

An Evaluation of the Business Plan and Web Site of ECB, an E-commerce Business

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Introduction

ECB¹, a live Internet learning company headquartered in the Southeast, was founded in August 1999. The company intends to become the worldwide leader in online learning by offering “a powerful, interactive learning experience to its customers and a powerful delivery method for its instructors – through the Internet” (ECB Web site). It also illustrates a business phenomenon occurring with increasing frequency, namely electronic commerce (e-commerce). ECB, however, presents a new type of e-commerce through its presence as an education brokerage, an intermediary for corporate online learning. Using the combination of teleconferencing and Internet access, ECB beams virtual seminars to conference rooms, classrooms, and offices nationwide, providing corporations with a low-cost training opportunity and an employee retention incentive.

This research conducted a study of ECB's Web site, focusing on 1) whether this site functions as a communication medium and as a transaction medium for ECB's current business plan, and 2) the site's overall usability. Analyzing ECB's business plan within the context of its Web site documents an interesting facet of the e-commerce organizational challenge, namely a business trying to manifest its customer-related operations through its Web presence. Web site usability, according to Nielsen (1999),

¹ An alias has been used to protect company confidentiality.

presents "the Web's Y2K crisis." He states, "every UI professional in the world would need to design one Web site every working hour from now on to meet demand" (p. 65-6). Determining the success of ECB's Web site in meeting their communication and business transaction needs will assist ECB in further refining their site and help define usability principles for similar e-commerce sites.

Literature Review

E-commerce

In order to understand the business context in which ECB operates, the historical background and current framework of e-commerce should be described. Papers authored by Beam and Segev (1996) and Zwass (1998) provide this information. Zwass initiates the review with a sweeping definition of e-commerce as “the sharing of business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks” (p. 1). The e-commerce trend introduces a major new business paradigm, which must be understood against the backdrop of changes in three business areas, information technology, value chain and organizational structure, over the last 50 years in the United States (Beam and Segev, 1996).

Changes in information technology, such as the use typewriters, telephones, and calculators in the 1950s and 60s and the advent of fax machines, mainframes, and microcomputers in the 1970s and 1980s, provided the horizon for the dawning of the age of connectivity in the late 1980s and 90s (Beam & Segev, 1996). Today’s Internet, WWW, e-mail, database systems and telecommunications services support the sharing of information within organizations and across the globe and make e-commerce technically possible. As stated by Zwass (1998), “. . . all the major computer and telecommunications technologies, and database management in particular, undergird e-commerce” (p. 3). He

continues, “The Internet has become the driver for e-commerce . . . the Web has turned the Internet into a global, distributed and hyperlinked multimedia database” (p. 6).

While advances in information technology have contributed heavily to the rise of e-commerce, Zwass (1998) acknowledges that, “it would be entirely wrong to interpret e-commerce as a largely technological development” (p. 3). As technology becomes faster, more available and less expensive, the economy’s value chain also changes. According to Beam and Segev (1996), the economy first moved from relying on manufacturing and physical goods to depending on services. Today, they state, “we are rapidly moving from a service-based economy to a knowledge and intellectual-property based economy” (p. 8). Because of the high value placed on information and the ability of technology to handle information transactions, the demand for e-commerce has risen.

The necessity of e-commerce for knowledge acquisition and transfer has encouraged a shift away from functional hierarchy or process management to a virtual enterprise model. In this model, “project teams form, perform, and then disband,” relying heavily on information technology to accomplish their goals (Beam & Segev, 1996, p. 15).

Zwass (1998) confirms this strategy and lists several organizational and management advances such as team-centered work organizations, transnational organizations, telework, and demassed firms focused on core competencies. E-commerce plays a critical role in supporting this decentralized organization.

The changes in information technology, value proposition, and management model discussed by Beam and Segev (1996) and Zwass (1998) thoroughly document the historical context of e-commerce. ECB represents the end result of these changes as a

business relying on the Internet to provide information in the form of training to organizations across the country. This type of business is highly complex, and Zwass goes on to develop a hierarchical framework to analyze this complexity. The framework consists of three meta-levels, infrastructure, services, and products and structures.

The first meta-level, infrastructure, is comprised of three levels, wide-area telecommunications, public and private communication utilities, and hypermedia/multimedia object management, and it includes the hardware, software, databases, and communication services that are deployed to support e-commerce. The intermeshed web of wide-area telecommunications networks provides the basis of the infrastructure, upon which utilities such as the Internet can be developed. These technologies support the transmission of content created through the use of tools such as HTML and Java for circulation through the World Wide Web. For an environment focused on adding value through information and knowledge such as e-commerce, the transmission and presentation of content are crucial aspects.

The second meta-level, services, consists of two levels, secure messaging and enabling services, which provide the underlying business infrastructure for e-commerce (Zwass, 1998). A secure messaging or distribution method must be employed in order to carry the information across the transmission understructure. These connections should be confidential, maintain message integrity, provide authentication of both parties, and allow for nonrepudiation by either party. In addition to secure messaging, several enabling services are now available that “facilitate searches for business information as well as for business partners, negotiate and maintain a business relationship, as well as consummate business transactions by financial settlements and other information-equivalent transfers”

(Zwass, 1998, p. 7). These services include electronic catalogs, electronic money, digital libraries, electronic authentication services, and traffic auditing.

Meta-level three, products and structures, also consists of two levels, products and systems and electronic marketplaces and electronic hierarchies, which encompass three categories of e-commerce applications, intra-organizational, business-to-business, and consumer-oriented. Business-to-business applications include EDI and extranet-based information sharing and collaboration. Intra-organizational applications, such as intranets, assist a company in maintaining internal relationships that are crucial for business success. Zwass, however, seems to downplay the importance of business-to-business and intra-organizational e-commerce as evidenced by his brief discussion of these topics. Instead, he presents several concise paragraphs regarding consumer-oriented applications, which include home shopping, banking, and investing, as well as a segment he refers to as infotainment, a range of activities from education to entertainment. Businesses such as Amazon.com, Dell, E*Trade, and the Webzine *HotWired*, exemplify the consumer-oriented category.

While Zwass categorizes e-commerce applications by interaction type, Tapscott, Ticoll and Lowy (1999) propose a classification scheme based on business function and describe five kinds of Business-Webs (B-Webs). A B-Web is “an elaborate network of suppliers, distributors, commerce services providers, and customers that conduct business communications and transactions on the Internet and other electronic media in order to produce value for end-customers and for one another” (p. 199). The authors believe these Internet-enabled models provide the keys to competing in an e-commerce based economy

by allowing each business to focus on a limited number of core competencies while collaborating with other businesses to create value.

The five B-Webs, Agora, Aggregation, Alliance, Value Chain, and Distributive Network, are differentiated along two dimensions, economic control and value integration.

Economic control can be either hierarchical with a superior controlling business operations as in the case of General Motors, or self-organizing meaning no single company drives transactions as in the case of auctions or stock exchanges. Value integration can be high, which occurs when the creation and delivery of specific product/service offerings are integrated, as exemplified by Dell Computer. It can also be low, which occurs when access to many sources is provided by one organization, such as Chemdex, a one-stop shopping site for chemical products produced by multiple manufacturers. Please refer to table one for more information.

Table 1: Descriptions of Business Webs

B-Web Name	Economic Control	Value Integration	Description	Example
Agora	Self-organizing	Low	Facilitates exchange between buyers and sellers	www.ebay.com www.priceline.com
Aggregation	Hierarchical	Low	Value-adding intermediary between producers and customers	www.amazon.com www.etrade.com
Alliance	Self-organizing	High	A community that designs things, creates knowledge, shares experiences	Open Source Movement
Value Chain	Hierarchical	High	Integrated value through a managed process Custom tailored products	www.dell.com www.cisco.com
Distributive Network	Both	Both	Provide social and economic glue, transfer and transmission services	www.hotmail.com

As stated by Tapscott, Ticoll and Lowy (1999), "most e-business situations will blend the features of multiple types" (p. 201). In its initial offerings, ECB appears to be a cross between an Alliance and an Aggregation. As an intermediary for online education, ECB positions itself between producers and customers to provide educational services to many different companies and individuals, exemplifying the qualities of an Aggregation. Through that role, however, it wants to create an online learning community where people can interact and learn from each other, similar to an Alliance. Thus, it shares the characteristics of an Aggregation, with hierarchical economic control and intermediary status, but it also demonstrates high value integration like an Alliance in its attempt to build an online community.

Hämäläinen, Whinston, and Vishik (1996) introduce a simpler, more concise description for businesses like ECB, the education brokerage. According to the authors, "education has the potential to be a key application in electronic commerce" but "new innovative models of production, delivery and presentation are needed to take advantage of the inherent power of this new platform" (p. 52). One such model is the education brokerage, an online intermediary that integrates the e-commerce technology and business infrastructures with the education and training application area to provide a just-in-time, on-demand approach to electronic educational products. The dispersal of team-oriented businesses, the demand for new knowledge and skills, the increase in the amount of information needed to be learned, and the expense of bringing participants together for a learning experience all encourage the development of education brokerages as a specialized intermediary that furnishes specific benefits to students (buyers) and course providers (sellers). Businesses like ECB can prepare marketing and advertising, match

customer needs with existing courses, customize student course requests, integrate different types of learning, reduce educational costs, and “play a major role in the reengineering of academic education and corporate training” (p. 52).

