped for pleasure and preferred multi-media presentations.
2. Experimental customers liked to touch and feel the product and preferred sites with a local brick-and-mortar store.
3. Convenience customers were pressed for time and preferred sites which were easy to find and could rapidly purchase the product.

The major outcome of Roldan’s (2001) study was that most shoppers preferred sites in which the product was easily found, convenient ordering online, and the products carried strong brand recognition (as cited in Scheffelmaier & Vinsonhaler, 2002).

In the empirical studies, as well as in the subjective studies, there was a lack of vocabulary standardization among the rating scales, and each scale used different descriptors for the same properties. The most outstanding finding seemed to be that study
participants who were required to rate the quality of Web sites, selected a common set of properties as most significant to satisfaction with the sites. The properties were:

1. Cohesiveness - all of the information on a page was related;
2. Consistency - overall layout the same for all pages;
3. Ease of Navigation - same navigation bars in the same location all pages;
4. Interactivity - good customer service, contact information physical street address, telephone numbers and e-mail for company;
5. Download Time - time to download any page was short, and so on (Scheffelmaier & Vinsonhaler, 2002, p. 25).

To summarize, the most often mentioned property groups consisted of: easy to understand and use, good values of the traditional store, customer services beyond expectations, efficient and fast, an effective home page, products quickly and easily found, a common design which was applied to all pages, and buying products in a fast and easy manner (Scheffelmaier & Vinsonhaler, 2002, p. 23).

Finally, Scheffelmaier & Vinsonhaler (2002) summarized the most frequently mentioned criteria for evaluating Web sites. There were 12 major properties, which characterized, effective Internet commerce sites, and were ordered as follows:

**ICES Development**

The Internet Commerce Evaluation Scale (ICES) was based on 68 phrases most universally mentioned in the literature as significant features of effective Web sites. The 68 standardized phrases were the most commonly used in the literature to describe properties of effective commerce Web sites. The phrases were structured into 12 property groups, each of which encompassed phrases relating to a common trait. These 12 property groups and the 68 standardized phrases were composed when creating the ICES. The scale contained 12 subtests, which stood for the 12 property groups, and a total of 68 checklist items, which corresponded to the 68 standardized phrases. The Internet Commerce Evaluation Scale (ICES) was based on a synthesized previous literature study on the properties of Web sites, which were evaluated the most effective in initial purchasing and return purchasing (Scheffelmaier & Vinsonhaler, 2002).

Although some efforts have been made to design scales, there were none that have created scales for appraising Internet commerce Web sites, and have presented the traditional reliability, validity, and normative data required of an assessment tool for use in research (Magnusson, 1996) (as cited in Scheffelmaier, 2003).

Forrester (2000) utilized an online questionnaire, Power Rankings, which rated the following 12 Web categories: electronics, health, apparel, toys and games, movies, flowers, books, music, brokerage, airlines, computing, and general merchandise. The questionnaire was posted on the Forrester Web site, and those who visited the site had the choice of using the questionnaire. The questionnaire was divided into two parts. The first section included 18 items concerning whether or not the subject thought the site met user expectations. A Likert scale was applied with 1 =
Much worse than expected and 5 = Much better than expected. The second part included three questions asking subjects to evaluate the level of quality of the site, in terms of expectations about online retailers (as cited in Scheffelmaier, 2003, p. 53-55).

Escalas, Jain, and Strebel (2001) developed a questionnaire with two sections. The first section related to site presentation and included several open-ended questions addressing whether or not the site had consistent design, pages linked to one another, exclusive design, "coolness," and caught the viewer's attention. The second section of the questionnaire addressed navigation and organization: was the site simple to navigate, permitting the viewer to go where the viewer wanted to go? Was the site organized in a rational method? Could the user view pages and return to previous pages easily? Was the most significant or preliminary information provided first and followed by pages including specific details (as cited in Scheffelmaier, 2003).

Scheffelmaier and Vinsonhaler (2002) developed the earlier work by synthesizing many studies of properties frequently mentioned in the literature as characterizing effective Internet commerce Web sites. These studies included 51 subjective studies, based on designers' opinions, and eight empirical studies based on Web users' ratings of sites. Statements about properties from the literature were coded into standard property phrases. A total of 68 standard phrases were found, such as "Provide human contact."

According to Scheffelmaier and Vinsonhaler (2002), the ICES standard phrases were organized into 12 property groups containing closely related phrases, as shown below:
• Visitor Greeting Page – the site had an attractive, effective home page,

• Catalog page – the products catalog clearly described and pictured the products so buying decisions were straightforward,

• Shopping Cart page – the site had an effective, easy to use list of intended purchases,

• Cash Out page – the cash register page made buying products fast and easy,

• Security – the site assured the customer a secure purchase,

• Coherence & Organization – the site was easy to understand and use,

• Consistency – the site pages were organized with a common format, which made the pages easier to learn to use,

• Efficiency – the site was efficient to use,

• Navigation – the site products were quickly and easily found,

• Style – pages were easy to read,

• Value Added – the site has customer services beyond what was expected,

• Brick & Mortar – the site had the values of the traditional store (p. 27).

Scheffelmaier and Vinsonhaler (2002) categorized and developed a conversion of the properties most mentioned in the literature into a combined checklist and rating scale of ICES. In addition, Scheffelmaier and Vinsonhaler (2002) modified the scale including a supplementary item for sites which suggested the purchase of items dealt with the ones being exhibited in the catalog; clear definitions for each phrase, and a set of standardized instructions. A sample page from ICES follows:
Coherence and Organization (ICES)

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

_____ Does each page serve a single purpose (e.g., do all products on the page belong together, such as all books or all tools; or are the products mixed together).

_____ Has the important information listed first (e.g., logo in the upper left corner, navigation bar on the left, content in the middle, etc.).

_____ Has an hierarchical menu (e.g., does the menu take the buyer to a product category and not a specific product, such as Amazon.com).

_____ Provides easy access to the product (e.g., are key words shown to allow the buyer to easily locate the product, such as tools or books, or is the buyer required to hunt for the product).

_____ Uses a common language (e.g., has language any buyer can understand without using technical terms that are industry specific).

Based on this questionnaire page, please rate the Coherence & Organization by circling one number below that best applies to this questionnaire.

1. Poor (I would not return to make another purchase)
2. Mediocre (I might return to make another purchase)
3. Good (I would return to make another purchase)
4. Excellent (I definitely would return to make another purchase)

An Internet Commerce Evaluation Scale (ICES), assessment tool, was designed based on the features and properties of a Web site as established through the literature study. The primary literature studies of ICES focus on the features, customer satisfaction, and used time as a measure of Web site quality. The study attempted to apply the ICES to investigate the influence of 12 major properties on effective Web site and customer satisfaction in Taiwan.

Overview E-Commerce in Taiwan

Due to the widespread use of computers and the Internet, the concept of shopping online is more acceptable to many people in Taiwan. Even businesses that began with brick-and-mortar stores have started to sell products and services online. Positive “word-of-mouth” advertising has decreased consumers’ distrust of Internet shopping. Meanwhile, with the prevalence of Internet networks on campus, young people, a group that has a strong purchasing history, have become knowledgeable online users who often “comparative shop” for prices and purchase products (FIND, 2004).

Focus on Internet News & Data (2004, ¶6) reported as following:
Approximately 67% of e-shops were managed and owned by traditional stores and 33% of e-shops by dotcoms in 2003. Thirty-six percent of dotcoms are also engaged in delivery of products. The primary reasons for pure e-shops to establish physical shops are to enhance consumers’ trust (30%), to make available settings where customers can pick up products (20%), and to provide maintenance services (12%). The foremost reasons for physical shops to create e-shops are to amplify distribution channels (33%), to expand the shop’s publicity on the Internet (24%), and to communicate with customers online (21%). Clearly, combining physical and online shops is a crucial development in the B2C market.

Approximately half of all online users live in Taipei, and more males are users than females. Most new participants in Internet come from the population group aged between 16 and 35, with college educations. Therefore, the majority of Internet users have an educational attainment beyond the secondary degree level. In addition, the average age of online visitors is descending, while the average level of educational attainment is
ascending (Institute for Information Industry, 1999) (as cited in Chen, 2003). In Taiwan, online chatting and interactions were the media that first brought the young cohort onto the Internet. The Internet gaming then prompted the penetration of broadband. Internet distribution was a prerequisite for B2C e-commerce (Chen, 2003).

In Taiwan, there is also extensive extent for expansion of online shopping. However, shopping is less popular than other Internet usage functions, such as, browsing, searching for information, communication, downloading software, viewing news, job search, e-learning, chatting, making friends and playing games (Shiu & Dawson, 2002).

**Population and Demographics**

Chen (2003) indicated that “Taiwan is a small island with a high population concentration living in either cities or towns. The most popular city and township habitat is condominiums, which makes cable TV networks common in Taiwan’s urban homes” (p. 3).

The World Fact Book reports the population of Taiwan is estimated at 22.7 million, in July 2004 (Central Intelligence Agency [CIA], 2004). Although there are declining fertility rate, life expectancy has increased to 77.06 years, resulting in a slow population growth (.64%). Since December 2000 (Chen, 2003), the 0 to 14 age group declined from 21.1% to 19.9% in 2004 (CIA, 2004); and, the 65 and over age group increased from 8.6% in December 2000 (Chen, 2003), to 9.4% in 2004 (CIA, 2004). The age group 15-64 increased .5% to 70.7% (CIA, 2004).

Chen (2003) conducted a study on the *Globalization of e-commerce*, which indicated the senior group member, as well as those aged 50-64, tended to be unwilling to adjust to Internet life, since the older generation was raised in the pre-computer era.
18.6% of the population is contained within this Internet-resistant group. On the other
hand, the younger population aged 15-29, made up over one-fourth of the population, and
inclined to be the most Internet-receptive. Between these two groups, those aged 30-49
have been exposed to computers, and can be educated to embrace Internet life. While
the recession has hindered the willingness and ability of corporations to invest in Internet
services, customer demand has not been affected.

*Internet Penetration*

Focus on Internet News & Data (2004, ¶ 3) reported as following:

As a matter of fact, the penetration rate of computers at home is 71%, equaling
4.96 million households in Taiwan. 57% of households in Taiwan are connected
to the Internet, which are about 3.94 million households. Compared to the survey
conducted in 2002, this year's penetration rate of Internet access at home is 4
percent point higher.

Taiwan has been fairly successful in encouraging Internet use in private homes.
By the end of 2001, Taiwan was one of the most Internet-penetrated countries in Asia, with
over 30% saturation rate. The most significant factor involved in the rapid distribution of
the Internet was the high level of education among Taiwan’s population. A second means
for Internet penetration has been the easy access to low-priced computers. Taiwan is one
of the leading producers of computer hardware in the world, so personal computers are
affordable. The third method has been the extensive telecommunications infrastructure,
with the majority of families connected to phone lines, which has meant easy “hook-up” to
the Internet (Chen et al., 2002) (as cited in Chen, 2003). Furthermore, Shiu and Dawson
(2002) indicated that two-to-five individual households were more possible to have online
shoppers in Taiwan.

Institute for Information Industry (1999) designated the following:

Internet penetration in Taiwan started with the younger people, just like most other
countries. Most students first gained experience with an Internet connection while
in school. Approximately 70% of Taiwan’s Internet users are below 30 years of
age, and 69.3% of these users are college students or college graduates (as cited in

Infrastructure

According to Focus on Internet News & Data (2004, ¶ 1), “There were 8.59
million Internet users in Taiwan by the end of 2002, with an Internet penetration rate of
38%. Taiwan’s Internet users with active access accounts reached 8.83 million by
December 2003.”

The studies of Chen et al. (2002) have demonstrated that having technical support
was vital to keeping Internet users online. Those who access the Internet only at home,
such as homemakers, undergo from an elevated dropout rate (as cited in Chen, 2003).
Internet penetration rate was the highest among the homes with two parents and a number
of children. On the other hand, single parent families, and families without children, were
often inert in Internet surfing. This suggested that children were a significant catalyst for
accessing the Internet. In terms of age, the majority of Internet-connected homes were

Commercial Times reported as follows (2001, quoting data from Netvalue):

The most common activities conducted on the Internet by Taiwanese users were,
respectively, sending and reading e-mail, transmitting files, searching for information, downloading online voices and images, playing games, chatting, and reading news. On average, Internet users in Taiwan spent 9.1 hours browsing Web sites each month, and remained online for 24.4 minutes during each visit. Most Internet users still used dial-up connections to access the World Wide Web, while the rest used alternative methods (as cited in Chen, 2003, p. 13-14).

In addition, according to Liu (2001), the prevalent presence of neighborhood traditional retail shops in Taiwan was another main infrastructure factor that influenced the development of e-commerce. Many traditional retail stores stayed open for business for long hours to accommodate late night shoppers. This challenged e-commerce to become a substitute for conventional trade by offering actual product improvements. Thus, a combination of online and brick-and-mortar stores seemed to be the best solution for e-commerce. The online shops on the Internet could reach distant customers while the actual shops offered real-time services, such as, product delivery. In addition, brick-and-mortar stores provided shoppers to examine the products in person before purchase. The security problem of online payment could be eliminated by purchasing at the store site. Internet shoppers could select any store as the distribution location, which is where the purchased product could be picked up, examined, and paid for at the same time. In fact, some of the online stores used convenience stores as the delivery site (as cited in Chen, 2003).

On the other hand, in order to encourage the expansion of telecommunication industry, Taiwan government has been proactive in developing the market currently. Following the experience of advanced countries, the government applied the liberalizing
policies according to schedules and in a steady way. The final objective is to launch competition means to an initially monopolized telecommunication market (FIND, 2004).

**Online Shopping Markets in Taiwan**

Taiwan's B2C market was valued at nearly NT$22.09 billion in 2003, growing 40% from 2002. Considering the substantial growth over the past year, the market is expected to raise 60% to NT$35.54 billion in 2004. The annual compound growth rate of the B2C market should continue at 41% between 2002 and 2007. In addition, Internet purchasing captured up to 0.68% of the retailing revenue in 2003 (FIND, 2004).

In 2003, 28% of e-shops surveyed were gainful. The other 19% maintained a balance in gains and losses while 53% experienced losses. Although 72% of the e-shops have not yet posted earnings, the shops are still hopeful about the prospective market with 79% predicting profits within two years (FIND, 2004).

Taiwan's B2C market persisted in growth during 2003 with many profitable releases from dotcoms, a sign of recovering from an unfavorable business environment earlier in the Internet industry. The market is promising considering the increasingly secure atmosphere created by Internet operators and customer's developing trust in online shopping. As Taiwan's online market extent is fairly small, only a few big e-shops can endure. Inevitably, acquisition and mergers between e-shops will persist. In addition, innovators, or top e-shops in each product grouping, will benefit from a greater share of the market. Excluding those which previously enjoyed publicity in real shops, businesses that deliberately penetrate the B2C market will encounter considerable challenges (FIND, 2004).
Income has had a noteworthy influence on online shopping in Taiwan. Those individuals in a higher income bracket have been more prone than others to purchase online. In Taiwan, people living in the capital city, Taipei, were more apt to shop online than people living in rural areas (Shiu & Dawson, 2002).

In the B2C market, Taiwanese Web sites needed to improve online customer service. If the products purchased online were incorrect or not working, customers usually sought help directly from the sellers. Nevertheless, if customers purchased products from a Web site, the users often had great difficulty getting help from the site's owners. This experience caused shoppers to become skeptical of online purchasing, and cost profits for the Web sites. Thus, to expand established e-commerce in Taiwan, the concept of “selling things without customer-service” must be rejected. To encourage online shopping, e-commerce must offer online customer service (Chen & Kuo, 2002).

Starting in 2002, the approach to online businesses tended to be direct-order. Online sellers ordinarily chose the product or the set of products. For customers, the difference between buying items from Web sites or from the traditional stores was based on whether or not the customer could touch the real product and select the preferred style and color. Marketing invisible products has been a serious disadvantage of e-commerce. Currently, few Web sites have adopted the “customer-suggestion” method of trading. Hence, to reinforce the potential for competitive superiority, commercial Web sites should be designed based on customer inclinations to meet customer needs (Chen & Kuo, 2002).

**Issues of Taiwan Internet**

Of course, there were also features that repressed Internet distribution. The most complex barrier to Internet access was the entrance of Chinese characters into a computer.
Instead of being “punched” into the keyboard in a clear-cut manner, Chinese characters must be decomposed and entered in a special method that was varied from conventional approaches. Thus, serious training was required for anyone to become at ease with computer entry (Chen, 2003).

The second issue that slowed the distribution of the Internet was the absence of Internet content specific to the Taiwanese culture. The majority of online services in Taiwan were designed for young people, such as, chat rooms and online games, due to the younger generation being the largest group of online users. In addition, most Internet content had been written in English, and most of Taiwan’s population was incapable of reading English (Chen, 2003).

The third concern that delayed Internet penetration was an inability to develop online activities beyond entertainment areas. Many adults dismissed the Internet due to the belief that online marketing was not of use business or work (Chen, 2003).

The fourth factor that impeded Internet penetration was technological barriers, which inhibited the introduction of e-commerce in Taiwan. Although most large corporations were interested in creating a Web site, and could afford the cost, businesses lacked personnel with the technical expertise to sustain a site. Actually, without the adjustment of a corporation’s operations, a Web site was merely a superficial arrangement, which could have little effect on effectiveness and/or profits (Chen, 2003).

In addition, Liu (2001) reported on a survey by III in 2001 that the primary obstacles to the expansion of B2C commerce faced by electronic stores in Taiwan included consumers’ trading habits and imitation by other stores. Furthermore, at least 30% of the electronic stores listed online security, legal environment, public relations, low
rate of investment return, and the frequency of phony credit cards as major problems that inhibited the development of online business (as cited in Chen, 2003).

As a matter of fact, the method of payment has been the most difficult challenge to overcome in B2C e-commerce distribution. Although credit cards have been commonly used in Taiwan, the security of online credit card usage continued uncertain. This lack of security has frustrated the synchronized payment in electronic trade. Separate payment methods had to be established to enhance online trade. Convenience stores, post offices, and bank accounts have served this purpose to date. Hence, a legal and financial environment that provided a convenient and secure method for online payment seemed to be the most essential factor that contributed to the distribution of B2C e-commerce. As of 2003, Taiwan was still lacking both legal protection and electronic banking. Although an electronic signature law has been approved, the detailed provisions have not been published for review by sellers, and buyers. B2C e-commerce might not reach full potential until a secure environment has been definitely created (Chen, 2003).

Web Site Design Strategies

According to Balanko-Dickson (2003, ¶ 3), businesses should focus on understanding the customers; who customers are, what consumers want, and what users seek to accomplish at the Web site. A Web site development process would look like this:

(1) define Web site purpose;
(2) determine customer needs, problems to be solved and information requirements;
(3) research competition;
(4) build Web site concept on a template of the first 2-3 pages.

Also, there are some essential steps for e-commerce success:

(1) re-define the competitive advantage,
(2) re-think business strategy,
(3) re-examine traditional business and revenue models,
(4) re-engineer the corporation and Web site, and
(5) re-invent customer service (Lee, 2001, p. 357).

E-commerce planners and strategic managers would be able to use the structure to examine and evaluate the significant successful factors for e-commerce success and effectiveness (Lee, 2001).

In fact, Web sites should assist in establishing, building, and maintaining lasting customer relations. Some theoretical frameworks guided the research examination. The Web can be viewed as an advertising tool; Web home pages may be viewed as online advertisements (Singh & Dalal, 1999) (as cited in Geissler, 2001). Also, Web users are regarded as consumers. Since the home page embodied the first look at a Web site, this presentation was an essential element in obtaining and holding consumers’ attention, either enticing users into the Web site or driving away potential customers. Given today’s swiftly changing, disjointed media environment, catching audience attention has become an increasingly important step in the marketing process. The essentials of Web site design often implicated a balancing act and a series of compromises, such as:

(1) designers weighed business’ goals with design considerations,
(2) designers balanced a Web site, particularly a home page, with a design that was neither too simple nor one that was too complex,
complex design capacities were attached, depending on user sophistication and computer systems (Geissler, 2001).

Online customers have proven to be easily frustrated. A Web site’s ability to ensnare the Web user’s attention has become increasingly important. Designers have determined that 5 to 30 seconds is the length of time needed to attract a consumer’s attention. The ability to capture user’s attention in such a limited period of time has become a primary concern. Therefore, the content and design of the home page must have a straightforward layout and practical presentation that can be easily navigated.

Navigational tools, i.e., links and frames, were viewed as crucial. Consumers preferred hyperlinks to separate pages, did not like to scroll down a home page, due to losing interest with too much information in the beginning. Thus, limiting the scope of the home page to one page or screen was a significant design consideration. Graphics were also invaluable in catching customer’s attention, but the images must be select, easily loaded, and skillful.

Designing a complex Web site, or a quite simple site, prohibited or limited usage (Geissler, 2001).

Download speed continued to be a vital concern for customers. At this time, Web sites should avoid huge downloads (massive capacities), slow graphics (delaying speed), too much text (too many words/content), or is too high-tech (too complicated). Properties of a Web site that decreased usage contained not providing business e-mail address, having non-working links, and embedding information among too much text on a Web page. Not having sufficient links was very frustrating to customers. The potential unconstructive effects, such as, a lower opinion of the corporation, or decreased opportunity for re-visit, should not be ignored (Geissler, 2001).
Spool et al. (1999) revealed that locating menus or navigation bars at the top and bottom of a page allowed more users to maneuver through the site effectively than with when menus were displayed at the side of a site (as cited in Cox & Dale, 2002). Creative Good (2000) indicated that there should be a “home” button on every page to assist the user in returning to the home page, if necessary, without the need to click on the “back” button in the browser menu. Use of a “home” button avoided what could be an extensive and frustrating process, depending on where the user was located in the site (as cited in Cox & Dale, 2002).

Meanwhile, Spool et al. (1999) found that users navigating sites with a site map were twice as successful in locating what was being sought, compared to those sites without a map. In addition, Spool et al. found that informing the user of the present location on the site was significant (as cited in Cox & Dale, 2002). Creative Good (2000) argued that a Web site with a clear menu and applicable information should be satisfactory, and that users were not truly interested in the present location within a site if the links were obvious (as cited in Cox & Dale, 2002).

To be effective, the Web site must be designed with consumer needs as the primary consideration. Business must weigh design considerations with strategic goals and with frustration-prone consumers who hold numerous levels of technological sophistication. The corporation must also convey the desired information to potential customers, including the “who we are, what we offer, what is inside,” and means to contact the company. Therefore, businesses must design and maintain an effective Web site to facilitate, establish, build, and preserve customer relationships (Geissler, 2001).
Additionally, a successful Web site required considerable deliberation, preparation, and revising to be effective; an ineffective one could actually be damaging to a business. The five basic steps necessary to create a Web site were:

1. Define the business goal: The Web site was to assist meet strategic goals such as increasing profits, decreasing expenses, or making other operations more effective. A Web site could boost business profits in several various ways: through direct sales; memberships; advertising; services; reducing expenses; and reinforcing other operations. Businesses determined precisely what each company wanted to achieve before moving on to the next step in the process of creating a Web site (Bock, 1999).

2. Design the site: This step involved deciding what information and graphics to apply and how to link these two key aspects of the site. The strength of the Web was the links that were contained in the site. Designed properly, a dynamic Web site could guide users move through information in a manner that was natural, relaxed, and effective. To create such an online experience, considerable time would be needed to define how that information would apply and what information was connected (Bock, 1999).

3. Develop the site: Step Three involved creating the actual pages and links to see how these items would interact. Successful designers recommended that the Web site be tested at various times of the day, using different Web browsers (Bock, 1999).

4. Deploy the site: Printed the corporate Web address on stationery, business cards, and brochures. Sent out special publication postcards. Provided a news release, and sent the release to important customers, prospects, and friends to become conscious of the Web site presence (Bock, 1999).
Refresh: Businesses whose Web sites were the most effective, constantly improved, updated, and redesigned the company site. Changing content kept the Web site up to date and brought customers back for more information (Bock, 1999).

The key point to making the most suitable use of e-commerce was to assure that organizational and structural changes stayed “one step ahead” of the competition. In the past, e-commerce solutions were accepted after the “bugs” have been “ironed out” of new systems, to evade the costs of learning by making errors. Being a risk-taker and keeping ahead of the game could be a risky strategy, because the cost of human and financial assets to apply e-commerce solutions was high, and the cost of learning by error could be high as well. The risk with the second method was that competitors who moved first could acquire cost and quality rewards, which could create challenges for “late movers” to compete effectively. Successful strategies towards the acceptance of e-commerce must be based on a clear understanding of the costs and profits of using online technologies (Fraser, Fraser, & McDonald, 2000).

However, recognizing and assessing these costs and profits would not be easy. The costs of ineffective timing when introducing e-commerce solutions could be very high. On the other hand, many buying and supplying processes would be basically changed by the introduction of e-commerce solutions, and these changes would also happen quickly. Therefore, developing and employing suitable e-commerce strategies would be significant for sustaining competitiveness (Fraser, Fraser, & McDonald, 2000).

Success in Web Site

In many points the Internet has been “just what the doctor ordered” for healthcare marketers. To establish a dynamic brand presence online, marketers have drawn on
political knowledge to bring whole organizations into accord on an interactive strategy.

Real-world tips to assist companies establish a more effective brand online contained:

1. Ensured that users could locate the Web site by easy-to-use search engines.
2. Created corporation-wide time reply standards for responding to Web mail.
3. Ensured the corporate domain name portfolio was sequential.
4. Contemplated registering domain names referred to medical services.
5. Built principles for the Web site.
6. Ensured the Web site was designed for unproblematic usage by consumers.
7. Examined site traffic data and conducted click stream analysis.
8. Revealed business’s technical sophistication.
9. Displayed high ethical criteria.
10. Created a clinical advisory board.
11. Verified leadership on emerging health tops and problems.
12. Advertised offline to invite users online (Olson, 2003).

Web sites have gradually become a business’s first point of contact with customers. According to the American Management Association’s Web site, there were numerous ways business could measure and improve the effectiveness of Web sites through addressing the following vital areas: strategic intent, processes, design, navigation, and content. A Web site must reveal and be aligned with the overall corporate image and values of the company brand. Businesses should ensure whether the design of the site was furthering strategic objectives. To keep customers coming back for more, effective Web site design has proven indispensable (Birchfield, 2003).
Providing customers with an easy way of navigating (e.g. hyperlinks, frames) through a Web site was vital for assisting in online communications. Customers should be capable of moving rapidly and efficiently within a site. Contact information offered a crucial connection to the business. Business considered including ways for customers to contact other customers to give feedback and share information. Certainly, chat could be valuable to a corporation when customers shared positive experiences; however, chat could also be harmful if consumers shared negative experiences (Geissler, 2001).

An interesting online communication theory implicated the use of “controlled navigation.” The concept was to present an enticement for customers to navigate through as much of a Web site as possible. One approach was to provide free products/services on the Web site. Another method was to develop contests for rewards to solve problems from information found on a Web site. The basic hypothesis was that the more information consumers collected from a Web site, the more likely the site visitors were to ultimately purchase online. Ordering online should be easy, with few steps between deciding to purchase and placing an order. Corporations must make Web sites easy to navigate and consider using controlled navigation to assist in facilitating consumers in accessing the site (Geissler, 2001).

In general, Wilhite’s (2003, p. 8) research provided evidence that a well-performing Web site should enable a utility, municipal agency, or cooperative to meet or exceed five basic E-Goals:

1. enhance corporate image and brand recognition,
2. extend corporate reach within the community and access new channels and geographies,
(3) earn dollars through lowered costs and/or new sales from scalable, online transactions,

(4) expand customer services and economic development efforts,

(5) encourage repeat visits based on ease of use and relevant, interesting content.

Web site characteristics should be designed with the user’s viewpoint in mind.

A corporate Web site must actively produce sales leads, and provide marketing value. Generating traffic to a Web site has been vital, for the purpose of a site is to attract customers to access a site. Studies have shown that 75%-95% of first time users to a Web site arrived via a search engine (such as Google) or directory (such as Yahoo) (GCT-Taiwan, 2003). Finally, for most corporations, the returning visitor was the best visitor to a Web site. Web sites needed to develop strategies to maintain visitors on site longer, and to attract potential customers to return (GCT-Taiwan, 2003).

**Web Site Analysis**

Businesses analyze Web site users’ activity to understand consumer and potential customer interests, improve Web site design and navigation, and enhance the success of the Internet sales process. Through following and examining Web traffic models, site navigation, page views, and transactions, online companies can design more persuasive Web sites and provide users better motivation to purchase and re-visit. Through the low switching costs provided on the World Wide Web, businesses understand that a user’s experience must present sufficient value to entice return visits. Businesses exact in an analytical approach to online marketing and/or sales are experiencing lower sales costs, higher online profits and enhanced customer loyalty (MicroStrategy, 2004).
Web site success and Web site "usability" were strongly related, but not identical, features. Effectiveness related to how well a site conducts the declared purpose, while usability related to how simply a user accessed a site. Apparently, a more accessible site can be more successful and an effective site is easier to use, but most sites could benefit from improvement on both features. Evaluating Web site effectiveness involved a resolve of the goal of the site, then a test of whether a user could swiftly and easily achieve that goal (Nordstrom, 1999).

Most businesses have established a Web site to market products and assist basic customer orders. There is general optimism that online transaction will grow as wide-ranging business use of the Internet grows. At present, most corporations look to the Internet to increase marketing instead of decreasing costs of operations. However, 10 ways businesses are applying the Web to save money and enhance capacity were found: 1. decreasing sales transaction costs, 2. offering online information, 3. applying electronic invoices, 4. settling disagreements, 5. using Internet suppliers, 6. bidding online, 7. purchasing used equipment online, 8. recruiting personnel, 9. conducting research, and 10. employee training via the Web (Krumwiede, Swain, & Stocks, 2003).

For e-commerce, an elaborate artistic design of a Web site may have been aesthetically pleasing, but, in fact, caused dissatisfaction, because customers were discouraged in finding the merchandises and services that were sought (Cox & Dale, 2002). According to Ody (2000), the primary motivation for customers to use the Internet was to find information, or buy a product or service, with an accent on convenience and speed (as cited in Cox & Dale, 2002). On the other hand, the perception of the Internet had raised customers’ acceptance of high-speed customer service. Any e-commerce
based on fundamental principles when designing the Web site should be reasonably successful (Ziff-Davies, 2000) (as cited in Cox & Dale, 2002).

When examining qualities of an enticing Web site, taking into consideration the main goal of the design has proven significant. When the purpose of the Web site has been clearly stated, the type of customer who responded could then be measured, and decision made on which graphics, special effects and other assets would be added to further increase the proposed value (Donlan, 1999) (as cited in Cox & Dale, 2002). A Web site should reveal this intention, and examine whether the site has satisfied the customers’ needs, with the objective of obtaining customer loyalty and retention (Cox & Dale, 2002).

Effective Web pages have become a significant tool in the interchange of information in today’s business society. E-commerce servers depended on vibrant applications to access and provide corporate material to users distributed across the Internet. The need for effective Web pages has been driven by the need for interactive business transactions, and Web sites which are personalized on a unique basis. The need for business to create enticing Web pages has lead to the emergence of new dynamic page technologies. As a result of the increasing prevalent use of exciting Web page technologies with the ever-increasing growth of the Internet, Web servers, such as MSN and AOL, have become more strained then ever (GVU, 1998) (as cited in Kothari & Claypool, 2001). Performance of Web providers has become a vital concern (Kothari & Claypool, 2001).

To support the advent of a reliable knowledge base for analyzing Web activity, a structure must be developed to examine and classify the capabilities of Web sites. Such a
framework could make a distinction between content and design. Content refers to the information, features, or services that have been presented on a Web site, as well as the means by which corporate material was made available for Web users. Both concepts have been institutionalized through objective and subjective measures to attain features and insights. Such a structure could be applied to study how various groups of companies have used the Internet for business purposes. Web sites were evaluated based on source, industry, and size. On the average, superior Web sites appeared to be more prosperous and more advanced (Huizingh, 2000).

According to Chen and Kuo (2002), the Web sites selling imperceptible products need to present detailed business background information, while those selling visible products can provide minimal corporate information. Selling imperceptible products on Web sites, without providing visual imagery to the consumer, caused shoppers to experience separation from the products. If a Web site could provide detailed company background information, and showed some distinctive products for consumers to assess, the site was able to appeal to more customers. Unfortunately, many Web site owners have yet to understand this concept. In fact, more Web sites selling visible products have provided detailed company background information than sites selling imperceptible products. Therefore, when designing commercial Web sites, considering product features as well as the in depth display of appropriate product and company information was essential, because future site revisions would be costly.

Researching the site’s function and purpose has generated an understanding of how potential visitors would find information on the site, and assisted plan keywords, titles, and descriptions to target. In addition, researching competitors’ sites has also undertaken an
understanding of who was succeeding, and why. With this information, a Web site could be developed that was beyond the level of all competitors. A list of keywords was developed for a Web site based on necessities and content of that site (GCT-Taiwan, 2003).

**Key Issues of Web Design**

*Links:* The navigation of a Web site must conduct with reliable links (Constantine & Lockwood, 1999; Spool et al., 1999) (as cited in Cox & Dale, 2002). Links needed to change color once used, and should exactly describe the information to which the links were connected (Creative Good, 2000; Vassilopoulou & Keeling, 2000) (as cited in Cox & Dale, 2002). Carefully planned Web sites feature graphics, which changed to text when the mouse cursor passed over, displaying the category of products dealing with the imagery (Cox & Dale, 2002). Constantine and Lockwood (1999) also discussed that “page bouncing” happens when the user follows links that served a series of pages, and then returned to the home page, finding extra links which connected to more pages (as cited in Cox & Dale, 2002).

*Consistency, menus, and site maps:* People want to easily navigate a Web site, once visiting the site (Constantine & Lockwood, 1999) (as cited in Cox & Dale, 2002). Each Web site displayed various business or value plans, and thus, the design differed according to what the Web site was providing. Additionally, the Web site pages must be consistent in form and design (Spool et al., 1999) (as cited in Cox & Dale, 2002). Vassilopoulou and Keeling (2000) disputed on the significance of the same procedures taking place for similar or related tasks, wherever the user would be within the site (as cited in Cox & Dale, 2002). In order to achieve this level of uniformity, many Web sites featured a list of
options, which was displayed in a prominent location, with all the prime links for every page (Cox & Dale, 2002).

*Pages, text, and clicks:* A Web site page should ideally be short; however, sometimes scrolling pages was adequate, if the information was properly laid out and not unnecessarily long (Cox & Dale, 2002). A vital concern was that consumers could make purchases quickly, with the least amount of pages in the check out process (Foremski, 2000; PR Newswire, 2000) (as cited in Cox & Dale, 2002). Foremski (2000) discussed that some Web sites made simple errors, which generated frustration for the users. A "shopping cart" button was needed for the user to press at any time to see which items had been placed in the online shopping cart, which permitted the customer to remove items, if so desired (as cited in Cox & Dale, 2002).

*Communication and feedback:* Constantine and Lockwood (1999) examined that the feedback was the basis for software design, and was particularly essential for communication with customers on the Internet. Such information advised the user of a mistake in the address input, that a Web page was being updated, permitted the buyer to see which items were in the shopping cart, or confirmed order details. Many Web sites informed the visitor of an error by writing the information in red next to the related box or area. Feedback in this form communicated to the user when a mistake had been made, and advised how to advance. The communication of a Web site was executed through text, graphics, and "moving animation," with text being to the point, and easily set out (as cited in Cox & Dale, 2002). Spool et al. (1999) found that Web pages with numerous empty spaces were less effective than those with few or no blank spaces (as cited in Cox & Dale, 2002).
Search: One of the first approaches used by customers to navigate a Web site was search. Users frequently understood that a search would cover an entire site, and could become perplexed when the search only covered a particular area. The use of “drop down lists” could clarify this confusion, as the lists informed the user of specific information that was accessible without the user having to presume what to type into the search box (Creative Good, 2000; Foremski, 2000) (as cited in Cox & Dale, 2002).

Fill-in forms: Some Web sites overwhelmed the user with a bulk of unnecessary instructions. Whether having filled in a form to register with a Web site, or having ordered and purchased, the design of such forms for the entry of individual details should be self-explanatory, or offered instances of the format to be used (Cox & Dale, 2002).

Model of Web Site Effectiveness

A model for Web site effectiveness must assume that businesses realize who the consumer is and what the customer will see as quality. “Quality is customer-focused; thus, quality must be customer-oriented” (Day, 1997, p. 109). Focusing on the customer ensures that communications reflect the customer’s needs and preferred medium style. Businesses need to create the basics of stable, long-standing quality and then be responsive to providing active, vibrant quality as well. A key feature of a Web site’s success is the site’s ability to achieve the business’s goals, and some of those objectives are linked to other parts of the business (Day, 1997). The Web site must have a “house-style,” a unique design, just like a publishing house has a specific style and layout for all site books and journals. There is no research that stated the selection of house-style features made the biggest difference for the customer, but the choice must be in keeping with the customer’s needs (Day, 1997).
Most confusing Web sites did not follow a rational framework, because the sites were not fashioned with the consumer in mind, nor followed the logic defined by the site’s purpose. Building a coherent framework was a function of two significant variables: following the logic required by the consumer and the purpose of the page, together with stating obviously what companies were doing, generally known as “signposting.” The design questions were answered by considering the shoppers’ needs, behaviors, and expectations, combined with the site’s goal. A Web site’s purpose was to inform customers immediately the reason a site had been created, and the services the site offered to the consumer. The purpose was to develop a long-term relationship where customers chose to return repeatedly (Day, 1997).

As a matter of fact, online shopper behavior has been attracting amplified attention from marketing and consumer researchers (Donthu & Garcia, 1999; Phau & Poon, 2000) (as cited in Goldsmith, 2001). Of particular interest to business has been the timing with which customers access the Internet and then begin shopping online (Eastlick & Lotz, 1999) (as cited in Goldsmith, 2001). Many “e-tailors” and managers were concerned with inviting customers to access Web sites, and encouraging those consumers to purchase (Wysocki, 2000) (as cited in Goldsmith, 2001). The better a Web site appealed to buyers; the more likely the business would become beneficial (Goldsmith, 2001).

Businesses were faced with the challenge of bringing better-quality customer service online at a time when consumers were still becoming accustomed to technology and the concept of revealing personal information to the online world. Convenience, content, and navigation alone would not gratify the discriminating customer. New concerns had to be considered that had not applied to traditional customer services.
Factors that must be addressed include privacy, online support without boundaries, return policies, and technical support (Brown, 2001).

Nevertheless, attracting online buyers has proved to be a “hit-or-miss” undertaking, with some companies having proven to be more skillful than others. Promoting online buying among “innovators” should develop the practice among “later adopters,” who waited to see how innovators responded before accepting the practice. By identifying the least innovative customer, managers might also gain awareness into the reasons later adopters were indecisive about purchasing online, and develop strategies to eliminate any objections (Goldsmith, 2001).

To classify Internet innovators should involve an easy-to-use, cheap, and flexible approach (Goldsmith, 2001). However, the lack of logical relationships between demographics and Internet-related consumption behaviors created a challenge when using demographic data to identify innovative online buyers (Aldridge et al., 1997; Miller, 2000) (as cited in Goldsmith, 2001). In the meantime, e-commerce managers should endeavor to improve the satisfaction of innovative buyers. Therefore, these risk-takers will continue to purchase online, increase the amount of purchases, and disseminate positive “word-of-mouth advertising” about the online buying experience in general and the particular e-tailor (Goldsmith, 2001).

Lociacono, Eleanor, Watson, & Goodhue (2000) created a scale, “WEBQUAL, with 12 dimensions: informational fit to task, interaction, trust, response time, design, intuitiveness, visual appeal, innovativeness, flow (emotional appeal), integrated communication, business processes, and substitutability” (as cited in Zeithaml et al., 2002, p. 365-366).
Customer Management, Support, and Satisfaction

Web sites in Taiwan focused mainly on content design, particularly on adding exciting vibrancy or developing special functions, but ignored the most vital issue—“customer-management.” Internet users have more and more choices as similar Web sites promote identical products repetitively. Also, techniques of designing Web pages have been variable. In such a competitive market, how to attract Internet users’ attention, how to get users to revisit the Web site and obtain customers’ loyalty have been the key points to ensuring Web sites were successful. Some Web sites in Taiwan have become aware of the need for customer-management, and have applied the marketing strategy of “collecting points to change awards” to attract customers. By means of registering on the Web sites or inviting friends to participate on the Web sites, the customers could collect more and more points, and used those points to exchange for gifts. However, this approach could not continue for an extended period of time, since offering attractive and valuable gifts required sufficient capital (Chen & Kuo, 2002).

Nonetheless, consumer information was fairly valuable to companies, and offered an effective means to profile and to track current and prospective customers. Follow-up information, for example, notices of specials, coupons, and discounts, could be sent to customers via e-mail. Businesses also assured that consumers were satisfied by periodically surveying a sample from the database (Geissler, 2001).

There were also some other companies that provided the “personal management system” to attract customers. Some of the eminent Web sites or search engines, such as PC home, Kimo, etc., have attached this function. Nevertheless, the “personal management system” on these Web sites has been passive, which could only offer fixed
information set by consumers at the very beginning. In other words, the customers could always get repetitive information, unless the consumer chose to change the personal settings. The computer should change settings actively and develop an appropriate information surroundings for individual users according to the user’s habits. Such a “personal management system” would offer each user a personal Web page which contained individual specific needs and wants information. Like this, the consumers would more likely be loyal to the Web sites. Accordingly, “intelligence personal information agent system” was a key factor, and also a tendency of designing the content of Web sites (Chen & Kuo, 2002).

Customer satisfaction originated from creating value for customers, and by having met or surpassed customer prospects. A superior customer support site must address managing both value and customer satisfaction. The World Wide Web has allowed customer support to place more information and tools in the hands of customers, which has benefits for both the customer and the corporation (Hanson, 2000). Further, to determine how well existing consumer theory applied to e-commerce, businesses should pay attention to consumer Internet behavior (Cowles & Kiecker, 2000; Phau & Poon, 2000) (as cited in Goldsmith, 2002).

**Issues of Privacy Disclosures in Web Sites**

Customers’ concerns about security and privacy should be reflected in a Web site design. Protecting customer information must be viewed as a means of promoting customers’ confidence, and needs to be included as part of the Web site’s marketing strategy. The development of information technologies has provided companies to profile consumers through an analysis of the information collected online. Ethics, and security
technology, have become especially imperative in e-commerce (Barlow, 1994) (as cited in Yang & Chiu, 2002). Hence, self-governance has become essential for Web site operators to capture customer loyalty, in addition to mandatory legislation and industry self-regulation. Self-regulation has enhanced professional ethics, provided security measures, and supplied audit measures (Yang & Chiu, 2002).

Online security continued to be a key issue for online users, but many businesses have not assured prospective customers by incorporating security and privacy policy statement in Web site designs (Ellinger, Lynch, Andzulis, & Smith, 2003).

Increasingly prevalent online dealings were bound to offer e-commerce with abundant business prospects. What was delaying prospective customers continued to be the lack of confidence in the Internet environment as experienced by online shoppers. In regular information communications on the Internet, the protection of information safety and customer privacy were the primary issues that e-commerce must initially address (HpAsiapac, 1999).

Taiwan needs to swiftly establish an alliance assuring the safety of transactions on the Internet and protecting the user’s privacy to establish a standard and promote public trust. To create a structure that encouraged public trust was invaluable to both consumers and dotcom companies alike. A “Win-Win” situation was created for both parties concerned, in which consumer privacy would be protected, and dotcom businesses would completely develop e-commerce transactions, even to the degree that personalized service could be further enhanced. Therefore, addressing security concerns about online trading and payment is critical for the acceptance of electronic commerce by Internet users in Taiwan (HpAsiapac, 1999).
Many corporate Web sites collected individual information while visitors shopped, or browse online. Vulnerable to exposure due to unauthorized personal information usages, Web users were gradually concerned with what specific personal information Web sites collect. In addition, users want to know how the sites controlled the use of this information, and what security measures the sites provided. In comparison to the US, the significance of personal privacy has yet to be recognized throughout Taiwan (Yang & Chiu, 2002).

**Web Site Promotion Is Vital**

The significance of Web site promotion was immediately obvious. Search engines were used to find information by 75% - 90% of visitors to Web sites. For online users who did not know the specific Web site addresses that offered the desired information, search engines were valuable online tools (GCT-Taiwan, 2003).

Therefore, a Web site must not only be listed in search engines, but also posted in "top positions" on each engine. The Internet user was unlikely to search further if a site could not be found in the first 30 results returned by a search engine. The issue was the means by which a Web site achieved the recognition necessary to be listed in the top 30 search results. Every business has a Web site, but the successful sites have been separated from the unsuccessful sites. The solution was extremely simple, but the ways has been far more complex. The effective sites were set apart from the rest because of a professional strategic Web site promotion campaign. Web site promotion had provided evidence of being a cost-efficient and effective method of business promotion on the Internet, possibly the best form of corporate promotion at this time (GCT-Taiwan, 2003).
According to Spool et al. (1999), one of the imperative search aspects was that the results were related and informative, and not irrelevant results, which would discourage users from accessing that specific search engine again (as cited in Cox & Dale, 2002). Creative Good (2000) also indicated the importance of the use and phrasing of language in the search factors, as many search facilities did not distinguish between singular and plural forms of the same word or phrase (as cited in Cox & Dale, 2002).

Furthermore, an effective Web master could vigorously maintain content principles and technical questions, according to the business’s goals. Depending on the extent of the organization, these obligations could be conducted by a committed staff person, or outsourced to a company with powerful capabilities. The skills and qualifications of a dynamic Web master should understand the particulars involved in programming, networking, and design applications, watch over managing details, and “troubleshoot” hardware and software problems. Periodic Web page updates could be designated to conscientious staff members, while maintaining veracity of company design standards and Web site structure. A valuable strategy would also contain the means to ensure that the Web site could be accessed through external search engines. Accessibility on the Internet required the use of (1) useful link position and, (2) favorable homepage and key page designs. Research has shown that 80% of Internet users discovered new sites while browsing through search engines (Wilhite, 2003).