Hämäläinen, Whinston, and Vishik (1996) recommend three steps in the design of a successful education brokerage. First, the brokerage must recognize and understand its reliance on its enabling infrastructure, namely the e-commerce business framework described by Zwass (1998). Second, it must uncover the needs of its customer base and establish relationships with course providers. Third, specialized software tools are needed to facilitate collaborative interaction and to produce customized educational products, thus reducing the tendency to simply reproduce existing materials online. In the case of ECB, these first two areas contribute to the development of the third. In order to facilitate interactive online learning, ECB developed an Internet-dependent Web site which serves its user population.

Web Site Usability

The importance of Web site usability is highlighted by Nielsen (1999) in his opinion piece on Web user interface directions. Although the number of Web sites increases more rapidly than the number of UI professionals available to design them, Nielsen believes that the Internet community should strive for "making it easier to design acceptable sites, and increasing the availability of staff who know how to do so" (p. 66). His suggestions for easing the design process include establishing templates and design conventions and focusing on design principles such as considering download speed, including a search mechanism, incorporating a strong navigational structure, avoiding scrollbars, compiling excellent content, and creating and writing content to appear online.

To prepare staff for good design, he recommends education in Web authoring and content structure techniques as well as a "do-it-yourself" approach to design.

Nielsen (1999) also discusses several unresolved issues of Web usability. One problem is the deployment of both lightweight interactions, such as browsing, entering a query and authenticating users, and heavy-duty applications, such as databases and shopping applications, on the Web. He believes the Web supports lightweight applications well but that "more heavy-duty applications are probably better treated as client-server applications and implemented as traditional GUI in applets written in a cross-platform Internet-aware language" (p. 68). He goes on to state, however, that additional research is needed "to partition the space correctly and determine the boundaries between lightweight and heavy-duty interactivity" (p. 68). This issue is particularly important for an e-commerce business like ECB, which is deploying both lightweight (browsing, advertising) and heavy-duty (conferencing) applications on the Web.

Given Nielsen's comments, the usability of an e-commerce Web site is important not only for ECB but for future e-commerce sites as well. Jones (1999) outlines seven rules for design consideration. First, "decide on the criteria for success" (p. 299). The organization should know why it wants a web site and how it will determine the site's success, whether through feedback from visitors, products sold, or number of hits per day. Second, "decide who you want to impress" (p. 300). The organization must recognize and know its audience before beginning the design process. Additionally, it must realize that not everyone will be satisfied with the final site.

Third, “let the information drive the design” (p. 301). As Jones states, the design process “should begin with consideration for what the user is going to want to do with it, what information he/she will need to be able to do that task, and therefore how to present that information in a way that facilitates the task” (p. 301). If the site structure is right, the overall usability of the site is increased. To get it right, she recommends defining the content, identifying the natural structure of the information, identifying the users’ tasks, and defining a navigation scheme based on the previously identified tasks. She also advocates prioritizing information, establishing user interest to draw them into the site for more information, and allowing graphics to support the information design instead of acting solely as decoration.

Fourth, “make it easy to see what’s there and how to get to it” (p. 309). The user should be able to understand the structure and not be bogged down by its complexity. Providing an overview page and consistent links to the home page as well as highlighting the user’s current location will assist him/her in navigating the site. Similarly, using explicit terminology and “making access as direct as possible” (p. 309) will also help. Closely related is the fifth rule, “Don’t expect WWW pages to be just like paper publications” (p. 312). The Web should be incorporated to benefit the user and make it easier to utilize the information presented. Designers should keep in mind that reading online can be difficult and that their site is an extension of their company and should be presented in the most positive light possible.

Rule six states designers should “use graphics with care” (p. 316). Because of today’s high standards for Web graphics, organizations should consider hiring a professional

graphic designer, preferably one who understands the Web medium. Also, a consistent graphic layout should permeate all pages of the site, while keeping in mind that graphics can be boring and as such, “less can be more” (p. 317). And, organizations should always test their graphics laden pages on different browsers to ensure compatibility.

Finally, rule seven states, “keep users interested” (p. 319). The content should be authentic, there should always be something new for the user, the site should be promoted through other marketing media, and it should “get users involved” (p. 320). Jones concludes her article by recommending that organizations treat “the web as one more kind of product and publication, albeit with its own set of technical characteristics and capabilities” in order to successfully enhance “the organization’s image” and improve
ication at a cost and effort that the organization considers
worthwhile” (p. 320).

Testing whether or not these principles and others have been followed involves conducting a usability study. Several approaches can be taken, including a heuristic evaluation, as described by Levi and Conrad (1996) and an empirical usability test, as illustrated by Alonso, Rose, Plaisant and Norman (1998). Levi and Conrad document the heuristic evaluation of the Bureau of Labor Statistics (BLS) prototype Web site, a technique that "involves having usability specialists judge whether aspects of a given interface conform to a list of established usability principles" (p. 53). Of interest to this study is the technique the experimenters utilized as well as the usability principles gleaned from the study. The experimenters allowed each individual evaluator to browse the prototype and identify potential usability problems at all levels of the system. They

then grouped the problems into larger themes and refined their list of heuristics to include, speak the user's language, consistency, memory load, flexibility and efficiency, aesthetic and minimalist design, chunking, progressive levels of detail, and navigation. As will be seen in this study, non-expert participants were given an opportunity to browse the site and identify areas of concern. These areas were then grouped into larger categories and specific areas of the site were addressed.

Alonso, Rose, Plaisant and Norman (1998) demonstrate a second usability study technique in their empirical user test of LifeLines, a graphical interface developed by the Human Computer Interaction Lab (HCIL) at the University of Maryland for the Maryland Department of Juvenile Justice (DJJ). DJJ case workers utilized a time-consuming system of tabular screens to review youth records; LifeLines presented an alternative to that system through its incorporation of timelines to represent chronological data. Thirty-six participants were shown either the graphical interface (LifeLines) or the tabular format, and several criteria were measured including first impression, speed, accuracy, user satisfaction, and recall of information. Of interest to this study are the techniques used to grasp these measurements.

The participant group included 36 individuals from the University of Maryland, 20 males and 16 females. The makeup of this group reflected the diversity of the actual user population. Each participant received a \$4 stipend, and a reward was given for the best performance on a set of 31 timed questions, which measured speed and accuracy. The questions were divided into three groups, tabular, LifeLines or both, depending on the format in which performance was expected to be superior. To measure user satisfaction, the experimenters relied on a questionnaire based on the Questionnaire for User

Interaction Satisfaction (Chin, Diehl & Norman, 1988). While the t-test on the mean score for the 11 questions was not significant, the user's reaction to the tabular display was better than the reaction to the LifeLine's display. However, the participants using the LifeLine's display found it more "satisfying, stimulating, and clear" (p. 256). The current study used similar research methods.

Summary

To support this project, two important areas of the literature were reviewed: e-commerce and Web site usability. E-commerce is creating a paradigm shift in today's business environment, which has been influenced by changes in information technology, value chain and management models (Beam & Segev, 1996; Zwass, 1998). Its established infrastructure (Zwass, 1998) provides the foundation for an infinite number of applications, only a few of which have been deeply explored. The applications can be categorized/classified in a number of ways, as demonstrated by Zwass and by Tapscott, Ticoll and Lowy (1999). While ECB represents a business-oriented application that follows the Aggregation and Alliance models, a more concise description of their business is an education brokerage (Hämäläinen, Whinston, and Vishik, 1996). ECB, as an example of an education brokerage relies on the Internet and its Web site to provide the tools required for their educational interaction. In Nielsen's (1999) opinion, this Web site must follow design guidelines in order to be usable by the user population. Jones (1999) provides these guidelines, while Levi and Conrad (1996) and Alonso, Rose, Plaisant, and Norman (1998) describe two types of usability studies.

Research Methodology

Two questions formed the foundation for this study: how does the Web site of an e-commerce business support and manifest its business model, and is the site successful in terms of navigation efficiency and user satisfaction standards? To answer these questions, the study 1) examined the relationship between ECB's business plan and its Web site by focusing on the site as a communication medium for promoting their business and as a transaction medium for providing their services to customers, and 2) conducted a usability study of this site, focusing on user satisfaction and navigation efficiency. The research was conducted in two phases.

Phase One

The first phase analyzed and documented ECB's business plan, the Web site user population, their goals and tasks, and the Web site organization. The data source was three interviews (A, B and C) with ECB employees conducted at their headquarters. Each interview was audio recorded, and prior to the interviews, each interviewee was asked to sign a consent form (Appendix A).

Interviews were chosen as the data collection method for several reasons. This technique is flexible and adaptable, particularly when used in face-to-face situations. The inquiry can be modified as the interview progresses according to verbal and non-verbal cues from the participants. This allows the interviewer to follow-up on interesting responses from the interviewees and observe their facial movements and gestures. As discovered,

however, interviews can also be problematic. An interview can be difficult to schedule and time-consuming for both interviewer and interviewee. Additionally, gaining full focus from interviewees during the course of a busy workday can be challenging. In order to overcome these issues, agendas were provided and strictly followed.

Interview A - The first interview was a semi-structured interview with the chief executive officer. The goal of the interview was to dissect and understand ECB's business plan for the coming year. A series of questions guided the interview (Appendix B), and some background documentation was provided by the interviewee. The interview lasted approximately 45 minutes.

Interview B - The second interview was a semi-structured interview with the technical director. The goal of the interview was to document 1) the expected Web site user population and 2) these users' tasks and activities. As defined by Hix and Hartson (1993), a user analysis provides "specific information about job functions and tasks of potential users, plus social and organizational work-flow considerations, to define representative classes of users in terms of the tasks to be performed and the skills and knowledge those users bring to the tasks." A task analysis "involves understanding the required sequences, why they are required, what the information flow is, [and] what the user contributes to the procedure" (p. 118). A series of questions guided the interview (Appendix C), which lasted approximately one hour and 30 minutes.

Interview C - The third interview was an informal interview with the technical director. The goal of the interview was to document the organization of ECB's Web site. The output from this interview was a state transition diagram, "a graphical representation of

interaction control flow in sequential interaction" (Hix & Hartson, 1993, p. 149). The diagram consists of nodes, representing the interface screen, and arcs, which represent state transitions according to inputs from the user (Appendix D). The interview lasted approximately 45 minutes, while the diagram was developed and refined over 5 days.

Phase Two

Phase two entailed an empirical usability test of ECB's Web site.

Participants - A sample of 8 participants was recruited from students enrolled in the MBA program at the Kenan-Flagler Business School, University of North Carolina at Chapel Hill. The students were invited to participate in the study via a mass e-mail to the MBA student listservs. For their participation, each student received a copy of *Blur* by Stan Davis and an entry in a drawing for a \$40 restaurant gift certificate.

Design - Each participant in the usability study was scheduled one at a time and run individually at the computer during two different sessions. Both sessions took place in the Interaction Design Laboratory (IDL) at the School of Information and Library Science, utilizing the Internet connection and Internet Explorer 5 browser available on the lab's computer. The sessions were observed, and video and audio recorded to capture user commentary. Verbal protocol or "thinking aloud" was highly encouraged to elicit audible comments concerning any problems and/or issues encountered by the participant.

The first session measured user satisfaction with ECB's site, focusing on users as explorers of the site's content. Prior to any data collection, each participant was asked to sign a consent form (Appendix E). The participant was then asked to complete a brief

background questionnaire regarding his/her current level of Internet use. This questionnaire (Appendix F) is based on the 10th WWW User Survey (1998), developed by the Graphic, Visualization and Usability Center at the Georgia Institute of Technology. Following completion of the background questionnaire, each participant was directed to the main screen of ECB's site and invited to freely navigate the site for up to 30 minutes. S/he was asked to spend at least 15 minutes exploring, to not move away from the site, and to speak out loud regarding their first impressions, likes and dislikes and impressions of ECB, including who they are and what they do.

Following the exploration session, each participant completed a satisfaction questionnaire based on the Questionnaire for User Interaction Satisfaction (QUIS), a tool developed at the Human-Computer Interaction Lab (HCIL), University of Maryland at College Park (About QUIS 7.0, 1998). As stated by its creators,

The QUIS™ was designed to assess users' subjective satisfaction with specific aspects of the human-computer interface. The QUIS™ team successfully addressed the reliability and validity problems found in other satisfaction measures, creating a measure that is highly reliable across many types of interfaces. (n.p.)

According to the QUIS 7.0 documentation (1998), "Each area measures the users' overall satisfaction with that facet of the interface, as well as the factors that make up that facet, on a 9-point scale" (n.p.). QUIS is configurable by including the parts that are of interest to the particular study. This study will utilize four parts of the QUIS, which measure:

- Overall User Reactions (Part 3) - "satisfaction along six high level interface factors"
- Screen (Part 4) - "satisfaction with a number of factors related to visual displays"

- Terminology and System Information (Part 5) - "satisfaction with system messages, user feedback, and task related wording that the system generates"
- Learning (Part 6) - "user's perception of their ability to learn complex system tasks"

The relevant questions in each of these four parts are included, but any non-relevant sub-questions were excluded, as recommended in the QUIS 7.0 documentation. See Appendix G for the final version of the questionnaire used in this study.

After completing the QUIS, each participant was asked seven structured interview questions to allow him/her to provide feedback in his/her own words.

1. What did you like best about the site?
2. What did you like least about the site?
3. What is ECB?
4. Who does ECB serve?
5. What does ECB sell?
6. Does the site motivate you to take advantage of these services? Why or why not?
7. What two pieces of advice would you provide to a first-time user of the site?

The first session provided the user with a chance to explore ECB's site and determine basic information about the company. Given this level of familiarity, the second session measured the efficiency of the site's navigational structure, focusing on use of the site to complete a specific task. Navigation efficiency is important for two reasons. First, use of the site is discretionary, that is, a user can choose whether or not to do business with ECB and use their site. Therefore, the site should be easy to navigate and absorb in order to encourage its use. Second, once familiar with the site, the user will typically visit the site to accomplish a specific task. In order to support these tasks, the site incorporates a

navigational structure, as diagrammed in the state transition diagram (Appendix D).

These structures can often be confusing, and as such, ECB's structure should be analyzed to ensure it promotes efficient task completion.

Efficiency was measured by counting the number of hops taken by each participant to locate the correct answer for three sets of questions, A, B and C. All participants answered all questions. The questions were determined following the completion of the task analysis and were reviewed with ECB's technical director in order to ensure they were relevant for this site. The definition of a hop (i.e. the movement between pages, between sections), the minimum number of hops that can be taken between two answer locations, and the acceptable number of hops that can be taken between two locations and still be considered efficient navigation, were determined following the completion of the state transition diagram. Please refer to Appendix I for a chart containing the questions, the number of hops taken when using the tab menu, the number of hops taken when using the left side menu, the acceptable number of hops for each question and the reasoning for this number.

Prior to answering the questions, each participant was instructed to:

- Answer the questions in order
- Return to the home page between each set of questions
- Not use the back button on the browser
- Request assistance if necessary
- Move at his/her own pace

After the questions were answered, each participant was asked four structured interview questions to allow him/her to provide feedback in his/her own words.

1. What did you like best about the site?
2. What did you like least about the site?
3. On a scale of one to five, was locating the answers
 1. Very easy
 2. Easy
 3. Some easy, some difficult
 4. Difficult
 5. Very difficult
4. What characteristics made it more or less easy/difficult?

Results

Results - Phase One

The interviews conducted during phase one of the study yielded basic information about ECB, their business plan, their Web site users and those users' tasks.

Business Plan

The vision of ECB, as stated by the CEO, is "to create the premier Internet learning community. Our strategy is to provide corporations with convenient access to the best business minds in the world." To accomplish this goal, ECB has created a Knowledge Network comprised of four main areas: Masters of the Internet events, simulcasting for associations, private label events for corporations, and Knowledge Exchange/ Knowledge Management. The Masters of the Internet events provide branding and credibility for ECB through online learning events hosted by top-level speakers. The simulcasting and private label events promote customer acquisition by offering the ability to participate in conferences and training sessions to people who cannot attend these events in person. Finally, the end result of branding and customer acquisition will be the "premiere live Internet learning community" where learners will return to ECB for the Knowledge Exchange, "a market in other people's knowledge," and Experience Management System (EMS), "a searchable library of archived seminars."

The Masters Series, simulcasting and private label events are quite similar in nature. Each provides access to a particular speaker or event live over the Internet. The benefits

for corporations can be measured by both cost and time; it is less expensive and less time-consuming for more people to participate in an event from a conference room than it is for those same people to travel to and attend an event. Additionally, the events are live and interactive and allow multiple people from an organization to participate.

The Knowledge Exchange and EMS areas are slightly different in nature and rely on the success of the live events. Regarding the Knowledge Exchange, the CEO stated,

Somebody can come into knowledge exchange, fill out their profile, key learning points, and then we'll offer that to our learning community. . . I call it the E-Bay model of learning where someone's going to offer a class and our community can decide, do they like what they see. If they like what they see, they want to take the class, and we'll offer it and share revenue with the instructor.

If people have participated in a live event, ECB believes they will come back to ECB to find additional programs that can be either ECB sponsored and organized or put together by an outside party. Thus, ECB makes a market in other people's knowledge. Like the Knowledge Exchange, EMS relies on repeat customers. As an archive of learning events, EMS can be searched like a library. The CEO said,

The holy grail is very simple. It's to have access to knowledge in a way that is simple that will solve my problems. . . . We will be focused on delivering answers to questions and the questions will be organized in such a way that you will have visuals, audio and some video as well.

In order to address the four areas of their Knowledge Network for the corporate market, ECB utilizes the Internet as a communication, and transaction and delivery channel. The CEO stated, "We use the Internet in a variety of ways. The first way we use the Internet is to deliver the visuals of our classes, so it is pushed through the Internet. Secondly, we use the Internet to sell." In order to participate, companies are required to have a telephone and an Internet connection of a minimum 28.8 baud speed. The audio is

transmitted via telephone, while the video is streamed over the Internet. The presentation becomes interactive through the participation of the users.

During the class, our customers have the opportunity to raise their hand in this virtual environment and ask a question. They have the opportunity to be polled, we will be polling them. They can give us answers as to what they think. Based on what they think, the instructor, or the teacher or the master that is teaching will actually change and provide answers to those questions.

Following the live event, the Internet is also utilized to host the Knowledge Exchange and EMS. This provides universal access to a wealth of knowledge that can be customized to suit the user's preferences, similar to Amazon.com.

The gist is you could then come to this experience management database, ask a question and the database would say, OK we have this answer, it was delivered Tuesday, 9:00am on the fifth of July and you can watch that answer. And then we would suggest, OK, because you asked this question, there may be three other questions you want to consider. We then build a learning profile for you.

Thus, all four areas of ECB's Knowledge Network rely heavily on the Internet, placing ECB in a new e-commerce space, namely e-learning.

Users

The overall composition of the user population is corporate as opposed to educational.