**Web Site Optimization and Positioning Strategies & Techniques**

Web site pages (including information pages) are persistently analyzed for optimum results. Other factors, such as, search engine placements, visitors, referring sites, and page views were also examined, so that strategies for additional improvements
could be put into action. Web site optimization has been an ongoing process due to search engines changing, site indexes changes, competition changes, and the way indexes operate changes. Hence, once a Web site accomplished a strong position, the site needed maintenance through regular monitoring and upgrading (GCT-Taiwan, 2003).

Important pages on a Web site were “Submitted By Hand.” Such a form of submission took longer than automated submission, but was worth the time involved. Search engines would index a site faster if the request was submitted by hand, rather than through automation. In addition, search engines have increased the difficulty in submitting Web site information automatically, to decrease the amount of irrelevant pages appearing in the search engine index (GCT-Taiwan, 2003).

Meanwhile, according to Lee (2002), some online companies encouraged consumers to shop on Web sites by including e-mail catalogs, providing an individual accounting of past purchases, choice of payments used for secured concerns, and education to increase the degree of customer Internet knowledge. In addition, mental concerns, i.e., shipment time, convenience, warranty, level of customer service, importance of human contact, and privacy issues were addressed. Companies that used a Web site based on customer needs could effectively increase the potential of real purchases. More Internet shoppers were likely to examine further and make purchases after accessing a Web site, and having trust reaffirmed.

Assessment Targets

What was needed for a business to invite consumers to a Web site and to engage prospective customers? Over time, a list has developed of the vital components, all related to the “usability” and convenience of the Internet experience (Wilhite, 2003).
In a study by Wilhite (2003) factors influencing usability included:

- **Timely and accurate content.** New features should be highlighted and featured outstandingly. User favorites could be recorded and stored for later retrieval.

- **Clear purpose & objective.** Home page apparently indicated company function, information, products, or services. Hypertext logo and firm name was clearly identified on each page.

- **Intuitive navigation.** Metaphors, link names, or titles should be clear and designed from a user’s standpoint. Long pages must have summarization and internal links. External links were to be validated, which eliminated “link rot.”

- **Natural readability.** Fonts should be consistent, misspelled words should not be present. Relevant graphics and rational download speeds should be encountered, but with adequate use of “white space.”

- **User support.** FAQs and Site Map were to be gladly available. Links provided to privacy policy, terms and conditions, and brand/copyright notices. Customer service and separate Web master contact information should be offered on each page.

- **Diverse interactivity.** Customers should be given a chance to self-service personal accounts through advanced, online functions. Options contained opening/updating/transferring/closing an account, viewing and/or paying bills.

- **Sense of community.** Differentiators contained information and services directed towards economic development activities, education, local events, municipal and private grants, and other co-sponsored programs (p. 4-5).
Successful link placements could be completed by placing articles in popular online publications, and by distributing linking information to interested parties. An ongoing, combined effort to place links onto other Web sites should be a key factor of the entire Web site design. The enterprise URL should be prominently displayed on all business cards, yellow page ads, marketing and promotional information, company vehicles, billing statements, annual reports, and other documents reviewed by the public. Many Internet pages and online publications were also dedicated to the solutions in creating helpful home page and key page designs (Wilhite, 2003).

Evaluations should be conducted on a periodic basis, which used recommended assessment structure and methodologies. Acquiring accurate employee performance data that can be measured against standards and objectives has been significant to any company. In addition, acquiring accurate data on the corporation’s e-business strategy and Web site performance can be just as vital. The value of these evaluations was particularly true given the potential of the Internet, and the need for increased cost management in today’s useful and cooperative atmosphere (Wilhite, 2003).

E-commerce has altered the way many corporations conduct business. In fact, e-commerce is no longer an option but is of the essence. Many businesses are endeavoring to address the most primary e-commerce concern: what is the best method for creating and conducting business in the digital economy? Some corporations have moved all business transactions to the Internet. Other corporations have organized subsidiaries, and created the subdivisions as branch online business organizations (Gulati & Garino, 2000) (as cited in Lee, 2001).
The greatest challenge most corporations experienced was not how to replicate or standardize the best e-commerce business model in the industry, but how to essentially transform the approach to operating traditional businesses. E-commerce is more than just another way to maintain or improve current business practices. Rather, e-commerce is a "paradigm shift," a revolutionary innovation of technology that has radically changed the traditional process of conducting business (Lee, 2001).

While the Internet performs as a faster and less expensive vehicle for customers and companies, an unintentional side effect has been an increase in the significance of customer satisfaction. Through the ability to make transactions more quickly and easily, customers were able to change just as rapidly between e-commerce, causing the element of competition to take on a new level of importance (Cox & Dale, 2002). Lastly, since Web sites alter graphics and content from time to time, site managers need to re-evaluate the sites in the future. A periodic assessment would provide accurate information on whether there was a greater difference or similarity in Web site usage (Mateos, Mera, Gonzalez & Lopez, 2001).

**Summary**

Chapter Two presented a review of the literature of this study. A review of literature related to developing the successful Web site evaluation tool - ICES and achieving customer satisfaction with the site quality in the context of previous research in Taiwan. This research also integrated previous literatures to emphasize the importance of the Web site design features and indicated effective design strategies to attract online customers.
The analysis of the literature concluded with a summary of research findings and the implication of subjective and empirical studies. Such an analysis could help examine how effective e-commerce Web sites attract and satisfy Taiwanese online shoppers to purchase and re-visit. This was followed by conclusions and recommendations for further study into developing various strategies to invite customer visits and purchases on the Web sites, as well as enhancing e-commerce Web site effectiveness in Taiwan.

Chapter Three presented the methodology that would be used to answer the research questions, which were formulated.
CHAPTER THREE
RESEARCH METHODOLOGY

Introduction

The research design employed in this study included a quantitative method approach, which used closed-ended and open-ended questions on survey instruments. The objective of this study was to understand and analyze the impact of effective Web site design on decision buying and customer satisfaction to online buyers in Taiwan.

The primary purpose of this study was to apply the ICES (Internet Commerce Evaluation Scale) instrument to assess the characteristics of effective commercial Web sites in Taiwan as identified by online shoppers. The ICES was developed by Scheffelmaier & Vinsonhaler, and used in the United States for the first time in 2002. The authors have encouraged the replication of the ICES instrument in other settings and countries, and have provided a copy of the instrument to this researcher. The ICES instrument consisted of 12 property groups which characterized effective Internet commerce sites as follows: (1) Visitor Greeting page, (2) Catalog page, (3) Shopping Cart page, (4) Cash Out page, (5) Security, (6) Coherence & Organization, (7) Consistency & Standardization, (8) Efficiency, (9) Navigation, (10) Style, (11) Value Added, and (12) Brick & Mortar (Scheffelmaier & Vinsonhaler, 2002, p. 27).

According to previous research, the ICES has demonstrated usefulness as a reliable and valid tool for the evaluation of Web sites. Spearman-Brown’s split-half reliability was applied the calculation of internal consistency for checklist and rating scores. The findings were high at .90 and .92 respectively, revealing the ICES has internal consistency. Inter-judge reliability was acquired by using Pearson’s product-moment
calculations for checklist (.85), rating (.81), and total score (.84). Total score was the most reliable as a result of including both checklist and rating scores. Total satisfaction was utilized to validate the ICES. Pearson’s product-moment was applied to correlate satisfaction with checklist, rating, and total scores. The rating score was the highest score obtained, resulting in a .54 correlation (Scheffelmaier, 2003, p. 115).

In general, sites favored by online shoppers were those that provided the following characteristics: ease of understanding and usage, enhanced values of the traditional store, customer services beyond expectations, efficiency and access speed, a user-friendly home page, a common design that was applied to all pages, and the ability to buy products easily and quickly (Scheffelmaier & Vinsonhaler, 2002).

The analysis of this study contained four parts:

1. A demographic questionnaire (Appendix D),
2. Evaluating a Web site for time used to complete the purchase (Appendix D),
3. Three closed-ended questions for total satisfaction (Appendix D),
4. Twelve major property groups which totaled in 68 checklist questions (Table 1) to develop 12 closed-ended rating scale questions of the ICES standardized evaluation tool (Appendix E).

**ICES Study**

Internet Commerce Evaluation Scale (ICES) was based on 68 phrases most frequently mentioned in the literature as vital features of effective Internet Commerce Web sites (Scheffelmaier & Vinsonhaler, 2002). The ICES booklet was composed of a set of standardized instructions and the scale, including 12 pages of property groups. Each page contained a checklist of property phrases, which the subject checked whether or not
displayed on the site, and a four-point evaluation rating scale, ranging from “1 - I would not use this site again” to “4 - I would definitely use this site again” (Scheffelmaier, 2003, p. 77).


Each property page of the ICES was divided into two parts:

(1) Checklist of features: participants were asked to place a check, if the element was found on that site (Scheffelmaier, 2003, p. 72).

(2) Rating Scale for a specific page or the entire Web sites: participants were asked to rate a particular page or a complete Web site for that property using a Likert scale, 1-poor, 2-mediocre, 3-good, 4-excellent (Escalas et al., 2001) (as cited in Scheffelmaier, 2003, p. 72).

The ICES data of this study was collected under lab conditions from 100 participants who had previously tried to locate and complete a purchase. A total of 50 participants were distributed per Web site. The ICES included a checklist, and rating scale, and total scores were tabulated. The main variables to be analyzed in this study were the 12 properties of Web sites and the property characteristics. The SPSS program was utilized to run a frequency distribution for each of the scores. The Checklist of
Features and Rating Scale parts was examined separately and integrated into a Total Score (Scheffelmaier, 2003).

Selected Web Sites

Two Web sites were chosen. One was selected due to having a High Convenience for buyers (products on this site seemed easier to find and buy). The other site was selected due to having a Low Convenience for shoppers (products on this site seemed more difficult to find and buy). The convenience factors were subjective judgments, by the researcher, based upon attempts to use the site to buy one or more products. Both Web sites included the product description, a catalog page, a shopping cart page, and a cash-out page (Scheffelmaier, 2003).

In this study, the assigned product that participants were required to search and purchase was a Chinese edition of *Harry Potter and the Order of the Phoenix (Book 5)*. The sites provided the shoppers to locate the product by selecting the keyword, title, author, publication, ISBN, or type of book desired (e.g., business, computer, literature, language, medical, law, science, etc.) Meanwhile, the subjects visiting the book Web sites can purchase textbooks, magazines, CD’s, and stationery (Scheffelmaier, 2003).

This study implemented the ICES to measure whether or not the instrument was a reliable and valid measure for assessing the quality of commercial Web sites in Taiwan. Furthermore, the data was analyzed applying the appropriate Statistical Package for Social Science (SPSS) 11.0 procedures to test the research question. Some statistics, such as means, standard deviation, frequency distribution, and correlation analysis, were implemented to facilitate data analysis. The statistical significance of this research for all analyses was 0.05.
Chapter Three began with defined research questions. A discussion of the research design, data collection methods, procedures, the instruments, sampling plan and setting, methods of data analyses, reliability and validity, and evaluation of ethical aspects follows:

**Research Questions**

The specific research questions for this study were as follows:

(1) Do scores from the ICES predict satisfaction with commercial Web sites in Taiwan?

(2) If ICES scores predict satisfaction with commercial Web sites, which of the scales were most highly correlated with commercial Web site satisfaction in Taiwan?

In order to answer the research questions, the study focused on fourteen independent variables and four dependent variables. The eighteen variables included:

**Independent Variables:**

(1) Visitor Greeting page,

(2) Catalog page,

(3) Shopping Cart page,

(4) Cash Out page,

(5) Security,

(6) Coherence,

(7) Consistency,

(8) Efficiency,

(9) Navigation,
According to Best & Kahn (1998):

Variables are the conditions or characteristics that the experimenter manipulates, controls, or observes. The independent variables are the conditions or characteristics that the experimenter manipulates or controls in his attempt to ascertain their relationship to observed phenomena. The dependent variables are the conditions or characteristics that appear, disappear, or change as experimenter introduces, removes, or changes independent variables. (p. 160-161)
This study investigated whether or not the ICES was a reliable and valid measure for assessing the quality of commercial Web sites in Taiwan. These variables were operationally defined as follows:

**Definition of Variables**

There were a total of eighteen variables used in this study, which included fourteen independent variables and four dependent variables. These variables were operationally defined as follows (See Table 2 & 3):

**Table 2**

**Independent Variables**

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Conceptualization</th>
<th>Operationalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV (1): Visitor Greeting Page</td>
<td>The site has an attractive, effective home page</td>
<td>Describes site or its content&lt;br&gt;Has navigation bar&lt;br&gt;Has contrasting colors&lt;br&gt;Eliminating scroll down option&lt;br&gt;Has Intranet links&lt;br&gt;Uses subject tags&lt;br&gt;Has shopping cart icon&lt;br&gt;Provides human contact&lt;br&gt;Has an Intranet search engine</td>
</tr>
<tr>
<td>IV (2): Catalog</td>
<td>The products catalog clearly describes and pictures the products so buying decisions are straightforward</td>
<td>Provides thumbnail photos&lt;br&gt;Provides product description&lt;br&gt;Provides product price&lt;br&gt;No unnecessary graphics&lt;br&gt;Provides shopping cart access&lt;br&gt;Provides links to related products</td>
</tr>
<tr>
<td>IV (3): Shopping Cart</td>
<td>The site has an effective, easy-to-use list of intended purchases</td>
<td>Displays a return policy&lt;br&gt;Provides S &amp; H charges&lt;br&gt;Allows buyer to return to the catalog&lt;br&gt;Provides an express cash out</td>
</tr>
</tbody>
</table>

*Note. From “Methods Used to Evaluate and Design a Successful Web Site,” by G. W. Scheffelmaier, 2003, Unpublished Doctoral Dissertation, Utah State University, Logan. Adapted with permission of the author (Appendix C).*
<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Conceptualization</th>
<th>Operationalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV (4): Cash Out</td>
<td>The cash register page makes buying products fast and easy</td>
<td>Has one time credit card registration</td>
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<tr>
<td></td>
<td></td>
<td>Has one time shipping address</td>
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<td></td>
<td></td>
<td>Provides human contact</td>
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<td></td>
<td></td>
<td>Provides link to the shipping carrier</td>
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<td></td>
<td></td>
<td>Provides e-mail verification shipping</td>
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<td></td>
<td></td>
<td>Provides one time account creation</td>
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<td></td>
<td></td>
<td>Provides deliver information</td>
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<tr>
<td>IV (5): Security</td>
<td>The site assures the customer a secure purchase</td>
<td>Provides transaction security</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provides payment options</td>
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<td></td>
<td></td>
<td>Provides electronic signature option</td>
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<tr>
<td>IV (6): Coherence &amp; Organization</td>
<td>The site is easy to understand and use</td>
<td>Does each page serve a single purpose</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lists the important information first</td>
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<tr>
<td></td>
<td></td>
<td>Has an hierarchical menu</td>
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<tr>
<td></td>
<td></td>
<td>Provides easy access to the product</td>
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<td></td>
<td></td>
<td>Uses common language</td>
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<tr>
<td>IV (7): Consistency &amp; Standardization</td>
<td>The site pages are organized with a common format, making them easier to learn to use</td>
<td>Has a simple uncluttered page design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do all applications look the same</td>
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<tr>
<td></td>
<td></td>
<td>Has the same shopping cart icon</td>
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<tr>
<td></td>
<td></td>
<td>Has partnership icons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Has consistent information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Has consistent format</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No scroll down option</td>
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<tr>
<td>IV (8): Efficiency</td>
<td>The site is efficient to use</td>
<td>Provides quick download time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Has descriptive URL address</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No unnecessary graphics</td>
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<tr>
<td></td>
<td></td>
<td>No orphan or dead-end pages</td>
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<tr>
<td></td>
<td></td>
<td>Requires few clicks to locate product</td>
</tr>
<tr>
<td>IV (9): Navigation</td>
<td>The site products are quickly and easily found</td>
<td>Provides buttons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No orphan or dead-end pages</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Has a site map</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Has an Intranet search engine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Has a help menu</td>
</tr>
<tr>
<td>IV (10): Style</td>
<td>Pages are easy to read</td>
<td>Easy to read font</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uses 12-14 font size</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uses of bold and italic text</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Has all text align left</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uses 40-60 characters per line</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No unnecessary graphics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provides discriminate links</td>
</tr>
<tr>
<td>Independent Variables</td>
<td>Conceptualization</td>
<td>Operationalization</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------</td>
<td>--------------------</td>
</tr>
</tbody>
</table>
| IV (11): *Value Added* | The site has customer services beyond that expected | Delivers an unexpected experience  
|                       |                   | Creates a positive sensory experience  
|                       |                   | Provides an attractive product display |
| IV (12): *Brick & Mortar* | The site has the values of the traditional store | Provides good customer service  
|                       |                   | Provides back office assistance  
|                       |                   | Provides a physical address  
|                       |                   | Provides telephone numbers  
|                       |                   | Provides current site information  
|                       |                   | Provides quality products  
|                       |                   | Provides competitive pricing |
| IV (13): *Total Checklist Score* | Sum of scores of 12 checked page | (Number Items Checked Pages 1-12) / 68 |
| IV (14): *Total Ratings Score* | Sum of scores of 12 rating page | Sum of the Ratings |
### Table 3

**Dependent Variables**

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Conceptualization</th>
<th>Operationalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>DV(1): <em>Use Again Item</em></td>
<td>Users consider if visit the repeated</td>
<td>“I would or would not use this site again.” A six-point scale with end points defined as follows: 1 = (would never use this site again to make a similar purchase) and 6 = (would always use this site again to make a similar purchase)</td>
</tr>
<tr>
<td>DV(2): <em>Level of Frustration Item</em></td>
<td>Users consider will not visit site when feeling discouraged</td>
<td>“My level of frustration while using this site.” A six-point scale with end points defined as follows: 1 = (very frustrated) and 6 = (not frustrated at all)</td>
</tr>
<tr>
<td>DV(3): <em>General Evaluation Item</em></td>
<td>Users evaluate whole quality of the site generalization</td>
<td>“General evaluation of the site.” A four point-scale with end points defined as follows: 1 = Poor (I feel the site is poor and would not return to make a similar purchase) and 4 = Excellent (I feel this site is excellent and would return to make a similar purchase).</td>
</tr>
<tr>
<td>DV(4): <em>Total Satisfaction Score</em></td>
<td>Sum of score of the three items</td>
<td>Sum of the Ranking on the three items in the questionnaire</td>
</tr>
</tbody>
</table>

### Population and Sample

The sample size of this research was based on 100 college students, and the population was from a college in Taiwan; i.e., the Chung Kuo Institute of Technology. The age of participants was between 18 and 40. This sample was appropriate for this study, because college students have been a significant part of the Web user population in

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Taiwan. Participants in this research were asked to find and attempt to buy a specific product on a particular Web site.

In random sampling, participants are chosen from the population so that all members of the group have the same probability of being invited as a study subject. Bias is prevented with random sampling since there is a high likelihood that all the population traits will be personified in the sample (McMillan & Schumacher, 2001).

A random sample is a probability sample in which every member of the population has a nonzero likelihood of being chosen. Random sample is an unbiased sample, which means that those participants selected differ because of random variation. There is no universal distinction in the sample that would make this chosen group different from other samples. A random sample is typical of the group from which the sample was selected (Wiersma, 2000). Certain sampling approaches are utilized to increase the validity of this study.

Inclusion and Exclusion Criteria

The purpose of this study was to examine the influence of an effective Web site and customer satisfaction in Taiwan. For this rationale, the inclusion factors were: participants who were knowledgeable of Web site navigation, participants who were agreeable to take part in the survey, security of the online purchase, products which were quickly and easily found, and consumer's bias. As a result, the subjects were selected from a population that had a high access rate for Internet shopping. College students fell into this group. In order to locate appropriate participants for the survey to increase validity and reliability, this inclusion criterion was included in the ICES Questionnaire (Appendix E), the Data Collection Booklet (Appendix D), and the Informed Consent
The exclusions of this study were individuals who were not agreeable, or who were unable, to access the online purchases (e.g., lack Internet knowledge, those who preferred traditional shopping, or consumers without credit cards), and individuals unable, or disagreeable, to repeat the criterion over the extent of the study.

**Data Collection and Instrumentation**

This quantitative research used information gained from the survey questionnaires to examine key properties of Web sites. This study focused on what consumers considered when deciding to purchase online. All 100 participants were college students in Taipei, Taiwan. Data collection implemented random sampling and survey with questionnaires.

Demographics of the participants were diverse, especially related to age, gender, and Internet usage. Groups of participants were gathered to fill out the questionnaire in a computer lab where the conditions were cautiously controlled by the researcher. The researcher confirmed the timing. Participants were asked questions regarding general attitudes towards the Internet (e.g., privacy protection, habits) and demographic traits (Scheffelmaier, 2003).

**Collection**

A questionnaire is used to collect data from participants who have a greater opportunity to access an online purchase. This research study selected 100 participants who were enrolled in a college in Taiwan. Following all data collection, the researcher performed a database search with variables, and transferred the data into the SPSS software program.
Quantitative data was collected by:

(1) Informed Consent (Appendix B) was given to participants before beginning the survey. Each participant must read, realize, initial in the right column, and date the form. Participants might refuse to participate and discontinue participation without penalty (Scheffelmaier, 2003, p. 84).

(2) A Data Collection Booklet (Appendix D) was prepared for this study, randomly given to each participant, and applied in the testing process. The booklet had the following parts:
   (a) Introduction,
   (b) Demographic Questionnaire,
   (c) Instructions for Evaluating the Web Site,
   (d) Form for Evaluating a Web site (time used to complete the purchase),
   (e) Site Review Protocol (1 to 6 Likert scale) containing the criterion of total satisfaction (Scheffelmaier, 2003, p. 83-84).

(3) ICES (Appendix E) specific property evaluation tool (including 68 checklist items and 12 rating scale) closed-ended questions with 1 to 4 Likert-type scales, ranging from poor to excellent (Scheffelmaier, 2003). The SPSS program was implemented to run a frequency distribution for checklist, rating, and total scores.

Each booklet included the same information excluding the URL address.
Procedures

This research survey procedure was divided into four parts to be completed in a computer lab with access to the Internet as follows:

First, the Informed Consent was submitted to participants before beginning the survey. Prior to participating in the study, each participant read and understood the consent form, and was provided the opportunity to review the survey questionnaire. Each participant initialed the Informed Consent in the right column, signed, and dated the form. If a participant was not willing to finish and sign the form, that participant was withdrawn from the survey (Scheffelmaier, 2003).

Second, this study applied a demographic questionnaire (Appendix D) to participants who were asked to read the instructions. Descriptive statistics were applied to assess the demographic questionnaire (Scheffelmaier, 2003).