Within the corporate sector, ECB wants to focus on five verticals: financial services, information technology, professional services, communications, and healthcare. As stated by ECB's technical director,

We're very narrow minded with respect to who we are going after, we're not going after the general education market, we're not going after higher ed, we're not going after every e-customer out there. And so, the verticals are our first attempt at getting specialized.

Within these corporate sector verticals, there are five main user groups.

1. General Users - people who are curious about ECB (including investors and speakers)
2. Attendees - people who register and attend an event
3. Facilitators - people who organize and attend events, typically ECB advocates
4. Associations, Conferences - organizations who want to buy ECB's services
5. Sponsors - organizations who want to support ECB's services through advertising

Currently, general users, attendees and facilitators are the most important users. As stated by ECB's technical director,

Just like in TV and radio, if you don't have readership or subscribers, then you can't get sponsors. If you have a good sponsor that's one thing, if you have a bad sponsor you can always get another one. That's not to discount the importance of sponsors, it's just that the butts in seats or the eyeballs on your product are the most important. And always will be.

The job functions vary widely within these five groups. As stated by the technical director, the user "might be wearing any number of hats." For example, facilitators might be an executive secretary, human resources agent, or the person in charge of equipment.

Motivation to use the site is high for attendees, facilitators and general users. As stated by the technical director,

We can use a lot of the technology that we use for events to sell our concept but also to communicate and train people for what we are trying to do. So we actually run people through our facilitator training using the technology that we would use in an event. People have been very receptive to that and it has accelerated the process a lot. . . . So I think it is pretty high, the desire to use the site and the technology that is there is pretty high and I think its going to be better and even higher when we roll out some of the new tools.

Motivation for sponsors and associations/conferences is low. Currently, the site does not contain much information for these groups. In the future, the Web site experience will be enhanced for this population.

The knowledge and experience of users will affect their usage patterns. Of particular interest are -

- Language - ECB is a national as opposed to international company, and, as such, English is the language expected to be used by the user population.
- Educational level - Because the user population is comprised of corporate users, ECB expects companies to have the infrastructure (people and equipment) to support their events. According to ECB's technical director, the educational level expected by the five verticals mentioned above reflects the educational level expected by ECB.
- Internet Experience - ECB asks the user population to participate in an interactive environment and expects an intermediate working knowledge of the Internet. In order to be interactive, users have to be comfortable using their systems and their tools and be able to contribute at a certain level to get more out of the event.

Tasks

Although there are five categories of users, general users, attendees and facilitators were the focus of this study given that the current Web site does not offer much to associations/conferences and sponsors. For general users, ECB hopes to provide basic background information about their company.

So, pieces of the pitch are who we are, a guided tour of ECB and what we're about, the corporate description pieces that everyone wants to see that talks about you as an entity and why you are different than all your competitors and also some promotions and particular promotions we're doing right now to try and capture someone's attention from a sales standpoint. To that, we've added client list, case

studies and testimonials, strategic partners . . . and the things that we have left to be somewhat stand alone under the about ECB areas are our team - management, investors - careers and opportunities, and traditional pressroom ideas, press releases, ECB in the news, the awards, features and upcoming activities and calendar items.

Given this information, six tasks and scenarios were created. The first two tasks are expected to be performed by general users.

1. What is ECB?
2. How can ECB benefit my company?

In addition, four tasks and scenarios were developed to represent the needs of attendees and facilitators.

3. I have signed up to attend an event. I would like more information.
4. I would like to participate in an online discussion.
5. How do I facilitate an event?
6. What needs to be done before my event takes place?

The attendees and facilitators utilize much of the same information on the site, and often, a facilitator is also an attendee. The facilitator, however, will support the internal production of the event.

And so, covering live events, we want to be able to search. . . find live events, participate in live events and follow up to live events or at least have some sort of post event activity. And so, for finding, they might find by date, topic, industry, speaker, product. For participating in live events, we might want people to participate in a tech check, which would be a pre event activity, participate in facilitator training, and to actually attend the event. And then on the follow up we would have people participate in discussions, reviews of events, success stories, testimonials, and purchase merchandise to follow up to the event.

All six tasks and their attributes and scenarios can be found in Appendix H.

The Web Site

After the business plan, site users and their tasks were documented, the current Web site was diagrammed and analyzed in a state transition diagram (Appendix D). It should be noted that ECB was in the midst of a redesign effort for their site, and this study focused on the results of that effort. The goal of the site, as stated by the technical director, is to "get out the message of who we are, what we do, and provide a tool for people to interact with us both during normal business hours when we're here and when we're not." He believes the old site was both confusing and somewhat frustrating. Users "come to the site and leave after the experience maybe not knowing what we are trying to do as a company or what our offerings are." Regarding the site, he asks the following questions,

- Does the site help us create products, market our products, sell our products?
- Does it help people buy our products, deliver the products, survey, tweak or correct the whole process?
- Does the site support the pre-event, event, and post-event activities?
- Can they get processed successfully through the facilitator training and prepare themselves for the events?
- Can the site deliver the event, deliver the post event q and a's and the follow up tasks and things that are associated with that?
- Can the site effectively communicate all the follow up materials maybe through an e-mail or provide the threaded discussions, and does it demonstrate/collect/support case studies that might advocate what we are trying to do?

The business plan and his questions were then compared to the state transition diagram.

The current site corresponds well to the Knowledge Network business plan as outlined

above. A tab menu appears at the top of each page in the site and contains the following headings: Live Events, Archived Events, EMS, Knowledge Exchange, Learning Resources, Sales Pitch and Sponsors. Obviously the Live Events and Archived Events correspond to the first three areas of the business plan, Masters Series, simulcasting for associations and conferences and private simulcasts. The EMS and Knowledge Exchange areas correspond to area four of the business plan. Thus, at a glance, the site appears to promote the current business plan.

Additionally, each tab displays mouseover menus, allowing the user to delve more deeply into the Knowledge Network and focus on the questions listed above. For example, under the Live Events tab, the user can review the requirements for hosting an event, attend the event and participate in the post-event online discussion forum, all through ECB's site. Similarly, the facilitator can utilize the Web site to support his/her hosting function; it provides a detailed description of all the duties required of him/her. The Sales Pitch tab provides an additional example; it incorporates the information needed for a person curious about ECB, their products, and their history.

Results - Phase Two

Following these comparisons, the two-session usability study was developed and conducted. The results from the first session fall into two areas, quantitative as based on the QUIS, and qualitative as gleaned from each participant's think aloud reactions and answers to interview questions. Before discussing these results, the participant group should be described in more detail.

As mentioned above, the participant group included eight MBA students from the University of North Carolina at Chapel Hill Kenan-Flager Business School. Using the Internet background questionnaire (Appendix F), basic information about the group was collected. Four men and four women participated, all between the ages of 26 and 30. All participants indicated their level of computer comfort as very comfortable. Seven participants rated their level of Internet comfort as very comfortable, while one rated his/her level as somewhat comfortable. Using the eleventh question on the background questionnaire, each participant's Internet skill level was classified according to the number of activities s/he had performed online:

- Novice: 0-3 activities
- Intermediate: 4-6 activities
- Experienced: 7-9 activities
- Expert: 10-12 activities

According to this scale, seven participants were rated as experienced while one participant was intermediate, with a score of 6. Finally, all participants were asked if they would use the Internet for an educational activity, and all responded positively, indicating an initial willingness to consider an online learning opportunity like ECB.

Results - Phase Two, Session One

During the first study session, the participants spent an average of just over 27 minutes reviewing the site, and all were audio and video recorded. Following their investigation, each participant completed the QUIS and responded to seven interview questions. The QUIS tabulation did not reveal anything of consequence about the ECB site. An average score of five (on a nine-point scale) was expected for each question (Appendix G). Only

parts 3, 4 and 6 were considered because many of the questions in part 5 received an NA (not applicable) answer. All of the questions had a mean score above five except:

- 3.3 - Overall Reactions to the System, dull - stimulating
- 4.4 - Sequence of Screens, confusing - clear
- 4.41 - Next screen in a sequence, unpredictable - predictable

A t-test was conducted on these three questions to determine the accuracy of each mean. Question 3.3 had a mean of 4 and was determined to be below the target of 5, with 95% confidence.² Thus, the QUIS results suggest the participants found the site to be more dull than stimulating, pointing out a need for improvement. This result is supported by participant statements,

- "Have things happening on this site - it is a live conference thing."
- "It is a dead screen."
- "I like what they are able to do. I think they could jazz up the site a little bit."
- "Not very interactive and dull. The viewer will lose interest very soon."

The final interview questions revealed that all of the participants had a basic understanding of ECB and their business after reviewing the site. However, the site was not perfect as revealed by participant comments. Their observations can be divided into four categories, structural, functional, content-oriented, and aesthetic.

² When compared to a mean of 5, the t-test revealed a t value of -2.366 and a significance of .050.

Structural Issues

- Navigation - Overall, the participants reacted positively to the site's navigational structure. Only one participant felt the site was confusing and thought there was “information all over the place - the same thing they told me I wasn’t going to”
For the other participants, two navigational features contributed to their satisfaction with the site, the tab menu and the left side hyperlink menu.

Seven of the eight participants felt the tabs and their mouse-over drop down lists made it faster to navigate and easier to "find information by trial and error." Two concerns were mentioned: 1) some of the current tabs "were more dense than others," and 2) the tabs might become too impenetrable as more information was added to the site. The participant who didn't like the tab format thought each tab seemed like a different business unit even though each represented different services. Additionally, s/he wanted the tabs to incorporate more user-intuitive headings such as About Us, Services, and Our Capabilities.

The other navigational feature helpful to the participants was the hyperlink menu on the left side of each company page. One participant mentioned she liked this feature but wanted her current and past locations within the site to be more obvious on this menu. The highlighting of the user's current location was not strong enough, and the links did not change in appearance to tell the user where she had already been.

- Location and Emphasis - Several participants criticized the location-created emphasis of what they considered key information. They stated,
 - "It was pretty clear what ECB was offering, but I think it was in the wrong places."

- "I think there was a lot of information buried in the third level down, and I think that it should be moved to the top."
- "I think there are some key concepts they are not highlighting about why they are different."
- "You don't know what they do until you click through a lot."
- "I don't think that is being brought forward about why I should use ECB."

The lack of appropriate emphasis was confirmed when one participant wanted to know if the companies could purchase a videotape of the event(s) or download the event(s) instead of paying ECB for the privilege. She did not realize the value of interaction during the event(s), one of ECB's main selling points.

Suggestions of where and how to place the emphasis, however, were not consistent.

Two participants thought the What We Do and Solutions areas (under Sales Pitch) should be highlighted because they provide good information about ECB and its advantages. One participant felt the Learning Resources section explained the whole value proposition for ECB. He said,

I haven't really gotten a good reason to use ECB or what ECB can do for me. But if I am an educator or someone who wanted to attend a conference and couldn't and there was a way for ECB to stream that information to me, either real-time or through an archive, I think that would be useful. But this is the only place on the Web site that tells me why I should come back here ever again.

In general, participants thought the home page should play a more active role in emphasizing the site's key points. One stated the home page did not "capture the essence of ECB." Two others said, "They should have done a better sell job up front in their first few pages with solutions, and this is what we've done, these are our

successes, and these are the types of services we can do for you " and "If I stumbled onto this site just surfing the Internet, I don't know that I would have explored it because I don't have a lot of up front information to help me out." Yet another stated, "Some of the screens had information that was better suited to the first overview screen. The first screen did not say what the company is all about."

- Home Page Area - While wanting the home page to play a more active role, one participant also thought the items on the home page (ECB Store and Easy Ways to Participate) should be available through other areas of the site as well.
- Sales Pitch Area- When asked to give two pieces of advice to a first time user of the site, seven of eight participants recommended starting in the Sales Pitch area.
 - "It enables you to understand the rest of the site."
 - "It showed me why I should stay on this site when I have a million other sites to choose from."
 - "It's the last item up here, but if you want to find out what they do, it's the first place you need to go."

Three participants suggested changing the heading of this area to "About Us." One felt the Sales Pitch title did not draw him to the area, while two mentioned that About Us is a Web standard. "Most web sites have something like an About Us or Overview or Company Mission tab."

Three additional suggestions were made for this area. Two participants suggested the information represented by the pyramid under Vision and Strategy should be linked to its associated descriptions to make it more "interactive." Under Careers, one

participant felt each job should link to the person hiring for that position. Finally, under Industry Focus, one thought this area should be renamed "Our Customers."

- Live Events Area - Within Live Events, two sections were targeted. First, three participants remarked on the discussion area. One expected to be able to move from a discussion topic to the event description related to that topic. Another entered the Help area, which opened a new browser window, and s/he could not return to the forum page. Yet another expected the forum preferences to allow him/her to select "the knowledge areas you were interested in."

Second, the registration process was problematic for three participants. Two suggested placing an asterisk by the required fields to avoid receiving an error after entering too little information. One went on to say, "Why should I give you all this information?" S/he believed it was unnecessary to require addresses when ECB could e-mail him/her. While reviewing the registration area, one person mentioned it "seems like a site where you have to know what you are doing before you come to the site. It is not very user-friendly for the novice." The same participant suggested the login screen should be available "up front" and said, "Maybe it would be better to just log me in once and then allow me to flow freely through these other pages."

Functional Issues

- General Search - Two participants wanted the ability to search the entire site. One said, "This is not the right way of finding things. There is no search box available."

- Live Events Area - All of the links (books and pictures) within the All Events section should be functional. As stated by one participant, broken links "can be really frustrating. I would be so turned off by this web site that I wouldn't even bother seeing what the rest of the site was."
- Browser check – When this option is selected from Live Events, the browser will not allow the user to return to their previous page and opens multiple tab menu bars.
- Browser type - The first participant used Netscape for five minutes at the beginning of the session. It shut down, and she switched to Internet Explorer 5. Subsequent participants, therefore, were instructed to use Internet Explorer 5 only. Additionally, I have attempted to use Netscape two other times, and it has shut down after 5-7 minutes on the site.
- Discussion Forum - When registering for the discussion forum, one participant received a Cold Fusion error stating the evaluation copy had expired.

Content-Oriented Issues

- Information - Lack of content was a common complaint among the participants. The EMS, Learning Resources and Knowledge Management areas were criticized because each contained only one to two paragraphs of information. As stated by one, "Why have a different link for it when all it does it talk about a piece of information that could have been part of the overview? This is just a waste of a click."

Four participants expressed a desire for an online demo of ECB's offerings. As stated by one, "It is very important for a person who is buying this service to see how it

works, what is the interaction level and how long it takes to get feedback." The need for an online demo describing the event process was emphasized by participant comments. While reviewing the Tom Peters section, two participants mentioned they wanted to have a more explicit explanation of how to sign up for the event and participate. One of these people brought up this same issue during the interview session as his/her major dislike of the site and suggested something more "self-service oriented." Another participant also felt the site needed to be more explicit about how "these things" are sold, and yet another wanted to register for an event online. Two people also wanted to know the equipment requirements for the events but never located the information, which is contained within the facilitator's guide.

Remarks were made on the content of three additional sections. First, the pyramid graphic within the Vision and Strategy section was not understood by two participants. One understood what ECB does but not their vision while the other said the pyramid was pretty but not functional. Second, the Investors section (Sales Pitch), did not contain any information about investors, which is what the heading led one participant to believe would be found there.

The third section, Success Stories, was disappointing for five of the participants. All five expected company-specific stories and cited quotations. This desire was summarized by one participant who wanted to see, "what they can offer and what the result would be." Another participant thought the lack of information in this area created validity issues for ECB. S/he stated, "I say startup because they said success

stories but they didn't give me any companies. It gave the impression that it was just starting and didn't really have any business yet."

- Audience - Several participants commented on the lack of audience focus. One said, "I don't think this is a live company from the way they are structured. I think it is just an idea brewing. They don't look as if they have cemented their audience." Another stated, "It doesn't say if it is for corporate executives. It is not quite clear who the specific target audience is. Is it for the HR people within the organization?"

Three participants suggested focusing on particular industries in order to cement the audience. One mentioned he would be more likely to use the service if it were tailored to a particular industry. He said, "Do you have a set of speakers that are tailored to my particular industry or business or is this just cookie-cutter motivational speakers?" Another stated, "What type of speakers are they getting to appeal to what type of company? If they can only get 10 speakers a year, should they maybe focus on one industry or another?" Yet another said that segmenting would be a "more effective tool to sell" this service by having "a different page for different industry groups." These comments are of interest considering ECB's documented desire to focus on five industry areas (see interview results above).

- Contact Information - One participant wanted the contact information to be more prevalent. S/he liked having it located at the bottom of each page but thought finding the information was not intuitive because s/he had to scroll. Another participant clicked on the Contact Us link and was transported to an entirely different site.

- Security - One participant thought the archiving option was intriguing. S/he was concerned, however, about archiving proprietary company information and wanted to review more information on security procedures.
- Price - One participant felt the pricing was quite steep and did not realize it included all participants from one organization. S/he said, it "seems like an amazingly high price unless everyone in your organization can participate." Another participant questioned the price for quality reasons. He felt streaming video was not nearly the quality of satellite feed.
- ECB Store - One participant like having the books available and hyperlinked to Amazon.com. Another participant commented this store was "pretty weak." S/he felt it could be enhanced by selling "multimedia devices that would aid or that would be complementary to service they're selling," such as video screens and phone equipment.

Aesthetic Issues

- Color – Reaction to the color scheme was mixed. One participant thought the red and black scheme was pleasing, and the abundance of white space made it easier to see everything on the screen. Two participants, however, did not like the scheme. One felt it was "bland," while the other stated, "The red stands out. The gray is very mellow and tends to take away from the site. So I don't get a feeling of excitement when I look at this site." Additionally, two participants specifically targeted the red as overpowering, and one suggested incorporating another color like blue.

- Text - Three participants thought the site contained too much text. One participant stated, "I don't think people really read paragraphs as much as they should," and another said, "Too many words used to convey ideas." Suggestions to overcome this issue included utilizing bullets more often, incorporating more images and graphics, and/or having "three-four liners to explain stuff." The Client List was mentioned as a good use of bullets, while Learning Resources and Careers were suggested as areas in need of bullets.
- Page Alignment and Layout - Two participants thought the page alignment was inconsistent, and one stated, "Some screens placed upper left, some centered information. Expected more consistency." The pages specifically designed by ECB are aligned to the upper left, while the pages provided by Contigo, the event software provider, and the discussion forum are aligned to the center. Page layouts received four comments. One participant preferred the layout of All Events to the layout for the Featured Event because it incorporated more detail about each speaker. Another suggested All Events should provide one screen of information per speaker. One participant felt the Facilitator's Guide was too long and should be divided into linked pages as opposed to one page with linked sections. Another liked the layout of the discussion forum because it allows the user to see the topic and the number of posts.
- Miscellaneous – The Team picture generated interest from one participant who felt the subjects looked unhappy and the picture should be captioned. Another participant liked the ability to utilize smiley faces in the discussion forum.