Third, in the Web purchasing part of this research, participants were asked to imitate the purchase of an assigned product on an assigned Web site. The form for evaluating a Web site (Time Used to Complete the Purchase) (Appendix D) included instructions and information that guided the participants as follows:

(a) Start the browser and enter the URL address. Record the time when the site came out in the browser,

(b) Search the assigned product on the site. Record the time once the product was found,

(c) Try to buy the product using a fabricated credit card number (Nielsen, Snyder, Molich, & Farrell, 2000) (as cited in Scheffelmaier, 2003, p. 57-59) and record the time for rejecting the purchase.
Fourth, in this research, after study subjects were finished with the search, and before viewing the ICES, the participants were requested to conclude the post search evaluation questionnaire (Site Review Protocol) which assessed the participant’s satisfaction with the site (Appendix D). A maximum of 16 points could be achieved (Scheffelmaier, 2003).

Finally, in the ICES Evaluation part of this research, each participant was instructed in the evaluation procedure and process. After the Web purchasing and Site Review Protocol part of the study was accomplished, the participants were given the ICES booklet (Appendix E). Participants finished the 12 Property Pages in the ICES with each page representing one specific property. Study subjects finished the ICES in the computer lab. The ICES instructions included:

(1) Review the whole site again,

(2) Conclude the ICES for the site, and

(3) Submit the ICES brochure to the researcher (Scheffelmaier, 2003).

After reading the instructions, the researcher asked whether or not participants had any questions and informed the participants that there was no time limit for this portion of the process (Scheffelmaier, 2003).

After receiving all responses from participants, the researcher developed a SPSS program, which integrated the data for this study. The researcher kept confidential all information provided by the participants. Data was analyzed in a standard SPSS statistical program and evaluated using simple descriptive analyses. The study used correlation analysis to examine the relationship between variables. Finally, the researcher
interpreted the results of all the data analyses, and made reasonable conclusions and recommendations for the study.

**Instruments**

The primary instrument of this study applied for the collection of the quantitative data was the ICES evaluation tool (Appendix E). The ICES Questionnaire included a series of 12 specific properties (checklist and rating scale) (Scheffelmaier, 2003).

Moreover, the Form for Evaluating a Web site - “Time Used to Complete the Purchase” (Appendix D) helped to explain the accumulated completion times for the three stages, shown on the Web site as “find the product, place the product to the shopping cart, and complete the purchase.” The Site Review Protocol-“Total Satisfaction” (Appendix D) was to evaluate the quality of the Web site. The Demographic Questionnaire (Appendix D) helped to reduce participant bias, as well as determining whether or not the Internet usage of the participant long enough to obtain the skill required to navigate the Internet effectively and purchase online (Scheffelmaier, 2003).

In addition, the Informed Consent (Appendix B) was to assure that participation was voluntary. This form presented the details of the subject rights for the testing process (Scheffelmaier, 2003).

This research study survey was conducted in a computer lab. The survey with closed-ended 1 to 4 Likert (ICES) and 1 to 6 Likert (Site Review Protocol) scale questionnaires were applied to evaluate the influence of 12 specific properties on effective Web site and customer satisfaction (Scheffelmaier, 2003).

**Questionnaires.** In this study, the survey was performed face-to-face with each participant, while the researcher conducted primarily applied closed-ended questions, plus
a few open-ended questions (e.g., Demographic Questionnaire) to collect more information desired. According to Best and Kahn (1998), the researcher must choose the most suitable instruments and measures that enabled the collection and analysis of data.

Closed-ended questionnaires are easy to fill out, take little time, keep the respondent on the subject, are relatively objective, and are fairly easy to tabulate and analyze. One should note the instruction to rank choices in the order of importance, a fact that enables the tabulator to properly classify all responses (p. 300). Open-ended questionnaires provide for greater depth of response. The respondents reveal a frame of reference and possibly the reasons for choosing a particular response. The open-ended items can sometimes be difficult to interpret, tabulate, and summarize in the research report. Also, since open-ended items need greater effort on the part of the respondents, returns may be meager. (p. 300)

The questionnaires of this study included Evaluating a Web site, Customer Satisfaction (Site Review Protocol), and a Demographic questionnaire.

**Checklist.** A checklist is merely an approach for giving the subject with numerous options from which to choose (McMillan & Schumacher, 2001). According to Best & Kahn (1998):

The checklist is an arranged list of behaviors or items. The presence or absence of the behavior may be designated by checking yes or no, the type or number of items may be demonstrated by entering the suitable mark or number. (p. 296)

In this study, sixty-eight items were presented in the Checklist section of the ICES. The total checks for each respondent were totaled, and a mean score for that respondent was acquired. Fifty respondents were assigned to each of the two Web sites. The mean
scores of 50 respondents each at the two Web sites were totaled together, resulting in a Web site mean score (Scheffelmaier, 2003).

Rating Scale. “A rating is a measured judgment of some form” (Fraenkel & Wallen, 2000, p. 135). “The rating scale encompasses qualitative descriptions of a limited number of aspects of a thing or of characteristics of a person” (Best & Kahn, 1998, p. 296).

In this study, the second section of each page in the ICES contained a Rating Scale. This section asked the participant to rate a specific page using a Likert scale:

1. Poor (I would not return to make another purchase)
2. Mediocre (I might return to make another purchase)
3. Good (I would return to make another purchase)
4. Excellent (I definitely would return to make another purchase)

(Escalas et al., 2001) (as cited in Scheffelmaier, 2003, p. 77). Each page had a maximum of 4 possible points. The rating scores for each of the 12 pages in the ICES were totaled, and a mean score for each participant was computed. The 50 participant mean scores were added and divided by 50 to achieve a Web site rating average score (Scheffelmaier, 2003, p. 77). In this study, the ICES applied the checklist items and the rating scales to measure the total score as noted above.

In brief, the questionnaires, checklist, and rating scale of this study were implemented for the collection of the quantitative data including:

(1) Informed Consent (Appendix B);
(2) Demographic Questionnaire (Appendix D);
(3) Evaluating Web site-“Time Used to Complete the Purchase” (Appendix D);
The Informed Consent statement contained a concise explanation of the purpose, procedures, findings, risks of the survey, the confidentiality of subjects' information, and other clear details on the survey. The researcher's individual information was also provided to participants who had questions or asked further concerns from this study (Scheffelmaier, 2003).

The demographic questionnaire (Appendix D) was to provide participant's personal background information in the study. The questionnaire asked for information such as age, gender, Internet usage, and category of shoppers (Scheffelmaier, 2003). The questions were related to the following statements:

1. whether or nor the participant had operated an e-commerce business,
2. whether or not the participant had designed a Web site,
3. whether or not the participant knew computer programming,
4. the participant's gender,
5. the participant's age,
6. the amount of time the participant had used the Internet,
7. whether or not the participant had made an online purchase,
8. and if so, what products the participant had purchased?,
9. or, if the participant had not made a purchase online, why not? and
10. into which category of online shopping the participant belonged (Scheffelmaier, 2003).
Seven questions required a specific answer. Questions 8 and 9 were open-ended and needed a written reply, and Question 10 permitted the respondents to select more than one answer. Descriptive statistics were applied to analyze the frequency of responses for the eight quantitative questions, and qualitative analysis was utilized to interpret the responses of the open-ended questions (Bogdan & Biklen, 1998) (as cited in Scheffelmaier, 2003).

The Form for Evaluating a Web site (Appendix D) was designed to gather the completion times for each of the following three phases: (a) find the product, (b) place the product to the shopping cart, and (c) conclude the purchase (Scheffelmaier, 2003, p. 87). The form consisted of instructions and information that guided the participant to do the following:

- Start Windows Explorer;
- Type in the URL of the listed Web site;
- Search the assigned product and record the time when this phase was completed;
- Place the product to the shopping cart and record the time;
- Use the phony personal identification and credit card information to complete the purchase;
- Record the time when the purchase was completed - subjects were instructed to stop when an error message appeared indicating the credit card information was invalid;
- Turn the page and answer the three questions on the Site Review Protocol -Customer Satisfaction (Scheffelmaier, 2003, p. 87).
The questionnaire form Criterion for Customer Satisfaction (Appendix D) included three items for rating the site, as follows:

- **Use Again Item:** “I would or would not use this site again.” A six-point scale with end points defined as follows: 1 = (would never use this site again to make a similar purchase) and 6 = (would always use this site again to make a similar purchase).

- **Level of Frustration Item:** “My level of frustration while using this site.” A six-point scale with end points defined as follows: 1 = (very frustrated) and 6 = (not frustrated at all).

- **General Evaluation Item:** “General evaluation of the site.” A four point-scale with end points defined as follows: 1 = poor (I feel the site was poor and would not return to make a similar purchase) and 4 = Excellent (I feel this site was excellent and would return to make a similar purchase) (Scheffelmaier, 2003, p. 94).

This questionnaire concentrated on the subject’s satisfaction level and was administered directly to measure the quality of the site.

The content of the ICES (Appendix E) data instrument was based on synthesized literature on the 12 property groups of Web sites developed by Scheffelmaier & Vinsonhaler (2002) that were regarded as the most successful in initial Internet buying and returning purchases. The standard phrases were organized into 12 property groups, each including phrases relating to a common trait (e.g., visitor greeting page, coherence, security, etc.) (Scheffelmaier & Vinsonhaler, 2002).
A full copy of the ICES was contained in this study (see Appendix E). Each property page of the ICES includes two sections: (a) Checklist of Features and (b) Rating Scale for a specific page. In the Checklist of Features, subjects were requested to place a check if that feature used to that site. More than one feature could be checked. In the Rating Scale, participants were asked to rate a particular page or a complete website for that property using a Likert scale, 1-poor, 2-mediocre, 3-good, 4-excellent (Escalas et al., 2001) (as cited in Scheffelmaier, 2003, p. 72). Use of a four-point scale required the participants to state a response instead of checking the middle point in this scale (Scheffelmaier, 2003).

**Data Analysis**

This study was a non-experimental, correlational (observational) study, which used descriptive statistics, inferential statistics, and explanatory approach to answer the research questions. There were three different statistical analyses employed in this study.

The data analysis plan proposed for the correlational (observational) study was essentially parallel to that employed by Vinsonhaler and Scheffelmaier (2002), the study that introduced the ICES. There were, however, a few alterations and extensions of that methodology. The primary differences between the proposed study and the analysis of Vinsonhaler and Scheffelmaier (2002) were:

(a) An examination of 12 subscales of the ICES in addition to main scales in all analyses (conducted in order to determine whether or not there were certain scales that were more strongly related to the Satisfaction Scale),

(b) A modified reliability analysis (to more appropriately assess reliability),

(c) An examination of the Satisfaction Scale items in addition to the total score
(in order to determine whether or not the ICES scores were more or less related to the different components of satisfaction). Descriptive (means, standard deviations, and distributional examinations), psychometric (reliability), and inferential (validity) statistical techniques were employed in the research study.

**Descriptive Statistics.** Initially, demographic information on the respondents was presented. Then, the proportion of individuals endorsing each of the 68 items on the ICES checklist was computed. Finally, a presentation of means and standard deviations for:

1. the ICES Checked Items Scores (both overall and for the 12 subscales individually),
2. the ICES Rating Score (again, both overall and for the 12 subscales),
3. the ICES Total Score, and
4. the Satisfaction Score.

Following the presentation of descriptive statistics, the distributions of scores on scales (1) through (4) above were examined graphically with histograms for adherence to normality. The skewness and kurtosis of the distributions also provided insight into precisely the normality of these score distributions.

**Psychometric Statistics.** The reliability of the Checked Items Scales was examined with Kuder Richardson-20 reliability coefficients, the appropriate method for examining the reliability of scales composed entirely of dichotomous items. The reliability was provided for each of the 12 scales individually and for the overall Checked Items Score. For the Ratings Score and the Total Score (the latter being composed of a
combination of Likert scales and dichotomous items), the reliability was assessed with Cronbach's \( \alpha \). Cronbach's \( \alpha \) is an internal consistency method of assessing reliability in which the average of all possible split-half reliabilities is computed.

**Inferential Statistics.** This study correlation analysis was tested for statistical significance using alpha level .05. A correlation coefficient is a number that describes the degree of relationship between two scores (variables) in this study. The primary inferential technique, employed to examine the validity of the ICES, found correlation coefficients between all of the ICES scores and (a) the three individual items composing the Satisfaction Scale, and (b) the sum of items composing the Satisfaction Score (the score that indicates overall satisfaction with the Web site). In addition, correlations were computed between the Satisfaction Scale items and total score, and (a) time to purchase product, and (b) ICES Total Score + (10*(15-time to purchase)) in order to replicate the results of Vinsonhaler and Scheffelmaier (2002).

To summarize, this study applied descriptive statistics in a standard SPSS program to interpret the validity of data status for this research. The analysis descriptive statistics helped the researcher to understand the basic features of the data, including measures of central tendency (Mean), measures of variability (Standard Deviation), measures of deviation from normality (Kurtosis and Skewness), and measure of relationship (correlation) (George & Mallery, 2003).

The researcher checked the frequency distribution of discrete variables and continuous variables. "Frequency distributions are very useful for answering many important questions. They indicate quickly the most and least frequently occurring
scores; the general shape of the distribution and whether any scores are isolated from the others" (McMillan & Schumacher, 2001, p. 210).

In this study, correlational analysis helped to measure the linear relationship between variables. The value of the correlation coefficient ranged from -1.0 to +1.0. If the correlation is close to +1.0, the value represents that two variables have a strong positive relationship. On the other hand, if the correlation is close to -1.0, the value represents that the two variables have a strong negative relationship. If the correlation is zero, the value represents that the two variables have no relationship (Wiersma, 2000). The researcher applied the Pearson Product-Moment correlations method in this study.

**Reliability and Validity**

The Kuder-Richardson and Cronbach's $a$ were used to estimate an internal consistency for this study.

According to Wiersma (2000):

Reliability is a necessary characteristic for validity; that is, a study cannot be valid and lack reliability (p. 9). Reliability means consistency of the instrument in measuring whatever the testing methodology proposes to measure. KR-20 required only one administration of a test. KR-20 provided the mean of all possible split-half coefficients. Reliability coefficients can take on value of 0 to 1.0, inclusive. (p. 297-298)

"Kuder-Richardson 20 could be applied to calculate an estimate of the reliability of a homogenous test. Internal consistency relates to how well a test assesses a single construct or concept" (Johnson & Christensen, 2000, p. 104). Kuder-Richardson 20 is based on the proportion of true and false replies to each of the items on a test. The
KR-20 is particularly suitable when the intention of the test is to evaluate a single characteristic (Ary, Jacobs, & Razavieh, 2002).

Cronbach Alpha can be applied for both binary-type and large-scale data. The Cronbach Alpha coefficient is an assessment of squared correlation between observed scores and true scores. In other words, reliability is calculated in terms of the ratio of true score variance to examined score variance (Yu, n.d.). In addition, researchers utilized Cronbach Alpha when measuring items that were not scored merely as correct or incorrect, such as, attitude scales (Ary, Jacobs, & Razavieh, 2002). “The Cronbach Alpha was derived from two or more parts of the test, which needs only one administration” (Wiersma, 2000, p. 298).

In this study, the reliability of the Checked Items Scales were examined with Kuder Richardson-20 reliability coefficients, the appropriate method for examining the reliability of scales composed entirely of dichotomous items. Ratings Score and the Total Score (the latter being composed of a combination of Likert scales and dichotomous items) reliability were assessed with Cronbach’s a.

In brief, this quantitative research utilized KR-20 to examine the reliability of the Checked Items Scales, and used Cronbach’s a method to measure the Ratings Score, and the Total Score for full test reliability.

According to Johnson and Christensen (2000), “Validity is a judgment of the appropriateness of the interpretations and actions made on the basis of a test score” (p. 106). “Validity is evaluated depending on the purpose, population, and surrounding traits in which measurement takes place. Thus, a test outcome could be valid in one situation and invalid in another” (McMillan & Schumacher, 2001, p. 239). Validity is
the most significant quality a test or measuring instrument can hold and is an essential feature of any assessment tool (Gay & Airasian, 2000). Validity is the suitability, meaningfulness, and helpfulness of the conclusions researchers make based on data collected (Fraenkel & Wallen, 2000).

This research intended to measure whether or not the ICES would be a reliable and valid measure for assessing the quality of commercial Web sites in Taiwan. The ICES has been a reliable and valid tool to predict a visitor's likelihood of purchasing a product initially (from visitor to buyer), and returning to buy soon (from buyer to repeat buyer) (Scheffelmaier, 2003).

In this study, the primary inferential technique attempted to examine the validity of the ICES, and determined whether or not the correlation coefficients measured user satisfaction in Taiwan. User satisfaction was calculated by the total satisfaction on the post search evaluation questionnaire, as the simultaneous validity standard for ICES.

**Ethics**

According to Creswell (2003):

It is useful to consider the ethical issues that can be anticipated and described in the research. These issues relate to all phases of the research process. With consideration for participants, research sites, and potential readers, studies can be designed that contain ethical practices. (p. 68)

In this study, the researcher was concerned with the safety and confidentiality of the participants. Except for the participation ID (serial) number, no identifying personal data was collected from the participants.
This study focused on ensuring privacy at every phase to protect the participant’s confidential information. In this study, a concise statement on the instructions was included in the questionnaire and was explained by the researcher. The introduction clarified the objective of this research, the procedures to be applied, and provided subjects with a chance to ask questions. Subjects were informed that participation in the research study was voluntary, did not influence any class grade, and the participant ID (serial) number was the only way used to identify the participant. Study subjects were assured that there was no recorded connection between the subject ID (serial) number and the subject’s name. Participants were notified that an informed consent was required and was administered before the study (Scheffelmaier, 2003).

Furthermore, data and human subject protection have implications for isolation and confidentiality of survey data. The responses were regarded as confidence, and continuously, data was provided in a manner that subject’s identity could not be linked with exact published information. All of the data were combined to examine, and no personal information was identified.

**Summary**

This quantitative research included descriptive statistics to analyze, describe, summarize, and present the original collected data in an organized manner that was easily managed by the researcher and understood by others. Descriptive statistics allowed the researcher to analyze all variables (demographic data, sets of questions, and key factors), to sort the variables into suitable categories, and to rank all values obtained from the sample.

A review of means, correlational coefficients, standard deviations, proportions, frequency histograms of variables, and a cross-tabulation of the demographic data was
used in this research. The researcher explained all data analysis using SPSS software, and make rational conclusions, and recommendations for this study. The level of significance for all analyses in this study was set at the $p = .05$ level.

Since the research involved a great deal of numerical information (data), and the mathematics associated with statistics was complicated, the researcher relied on technological support to avoid error. The Statistical Package for Social Science (SPSS) is a powerful program that guides researchers step-by-step through the research process. The vital point addressed by this research was to assess the validity and reliability of ICES on Web site design effectiveness in Taiwan. The results will be presented in Chapter Four.
CHAPTER FOUR

RESULTS

Introduction

In this chapter, the descriptive, psychometric, and inferential statistical results of the sample, the statistical analyses, and the research findings of this study were discussed. Two research questions were examined and analyzed using frequency distributions, correlation analyses, t-tests, and Pearson product-moment correlations. The sample consisted of 100 college students, and the population was selected from a college in Taiwan. The age of participants was between 18 and 40. The data was collected during the 2004 spring semester.

The purpose of the research study was to examine the performance of the Internet Commerce Evaluation Scale (Scheffelmaier & Vinsonhaler, 2002) in Taiwan. Data collection involved 100 Taiwanese individuals who rated one of two Web sites using the ICES and filled out two short surveys consisting of (a) demographic and computer/Internet usage data, and (b) a scale that assessed user level of satisfaction with the Web site.

Organization of Data Analysis

The data analysis was organized into three stages. First, basic descriptive (means, standard deviations, and distributional examinations) information was provided for (a) the demographic characteristics of the sample, (b) computer/Internet usage data, and (c) scores from the ICES and satisfaction surveys. Second, the psychometric characteristics of the ICES were explored through an analysis of the reliability of the scores. Third, inferential (validity) statistical analysis was performed to examine the relationships between the ICES scores and the satisfaction scale.
Description, Analysis, and Interpretation of Results

Descriptive Statistics

The mean age of the sample was 25.21 years (standard deviation = 5.74 years) and the study participants had been using the Internet for an average of 5.9 years (standard deviation = 2.32). Demographic information (frequencies and percentages) for the nominal respondent characteristics included computer/Internet usage data was provided in Table 4. There were approximately equal numbers of males (52%) and females (48%) in the sample. Only a small percentage of the sample had operated an e-commerce business (11%) or know computer programming (16%). A somewhat larger percentage (38%) had designed a Web site. Exactly half of the sample had made an online purchase. The products the participants had purchased were presented in Table 5. Books and clothing were the most frequently purchased items. Of the half of the sample who had not made an online purchase, Table 6 presented the reasons for not having made a purchase. By far the most common reason was a concern for the security of the transaction.
Table 4

**Descriptive Statistics for Respondent’s Background and Computer/Internet Usage**

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>52</td>
<td>52.0</td>
</tr>
<tr>
<td>Female</td>
<td>48</td>
<td>48.0</td>
</tr>
<tr>
<td><strong>Have operated an e-commerce business</strong></td>
<td>11</td>
<td>11.0</td>
</tr>
<tr>
<td><strong>Have designed a Web site</strong></td>
<td>38</td>
<td>38.0</td>
</tr>
<tr>
<td><strong>Know computer programming</strong></td>
<td>16</td>
<td>16.0</td>
</tr>
<tr>
<td><strong>Have made an online purchase</strong></td>
<td>50</td>
<td>50.0</td>
</tr>
<tr>
<td><strong>Type of online shopper</strong>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recreational</td>
<td>44</td>
<td>44.0</td>
</tr>
<tr>
<td>Experimental</td>
<td>44</td>
<td>44.0</td>
</tr>
<tr>
<td>Convenience</td>
<td>46</td>
<td>46.0</td>
</tr>
<tr>
<td>Economic</td>
<td>46</td>
<td>46.0</td>
</tr>
</tbody>
</table>

Note. *Percentages do not sum to 100.0 because multiple responses were allowed.*
<table>
<thead>
<tr>
<th>Product</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book</td>
<td>14</td>
<td>14.0</td>
</tr>
<tr>
<td>Clothes</td>
<td>9</td>
<td>9.0</td>
</tr>
<tr>
<td>Cosmetics</td>
<td>5</td>
<td>5.0</td>
</tr>
<tr>
<td>Electronics</td>
<td>4</td>
<td>4.0</td>
</tr>
<tr>
<td>Video Games</td>
<td>3</td>
<td>3.0</td>
</tr>
<tr>
<td>Video Compact Disk</td>
<td>3</td>
<td>3.0</td>
</tr>
<tr>
<td>Airline Ticket</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Cellular Phone</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Computer Accessories</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Handbag</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Shoes</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Hotel Room</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Backpack</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Camera</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Car Detector</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Daily Supplies</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Dog</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Food</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Package Tour</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Records</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Computer Software</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Tea</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Tour Gift Certificate</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Ornament</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Car</td>
<td>1</td>
<td>1.0</td>
</tr>
</tbody>
</table>
Table 6

Reasons for Not Purchasing Online

<table>
<thead>
<tr>
<th>Reason</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security concern</td>
<td>20</td>
<td>20.0</td>
</tr>
<tr>
<td>Inconvenience</td>
<td>5</td>
<td>5.0</td>
</tr>
<tr>
<td>Not familiar with online shopping process</td>
<td>4</td>
<td>4.0</td>
</tr>
<tr>
<td>Product quality</td>
<td>4</td>
<td>4.0</td>
</tr>
<tr>
<td>High risk</td>
<td>3</td>
<td>3.0</td>
</tr>
<tr>
<td>Not necessary</td>
<td>3</td>
<td>3.0</td>
</tr>
<tr>
<td>Security concern and product quality</td>
<td>3</td>
<td>3.0</td>
</tr>
<tr>
<td>Can not find attractive products</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Have no desire to shop online</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Can not see the physical product before purchasing</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Like to make a purchase in brick &amp; mortar</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Not interested in online shopping</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Unaccustomed to online purchase</td>
<td>1</td>
<td>1.0</td>
</tr>
</tbody>
</table>

In addition to demographic and computer usage data, descriptive statistics were used to characterize responses to the ICES scores and satisfaction scale scores. The proportion of respondents who endorsed each of the 68 items from the ICES was provided in Table 7. Table 7 included both the High and Low Convenience Web sites and Overall. Also contained in Table 7 were the mean numbers of items checked within each category. Twelve independent samples t-tests were conducted to determine if the mean number of items checked within each category differed between the High and Low Convenience Web sites.
Four of these twelve tests were statistically significant: A higher number of the Shopping Cart items were checked for the High Convenience Web site ($t(98) = 2.13$, $p = .035$), a higher number of the Coherence & Organization items were checked for the High Convenience Web site ($t(98) = 2.37$, $p = .020$), a higher number of the Consistency items were checked for the High Convenience Web site ($t(98) = 3.50$, $p = .001$), and a higher number of the Style items were checked for the High Convenience Web site ($t(98) = 2.93$, $p = .004$). The number of items checked for the other eight categories were similar in results and was not statistically significant between the two Web sites.