Given the qualitative and quantitative results of the first session, it is apparent the users had mixed reactions to the site. When asked, "Does the site motivate you to take advantage of these services? Why or why not?", four participants said yes and four said no. Since all participants expressed a willingness to use the Internet for an educational opportunity, the fact that half of the group wouldn't utilize ECB's services indicates problems with the site as opposed to the concept. The participants made a number of general comments, which can be categorized as positive, negative and mixed.

Positive

- "If I were working for a company, say in HR, and looking for ways, I would definitely pursue it because it is a cost-effective way to try and train people. But I would have to try and get input from the employees. Is this something you would be interested in? Would you rather go to a conference where there is a lot of networking that goes on as well?"
- "The concept of distance learning and linking organizations even if they are in 10 different places or within the same city, that's an advantage to having to rent a facility

Mixed

- "It is cost effective in terms of, you can gather a lot of people together but are they really going to sit there and watch it and interact? If you have a room of 30 people, how interactive can it be?"

Negative

- "The idea is good but it is not well laid out. I am not too excited about the site."

- "Is this a real business? So many pieces of information are missing. So I thought maybe this is in the process of being built and not a real company."
- "They didn't do a real good job of selling me on it. One, I don't think they have a lot of experience. I don't think they take enough steps to look at what I as a healthcare professional would want out of their service."
- "I came away with the impression that it was disorganized, and my service probably

Results - Phase Two, Session Two

Session two focused on the navigational efficiency of the site by asking the participants to locate the answers to three sets of questions (Appendix I). Each participant spent an average of 20 minutes locating the answers to all three sets of questions, and following the search period, s/he was asked four interview questions. Like session one, the results from session two were analyzed qualitatively and quantitatively. The qualitative results were based on each participant's think aloud reactions to the site, his/her navigational pattern while answering the questions, and his/her answers to four interview questions. The quantitative results were determined by calculating the mean number of hops taken for each task and comparing that mean to the previously determined acceptable number of hops (Appendix I) in order to identify areas of problematic navigation.

The participants' overall reactions to finding the answers were gleaned by asking, "On a scale of one to five (one being the easiest and five being the most difficult) how would you rate locating the answers?" Three participants rated the task as a two (easy) and five participants rated it as a three (some easy, some difficult). As stated by one participant,

"The information is available but finding it is difficult at times." Based on the hop data collected, however, the participants seemed to have more difficulty than they perceived. Of the 16 tasks, 6 required hops at or below the acceptable number and 10 required hops above the acceptable number (Appendix I). A t-test was conducted on these 10 tasks, but none of the results were significant, meaning none of the means were significantly over the target number of hops, at 95% confidence.

Despite the lack of significant numbers, looking at each of the 10 tasks to determine where the participants "went wrong" is instructive.

Question A3: Why is ECB different from other online learning opportunities?

Two participants above the target mean.

This question is somewhat difficult because its location on the site is not immediately obvious. The two participants not meeting the acceptable number of hops both required a hint to reach the final answer. One looked under Solutions, Learning Resources and Archived Events before receiving the hint to look under Sales Pitch. The other looked under Learning Resources and EMS, received the hint to look under Sales Pitch, reviewed the Overview twice, received another hint to look elsewhere under Sale Pitch and finally located the answer.

Question A4: Does ECB have any marketing jobs available?

Two participants above the target mean.

After locating three answers under Sales Pitch, the participants were expected to recognize Careers as an option in this area. Of those who did not, one went to the

home page before returning to the Sales Pitch. The other went astray and looked under EMS, Archived Events, and Sponsor Events before returning to the Sales Pitch.

Question B1: How much does it cost to attend a Tom Peters event?

Three participants above the target mean.

Each participant was on the home page when presented with this question, and each was expected to notice the Tom Peters graphic, one of three featured links on this page. Three participants, however, did not notice the graphic. One went directly to Live Events and found the information within the Find section. Another went to Archived Events and Sponsor Events before locating the answer under Live Events. The third entered the Attend area under Live Events and was dismayed not to find Tom Peters on the View Scheduled Events page. S/he was given the hint to return to Live Events and finally found the answer under Find.

Question B2: Name two other events offered by ECB in the last year.

Two participants above the target mean.

The answer was located under All Events, one of the selections on the left side of the screen when participants received this question. Two participants did not notice this option. One went to Archived Events, a logical choice when searching for events occurring in the past. S/he received a hint to return to Live Events. The other also went to Archived Events after reviewing the Success Stories and Discussion Forum areas. S/he received a hint to return to Live Events.

Question B4: Now that you are registered, how many events are being held in May?

Two participants above the target mean.

When the participant completed the registration, s/he was presented with a menu containing seven options, one of which was View Schedule Events. Two participants did not take advantage of this menu option. Both remembered locating events from questions B1 and B2 and returned to the Find section under Live Events. Each received a hint to return to the registration area.

Question B5: You are the facilitator for an event. What size monitor does ECB recommend?

One participant above the target mean.

The participant who had difficulty with this question actually noticed the facilitator information while answering question B3. However, he utilized 11 hops to reach this information and cited the lack of mouseovers on the tabs in the Attendee registration area as part of his difficulty. Two additional points arose while participants answered this question. First, four participants relied on scrolling to find the information while four relied on the hyperlinks at the top of the page to reach it. Second, none of the participants utilized the "top" link to return to the top of the page once the information was found.

Question B6: You have moved and need to update your address in your ECB profile.

Two participants above the target mean.

Two participants did not remember how to access the profile created in question B3. One went from Participate to Find to Overview to Attend before locating the login

screen for accessing the profile. The other went directly to Attend but decided to look under the Help section. S/he went back to the Live Events tab, then to Attend and finally to the profile.

Question C1: I want to see a demo of ECB's service. How do I obtain a demo code?

Four participants above the target mean.

This question was surprisingly difficult. Given the amount of time previously spent under Sales Pitch, the participants were expected to deduce the location of demo information. One went to Live Events and Archived Events before locating the Presentation section under Sales Pitch. Another went to Archived Events, logged in and finally received a hint to look under Sales Pitch. The third went to Learning Resources and Sponsor Events before locating Presentation through the Live Events tab. Finally, one went to Knowledge Exchange before entering the Sales Pitch.

Question C4: You would like to find some success stories from others that have participated in live events. What have others said about the ECB experience?

Three participants above the target mean.

The Success Stories can only be reached by using the mouseover menu on the Live Events tab. All who went above the target number of hops attempted to find this information within the discussion forum, the location for question C3. All were given the hint to move out of the forum and then an additional hint to look under Live Events. Of the participants who found the information using the acceptable number of hops, three of the five started by looking under the Sales Pitch. One of the five

was told to move out of the forum and then located the information, while one located the Success Stories by moving directly to it on the Live Events tab.

Question C5: On what date was Deloitte and Touche named as the title sponsor for ECB's Master's of the Internet conference?

Five participants above the target mean.

This question was also surprisingly difficult for 5 participants. Because the question is requesting the date for a particular occurrence, locating articles seemed logical.

Two participants, however, had to be reminded that the question was asking for a date while four were given the hint that the answer was located under the Sales Pitch. All five looked under Sponsor Events before locating the answer.

Besides observation notes, each participant's recorded actions and utterances and responses to the interview questions were analyzed to ascertain particular interface issues noticed by the participants as well as their suggestions for improvement. Three items were of particular note. First, three participants commented that their exploration of the site during the first session assisted them with locating the answers during the second session. Second, five participants thought the tab mouseover menus provided the most assistance when answering the questions. They relied heavily on these menus to browse the site without having to click on a particular link. As one participant stated, the tabs are "a really nice key feature that leads you to a lot of information." Another thought they prevented the user from "having to click all around." Several participants commented on the lack of mouseovers in the attendee registration and discussion forum areas because they wanted to see the options before clicking on a particular tab.

Third, the lack of a home link within the discussion forum and attendee registration area was problematic for all of the participants. After answering each set of questions, the participants were required to return to the home page. The first question set ended in the attendee registration area. Two participants tried clicking on the logo, which moved them to a page with the tab menu but a completely different look and feel than the standard home page. The other six participants returned to other areas of the site by clicking on the tabs and then utilized the home link from these areas.

In addition to specific interface issues, the participants also made a number of suggestions for site improvement.

- Add searching capability.
- Add an online demo. Currently, receiving a demo is "too much work."
- Enhance the home page by including more information "up front."
- Create an overview page under each tab, which would provide hyperlinks to the sections located within that tab.
- Combine the Archived Events and Live Events tabs to conserve space and create one location for all event information, both present and past.
- Eliminate the middle tabs (EMS, Knowledge Exchange and Learning Resources).
- Divide the Sales Pitch tab into two separate tabs, Company Overview and Sales Pitch. Place all company specific information (vision, team, careers, press room) under Company Overview, and place all sales information (demos, reasons to buy, clients) under Sales Pitch.

- Alter the current names provided on the tabs to be more descriptive of their contents. One stated, "I don't think the tabs give a good idea of the info they have under them." Another said, "Some of the names, which they have given for some of the pages, are misleading." Yet another said, "These tabs don't tell me anything unless I have been here ten times."

Discussion and Recommendations

Based upon the interview and usability study results, ten recommendations are suggested for improving the quality and overall usability of the ECB Web site. The first six pertain to the site as a whole while the last four focus on specific areas within the site.

1. The tab menu located on the top of each page should remain as a key feature of the site, and every page should include the mouseover functionality for these tabs. In the first session, seven participants commented on the tabs as a useful aspect of the site, while in the second session, five participants thought it was the most helpful navigation aid. However, while the tabs appear on every page, the mouseovers do not materialize in the discussion and registration areas. Because of their navigational benefit to users, the mouseovers should be included in these areas. After adjusting to the tab menus with mouseovers, it is frustrating for them not to appear when needed.
2. The site's audience should be more clearly defined and addressed by the content. Several participants mentioned the site's lack of audience focus, and three specifically suggested focusing on particular industries as a method of further defining the audience. As discussed by the technical director in Interview B, ECB is currently altering their business operations to concentrate more closely on five industries, financial services, information technology, professional services, communications and healthcare. This change in perspective can and should be demonstrated by the

- site's content and organization by incorporating separate pages or areas of the site to address the information seeking needs of these specific industries.
3. An online demo should be included. Four participants mentioned this need and suggested it as a method of creating informational value and adding interactivity.
 4. The ability to search the site using keywords should be included. Three participants mentioned this need. It would help first time users of the site to search for specific topics, and it would also assist repeat users to quickly locate needed information.
 5. The amount of text should be reduced and/or replaced by bullets or descriptive graphics. Three participants felt the amount of text within the site was too much.
 6. The site should be more intriguing and interactive. Given the QUIS results, the site was more dull than stimulating for the eight participants. Altering the color scheme is one method of injecting excitement into the site. One participant liked the current red and black scheme because it was pleasing to her eye, and the large amount of white space made the site easy to read. However, the scheme was considered as bland by two participants, and another two found the red overpowering. By adding a third or fourth color to the site, the site would still be easy to read, but would not be bland. And, the red would cease to be the focus. Color changes, however, will not solve the interactivity problem. Because ECB is selling interactive events, the participants expected to see something interactive on the site. Adding an online demo, as mentioned in recommendation three, would provide this interactivity.

7. As the focal point of the site, the home page should generate excitement as users enter the site and be accessible from all pages within the site. ECB's home page received comments from four participants, who considered it the ideal place for key information (selling points, customer success stories etc.) as well as an area to generate more excitement about the company and the site. Additionally, the home page should be a link from every page in the site. During the second session, users were asked to return to the home page between each set of questions. However, in the pages generated by Contigo, the event software provider, a link to the home page was not readily available, and six participants required assistance to move to home.
8. The Live Events and Archived Events tabs should be combined to form an Events area, and within this area, the user should be able to login one time and receive the benefits of both ECB's content and the content generated by Contigo. The distinction between current and past events was confusing for two participants when answering question B2 in session two. Both believed events held during the last year should be located under Archived Events when, in fact, they are located under Live Events. Additionally, the events listing occurs twice under Live Events, once within Featured Events/All Events and once within the registered attendee area (generated by Contigo). Instead of this variety, the user should be able to login once within an Events area and view future events in one section and past events in another. This one-time login should provide access to the events discussion forum; currently, the user must register separately to participate in the discussion. Finally, the provision to advertise a coming featured event, not past featured events, outside the registration area should also be included.

9. The Sales Pitch should be divided into two sections, Company Overview (About Us) and Sales Pitch. The current Sales Pitch area contains a significant amount of important information including company background, selling points, customer lists, demo information, employment information and press articles. Five participants commented on the need for this critical information to be displayed more prominently. By dividing the content into two tabs, the selling points and demo information for potential customers could be located within Sales Pitch while the general company information for site explorers and potential sponsors or investors could be located within Company Overview. Additionally, the revised Sales Pitch should include an updated Success Stories section, a category currently located under Live Events. When searching for these stories, three participants looked in the Sales Pitch first, while five people wanted the category to provide more information such as cited quotations and company-specific stories.
10. The Learning Resources, EMS, and Knowledge Exchange tabs should be either removed or consolidated into a Futures tab until they have been more fully developed. As previously discussed, the current site corresponds to the four parts of ECB's Knowledge Network: Master of the Internet events, simulcasting for associations, private label events for corporations and Knowledge Exchange/Knowledge Management. The three tabs mentioned above relate to pieces of this Knowledge Network but contain very little information. This lack of data was criticized by the participants in session one, and for this reason, these tabs were not included as part of the exercises in session two.

In addition to these ten recommendations on usability, four problems in the functionality of the site must be addressed.

1. Live Events Area - All of the links (books and pictures) within the All Events section should be functional.
2. Browser check – When this option is selected from Live Events, the browser will not allow the user to return to their previous page and opens multiple tab menu bars.
3. Browser type - When viewing the site with Netscape 4.6, the browser shuts down after 5 to 7 minutes on the site.
4. Registration - On the registration form, the required fields should be marked with an asterisk.

Summary and Conclusion

The focus of this research study was to evaluate whether the Web site of one e-commerce business, ECB, supports and manifests the company's business plan and to evaluate this site's usability according to user satisfaction and navigation efficiency measures.

To conduct this research, the study was divided into two phases. The first phase entailed interviews with ECB personnel to document and analyze their business model, Web site user population, user tasks and goals, and Web site organization. The results of the first phase were utilized to support phase two, which conducted an empirical usability test of the site. The test included 8 participants, selected as representatives of the user population, who took part in two sessions. The first session gauged user satisfaction and required each participant to browse ECB's Web site and provide his/her impressions. Their reactions were measured using the QUIS (Appendix G) and seven structured interview questions. The second session gauged navigation efficiency, which was measured by counting the number of hops a user required to complete a specified task within the Web site. It involved quantitative analysis of the number of hops taken compared with the number of acceptable hops for each task. Additionally, the participants answered a second set of structured interview questions, which, combined with their think aloud reactions, were analyzed qualitatively.

The research design involved several techniques, and as a whole, had several strengths. First, the phase one interviews provided the opportunity to work with ECB directly, to

learn about their business and their Web site face to face and in their working environment. Second, the study focused on determining the Web site's success as a communication medium for general users, that is, as a method for advertising services and soliciting participants, and as a business transaction medium for attendees and facilitators who come to the site to complete a particular task. Third, the usability study utilized two quantitative measures, user satisfaction and navigation efficiency, which collected a reasonable amount of data collection to gauge success. And fourth, the qualitative data collected through interviews and think aloud reactions provided for richness of data.

The design also had a number of limitations. First, the disadvantages of interviewing were discussed above, but they include lack of participant focus and time consumption. As I discovered, the interviewees had hectic schedules and many responsibilities, which made it difficult to attract their full attention during interviews. Second, during the usability sessions, each participant used the same browser on the same machine with a network connection to the Internet, which does not reflect the platform diversity of the ultimate user base. Finally, the sample size, while representative of the population, was small. Nielsen (2000), however, defends using small populations for usability studies. Given that the user populations under consideration (General, Attendees and Facilitators) were comparable in their information needs and habits, Nielsen's formula for conducting usability studies with small groups holds true in this study. He believes, "The best results come from testing no more than 5 users and running as many small tests as you can afford" (2000, n.p.). Thus, in keeping with Nielsen's claim, using 8 participants to run two tests provided accurate information about the usability problems of the site.

Given its strengths and limitations, the study supported the collection of data that has generated a number of interesting results. As expected, the interviews provided the business plan information as well as the user/task information to support the development of the second phase of the study, the empirical usability test of ECB's Web site. This test incorporated both qualitative and quantitative measures to identify specific issues and problems as well as trends and user tendencies. In particular, the subjective information provided by each participant's think aloud reactions and interview comments provided excellent insights regarding the site. The combination of the qualitative data and the indications provided by the quantitative results supported several recommendations for improving the quality and usability of the site, which were summarized in the Discussion and Recommendations section. It is hoped the data gathered from the study will assist ECB's Web site designer in making appropriate enhancements and alterations to the site for future users. Additionally, for a company wanting to advertise and deliver services from its Web site, the information synthesized by this study provides an excellent foundation for the development of the site as well as a methodology for testing its usability. Finally, as the business world continues to shift its attention to the Web, the results of this study can contribute to the development of general heuristics for e-commerce Web sites.

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Appendix A: Participant Consent Form - Interviews

Source: AA-IRB Manual, p. 33, Sample A
Academic Affairs Institutional Review Board (AA-IRB) of the University of North Carolina at Chapel Hill

Introduction to the Study:

You are invited to participate in a research study evaluating the business model and web site of ECB, an e-commerce business headquartered in the Southeast. Anna Kemp, a master's degree student at the University of North Carolina at Chapel Hill, is conducting this study.

Purpose:

The purpose of this study is to document ECB's business model in relation to their Web site and determine the usability of the resulting site. Data gathered from the study will assist the Web site designer in making appropriate enhancements and alterations to the site for future users.

What Will Happen During the Study:

1. You will be asked to participate in one to three interviews. Interview A (business model) is expected to last a maximum of two hours. Interview B will be divided into two sessions. The first session, user analysis, is expected to last a maximum of one hour and 30 minutes. The second session, task analysis, is expected to last a maximum of three hours. Interview C, a Web site walkthrough, is expected to last a maximum of three hours.
2. You will be asked questions regarding -
 - ECB's business model
 - ECB's Web site user population
 - the tasks/goals of those users
 - the organization of the Web site
3. The interviews will take place at ECB's headquarters.
4. You will be observed by the researcher during the interview, and you will be audio recorded.

If you have any questions or concerns about participating in this study, please call Anna Kemp at (919) 929-4685.