Table 7

Proportion of Respondent's Endorsing Each of the Items on the ICES

<table>
<thead>
<tr>
<th>Visitor Greeting Page [Mean (SD)]</th>
<th>High Convenience</th>
<th>Low Convenience</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describes the site</td>
<td>5.62 (1.71)</td>
<td>5.34 (1.93)</td>
<td>5.48 (1.82)</td>
</tr>
<tr>
<td>Has a navigation bar</td>
<td>.70</td>
<td>.84</td>
<td>.77</td>
</tr>
<tr>
<td>Has contrasting colors</td>
<td>.78</td>
<td>.72</td>
<td>.75</td>
</tr>
<tr>
<td>Eliminates scroll downs</td>
<td>.38</td>
<td>.40</td>
<td>.39</td>
</tr>
<tr>
<td>Has intranet links</td>
<td>.30</td>
<td>.18</td>
<td>.24</td>
</tr>
<tr>
<td>Uses subject tabs</td>
<td>.56</td>
<td>.60</td>
<td>.58</td>
</tr>
<tr>
<td>Has a shopping cart icon</td>
<td>.64</td>
<td>.60</td>
<td>.62</td>
</tr>
<tr>
<td>Provides human contact</td>
<td>.82</td>
<td>.80</td>
<td>.81</td>
</tr>
<tr>
<td>Has an Internet search engine</td>
<td>.66</td>
<td>.46</td>
<td>.56</td>
</tr>
</tbody>
</table>

<p>| Catalog Page [Mean (SD)]          | 4.16 (1.25)      | 4.16 (1.45)     | 4.16 (1.35) |
| Provides thumbnail photos         | .80              | .60             | .70     |
| Provides a product description    | .82              | .88             | .85     |
| Provides the product price        | .84              | .92             | .88     |
| No unnecessary graphics           | .32              | .42             | .37     |
| Provides shopping cart access     | .82              | .90             | .86     |
| Provides links to related products| .56              | .44             | .50     |</p>
<table>
<thead>
<tr>
<th>Feature</th>
<th>High Convenience</th>
<th>Low Convenience</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shopping Cart Page [Mean (SD)]</strong></td>
<td>3.02 (0.87)</td>
<td>2.60 (1.09)</td>
<td>2.81 (1.00)</td>
</tr>
<tr>
<td>Displays a return policy</td>
<td>.68</td>
<td>.50</td>
<td>.59</td>
</tr>
<tr>
<td>Provides shipping and handling charges</td>
<td>.74</td>
<td>.74</td>
<td>.74</td>
</tr>
<tr>
<td>Allows return to catalog page</td>
<td>.80</td>
<td>.68</td>
<td>.74</td>
</tr>
<tr>
<td>Provides an express cash out</td>
<td>.80</td>
<td>.68</td>
<td>.74</td>
</tr>
<tr>
<td><strong>Security [Mean (SD)]</strong></td>
<td>1.86 (0.64)</td>
<td>1.70 (0.65)</td>
<td>1.78 (0.64)</td>
</tr>
<tr>
<td>Provides security information</td>
<td>.78</td>
<td>.78</td>
<td>.78</td>
</tr>
<tr>
<td>Provides payment options</td>
<td>.80</td>
<td>.72</td>
<td>.76</td>
</tr>
<tr>
<td>Provides e signature option</td>
<td>.28</td>
<td>.20</td>
<td>.24</td>
</tr>
<tr>
<td><strong>Cash Out Page [Mean (SD)]</strong></td>
<td>4.18 (1.56)</td>
<td>3.6 (1.60)</td>
<td>3.89 (1.60)</td>
</tr>
<tr>
<td>Has one time card registration</td>
<td>.62</td>
<td>.48</td>
<td>.55</td>
</tr>
<tr>
<td>Has one time shipping information</td>
<td>.64</td>
<td>.64</td>
<td>.64</td>
</tr>
<tr>
<td>Provides human contact</td>
<td>.72</td>
<td>.56</td>
<td>.64</td>
</tr>
<tr>
<td>Provides a link to shipping carrier</td>
<td>.48</td>
<td>.26</td>
<td>.37</td>
</tr>
<tr>
<td>Provides email verification</td>
<td>.58</td>
<td>.56</td>
<td>.57</td>
</tr>
<tr>
<td>Provides one time account creation</td>
<td>.66</td>
<td>.70</td>
<td>.68</td>
</tr>
<tr>
<td>Provides delivery information</td>
<td>.48</td>
<td>.40</td>
<td>.44</td>
</tr>
<tr>
<td><strong>Coherence &amp; Organization [Mean (SD)]</strong></td>
<td>3.70 (1.04)</td>
<td>3.16 (1.23)</td>
<td>3.43 (1.17)</td>
</tr>
<tr>
<td>Does each page have a single purpose</td>
<td>.54</td>
<td>.52</td>
<td>.53</td>
</tr>
<tr>
<td>Lists the important information first</td>
<td>.78</td>
<td>.68</td>
<td>.73</td>
</tr>
<tr>
<td>Has a hierarchical menu</td>
<td>.72</td>
<td>.46</td>
<td>.59</td>
</tr>
<tr>
<td>Provides easy access to the product</td>
<td>.92</td>
<td>.84</td>
<td>.88</td>
</tr>
<tr>
<td>Uses common language</td>
<td>.74</td>
<td>.66</td>
<td>.70</td>
</tr>
<tr>
<td><strong>Consistency &amp; Standardization [Mean (SD)]</strong></td>
<td>4.52 (1.31)</td>
<td>3.56 (1.43)</td>
<td>4.04 (1.45)</td>
</tr>
<tr>
<td>Has a simple page design</td>
<td>.70</td>
<td>.40</td>
<td>.55</td>
</tr>
<tr>
<td>All the applications look the same</td>
<td>.76</td>
<td>.66</td>
<td>.71</td>
</tr>
<tr>
<td>Has the same shopping cart icon</td>
<td>.72</td>
<td>.80</td>
<td>.76</td>
</tr>
<tr>
<td>Has partnership icons</td>
<td>.50</td>
<td>.14</td>
<td>.32</td>
</tr>
<tr>
<td></td>
<td>High Convenience</td>
<td>Low Convenience</td>
<td>Overall</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------</td>
<td>-----------------</td>
<td>----------</td>
</tr>
<tr>
<td>Has consistent information</td>
<td>.82</td>
<td>.68</td>
<td>.75</td>
</tr>
<tr>
<td>Has consistent format</td>
<td>.74</td>
<td>.66</td>
<td>.70</td>
</tr>
<tr>
<td>No scroll down option</td>
<td>.28</td>
<td>.22</td>
<td>.25</td>
</tr>
<tr>
<td><strong>Efficiency [Mean (SD)]</strong></td>
<td>3.16 (.11)</td>
<td>2.86 (.11)</td>
<td>3.01 (.11)</td>
</tr>
<tr>
<td>Provides quick download time</td>
<td>.72</td>
<td>.68</td>
<td>.70</td>
</tr>
<tr>
<td>Has a descriptive URL</td>
<td>.52</td>
<td>.56</td>
<td>.54</td>
</tr>
<tr>
<td>No unnecessary graphics</td>
<td>.52</td>
<td>.38</td>
<td>.45</td>
</tr>
<tr>
<td>No orphan pages</td>
<td>.56</td>
<td>.40</td>
<td>.48</td>
</tr>
<tr>
<td>Requires few clicks</td>
<td>.84</td>
<td>.84</td>
<td>.84</td>
</tr>
<tr>
<td><strong>Navigation [Mean (SD)]</strong></td>
<td>2.86 (.99)</td>
<td>2.58 (1.03)</td>
<td>2.72 (1.02)</td>
</tr>
<tr>
<td>Provides buttons</td>
<td>.74</td>
<td>.62</td>
<td>.68</td>
</tr>
<tr>
<td>No orphan pages</td>
<td>.52</td>
<td>.28</td>
<td>.40</td>
</tr>
<tr>
<td>Has a site map</td>
<td>.32</td>
<td>.50</td>
<td>.41</td>
</tr>
<tr>
<td>Has an intranet search engine</td>
<td>.86</td>
<td>.86</td>
<td>.86</td>
</tr>
<tr>
<td>Has a help menu</td>
<td>.42</td>
<td>.32</td>
<td>.37</td>
</tr>
<tr>
<td><strong>Style [Mean (SD)]</strong></td>
<td>4.58 (1.63)</td>
<td>3.62 (1.65)</td>
<td>4.10 (1.70)</td>
</tr>
<tr>
<td>Has easy to read font</td>
<td>.94</td>
<td>.78</td>
<td>.86</td>
</tr>
<tr>
<td>Uses 12-14 font size</td>
<td>.62</td>
<td>.52</td>
<td>.57</td>
</tr>
<tr>
<td>Use of bold and italic text</td>
<td>.60</td>
<td>.36</td>
<td>.48</td>
</tr>
<tr>
<td>Has all text aligned left</td>
<td>.54</td>
<td>.46</td>
<td>.50</td>
</tr>
<tr>
<td>Uses 40-60 characters per line</td>
<td>.68</td>
<td>.48</td>
<td>.58</td>
</tr>
<tr>
<td>No unnecessary graphics</td>
<td>.68</td>
<td>.52</td>
<td>.60</td>
</tr>
<tr>
<td>Provides discriminate links</td>
<td>.52</td>
<td>.50</td>
<td>.51</td>
</tr>
<tr>
<td><strong>Value Added [Mean (SD)]</strong></td>
<td>1.16 (.77)</td>
<td>1.08 (.85)</td>
<td>1.12 (.81)</td>
</tr>
<tr>
<td>Delivers an unexpected experience</td>
<td>.16</td>
<td>.20</td>
<td>.18</td>
</tr>
<tr>
<td>Creates a positive sensory experience</td>
<td>.30</td>
<td>.22</td>
<td>.26</td>
</tr>
<tr>
<td>Provides an attractive product display</td>
<td>.70</td>
<td>.66</td>
<td>.68</td>
</tr>
</tbody>
</table>
Brick and Mortar [Mean (SD)] | High Convenience | Low Convenience | Overall
---------------------------------|-----------------|-----------------|-----------------|
Provides good customer service     | 3.94 (1.33)     | 3.76 (1.82)     | 3.85 (1.59)     |
Provides back office assistance    | .50             | .66             | .58             |
Provides a physical address        | .52             | .46             | .49             |
Provides telephone numbers         | .54             | .56             | .55             |
Provides current site information  | .46             | .58             | .52             |
Provides quality products          | .68             | .52             | .60             |
Provides competitive pricing       | .72             | .50             | .61             |

Means and standard deviations for the ICES scores and satisfaction scale scores were provided in Table 8, again separately for the High and Low Convenience Web sites and Overall. Nineteen independent sample t-tests were conducted for each of the scores in Table 8 (12 category ratings, the total number of checked items, the overall ratings score, the total score, scores on the three satisfaction items, and the overall satisfaction score). Only three of these t-tests were statistically significant: The ratings of the Coherence & Organization scale were higher for the High Convenience Web site (t (98) = 3.84, p < .0005), the sum of the 68 checked items was higher for the High Convenience Web site (t (98) = 2.42, p = .017), and the total score from the ICES was higher for the High Convenience Web site (t (98) = 2.74, p = .007). None of the other scores in Table 8 differed between the High and Low Convenience Web sites and were not statistically significant.

Figures 2, 3, 4, and 5 presented the distribution of scores for the ICES checked items score, the ICES ratings score, the ICES total score, and the overall satisfaction score, respectively. These figures were provided in order to determine if the
distributions of these scores were approximately normal. For skewness and kurtosis, values of zero were found in perfectly normal distributions, and values less than one indicated small deviations from normality.

The distribution of the ICES checked items score in Figure 2 appeared approximately normal, and the small skewness value of -.53 and small kurtosis value of -.20 similarly indicated approximate normality. The distribution of ICES ratings scores in Figure 3 also appeared normal, and the skewness of .01 and kurtosis of -.69 concurred. The distribution of ICES total scores in Figure 4 also looked normal, and the distribution had a small value for skewness (-.53) and a small value for kurtosis (-.02). Finally, the distribution of overall satisfaction scale scores in Figure 5 appeared approximately normal and was accompanied by small values for skewness (-.43) and kurtosis (.08).
## Table 8

**Descriptive Statistics for ICES and Satisfaction Scale Scores**

<table>
<thead>
<tr>
<th></th>
<th>High Convenience</th>
<th>Low Convenience</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>ICES Scores</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICES Rating Scores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visitor Greeting</td>
<td>2.38</td>
<td>.49</td>
<td>2.32</td>
</tr>
<tr>
<td>Catalog</td>
<td>2.64</td>
<td>.72</td>
<td>2.44</td>
</tr>
<tr>
<td>Shopping Cart</td>
<td>2.50</td>
<td>.65</td>
<td>2.32</td>
</tr>
<tr>
<td>Cash Out</td>
<td>2.42</td>
<td>.73</td>
<td>2.22</td>
</tr>
<tr>
<td>Security</td>
<td>2.42</td>
<td>.67</td>
<td>2.18</td>
</tr>
<tr>
<td>Coherence &amp; Organization</td>
<td>2.80</td>
<td>.61</td>
<td>2.34</td>
</tr>
<tr>
<td>Consistency &amp;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standardization</td>
<td>2.50</td>
<td>.54</td>
<td>2.32</td>
</tr>
<tr>
<td>Efficiency</td>
<td>2.54</td>
<td>.61</td>
<td>2.46</td>
</tr>
<tr>
<td>Navigation</td>
<td>2.42</td>
<td>.61</td>
<td>2.28</td>
</tr>
<tr>
<td>Style</td>
<td>2.54</td>
<td>.65</td>
<td>2.38</td>
</tr>
<tr>
<td>Value Added</td>
<td>1.98</td>
<td>.71</td>
<td>2.08</td>
</tr>
<tr>
<td>Brick &amp; Mortar</td>
<td>2.34</td>
<td>.59</td>
<td>2.36</td>
</tr>
<tr>
<td><strong>ICES Total Checked Items Score</strong></td>
<td>29.48</td>
<td>4.06</td>
<td>27.70</td>
</tr>
<tr>
<td><strong>ICES Total Ratings Score</strong></td>
<td>72.24</td>
<td>9.88</td>
<td>65.72</td>
</tr>
<tr>
<td><strong>ICES Total Score</strong></td>
<td>42.76</td>
<td>8.46</td>
<td>38.02</td>
</tr>
<tr>
<td><strong>Satisfaction Scale Scores</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use Again</td>
<td>3.60</td>
<td>1.28</td>
<td>3.50</td>
</tr>
<tr>
<td>Level of Frustration</td>
<td>4.30</td>
<td>1.16</td>
<td>4.26</td>
</tr>
<tr>
<td>General Evaluation</td>
<td>2.22</td>
<td>.46</td>
<td>2.18</td>
</tr>
<tr>
<td><strong>Total Satisfaction Score</strong></td>
<td>10.12</td>
<td>2.18</td>
<td>9.94</td>
</tr>
</tbody>
</table>
Sum of 68 Checked Items

Figure 2
Distribution of ICES Checked Items Scores

Ratings Score

Figure 3
Distribution of ICES Ratings Scores
Total Score

Figure 4
Distribution of ICES Total Scores

Satisfaction Scale Sum

Figure 5
Distribution of Overall Satisfaction Scores
Psychometric Statistics

Reliability coefficients were computed for 15 scales from the ICES: (a) the 12 checked item scales, (b) the overall checked items scale, (c) the ratings score, and the total score. These were computed separately for the High Convenience and Low Convenience Web sites, and for the data from both Web sites combined. Table 9 contained these reliability coefficients. For the scales composed of dichotomous items (i.e. the 12 checked items scales and the overall checked items scale) these were Kuder-Richardson 20 reliability coefficients, while for the ratings score and the total score these were Cronbach's $a$ coefficients. Both were types of internal consistency reliability and therefore have been interpreted identically.

As can be seen, the reliability coefficients for the 12 checked items scales were low when data from the High Convenience and Low Convenience Web sites were combined, and ranged from -.45 to .52. When the High and Low Convenience Web sites were considered separately, the situation did not improve: For the High Convenience Web sites the reliability coefficients ranged from -.50 to .51, while the Low Convenience Web sites ranged from -.45 to .62. For 10 of the 12 checked items scales, the reliability for the Low Convenience Web site was higher than that for the High Convenience Web site. Nevertheless, the reliability coefficients were too low to justify using the 12 checked items scale scores.

For the overall checked items scale, the reliability coefficients were all .81 or above. The reliability of the ratings scores were all .77 or above. For the total scores, the reliability was .82 or above. In the case of these three scores, the reliability was always higher for the Low Convenience Web site than for the High Convenience Web site.
Table 9

Reliability Coefficients for the ICES Scales

<table>
<thead>
<tr>
<th>Checked Items Scales</th>
<th>High Convenience</th>
<th>Low Convenience</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor Greeting (9 items)</td>
<td>.40</td>
<td>.57</td>
<td>.49</td>
</tr>
<tr>
<td>Catalog (6 items)</td>
<td>.38</td>
<td>.62</td>
<td>.50</td>
</tr>
<tr>
<td>Shopping Cart (4 items)</td>
<td>.02</td>
<td>.32</td>
<td>.23</td>
</tr>
<tr>
<td>Cash Out (7 items)</td>
<td>.37</td>
<td>.42</td>
<td>.41</td>
</tr>
<tr>
<td>Security (3 items)</td>
<td>-.50</td>
<td>-.45</td>
<td>-.45</td>
</tr>
<tr>
<td>Coherence &amp; Organization (5 items)</td>
<td>.19</td>
<td>.35</td>
<td>.32</td>
</tr>
<tr>
<td>Consistency &amp; Standardization (7 items)</td>
<td>.21</td>
<td>.33</td>
<td>.34</td>
</tr>
<tr>
<td>Efficiency (5 items)</td>
<td>.14</td>
<td>.13</td>
<td>.14</td>
</tr>
<tr>
<td>Navigation (5 items)</td>
<td>-.08</td>
<td>.02</td>
<td>-.04</td>
</tr>
<tr>
<td>Style (7 items)</td>
<td>.51</td>
<td>.45</td>
<td>.52</td>
</tr>
<tr>
<td>Value Added (3 items)</td>
<td>.05</td>
<td>.33</td>
<td>.20</td>
</tr>
<tr>
<td>Brick &amp; Mortar (7 items)</td>
<td>.05</td>
<td>.55</td>
<td>.37</td>
</tr>
<tr>
<td>Total Checked Items Scale (68 items)</td>
<td>.81</td>
<td>.89</td>
<td>.87</td>
</tr>
<tr>
<td>Ratings Scale (12 items)</td>
<td>.77</td>
<td>.87</td>
<td>.83</td>
</tr>
<tr>
<td>Total Score (80 items)</td>
<td>.82</td>
<td>.91</td>
<td>.88</td>
</tr>
</tbody>
</table>

Inferential Statistics

The primary set of inferential analyses was aimed at determining if there were relationships between the 15 scales of the ICES and the level of satisfaction the respondents had with the Web sites. These analyses answered the primary research questions of the study, related to the validity of the ICES in terms of predicting Web site satisfaction. The level of satisfaction was examined for each of the three items which
composed the satisfaction scale and for the sum of those three items (note that the level of frustration item was scored such that ‘1’ indicated a high degree of frustration, while ‘6’ indicated a lack of frustration) (Scheffelmaier, 2003). These analyses were conducted for the High Convenience and Low Convenience Web sites individually and combined. Tables 10, 11, and 12 contained these correlations for the High Convenience Web site, Low Convenience Web site, and both Web sites combined, respectively.

For the High Convenience Web site, only 5 of the 48 correlations between the checked items scales and the satisfaction scores were statistically significant, which indicated that the checked items scores were not particularly valid for predicting satisfaction. Conversely, 15 of the 48 correlations between the ratings scores and the satisfaction scores were statistically significant, which indicated a higher degree of validity. In particular, the Visitor Greeting, Catalog, Shopping Cart, Consistency & Standardization, Efficiency, and Brick & Mortar ratings were all positively correlated with the total satisfaction score.

Surprisingly, the total checked items score was negatively correlated with the general satisfaction item, which indicated that the more items were checked, the less satisfied the respondents were with the site. The overall ratings score was positively correlated with all three satisfaction items and the total satisfaction score, while the total score was correlated with only two of the items and the total score. In general, the research provided evidence that several of the ratings scores and in particular the overall ratings score were the most valid predictors of satisfaction for the High Convenience Web site.
Table 10

Correlations Between ICES and Satisfaction Scores for the High Convenience Web Site

<table>
<thead>
<tr>
<th>Checked Items Scales</th>
<th>Use Again</th>
<th>Frustration</th>
<th>General</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor Greeting</td>
<td>.17</td>
<td>.23</td>
<td>-.30*</td>
<td>.16</td>
</tr>
<tr>
<td>Catalog</td>
<td>.23</td>
<td>.15</td>
<td>-.20</td>
<td>.17</td>
</tr>
<tr>
<td>Shopping Cart</td>
<td>.34*</td>
<td>.14</td>
<td>.04</td>
<td>.28</td>
</tr>
<tr>
<td>Cash Out</td>
<td>-.01</td>
<td>-.02</td>
<td>-.11</td>
<td>-.04</td>
</tr>
<tr>
<td>Security</td>
<td>.25</td>
<td>.00</td>
<td>-.17</td>
<td>.11</td>
</tr>
<tr>
<td>Coherence &amp; Organization</td>
<td>.19</td>
<td>.13</td>
<td>-.24</td>
<td>.12</td>
</tr>
<tr>
<td>Consistency &amp; Standardization</td>
<td>.04</td>
<td>.32*</td>
<td>-.16</td>
<td>.16</td>
</tr>
<tr>
<td>Efficiency</td>
<td>.12</td>
<td>.39*</td>
<td>-.15</td>
<td>.24</td>
</tr>
<tr>
<td>Navigation</td>
<td>.05</td>
<td>.18</td>
<td>-.15</td>
<td>.09</td>
</tr>
<tr>
<td>Style</td>
<td>-.15</td>
<td>.22</td>
<td>-.31*</td>
<td>-.04</td>
</tr>
<tr>
<td>Value Added</td>
<td>.00</td>
<td>.20</td>
<td>.19</td>
<td>.15</td>
</tr>
<tr>
<td>Brick &amp; Mortar</td>
<td>.14</td>
<td>-.09</td>
<td>-.11</td>
<td>.01</td>
</tr>
</tbody>
</table>

| Rating Scores                                 |           |             |         |       |
| Visitor Greeting Checked Items                | .35*      | .26         | .16     | .38*  |
| Catalog Checked Items                         | .37*      | .35*        | .06     | .42*  |
| Shopping Cart                                 | .37*      | .26         | .31*    | .42*  |
| Cash Out                                      | .16       | .06         | .26     | .19   |
| Security                                      | .25       | -.06        | .22     | .16   |
| Coherence & Organization                     | .08       | -.03        | .09     | .05   |
| Consistency & Standardization                 | .18       | .21         | .44*    | .31*  |
| Efficiency                                    | .28*      | .40*        | .15     | .41*  |
| Navigation                                    | .17       | .16         | .10     | .21   |
| Style                                         | .09       | .19         | .14     | .18   |
| Value Added                                   | .17       | .08         | .38*    | .22   |
| Brick & Mortar                                | .26       | .20         | .24     | .31*  |

Total Checked Items Scale                     | .16       | .26         | -.27*   | .18   |

| Ratings Scale                                 | .42*      | .32*        | .40*    | .50*  |
| Total Score                                    | .31*      | .36*        | -.07    | .36*  |

Note. N=100, *p<.05.
For the Low Convenience Web site, only eight of the 48 correlations between the checked items scores and the satisfaction scores were statistically significant, compared to 43 of the 48 correlations between the ratings scores and the satisfaction scores. The correlations between the Visitor Greeting, Catalog, and Coherence & Organization ratings scores and the total satisfaction score were all greater than .50, which indicated a high degree of validity for these ratings with respect to satisfaction. The overall rating score was more strongly correlated with the total satisfaction score (.69) than any other ICES score. As with the High Convenience Web site, the research provided evidence that the ratings scores, and in particular the overall ratings score, were the most valid predictors of Web site satisfaction.

When the data from the High and Low Convenience Web sites were combined, a similar pattern emerged. Thirteen of the 48 correlations between the checked items scales and the satisfaction scores were statistically significant, compared to 43 out of 48 for the ratings scores. Again, the most valid predictor of total satisfaction was the overall ratings score, with a value of .62.

Vinsonhaler and Schefermaier (2002) also used four other predictor variables: (a) minutes needed to locate the product, (b) minutes needed to add product to shopping cart, (c) minutes needed to complete the purchase, and (d) a derived variable designed to assess the overall quality of the Web site, which were computed as ICES total score + [10*(15-minutes needed to complete the purchase)]. Table 13 presented the correlations between the satisfaction scale scores and these four measures, both separately for the High and Low Convenience Web sites and overall.
Table 11

Correlations Between ICES and Satisfaction Scores for the Low Convenience Web Site

<table>
<thead>
<tr>
<th>Checked Items Scales</th>
<th>Use Again</th>
<th>Frustration</th>
<th>General</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor Greeting Checked Items</td>
<td>.03</td>
<td>.10</td>
<td>.03</td>
<td>.07</td>
</tr>
<tr>
<td>Catalog Checked Items</td>
<td>.23</td>
<td>.03</td>
<td>-.01</td>
<td>.12</td>
</tr>
<tr>
<td>Shopping Cart</td>
<td>.20</td>
<td>.14</td>
<td>.16</td>
<td>.20</td>
</tr>
<tr>
<td>Cash Out</td>
<td>.18</td>
<td>.09</td>
<td>.13</td>
<td>.16</td>
</tr>
<tr>
<td>Security</td>
<td>.14</td>
<td>.13</td>
<td>.03</td>
<td>.14</td>
</tr>
<tr>
<td>Coherence &amp; Organization</td>
<td>.38*</td>
<td>.29*</td>
<td>.16</td>
<td>.36*</td>
</tr>
<tr>
<td>Consistency &amp; Standardization</td>
<td>.26</td>
<td>-.04</td>
<td>.15</td>
<td>.14</td>
</tr>
<tr>
<td>Efficiency</td>
<td>.39*</td>
<td>.26</td>
<td>.26</td>
<td>.38*</td>
</tr>
<tr>
<td>Navigation</td>
<td>.28*</td>
<td>-.04</td>
<td>.08</td>
<td>.14</td>
</tr>
<tr>
<td>Style</td>
<td>.27</td>
<td>-.02</td>
<td>.05</td>
<td>.13</td>
</tr>
<tr>
<td>Value Added</td>
<td>.32*</td>
<td>.05</td>
<td>.23</td>
<td>.23</td>
</tr>
<tr>
<td>Brick &amp; Mortar</td>
<td>.33*</td>
<td>.06</td>
<td>.04</td>
<td>.20</td>
</tr>
</tbody>
</table>

| Rating Scores                        |           |             |         |       |
| Visitor Greeting Checked Items       | .46*      | .47*        | .65*    | .60*  |
| Catalog Checked Items                | .47*      | .37*        | .48*    | .51*  |
| Shopping Cart                        | .28       | .42*        | .45*    | .44*  |
| Cash Out                             | .49*      | .33*        | .37*    | .48*  |
| Security                             | .34*      | .36*        | .37*    | .42*  |
| Coherence & Organization             | .47*      | .36*        | .41*    | .50*  |
| Consistency & Standardization        | .39*      | .08         | .31*    | .30*  |
| Efficiency                           | .43*      | .32*        | .38*    | .45*  |
| Navigation                           | .37*      | .24         | .37*    | .38*  |
| Style                                | .46*      | .11         | .41*    | .37*  |
| Value Added                          | .57*      | .22         | .38*    | .47*  |
| Brick & Mortar                       | .47*      | .28*        | .39*    | .46*  |
| Total Checked Items Scale            | .35*      | .12         | .14     | .26   |
| Ratings Scale                        | .67*      | .46*        | .64*    | .69*  |
| Total Score                          | .53*      | .26         | .35*    | .46*  |

Note. N=100, *p<.05.
Table 12

**Correlations Between ICES and Satisfaction Scores for Both Web Sites**

<table>
<thead>
<tr>
<th>Checked Items Scales</th>
<th>Use Again</th>
<th>Frustration</th>
<th>General</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor Greeting Checked Items</td>
<td>.09</td>
<td>.15</td>
<td>-.09</td>
<td>.10</td>
</tr>
<tr>
<td>Catalog Checked Items</td>
<td>.23*</td>
<td>.08</td>
<td>-.08</td>
<td>.14</td>
</tr>
<tr>
<td>Shopping Cart</td>
<td>.26*</td>
<td>.14</td>
<td>.12</td>
<td>.23*</td>
</tr>
<tr>
<td>Cash Out</td>
<td>.09</td>
<td>.05</td>
<td>.04</td>
<td>.08</td>
</tr>
<tr>
<td>Security</td>
<td>.20*</td>
<td>.08</td>
<td>-.04</td>
<td>.13</td>
</tr>
<tr>
<td>Coherence &amp; Organization</td>
<td>.30*</td>
<td>.22*</td>
<td>.02</td>
<td>.27*</td>
</tr>
<tr>
<td>Consistency &amp; Standardization</td>
<td>.16</td>
<td>.11</td>
<td>.04</td>
<td>.15</td>
</tr>
<tr>
<td>Efficiency</td>
<td>.26*</td>
<td>.32*</td>
<td>.09</td>
<td>.32*</td>
</tr>
<tr>
<td>Navigation</td>
<td>.18</td>
<td>.06</td>
<td>-.01</td>
<td>.12</td>
</tr>
<tr>
<td>Style</td>
<td>.08</td>
<td>.09</td>
<td>-.08</td>
<td>.07</td>
</tr>
<tr>
<td>Value Added</td>
<td>.18</td>
<td>.11</td>
<td>.21*</td>
<td>.20*</td>
</tr>
<tr>
<td>Brick &amp; Mortar</td>
<td>.25*</td>
<td>.00</td>
<td>-.01</td>
<td>.13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rating Scores</th>
<th>Use Again</th>
<th>Frustration</th>
<th>General</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor Greeting Checked Items</td>
<td>.41*</td>
<td>.39*</td>
<td>.48*</td>
<td>.52*</td>
</tr>
<tr>
<td>Catalog Checked Items</td>
<td>.41*</td>
<td>.35*</td>
<td>.28*</td>
<td>.45*</td>
</tr>
<tr>
<td>Shopping Cart</td>
<td>.32*</td>
<td>.34*</td>
<td>.38*</td>
<td>.43*</td>
</tr>
<tr>
<td>Cash Out</td>
<td>.33*</td>
<td>.20*</td>
<td>.32*</td>
<td>.34*</td>
</tr>
<tr>
<td>Security</td>
<td>.30*</td>
<td>.17</td>
<td>.31*</td>
<td>.31*</td>
</tr>
<tr>
<td>Coherence &amp; Organization</td>
<td>.28*</td>
<td>.17</td>
<td>.27*</td>
<td>.29*</td>
</tr>
<tr>
<td>Consistency &amp; Standardization</td>
<td>.29*</td>
<td>.14</td>
<td>.36*</td>
<td>.30*</td>
</tr>
<tr>
<td>Efficiency</td>
<td>.36*</td>
<td>.35*</td>
<td>.28*</td>
<td>.43*</td>
</tr>
<tr>
<td>Navigation</td>
<td>.28*</td>
<td>.21*</td>
<td>.27*</td>
<td>.31*</td>
</tr>
<tr>
<td>Style</td>
<td>.28*</td>
<td>.14</td>
<td>.29*</td>
<td>.28*</td>
</tr>
<tr>
<td>Value Added</td>
<td>.38*</td>
<td>.15</td>
<td>.37*</td>
<td>.36*</td>
</tr>
<tr>
<td>Brick &amp; Mortar</td>
<td>.38*</td>
<td>.25*</td>
<td>.33*</td>
<td>.40*</td>
</tr>
<tr>
<td>Total Checked Items Scale</td>
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<td>.17</td>
<td>.01</td>
<td>.23*</td>
</tr>
<tr>
<td>Ratings Scale</td>
<td>.56</td>
<td>.40*</td>
<td>.55*</td>
<td>.62*</td>
</tr>
<tr>
<td>Total Score</td>
<td>.43</td>
<td>.29*</td>
<td>.21*</td>
<td>.42*</td>
</tr>
</tbody>
</table>

Note. N=100, *p<.05.
Table 13

Correlations Between Satisfaction Scores and Minutes to Complete Purchase and the Derived Measure of Vinsonhaler and Scheffelmaier (2002)

<table>
<thead>
<tr>
<th></th>
<th>Use Again</th>
<th>Frustration</th>
<th>General</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Convenience (N=50)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minutes to Locate Product</td>
<td>.07</td>
<td>-.20</td>
<td>.09</td>
<td>-.05</td>
</tr>
<tr>
<td>Minutes to Add to Shopping Cart</td>
<td>-.07</td>
<td>.00</td>
<td>-.06</td>
<td>-.06</td>
</tr>
<tr>
<td>Minutes to Purchase</td>
<td>-.08</td>
<td>-.10</td>
<td>-.03</td>
<td>-.11</td>
</tr>
<tr>
<td>Derived Measure</td>
<td>.31*</td>
<td>.35*</td>
<td>-.06</td>
<td>.36*</td>
</tr>
<tr>
<td><strong>Low Convenience (N=50)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minutes to Locate Product</td>
<td>-.17</td>
<td>-.34*</td>
<td>-.25</td>
<td>-.30*</td>
</tr>
<tr>
<td>Minutes to Add to Shopping Cart</td>
<td>-.12</td>
<td>-.20</td>
<td>-.21</td>
<td>-.20</td>
</tr>
<tr>
<td>Minutes to Purchase</td>
<td>-.23</td>
<td>-.23</td>
<td>-.14</td>
<td>-.25</td>
</tr>
<tr>
<td>Derived Measure</td>
<td>.52*</td>
<td>.30*</td>
<td>.34*</td>
<td>.48*</td>
</tr>
<tr>
<td><strong>Overall (N=100)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minutes to Locate Product</td>
<td>-.09</td>
<td>-.28*</td>
<td>-.16</td>
<td>-.22*</td>
</tr>
<tr>
<td>Minutes to Add to Shopping Cart</td>
<td>-.11</td>
<td>-.13</td>
<td>-.17</td>
<td>-.16</td>
</tr>
<tr>
<td>Minutes to Purchase</td>
<td>-.17</td>
<td>-.18</td>
<td>-.11</td>
<td>-.20*</td>
</tr>
<tr>
<td>Derived Measure</td>
<td>.42*</td>
<td>.30*</td>
<td>.21*</td>
<td>.42*</td>
</tr>
</tbody>
</table>

Note. N=100*p<.05.
For the High Convenience Web site, only the derived measure was correlated with the satisfaction items (except general satisfaction) and the overall satisfaction score. For the Low Convenience Web site, the number of minutes needed to locate the product was negatively correlated with both the level of frustration (recall that level of frustration was coded such that ‘1’ indicated a high degree of frustration and a ‘6’ indicated no frustration) (Scheffelmaier, 2003), and the total satisfaction score. Also, the derived measure was correlated with each of the satisfaction items and the total satisfaction score. When the data from the two Web sites were combined, the number of minutes to locate the product was negatively correlated with the level of frustration item and the total satisfaction score, and the derived measure was again positively correlated with all three satisfaction items and the total satisfaction score. In addition, the number of minutes needed to purchase the product was negatively correlated with the total satisfaction score.

Explanation and Discussion of Results

The psychometric analyses were designed to assess the reliability of the various ICES scores. The checked items scores from the 12 individual Web site categories were determined to be unreliable, regardless of whether the Low Convenience, High Convenience Web sites were considered. The overall checked items score, the ratings score, and the total score from the ICES, however, did demonstrate adequate reliability. There was a trend toward higher reliability for the Low Convenience Web site compared to the High Convenience Web site.

The inferential analyses were designed to assess the extent to which the ICES scores were valid for predicting Web site satisfaction. The checked items scores for the
12 individual Web site categories were not strongly correlated to satisfaction with the Web site, for either the High Convenience Web site or the Low Convenience Web site.

The most valid ICES scale, i.e., the scale that was most strongly correlated with Web site satisfaction, was the overall ratings scale, although several of the individual ratings scores and the total score were moderately related to the satisfaction scores. The overall ratings scale was more highly correlated than all other ICES measures regardless of whether the High Convenience Web site satisfaction or the Low Convenience Web site satisfaction was considered.

The fact that the overall rating scale, which was the sum of the respondents’ ratings of the 12 categories outlined by Scheffelmaier and Vinsonhaler (2002), was more valid in terms of correlations with the satisfaction measures indicated that Web users were not looking for specific components of each of the 12 categories. Therefore, having included many of the components outlined by Scheffelmaier and Vinsonhaler (2002) did not mean that the user would be satisfied with the Web site.

Summary

The two research questions that motivated the study were: (a) are the ICES scores valid for predicting Web site satisfaction in Taiwan, and (b) if so, which ICES scores were most valid. The answer to the first question was yes for several ICES scores (in particular the ratings scores) and no for others (in particular the checked items scores). The answer to the second question was that the ICES overall ratings score appeared to be the most valid for predicting Web site satisfaction in Taiwan. The final chapter of this dissertation provided a summary of the findings, the conclusions, and the implications of this study.
CHAPTER FIVE
FINDINGS, CONCLUSIONS, AND IMPLICATIONS

Introduction

This chapter is divided into five sections. First, a summary of the study is provided to review the research study including the statement of problem, research questions, population, survey instruments, findings, and statistical analysis. Second, the main conclusions from the study are stated. Third, recommendations for further research into the area of assessing the quality of Internet Web sites are given. Fourth, the implications of this study are provided. Implications involved practical suggestions of further considerations. And lastly, a final summary of the dissertation is furnished which encompasses the purpose, findings, and conclusion of the study.

Summary of the Study

The World Wide Web has volatilized in the business arena and has built a new Internet market. A commercial Web site has become a significant marketing tool. In some cases, a Web site has been the primary means through which customers and others interact with business. Web site designs are developed to make sites as easy to utilize as possible. Web pages should be easy to understand; buttons should communicate what would be activated when pushed, and; the sites should perform effortlessly and efficiently. In a society that has expected fast food and fast service; a slowly operating site could discourage users and cause the potential customer to dismiss the site (Janssen & Associates, 2003).

Web site functionality has been judged a crucial competitive advantage for energy corporations today (Wilhite, 2003). In addition to providing marketing and company
background information, dynamic Web sites are vehicles that improve customer satisfaction and increase company profitability. Companies should learn how to devise an effective Web site to ensnare and satisfy the expectations of customers (Scheffelmaier & Vinsonhaler, 2002).

Today is a decisive time for Taiwan. Since entering the WTO, many companies in Taiwan are considering expansion or extradition. Thus, the Taiwan Industrial Marketplace (TIM) plan has considerable importance and has become government’s primary project to encourage e-commerce in Taiwan. The promotion of the TIM project is expected to form the entire development situation of Taiwan’s industrial e-marketplaces, accelerate the link between Taiwan’s industries and universal production and delivery systems, and create lasting cooperation relationship with foreign buyers. As e-marketplaces become the primary entry into Taiwan’s industries, the outlook for Taiwan becoming an international coordinating center can be attained. This may assist Taiwan’s industries to discover a method in this competitive worldwide market and sustain Taiwan’s international competitiveness (FIND, 2002).

Internet marketing strategies should initially concentrate on the market segment with a high degree of e-marketing involvement, for example, students or business professionals with a high degree of education and income level. The next strategy would be to stress the characteristics of fashion and self, as well as family life to best match individual lifestyles. In the meantime, Internet marketing should reinforce customer trust, knowledge, and understanding through dynamic and secure Web sites. Through the satisfying of customer needs, Internet marketing can increase the online shopping rate. By presenting further product information, customer service, and
convenient payment means, Internet marketing can facilitate to the enhancement of online purchase frequency and the amount of money spent (Wu, 2002).

This research study attempted to explore Web site design using twelve major properties and factors developed by Scheffelmaier and Vinsonhaler (2002). The sample size of this research was based on 100 college students, and the population was the Chung Kuo Institute of Technology, in Taiwan. The age of participants was between 18 and 40. The researcher felt that college students have been a significant segment of the online shopper population in Taiwan and, therefore, this sample was appropriate for this study.

The main purpose of the research study was to evaluate the use of the Internet Commerce Evaluation Scale (ICES; Scheffelmaier & Vinsonhaler, 2002) in Taiwan. Previous research with the ICES in the United States had demonstrated that the ICES was a valid measure to aid in understanding what factors were involved in a site user being satisfied with a particular Web site. In light of this, the researcher wanted to conduct this research in Taiwan to ascertain if this was true in this country. In order to address the main purpose of the study, two research questions were posed: (a) Are the scales of the ICES valid for predicting Web site satisfaction in Taiwan and (b) If so, which ICES scores were most valid for that purpose? In order to address these questions, 100 individuals in Taiwan evaluated either a High Convenience or Low Convenience Web site and then completed demographic measures, the ICES, and a Web site satisfaction survey. The population under study was college students in Taiwan.

The main findings of the research study were as follows: First, the reliability coefficients for the 12 checked items categories were very low, while those from the overall ratings scale, the total score, and the sum of all 68 checked items scales were
adequate. This was true for both the High and Low Convenience Web sites, although the coefficients for the Low Convenience Web site were generally higher than those for the High Convenience Web site. Second, the 12 individual ratings and the overall ratings scale were the most valid predictors of Web site satisfaction, while the checked items scales were the least valid. That is, the relationships between which specific components a Web site contains (i.e. the checked items) and satisfaction were not as strong as those between respondents’ overall ratings and satisfaction. This was particularly true for the Low Convenience Web site, where almost all of the ratings scores were significantly correlated with the satisfaction items and the overall satisfaction score.

This study was useful because the research offered the ability to understand the relationship between major properties of effective Web sites and customer satisfaction for the sales Internet model. The results of this research study helped in understanding and analyzing the impact of Web site designs on decision buying and customer satisfaction for online buyers in Taiwan. In addition, the study also recognized what were the most important or more significant characteristics of successful Web sites.

**Conclusions**

The research study resulted in the following conclusions: Certain scales from the ICES were strongly related to satisfaction with the Web sites. Specifically, the respondents’ ratings of the 12 categories outlined by Scheffelmaier and Vinsonhaler (2002) and the sum of these 12 ratings were strongly correlated with the satisfaction items and total satisfaction score. For the High Convenience Web site, particularly, the Visitor Greeting, Catalog, Shopping Cart, Consistency & Standardization, Efficiency, and
Brick & Mortar ratings were all positively correlated with the total satisfaction score. For the Low Convenience Web site, the correlations between the Visitor Greeting, Catalog, and Coherence & Organization ratings scores and the total satisfaction score were all greater than .50, indicating a high degree of validity for these ratings with respect to satisfaction. When the data from the High and Low Convenience Web sites were combined, a similar result appeared.

Therefore, when designing a Web site, these categories should be examined by the designer in order to determine if the Web site is adequate in these areas. However, the fact that the checked items scales were not strongly correlated with Web site satisfaction means that when designing a Web site, the designer does not need to emphasize the 68 individual Web site components outlined by Scheffelmaier and Vinsonhaler. This study provided evidence that, for college students in Taiwan, Web site satisfaction was not strongly related to whether or not these components were present in the Web site. These results may be due to the fact that individuals viewing a given Web site were more concerned with ease of use and functionality than with whether or not particular components were present. That is, how well the Web site works overall was more important than if the site had a given characteristic.

One limitation of the research study was that only two Web sites were examined and were subjectively chosen by the researcher. A more comprehensive examination of a larger number of Web sites would provide a stronger basis for drawing conclusions. There are a wide variety of Web site designs and whether or not these research results apply to other sites is unknown. A second limitation was that the respondents were all college students. Examinations of other respondent groups may produce different
results. A third limitation was that there were only three items in the satisfaction survey. A more comprehensive examination of Web site satisfaction may have been beneficial. A fourth limitation was that both of the Web sites examined focused only on the traditional sales marketing model (i.e. catalog, shopping cart), whereas there are a number of other types of Web sites that do not offer any products for sale. New business models such as Web services, affiliate marketing, and others are beginning to be successful in procuring sales. The expectations of Web users for e-commerce sites may differ from those of individuals merely looking for information, and the findings of this study may not generalize to other types of Web sites.

**Recommendations for Further Research**

There are several recommendations for further research that would extend the results of this study. First, the research results should be extended to other respondent groups. Specifically, the respondents in this research study were all college students. The results of this study may generalize to other types of Web users in Taiwan, but the results may not. In other words, using a population other than college students, such as, participants over the age of 40 or below 18, may have different results.

Therefore, examining the responses of other types of Web users would be helpful. Second, one of the key findings of this research study was that the checked items scales were not strongly related to Web site satisfaction. This finding may be due to the fact that Web site users do not look for specific components when evaluating a Web site, or that the 68 items compiled by Scheffelmaier and Vinsonhaler (2002) do not tap into the key components that users are seeking. Therefore, a re-examination of the components of Web sites may offer additional components that would be more
strongly related to Web site satisfaction. Meanwhile, qualitative approach might possibly be conducted when the variables of this study were different.

In addition, because this study focused on only two Web sites and one product on the Internet, testing more Web sites using different products could be valuable. Therefore, the ICES instrument should be re-examined in light of changes in the e-commerce environment.

Finally, there may also be an interest in examining the utility of the ICES in other countries. The study by Scheffelmaier and Vinsonhaler (2002) used respondents in the United States, and this research study used respondents from Taiwan, but other countries should be examined in subsequent research. For demographics, the national cultural diversities and purchasing habits may be the more crucial considerations influencing online shopping. Therefore, the development of this research can be conducted the evaluation tool (ICES) in different countries whether or not generating the same results (Shiu & Dawson, 2002).

Implications

The primary implication of the research results is that Web designers should attend to the 12 categories outlined by Scheffelmaier and Vinsonhaler (2002), but in a broad sense. That is, respondents’ satisfaction with the Web sites was related to the ratings of the 12 categories, but not to the individual components contained within the 12 categories. As noted previously, the overall functionality of the Web site appeared to be more important than the presence of specific characteristics.
Final Summary

The purpose of this study was to determine the properties of effective Web sites in Taiwan as identified by online shoppers. This study was based on the ICES instrument (Internet Commerce Evaluation Scale), which was developed by the Scheffelmaier and Vinsonhaler (2002), to measure Web sites effectiveness in the United States. The researcher felt this would be a good test to use in Taiwan because of the powerful effectiveness of this instrument. The objectives of this study were to determine the characteristics of effective Web sites from the standpoint of Taiwanese online shoppers; explore how certain Web site characteristics impact Web site effectiveness; provide research results to help businesses understand what kind of Web site design was the most effective in online shopping in Taiwan; and, understand the relationship between customer satisfaction and Web site design in Taiwan.

This was an observational study and looked for correlations between all of the ICES scores and (a) the three individual items composing the Satisfaction Scale and (b) the sum of items composing the Satisfaction Score (the score that indicates overall satisfaction with the Web site). This study contains eighteen variables, including fourteen independent variables, which were the scores from the ICES, and four dependent variables. The data analysis of this research study focused on an examination of 12 subscales of the ICES in addition to main scales in all analyses, a modified reliability analysis, and an examination of the Satisfaction Scale items.

The purpose of this research study was to examine the use of the ICES in Taiwan. Both psychometric and validity information was examined. Ratings were collected from 100 college students who examined a High Convenienc
Web site. The results from the Low and High Convenience Web sites were fairly similar with a couple of exceptions. Specifically, both the reliability and validity of the ICES were higher when used to examine the Low Convenience Web site.

The findings of this study could facilitate online businesses to develop strategies for Internet marketing, to attract customers and potential consumers to repeatedly visit the commercial Web site in the digital economy in Taiwan. Therefore, this study could make a noteworthy contribution to Taiwanese businesses, Web designers, and online market researchers.

Demographic information from the respondents revealed that mean age of the sample was 25.21 years, and the participants had been using the Internet for an average of 5.9 years. There were approximately equal numbers of males (52%) and females (48%) in the sample. Only a small percentage of the sample had operated an e-commerce business (11%) or knew computer programming (16%). A somewhat larger percentage (38%) had designed a Web site. Exactly half of the sample had made an online purchase.

In terms of the proportion of respondents endorsing each of the 68 items from the ICES, twelve independent samples t-tests were conducted to determine if the mean number of items checked within each category differed between the High and Low Convenience Web sites. Four of these twelve tests were statistically significant: Shopping Cart items, Coherence & Organization items, Consistency items, and the Style items.

An analysis of the means and standard deviations for the ICES scores and satisfaction scale scores revealed that only three of these t-tests were statistically
significant: The ratings of the Coherence & Organization scale, the sum of the 68 checked items, and the total score from the ICES. Meanwhile, the distribution of scores for the ICES checked items score, the ICES ratings score, the ICES total score, and the overall satisfaction score appeared approximately normal.

The reliability coefficients for the 12 checked items scales were low when data from the High Convenience and Low Convenience Web sites were combined. The situation did not improve even if the High and Low Convenience Web sites were considered separately. In addition, the reliability coefficients of overall checked items scale, the ratings scores, the total scores, were all higher than .77. In the case of these three scores, the reliability was always higher for the Low Convenience Web site than for the High Convenience Web site.

For the High Convenience Web site, the checked items scores were not particularly valid for predicting satisfaction, while the ratings scores and the satisfaction scores were statistically significant with a higher degree of validity, especially, the Visitor Greeting, Catalog, Shopping Cart, Consistency & Standardization, Efficiency, and Brick & Mortar ratings. In general, several of the ratings scores, and in particular, the overall ratings score, were the most valid predictors of satisfaction for the High Convenience Web site.

For the Low Convenience Web site, only eight correlations between the checked items scores and the satisfaction scores were statistically significant, compared to 43 correlations between the ratings scores and the satisfaction scores. The correlations between the Visitor Greeting, Catalog, and Coherence & Organization ratings scores and the total satisfaction score indicated a high degree of validity for these ratings with
respect to satisfaction. The overall rating score was more strongly correlated with the total satisfaction score than any other ICES score. As with the High Convenience Web site, the ratings scores, and in particular, the overall ratings score, were the most valid predictors of Web site satisfaction.

Furthermore, when the data from the High and Low Convenience Web sites were combined, the most valid predictor of total satisfaction was the overall ratings score. This finding held true for both Low and High Convenience Web sites.

In summary, the main finding of this research study was that the ratings scores (in particular the total rating score) were more valid than the checked items scores in terms of predicting Web site satisfaction. The breakdown of a Web site into the site components does not contribute to understanding what makes a user more or less satisfied with the site. However, the users' ratings of each of the 12 ICES areas do aid in understanding the satisfaction consumers feel when using the site. Therefore, the most valuable aspect of the ICES appears to be the breakdown of a Web site into the 12 areas, not the breakdown of the 12 areas into specific components.

Further research examining additional Web sites, additional samples within Taiwan, and samples within additional countries would help to determine the extent to which these study results may be generalized.
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BIBLIOGRAPHY


APPENDICES
Institutional Review Board Approval
April 22, 2004

Yue-Jer Lin

Re: 2004-012

Dear Mr. Jer Lin:

Thank you for submitting the documentations of certified translations of the consent form and the questionnaires in Chinese; and the permission letter from Professor John Vinsonhaler.

The Institutional Review Board has given final approval of your proposal.

Best of luck in conducting your research!

Sincerely,

[Redacted]

Farideh Farazmand, Ph.D.
Institutional Review Board, Chair

Cc: Dissertation Chair, Dr. Francis
APPENDIX B

Informed Consent
# Informed Consent

A Study into Effective Web Sites Properties as Defined by the Internet Commerce Evaluation Scale in Taiwan

After reading and understanding each row, please your initials in the last column.

<table>
<thead>
<tr>
<th><strong>Purpose</strong></th>
<th>The purpose of this portion of the study is to have you view a Web site and complete several questionnaires.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Procedures</strong></td>
<td>The testing will be in a computer lab in the college. The computer test will take approximately 50 minutes.</td>
</tr>
<tr>
<td><strong>Research Findings</strong></td>
<td>A copy of the results will be available after 2004 at Lynn University, Boca Raton, FL.</td>
</tr>
<tr>
<td><strong>Risks</strong></td>
<td>No predicted risks have been noted.</td>
</tr>
<tr>
<td><strong>Explanation to Questions</strong></td>
<td>The researcher will give you a test booklet and read the instructions as you read along. However, if your computer malfunctions, please raise your hand and the problem will be rectified.</td>
</tr>
<tr>
<td><strong>Compensation</strong></td>
<td>No compensation will be given for participating in this study. This includes monetary or grade compensation.</td>
</tr>
<tr>
<td><strong>Voluntary Participation</strong></td>
<td>Your participation in this study is voluntary; refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled.</td>
</tr>
<tr>
<td><strong>Concerns</strong></td>
<td>If you have any questions about the research test, please feel free to contact Yue-Jer Lin at [redacted] or [redacted].</td>
</tr>
</tbody>
</table>

I understand that the research study has been explained to the participant by the researcher and the individual understands the nature and purpose of the study, any questions that have been raised have been answered by the researcher.

---

**Yue-Jer Lin, Researcher**

By signing below, you agree to participate.

Signature: ______________________________

Print Your Name: ______________________________

Date: ______________________________

---

APPENDIX C

Permission to Use the ICES in Dissertation
Dear Professor Francis

You have my complete permission to use the ICES for your research studies in perpetuity. Good luck with your research.

John F. Vinsonhaler
Professor
APPENDIX D

Data Collection Booklet
Introduction

Thank you for participating in this study. Your participation is voluntary and if you do not want to participate, you are free to leave at this time. If you participate, your name will not appear in this study. You have been randomly assigned a Participant Identification Number that is located at the top of this page. This is a tracking number for statistical purposes only and is not connected to your true identity in any form.

Before continuing with this study, you are asked to complete an Informed Consent required by the University, which details your rights during and after the testing process.

Demographic Questionnaire

Place your Participation ID (serial) Number in the space provided above. Your personal identity will not be recorded. For each of the following questions, please CIRCLE the one answer that most closely matches your characteristics.

1. Have you operated an e-commerce business? Yes No
2. Have you designed a Web site? Yes No
3. Do you know computer programming? Yes No
4. Gender: Male Female
5. What is your age? ___________________________
6. How long have you used the Internet? _______________________
7. Have you made an online purchase? Yes No
8. What products have you purchased? ____________________
9. If you have not made a purchase online, why not? __________________
10. If you shop online, CIRCLE the type of shopper that applies to your online buying habits. (You can circle more than one)
   a. Recreational: The shopper that shops for pleasure.
   b. Experimental: The shopper who likes to touch and feel the product before making the purchase.
   c. Convenience: The shopper who has little time to expend and makes the purchase based on time saved.
   d. Economic: The shopper who wants the best deal for their money.

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Instructions for Evaluating the Web Site

In this study you will be asked to visit a Web site, find a product and attempt to purchase it online. The next page gives you a Web site address, product to be purchased on the Web site, and fictitious credit card information.

You will do the following:

1. Log onto the provided Web site address.
2. Locate the product as quickly as possible and record the time.
3. Add the product to the shopping cart as quickly as possible and record the time.
4. Input information required to make the purchase and record the time when credit card is refused.
5. Do not rush as fast as you can, but assume your time is valuable and you do not want to waste it.

Internet Commerce Site Evaluation Study (ICES)

Project Instructions and Form for Evaluating a Web Site

(Please read these instructions along with the researcher and use them when you are attempting the purchase)

1. Start Windows Explorer

2. In the URL box at the top of the page type:

3. Find the Product:

   When you have located the product, record the time: ____________

4. Add the product to the Shopping Cart and record the time: ____________

5. Buy the product with the following information:

   Name: 
   Address: 
   City: 
   State: 
   Zip: 
   E-mail address:
   Telephone: 
   Credit Card Type:
   Credit Card Name:
   Credit Card Number:
   Expiration Date:

6. When you get the error message about an invalid credit card number,

   record the time: ________

---

Site Review Protocol (Total Satisfaction)

Please answer the following 3 questions. This is not timed.

**Question 1:** I would or would not use this site again

Please CIRCLE the number 1 through 6 that best indicates your future use of the site to make a similar purchase.

1 (would never use this site again to make a similar purchase)
2
3
4
5
6 (would always use the site to make a similar purchase)

**Question 2:** My level of frustration while using this site

Please CIRCLE the number 1 through 6 that best describes your frustration level.

1 (Very frustrated) 2 3 4 5 6 (Not frustrated as all)

**Question 3:** General evaluation of the site

Please CIRCLE the number 1 through 4 that best describes your feeling about this site.

1. Poor (I feel the site is poor and I would not return to make a similar purchase)
2. Mediocre
3. Good
4. Excellent (I feel the site is excellent and I would return to make a similar purchase)

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APPENDIX E

Internet Commerce Evaluation Scale (ICES) Version 2.0
Participant ID: ________

Introduction

The ICES is NOT concerned with the product you were attempting to purchase, but IS concerned with the functionality of the Web site.

Instructions

1. The ICES is a set of 12 questionnaires for evaluating Web Sites. Each questionnaire occupies one page. Some Questionnaires evaluate “Pages” or Screens on the site. Others evaluate the entire site. Complete each questionnaire on the following pages. You should review the site before, or as, you complete the questionnaire.

2. Each questionnaire is divided into the following two sections: (a) a Checklist of features of the Web site and (b) Web site/page rating scale.
   a. The Checklist section allows you to check the features you see on a specific page or on the entire Web site. You may check more than one feature.
   b. The Rating section for a page, or the entire Web site, requires selecting and circling one of the following numbers that best describes the page or site: 1 (Poor), 2 (Mediocre), 3 (Good), and 4 (Excellent).

3. After completing all the questionnaires, please return the ICES Booklet to the researcher.

4. Before you begin, write your participant ID (serial) number on each page of the ICES in the blank space at the top of the page.

5. Write the URL for the site, which you have been assigned in the blank space below.

   URL for the site: ________________________________

---

Visitor Greeting Page (The first screen you see when the site loads)¹³

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

____ Describe the site or its content (e.g., describes the specific purpose of the Web site, such as selling tools, sports equipment, etc. or information about tools, sports equipment, etc.).

____ Has a navigation bar (e.g., shows the buyer the different pages within the site and where the buyer can go).

____ Has contrasting colors (e.g., uses light background w/dark letters or dark background w/light letters).

____ Eliminates scroll down option (e.g., has all the information on the screen and the buyer is not required to use a scroll left/right or down to see everything on the page).

____ Has Intranet links (e.g., provides links to take the buyer to other pages within the Web site and does not take the buyer to a different Web site).

____ Uses subject tabs (e.g., uses subject tabs, such as the book tab at the top of the content information on the Amazon.com Web site to take the buyer to specific books).

____ Has a shopping cart icon (e.g., has an image of a shopping cart, shopping bag, or some similar pictorial icon).

____ Provides human contact (e.g., has a telephone and/or street address for human contact)

____ Has an Intranet Search engine (e.g., has a search engine that searches for products only within the Web site and not other Web sites).

Please rate the Visitor Greeting Page by circling one number below that best applies.

1. Poor  (I would not return to make another purchase)
2. Mediocre  (I might return to make another purchase)
3. Good  (I would return to make another purchase)
4. Excellent  (I definitely would return to make another purchase)

Catalog Page (The screen(s) which display and describe products)¹⁴

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

- Provides thumbnail photos (e.g., is a small photo that can be enlarged by clicking on the photo).
- Provides a product description (e.g., has text next to the photo of the product describing the product).
- Provides the product price (e.g., provides the product price near the text or photo).
- No unnecessary graphics (e.g., eliminates pictures or animation that are unrelated to the product).
- Provides shopping cart access (e.g., has an image of a shopping cart, shopping bag, or some similar pictorial icon).
- Provides links to related products (e.g., if you have selected shirts, the page shows ties, pants, etc.)

Please rate the Catalog Page by circling one number below that best applies.

1. Poor (I would not return to make another purchase)
2. Mediocre (I might return to make another purchase)
3. Good (I would return to make another purchase)
4. Excellent (I definitely would return to make another purchase)

Participant ID: __________

**Shopping Cart Page** (Screen on which you order products)

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

- Displays a return policy (e.g., provides a link to the return policy page that provides information and policies as to how to return an unwanted product).
- Provides shipping and handling charges (e.g., adds and displays shipping charges to each product when that product is “added” to the shopping cart).
- Allows the buyer to return to the catalog page (e.g., provides a return to catalog link, and does not require the buyer search for the catalog page).
- Provides an express cash out (e.g., computes total product price, shipping, and tax (if applicable) automatically).

Please rate the **Shopping Cart Page** by circling one number below that best applies.

1. Poor (I would not return to make another purchase)
2. Mediocre (I might return to make another purchase)
3. Good (I would return to make another purchase)
4. Excellent (I definitely would return to make another purchase)

---

Cash Out Page (Screen(s) on which you pay for the product you wish to purchase)\textsuperscript{16}

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

- Has one time credit card registration (e.g., does not require the buyer to duplicate the credit card information each time the buyer makes a purchase, similar to Amazon.com).

- Has one time shipping address (e.g., does not require the buyer to duplicate the shipping information each time the buyer makes a purchase, similar to Amazon.com).

- Provides human contact (e.g., has a telephone and/or street address for help).

- Provides a link to the shipping carrier (e.g., provides a direct link to the shipping carrier, such as Fed-Ex, UPS, Postal Service, etc.).

- Provides E-mail verification of shipment (e.g., sends an e-mail to the buyer when the product is shipped).

- Provides one time account creation (e.g., remembers the buyer’s account information for future purchases).

- Provides delivery information (e.g., gives the buyer an estimated time of arrival for the product).

Please rate the Cash Out Page by circling one number below that best applies.

\begin{itemize}
\item 1. Poor (I would not return to make another purchase)
\item 2. Mediocre (I might return to make another purchase)
\item 3. Good (I would return to make another purchase)
\item 4. Excellent (I definitely would return to make another purchase)
\end{itemize}

Security (Describes security of the customer’s information on the Web site)  

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

___ Provides transaction security information (e.g., provides the buyer with information as to how the buyer’s information is secured and how it will be used in the future, such as mailing lists, sold to other companies, etc.)

___ Provides payment options (e.g., provides the buyer with payment options, such as MC/Visa, PayPal, Check, etc.).

___ Provides electronic signature option (e.g., gives the buyer the option to electronically sign the purchase order).

Please rate the Security by circling one number below that best applies.

1. Poor (I would not return to make another purchase)
2. Mediocre (I might return to make another purchase)
3. Good (I would return to make another purchase)
4. Excellent (I definitely would return to make another purchase)

Coherence & Organization (How well the site is structured and organized)\(^\text{18}\)

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

- Does each page serve a single purpose (e.g., do all products on the page belong together, such as all books or all tools; or are the products mixed together).
- Lists the important information first (e.g., logo in the upper left corner, navigation bar on the left, content in the middle, etc.).
- Has a hierarchical menu (e.g., does the menu take the buyer to a product category and not to a specific product, such as Amazon.com).
- Provides easy access to the product (e.g., are key words shown to allow the buyer to easily locate the product, such as tools or books, or is the buyer required to hunt for the product).
- Uses common language (e.g., has language any buyer can understand without using technical terms that are industry specific).

Please rate the Coherence & Organization Page by circling one number below that best applies.

1. Poor (I would not return to make another purchase)
2. Mediocre (I might return to make another purchase)
3. Good (I would return to make another purchase)
4. Excellent (I definitely would return to make another purchase)

---

Consistency & Standardization (Layout is similar on all pages/screens)\textsuperscript{19}

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

- Has a simple uncluttered page design (e.g., there is lots of space between items and text is not jammed together).
- Do all the applications look the same (e.g., do all buttons, layout, such as the menu bar is located at the top or left side of each page in the site).
- Has the same shopping cart icon (e.g., has the same shopping cart icon, such as an image of a shopping cart or shopping bag, located in the same place on each page).
- Has partnership icons (e.g., has partnership icons, UPS, Fed-Ex, USPS, etc., located in the same place on each page).
- Has consistent information (e.g., places the e-mail address, company logo and headings, physical mail address located in the same place on each page).
- Has consistent format (e.g., places the content information, menu, & navigation bar are present in the same location on each page)
- No scroll down option (e.g., has all the information on the screen and does not require the buyer to scroll down or to the side).

Please rate the Consistency & Standardization by circling one number below that best applies.

1. Poor (I would not return to make another purchase)
2. Mediocre (I might return to make another purchase)
3. Good (I would return to make another purchase)
4. Excellent (I definitely would return to make another purchase)

Efficiency (You can move quickly from page/screen to page/screen on the site)

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

___ Provides quick download time (e.g., provides download time usually less than 15 seconds per page on the site).

___ Has a descriptive URL address (e.g., has a short URL address that describes the product, such as www.dell.com or www.sears.com).

___ No unnecessary graphics (e.g., eliminates pictures or animation that are unrelated to the product).

___ No orphan or dead-end pages (e.g., eliminates pages that do not lead to another page forcing the buyer to return to the Home page).

___ Requires few clicks to locate the product (e.g., 3-4 clicks to locate the desired product).

Please rate the Efficiency by circling one number below that best applies.

1. Poor (I would not return to make another purchase)
2. Mediocre (I might return to make another purchase)
3. Good (I would return to make another purchase)
4. Excellent (I definitely would return to make another purchase)

Participant ID: ______

**Navigation** (Easy to find pages/screens that you want for information or products)\(^{21}\)

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

____  Provides buttons (e.g., uses button or links to other pages in the site).

____  No orphan or dead-end pages (e.g., eliminates pages that do not lead to another page, forcing the buyer to return to the Home page).

____  Has a Site Map (e.g., has a directory that will lead the buyer to another page or section in the site).

____  Has an Intranet Search engine (e.g., has a search engine that searches for products only within the Web site and not on other Web sites).

____  Has a Help Menu (e.g., has a menu or tool bar to assist the buyer complete a task).

Please rate the **Navigation** by circling one number below that best applies.

1. Poor  (I would not return to make another purchase)
2. Mediocre  (I might return to make another purchase)
3. Good  (I would return to make another purchase)
4. Excellent  (I definitely would return to make another purchase)

Style (How well you can read information on the pages in the site)\textsuperscript{22}

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

- Has easy to read font (e.g., uses either "Ariel" or "Serif – Times New Roman" font style).
- Uses 12 – 14 font size (e.g., uses "Web Design" = 12 font or "Web Design" = 14 font).
- Use of bold and italic text (e.g., does not use \textbf{bold} or \textit{italic} font in the description of the product).
- Has all text aligned left (e.g., has all the text aligned left and not aligned centered or aligned right).
- Uses 40 - 60 characters per line (e.g., uses a maximum of 40 – 60 characters per line thus not requiring a left/right scroll bar).
- No unnecessary graphics (e.g., eliminates unnecessary pictures or animation that are unrelated to the product).
- Provides discriminate links (e.g., provides links that change color indicating the buyer has already visited that link, such as blue before the click and purple after the click).

Please rate the Style by circling one number below that best applies.

1. Poor (I would not return to make another purchase)
2. Mediocre (I might return to make another purchase)
3. Good (I would return to make another purchase)
4. Excellent (I definitely would return to make another purchase)

Participant ID: _______

**Value Added** (Special, unexpected positive features of the site)\(^{23}\)

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

- Delivers an unexpected experience (e.g., sports score, music, etc.)
- Creates a positive sensory experience (e.g., seeing an apple pie brings back a memory of the smell of a freshly cooked apple pie).
- Provides an attractive product display (e.g., provides ample space between products so that the buyer is not confused about which product the buyer is purchasing).

Please rate the **Value Added** by circling one number below that best applies.

1. Poor (I would not return to make another purchase)
2. Mediocre (I might return to make another purchase)
3. Good (I would return to make another purchase)
4. Excellent (I definitely would return to make another purchase)

---

Brick and Mortar
(Site features which are dependent on the company which pays for the site)

Check the Standard Phrase(s) below that you have viewed in the Web page (you may check more than one Standard Phrase).

- Provides good customer service (e.g., has a personal greeting, e-mail notification of sales or specials, follow-up contact after the sale).
- Provides back office assistance (e.g., has a method to contact shipping, accounting, etc. personal to assist the buyer in solving a problem with the order).
- Provides a physical address (e.g., provides a real snail mail address, such as Lynn University, 3601 Military Trail, Boca Raton, FL 33431).
- Provides telephone numbers (e.g., provides a real telephone number, such as a 1-800 number and not just an e-mail address)
- Provides current site information (e.g., provides a date when last modified).
- Provides quality products (e.g., provides competitive products that are similar in quality to physical retail stores, such as brand name).
- Provides competitive pricing (e.g., provides competitive pricing that is similar in quality to physical retail stores).

Please rate the Brick & Mortar by circling one number below that best applies.

1. Poor (I would not return to make another purchase)
2. Mediocre (I might return to make another purchase)
3. Good (I would return to make another purchase)
4. Excellent (I definitely would return to make another purchase)

Did you have time to review the site before, or during, completion of the ICES questionnaires?

- Yes
- No

APPENDIX F

Affidavit – Certification of Chinese Translation of
Informed Consent
Data Collection Booklet
Internet Commerce Evaluation Scale (ICES)
AFFIDAVIT

I, LIU, Yu-chen, being duly sworn, depose and say that I am thoroughly conversant with the English and Chinese languages, that I have prepared and read the attached translation and compared same with the original document in the English language, and that to the best of my knowledge and belief, the said translation is a true and correct version of the original.

[Signature]

 Translator

 Office

 TAAT Membership No. 20

 In witness whereof I have signed this affidavit with my own hand and affixed my official seal on April 16, 2004

 Patrick Lee, Chairman
 Board of Directors
 Translation and Authentication Association of Taipei

 FOR THE CONTENT(S) OF THE DOCUMENT I ASSUME NO RESPONSIBILITY.
APPENDIX G

Informed Consent
Data Collection Booklet
Internet Commerce Evaluation Scale (ICES)
(Chinese Version)
第一部分
(Part One)

資料彙集冊
(Data Collection Booklet)
說明
(Introduction)

謝謝您參與此研究調查，您的參加純屬自願，如不想參與，可自行離開。參與此項調查，您的姓名將不會被記錄。每位參與者已經被隨機分發一個參與者編號，位於封面的上緣部分，此編號僅供統計分析使用，將不會與您個人有任何關連。

研究調查開始之前，請您先填寫同意函，此同意函詳述您在研究調查過程中及之後的權利。
同意函
(Informed Consent)
電子商務特性評量準則對於台灣高效率網站之研究
請詳讀及解每一項敘述後，於最右欄位簽字。

<table>
<thead>
<tr>
<th>項目</th>
<th>具體內容</th>
</tr>
</thead>
<tbody>
<tr>
<td>目的</td>
<td>此研究目的為瀏覽一指定網站後，完成問卷之填寫。</td>
</tr>
<tr>
<td>程序</td>
<td>此研究調查於學校電腦室進行，將持續大約50分鐘。</td>
</tr>
<tr>
<td>研究發現</td>
<td>研究結果將於2004年後提供於美國佛羅里達州林恩大學。</td>
</tr>
<tr>
<td>風險</td>
<td>無明顯可預期之風險。</td>
</tr>
<tr>
<td>問題解說</td>
<td>問卷研究者將發給您一份問卷冊，並與您同時閱讀說明指南。若您的電腦故障，請舉手求助。</td>
</tr>
<tr>
<td>報酬</td>
<td>此研究將不提供任何報酬，包括獎金或成績的補償。</td>
</tr>
<tr>
<td>參與意願</td>
<td>您的參與純屬自願，若拒絕參與測驗，將無任何罰責或權益上的損失。</td>
</tr>
<tr>
<td>利害關係</td>
<td>對於此研究調查有任何疑問，請與研究者林裕哲連絡。</td>
</tr>
</tbody>
</table>

本人了解研究者已詳細說明此項研究調查，並明瞭此研究的性質與目的，研究者並已答覆所有參與者提出的問題。

研究者        林裕哲

若同意參與此研究調查，請於下列簽名

簽名：

姓名(請以正楷書寫)：

日期：
參與者編號：

參與者統計資料問卷
(Demographic Questionnaire)

請於右上角填寫參與者編號，您個人身分資料將不會被記錄，就以下 1~10 題，請圈選一個最接近之答案或回答其問題(第 10 為複選題)

1. 您是否曾經營過電子商務事業？ 是 否
2. 您是否曾設計過網站？ 是 否
3. 您是否會電腦程式設計？ 是 否
4. 性別？ 男性 女性
5. 您的年齡為？ _____________________________
6. 您使用網際網路有多久時間？ _____________________________
7. 您是否曾上網購物？ 是 否
8. 如果您曾上網購物，請問購買什麼商品？ _____________________________
9. 如果您從未上網購物，為什麼不？ _____________________________

10. 如果您上網購物，請圈選您是屬於哪一類型的消費者。(可複選)
    a. 娛樂/消遣型：購物者上網購物只為娛樂消遣。
    b. 嘗試/試探型：購物者在購買前喜歡接觸和探究商品。
    c. 便利/方便型：購物者沒有太多時間消費購物，以省時為原則。
    d. 節省/經濟型：購物者欲在金錢上獲得到最好的交易。
網站評量指示說明
(Instructions for Evaluating the Web Site)
在此研究調查中，您將被要求瀏覽一個指定的網站，找到一個指定的商品，然後進行購買。本頁下半部將提供您網址、商品以及虛構的信用卡資料。

請按照下列指示:
1. 登錄指定的網址。
2. 以最快速度找到指定商品，並且記錄所需要的时间。
3. 以最快速度將商品加入購物車中，並且記錄所需要的时间。
4. 輸入必要資料來進行購買，並記錄信用卡被拒絕所需要的时间。
5. 過程不必太過倉促，但是請假設您花的時間是值得的而且您不想浪費。

電子商用網站評量研究 (ICES)
網站評量之計畫說明與表格
(Project Instructions and Form for Evaluating a Web Site)

1. 啟動瀏覽器 (Internet Explore)
2. 於全球資源定位器 (URL) 欄位中輸入網址:
3. 找尋商品:
   當您找到此商品時，記錄所需要的时间：______________
4. 將商品加入購物車中，並且記錄期間所需要的時間：______________
5. 購買商品時輸入以下資料:
   姓名： 電話：
   地址： 信用卡種類：
   城市： 信用卡姓名：
   州名： 信用卡號碼：
   郵遞區號： 信用卡到期日：
   電子郵件信箱：
6. 當您收到有關無效信用卡號碼被拒絕的錯誤訊息通知時，
   記錄期間所需要的時間：______________
參與者編號：

### 網站滿意度調查表

Site Review Protocol (Total Satisfaction)

請回答下列三項問題，不限時間。

<table>
<thead>
<tr>
<th>問題 1：我會或不會再次重返使用此網站？</th>
</tr>
</thead>
<tbody>
<tr>
<td>請以圈選數字 1~6 來表示您將來重返此網站購買的意願。</td>
</tr>
<tr>
<td>1 我絕對不會再重返此網站進行類似購買。</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6 我會一直到此網站進行類似購買。</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>問題 2：我對使用此網站購物時的失望感程度</th>
</tr>
</thead>
<tbody>
<tr>
<td>請以圈選數字 1~6 來表示您的挫敗感程度。</td>
</tr>
<tr>
<td>1 (非常挫折)  2  3  4  5  6 (完全沒有挫敗感)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>問題 3：對此網站的整體評價</th>
</tr>
</thead>
<tbody>
<tr>
<td>請以圈選數字 1~4 來表示您對此網站的整體感覺。</td>
</tr>
<tr>
<td>1. 不滿意 (我感覺此網站很差，並且不會再重返去進行類似購買)</td>
</tr>
<tr>
<td>2. 尚可</td>
</tr>
<tr>
<td>3. 滿意</td>
</tr>
<tr>
<td>4. 非常滿意 (我感覺此網站非常完美，絕對會重返去進行類似購買)</td>
</tr>
</tbody>
</table>
第二部分

(Part Two)

電子商務評量基準表 2.0 版本

Internet Commerce Evaluation Scale (ICES) Version 2.0
問卷介紹
(Introduction)
本電子商務評量準則 (ICES) 著重於網站的功能，而不是在網上購買的商品。

說明
(Instructions)
1. 電子商務評量準則(ICES)是一套包含 12 份問卷的評量網站調查表，每份各佔
   一頁，有些是評量網站的網頁或其螢幕，有些則是評量整個網站。為確實完成
   每份問卷調查表，您應該在填寫前或完成問卷時再次瀏覽該網站。
2. 每份問卷調查表分成兩部分：(A)網站特性的核對清單 (B)整體網頁/網站的評
   量等級標準。
   a. 核對清單的部分：您可以檢查您瀏覽過之特定網頁或整個網站，以便確認
      其特性，可複選。
   b. 網頁/整體網站的評量等級：圈選一項最佳描述來評量。
      1 (不滿意), 2 (尚可), 3 (滿意), 4 (非常滿意)
3. 完成後請繳回整份問卷調查表。
4. 請於問卷開始前，將您分發到的參與者編號填寫於每頁上方空白處。
5. 請於下方空白處填寫被指定的網址。
   網址：__________________________________________
歡迎首頁 (Visitor Greeting Page) (網站出現的第一個問候造訪者畫面)
在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

_____ 網站及其主要內容的描述 (描述明確的主題，讓購物者很快明瞭此網站主要功能和目的。例如，販賣運動器材或提供運動資訊)。

_____ 導覽列 (例如，提供網站內不同網頁間良好的導覽流程，且讓購物者明確了解尚有何處可以瀏覽，並可以很順暢的找尋到欲查閱的資訊)。

_____ 鮮明對比的顏色配置 (例如，文字與背景顏色對比，明顯突顯文字效果)。

_____ 避免捲軸的使用 (例如，所有資訊均呈現在同一螢幕，購物者不需使用滑鼠上下左右捲動，即能看到所有的資訊或事物)。

_____ 網頁內部連結 (例如，提供導引購物者在同網站內網頁間的連結，但不引導購物者至其他不同的網站)。

_____ 使用主題標籤 (例如，顯示在網頁上方的分類商品標籤，引導購物者找尋到特定類別的商品)。

_____ 購物車選項圖像 (例如，具有購物車、購物袋、或者某種類似的圖片的圖像)。

_____ 提供客服人員聯絡資訊 (例如，聯絡電話或地址)。

_____ 內部搜尋引擎 (例如，提供僅限網站內搜索欲找尋商品的搜尋引擎)。

請圈選最合適的一項描述來評分歡迎首頁

1. 不滿意 (我不會重返此網站再次消費購物)
2. 尚可 (我可能會重返此網站並再次消費購物)
3. 滿意 (我會重返此網站並再次消費購物)
4. 非常滿意 (我絕對會重返此網站並再次消費購物)
商品目錄網頁 (Catalog Page) (呈現及描述產品的畫面)

在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

______ 提供商品的縮小照片 (例如，提供可點選放大的小照片)。

______ 提供商品的描述與說明 (例如，在照片旁提供敘述此商品的的文字)。

______ 提供商品的價格 (例如，於商品照片或文字說明旁標示價格)。

______ 避免不必要的圖像 (刪除與商品無關的圖片與卡通圖案)。

______ 提供購物車的使用途徑 (例如，具有購物車、購物袋、或者某種類似圖片的圖像)。

______ 提供相關商品的連結 (例如，如果您選擇襯衫的項目時，網頁會出現如領帶，長褲等)。

請圈選最合適的一項描述來評分商品目錄網頁

1. 不 滿 意 （我不會重返此網站再次消費購物）
2. 尚 可 （我可能會重返此網站並再次消費購物）
3. 滿 意 （我會重返此網站並再次消費購物）
4. 非常滿意 （我絕對會重返此網站並再次消費購物）

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參與者編號: """"

購物車網頁 (Shopping Cart Page) (訂購商品的畫面)

在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

____ 標示退/換貨條款 (例如，提供有關退換貨的資訊及條款的網頁連結)。

____ 標示運費及手續費 (例如，當商品加入購物車時，運費亦同時一併顯示並加入)。

____ 給予購物者可直接回到商品目錄網頁之便利 (例如，提供可返回商品目錄頁的連結，以便購物者繼續選購商品，而不需重新搜尋商品目錄頁)。

____ 提供快速結帳流程 (例如，自動計算總金額，包含商品、運費及稅金)。

請圈選最合適的一項描述來評分購物車網頁

1. 不滿意 (我不會重返此網站再次消費購物)
2. 尚可 (我可能會重返此網站並再次消費購物)
3. 滿意 (我會重返此網站並再次消費購物)
4. 非常滿意 (我絕對會重返此網站並再次消費購物)
結帳程序網頁 (Cash Out Page) (支付購買商品的畫面)
在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

___ 提供信用卡一次登錄 (例如，每次購買不需重複登錄信用卡資料)。
___ 提供送貨地址一次登錄 (例如，每次購買不需重複填寫送貨地址)。
___ 提供客服人員聯絡資訊 (例如，聯絡電話或地址)。
___ 貨運公司的直接連結 (例如，網頁可直接連結至宅配服務公司，如 Fed-Ex, UPS,或其他貨運公司)。
___ 出貨前以 E-mail 回覆確認 (例如，出貨前以電子郵件寄出「出貨通知函」給購物者)。
___ 提供會員帳號一次登錄 (例如，記錄購物者帳號資料以供將來消費使用)。
___ 提供送貨相關訊息 (例如，提供購物者商品送達之預估時間)。

請圈選最合適的一項描述來評分結帳程序網頁

1. 不滿意  (我不會重返此網站再次消費購物)
2. 尚可     (我可能會重返此網站並再次消費購物)
3. 滿意     (我會重返此網站並再次消費購物)
4. 非常滿意 (我絕對會重返此網站並再次消費購物)
安全性 (Security) (叙述網站顧客資料之安全防範)

在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

___ 提供購物者相關安全資訊 (例如，提供購物者有關於如何保護其個人資料的安全性，以及將來如何被運用，包括郵寄名冊或出售予其他公司等等)。

___ 提供多樣化付款選擇 (例如，信用卡、ATM 轉帳、銀行電匯、支票等方式)。

___ 提供電子簽名 (提供購物者以電子簽字來完成訂購手續)。

請圈選最合適的一項描述來評分安全性

1. 不滿意 (我不會重返此網站再次消費購物)
2. 尚可 (我可能會重返此網站並再次消費購物)
3. 滿意 (我會重返此網站並再次消費購物)
4. 非常滿意 (我絕對會重返此網站並再次消費購物)
參與者編號: ________

協調性&系統性 (Coherence & Organization) (良好的網站架構和組織)

在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

_____ 每一網頁均有其單一主題 (例如，同一網頁上的所有商品均屬於同一類別)。

_____ 重要訊息優先列示 (例如，商標置於左上角、導覽列位於左側、內文放置中央)。

_____ 提供層次化等級的功能選擇清單 (功能選單帶導購者至商品之類目而非特定的商品)。

_____ 提供簡單方便的商品搜尋途徑 (例如，提供使用關鍵字搜尋功能，讓購者較容易找到商品)。

_____ 使用淺顯易懂的言語 (購者較容易了解，且避免使用專用術語的文字表達方式)。

請圈選最合適的一項描述來評分協調性&系統性

1. 不滿意 (我不會重返此網站再次消費購物)

2. 尚可 (我可能會重返此網站並再次消費購物)

3. 滿意 (我會重返此網站並再次消費購物)

4. 非常滿意 (我絕對會重返此網站並再次消費購物)
一致性&標準化 (Consistency & Standardization) (一體成形的版面設計與編排)
在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

- 簡單且不凌亂的版面設計 (例如，商品項目之間有充分的空間，且內容文字無擁擠的現象)。
- 所有網頁運用模式大致相同 (所有按鈕、編排設計，例如工具列，均置於每一網頁的最上方或左側)。
- 具有相同的購物車點選圖像 (例如，相同的購物車或購物袋圖像，且均擺放在每一網頁的相同位置)。
- 提供相關合夥廠商連結之圖像 (配合廠商「例如，UPS, Fed-Ex, USPS 等快遞宅配服務公司」的連結按鈕，均擺放在每一網頁的相同位置)。
- 具有一致性的資訊編排 (例如，電子郵件地址、公司商標、標題、聯絡地址，均擺放在每一網頁的相同位置)。
- 具有一致性的格式設計 (例如，內容資訊、功能選單、導覽列，均擺放在每一網頁的相同位置)。
- 避免捲軸的使用 (所有資訊均呈現在同一熒幕，購物者不需使用滑鼠上下左右捲動，即能看到所想要的功能或資訊)。

請圈選最合適的一項描述來評分一致性&標準化

1. 不滿意 (我不會重返此網站再次消費購物)
2. 尚可 (我可能會重返此網站並再次消費購物)
3. 滿意 (我會重返此網站並再次消費購物)
4. 非常滿意 (我絕對會重返此網站並再次消費購物)
效率 (Efficiency) (網站內各網頁間可快速瀏覽與移動的效率)

在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

____ 提供快速下載時間 (例如，提供網頁下載時間於 15 秒之內)。

____ 提供具有描述性之全球資源定位網址 (例如，以簡短全球資源定位網址來
描述商品，例如 www.dell.com 或 www.sears.com)。

____ 避免不必要的圖像 (例如，刪除與商品無關的圖片與卡通圖片)。

____ 避免產生無法繼續連結之網頁 (刪除無法再連結至其他網頁，而迫使購物者必須回到首頁)。

____ 僅需要簡短的點選步驟即可找到商品 (例如，3～4 個點選動作即可找到欲購的商品)。

請圈選最合適的一項描述來評分效率

1. 不滿意 (我不會重返此網站再次消費購物)

2. 尚可 (我可能會重返此網站並再次消費購物)

3. 滿意 (我會重返此網站並再次消費購物)

4. 非常滿意 (我絕對會重返此網站並再次消費購物)
導覽功能 (Navigation) (購物者容易找到想要的資訊或商品網頁)

在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

____ 提供功能點選按鈕 (網站內可使用按鈕或連結功能至其他網頁)。

____ 避免產生無法繼續連結之網頁 (刪除無法再連結至其他網頁，而迫使購物者必須回到首頁)。

____ 提供網站地圖 (提供網頁瀏覽指南，可以很快了解網站的架構，並引導購物者順暢的找尋到網站內其他欲查閱的網頁)。

____ 內部搜尋引擎 (提供僅限網站內搜索欲找尋商品的搜尋引擎)。

____ 小幫手功能項目選擇清單 (提供功能選單或工具列協助購物者完成購物流程作業)。

請圈選最合適的一項描述來評分導覽功能

1. 不滿意 (我不會重返此網站再次消費購物)
2. 尚可 (我可能會重返此網站並再次消費購物)
3. 滿意 (我會重返此網站並再次消費購物)
4. 非常滿意 (我絕對會重返此網站並再次消費購物)
設計風格 (Style) (提供網站良好的編排設計以利閱讀資訊)
在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

____ 容易閱讀的字型 (例如，使用"新細明體"，"Ariel"或"Times New Roman"字型)。

____ 使用 12 ～ 14 大小尺寸的文字 (字體大小尺寸)。

____ 粗體和斜體文字的使用 (商品的文字說明不使用粗體或斜體字)。

____ 所有文字均靠左對齊 (所有文字一律靠左對齊，且無置中或靠右對齊)。

____ 每行以 40 至 60 文字為原則 (即每行文字的限制，避免右方畫面過大，每行最多 40 ～ 60 個文字，不需使用滑鼠左右捲動，就能看到所有畫面)。

____ 避免不必要的圖像 (刪除與商品無關的圖片與卡通圖案)。

____ 提供有顏色區別的連結字體 (該連結如已被購買者點選過，會呈現不同顏色，顯示出哪些連結是購買者已瀏覽過。例如，點選之前是藍色，之後變為紫色)。

請圈選最合適的一項描述來評分設計風格

1. 不滿意 (我不會重返此網站再次消費購物)
2. 尚可 (我可能會重返此網站並再次消費購物)
3. 滿意 (我會重返此網站並再次消費購物)
4. 非常滿意 (我絕對會重返此網站並再次消費購物)
附加價值 (Value Added) (網站的獨特性及超乎想像的特色)

在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

_____ 傳遞一個超乎想像的經驗 (例如，螢幕上同時顯示運動比賽之比數、背景音楽等等)。

_____ 創造一個真實的感官經歷 (例如，看到蘋果派，就想起它剛新鮮烘焙出爐的香味)。

_____ 提供具有吸引力的商品展示 (提供寬廣充分的商品展示空間，使購物者在購買時不至因凌亂的版面設計而感到困惑)。

請圈選最合適的一項描述來評分附加價值

1. 不滿意  (我不會重返此網站再次消費購物)
2. 尚可     (我可能會重返此網站並再次消費購物)
3. 滿意     (我會重返此網站並再次消費購物)
4. 非常滿意 (我絕對會重返此網站並再次消費購物)
實體商店 (Brick and Mortar) (網站特性取決於公司對於網站之付出)

在您瀏覽網頁後，請勾選此網頁是否具有下列陳述的功能或特性。(可複選)

____ 提供良好的顾客服务 (例如，對個別造訪者的問候、銷售或其他特別的電子郵件通知、售後服務與連繫)。

____ 提供售後協助 (例如，提供詢問運送、帳單等相關問題的聯絡方法，個別協助購物者解決有關訂購的問題)。

____ 提供實際的地址 (提供實際郵寄信件的地址，例如，Lynn University, 3601 Military Trail, Boca Raton, FL 33431)。

____ 提供電話號碼 (提供真實電話號碼，例如 1-0800 免付費電話，而不僅僅只是電子郵件地址)。

____ 提供目前網站最新的資訊 (例如，提供網頁資訊最後更新日期)。

____ 提供優質商品 (提供與實際零售商店相同品質、並且具有競爭性的商品，例如，商標品牌)。

____ 提供競爭性商品價格 (提供與實際零售商店同樣品質，且具有競爭性的商品價格)。

請圈選最合適的一項描述來評分實體商店

1. 不 滿 意 （我不會重返此網站再次消費購物）
2. 尚 可 （我可能會重返此網站並再次消費購物）
3. 滿 意 （我會重返此網站並再次消費購物）
4. 非常滿意 （我絕對會重返此網站並再次消費購物）

您之前或在完成此項電子商務評量基準表 (ICES) 問卷期間時，有時間來回顧此網站嗎？

____ 有       ____ 沒有