Your Privacy is Important:

- Every effort will be made to protect your privacy.
- Your name will not be used in any of the information obtained from this study or in any of the research reports.
- Your job title/function will be used in the research reports.
- The audio recordings of your participation will be used for internal purposes and will not be publicly released.

- Since efforts will be made to protect your privacy, we ask you to agree that we may use the information obtained from this research study in any way we think is best for publication or education.

Risks and Discomforts:

We are unaware of any personal risk or discomfort you will have from participating in this study.

Your Rights:

- You decide on your own whether or not you want to be in this study.
- You will not be treated any differently if you decide not to be in the study.
- If you decide to be in the study, you will have the right to stop being in the study at any time.

Institutional Review Board Approval:

The Academic Affairs Institutional Review Board (AA-IRB) of the University of North Carolina at Chapel Hill has approved this study. You may contact the UNC-CH Academic Affairs Institutional Review Board at the following address and telephone number at any time during this study if you have questions or concerns about your rights as a research participant:

Academic Affairs Institutional Review Board
 David A. Eckerman, Chair
 CB#4100, 201 Bynum Hall
 The University of North Carolina at Chapel Hill
 Chapel Hill, NC 27599-4100
 (919)962-7761, aa-irb@unc.edu

Summary:

I understand this is a research study to evaluate the business model and web site of ECB, an e-commerce business headquartered in the Southeast. If I agree to be in the study, several things will happen:

1. I will be asked to participate in one to three interviews. Interview A (business model) is expected to last a maximum of two hours. Interview B will be divided into two sessions. The first session, user analysis, is expected to last a maximum of one hour and 30 minutes. The second session, task analysis, is expected to last a maximum of three hours. Interview C, a Web site walkthrough, is expected to last a maximum of three hours.
2. I will be asked will be asked questions regarding -
 - ECB's business model
 - ECB's Web site user population
 - the tasks/goals of those users
 - the organization of the site
3. The interviews will take place at ECB's headquarters.
4. I will be observed by the researcher(s) while I use the web site, and I will be recorded.

I have had the chance to ask any questions I have about this study, and they have been answered for me. I have read the information in this consent form, and I agree to be in the study. There are two copies of this form. I will keep one copy and return the other to the investigator.

(Signature of Participant)

(DATE)

Appendix B: Schedule for Interview A

Thank you for participating in this group interview. The goal of the interview is to thoroughly document your current business plan.

- Describe the products and services you offer.
 - How do your offerings add value to the traditional educational model?
 - How do you take advantage of the Internet as a transactions channel?
- Describe your marketing and sales efforts.
 - How do you take advantage of the Internet as a communications channel?
- Describe the tools needed to facilitate your services.
- Describe the relationship between you and your customers.
 - Are you focused on creating a customized product for the user?
Why or why not?
 - In what ways is customer service paramount to your business?
- Describe the relationship between you and your content providers.
- How do you view your functional position in the e-commerce community?

Appendix C: Schedule for Interview B

Thank you for participating in this group interview. The goal of the interview is to thoroughly document your Web site user population and the tasks and goals of those users. The interview will be conducted in two parts. The first section will be the user analysis; it will cover three broad areas, scope of the user group, psychological characteristics and knowledge and experience. The second section will be the task analysis; it will cover the specific tasks and activities expected to occur on your Web site.

Scope of the User Group

What kinds of people currently utilize your web site?

What kind of setting do they work in? (corporate, educational, non-profit)

What are their job functions? (human resources, consultants)

Why do they come to your site?

* These should be broad goals.

Psychological Characteristics

What is the attitude of the user toward your site and its offerings?

What is the motivation level of the user to utilize your offerings?

Knowledge and Experience

What is the native language of the user?

What is the educational level of the user?

How would you rate the user's computer literacy?

Novice

Intermediate

Advanced

What is the user's level of similar experience?

What tasks/activities will the user want to accomplish when using the Web site?

Methods for Describing Each Task -

Frequency/Time

- Is use of the Web site mandatory or discretionary?
- How frequently will the task be performed?
- Are there any time constraints on the task?

Environment/Context

- How important is the task to the user in relation to his/her other tasks?
- Where will the task be performed?
- What other tools does the user have?

Complexity/Difficulty

- How complex is the task? How difficult is the task?
- How structured is the task?
- What training will be provided? How is the task learned?
- What happens when things go wrong?

Appendix D: State Transition Diagrams

(see attached)

Appendix E: Participant Consent Form - Usability Study

Source: AA-IRB Manual, p. 33, Sample A
Academic Affairs Institutional Review Board (AA-IRB) of the University of North Carolina at Chapel Hill

Introduction to the Study:

You are invited to participate in a research study evaluating the use of a Web site containing information about ECB, an e-commerce business based in the Southeast. This site functions as ECB's primary communication and business transaction medium. Anna Kemp, a master's degree student at the University of North Carolina at Chapel Hill, is conducting this study.

Purpose:

The purpose of this study is to determine user satisfaction and navigation efficiency on ECB's Web site. Data gathered from the study will assist the Web site designer in making appropriate enhancements and alterations to the site for future users, as well as generate usability principles for similar sites.

What Will Happen During the Study: The study will occur over two sessions.

1. During the first session, the following activities will occur -
 - You will be asked to complete a background questionnaire containing demographic questions (age, gender etc.) and questions regarding your current level of Internet use.
 - You will be asked to browse the Web site for up to 30 minutes.
 - You will be asked to complete a questionnaire regarding your satisfaction with the performance of the site.
 - You will be asked seven free answer questions regarding your experience with the web site.
2. During the second session, the following activities will occur -
 - You will be asked to locate the answers to a series of questions regarding ECB on their Web site. These questions may include locating information about the founders, the business, their services, and their interactive discussion area.
 - You will be asked four free answer questions regarding your experience with the web site.
3. Both sessions will take place in the Interaction Design Lab using the Internet connection and browser provided.
4. During both sessions you will be asked to speak aloud regarding your impressions and your actions.
5. You will be observed by the researcher while you use the web site, you will be audio recorded, and you will be video recorded.

If you have any questions or concerns about participating in this study, please call Anna Kemp at (919) 929-4685.

Your Privacy is Important:

- Every effort will be made to protect your privacy.
- Your name will not be used in any of the information obtained from this study or in any of the research reports.
- The audio and video recordings of your participation will be used for internal purposes and will not be publicly released.
- Since efforts will be made to protect your privacy, we ask you to agree that we may use the information obtained from this research study in any way we think is best for publication or education.

Risks and Discomforts:

We are unaware of any personal risk or discomfort you will have from participating in this study.

Your Rights:

- You decide on your own whether or not you want to be in this study.
- If you decide to be in the study, you will have the right to stop being in the study at any time.

Institutional Review Board Approval:

The Academic Affairs Institutional Review Board (AA-IRB) of the University of North Carolina at Chapel Hill has approved this study. You may contact the UNC-CH Academic Affairs Institutional Review Board at the following address and telephone number at any time during this study if you have questions or concerns about your rights as a research participant:

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David A. Eckerman, Chair
CB#4100, 201 Bynum Hall
The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-4100
(919)962-7761, aa-irb@unc.edu

Summary:

I understand this is a research study to evaluate the performance of a Web site for ECB. If I agree to be in the study, several things will happen:

1. I will be asked to participate in two study sessions.
2. During the first session, I will participate in the following activities -
 - I will be asked to complete a background questionnaire containing demographic questions (age, gender etc.) and questions regarding my current level of Internet use.
 - I will be asked to browse the Web site for up to 30 minutes.
 - I will be asked to complete a questionnaire regarding my satisfaction with the performance of the site.
 - I will be asked seven free answer questions regarding my experience with the web site.

3. During the second session, I will participate in the following activities -
 - I will be asked to locate the answers to a series of questions regarding ECB on their Web site. These questions may include locating information about the founders, the business, their services, and their interactive discussion area.
 - I will be asked four free answer questions regarding my experience with the web site.
4. Both sessions will take place in the Interaction Design Lab using the Internet connection and browser provided.
5. During both sessions, I will be asked to speak aloud regarding my impressions and my actions.
6. I will be observed by the researcher while I use the web site, I will be audio recorded, and I will be video recorded.

I have had the chance to ask any questions I have about this study, and they have been answered for me. I have read the information in this consent form, and I agree to be in the study. There are two copies of this form. I will keep one copy and return the other to the investigator.

(Signature of Participant)

(DATE)

Appendix F: Internet Background Questionnaire

Source: GVU's 10th WWW User Survey, www.gvu.gatech.edu/user-surveys/
 Copyright 1994-1998 Georgia Tech Research Corporation. All rights reserved.

The recipient agrees to obey all U.S. Government restrictions governing redistribution or export of such information. These restrictions may apply to redistribution within an international organization.

Instructions: Please answer the following 12 questions truthfully. Your answers will be used to describe the background of the study participants as a group and will not be associated with you in any way. If you have questions regarding the questionnaire, please ask Anna Kemp, the principal researcher. Thank you.

1. Age: ___ 16-20 ___ 46-50
 ___ 21-25 ___ 51-55
 8 26-30 ___ 56-60
 ___ 31-35 ___ 61-65
 ___ 36-40 ___ 66-70
 ___ 41-45 ___ 71-75

2. Gender: 4 M 4 F

3. Please indicate the highest level of education completed.

___ Grammar School

___ High School (or equivalent)

___ Vocational/Technical School

___ Some College

8 College Graduate (4 year)

___ Master's Degree

___ Doctoral Degree

___ Professional Degree (MD, JD)

___ Other, _____

4. Which of the following categories best describes the **industry** you expect to work in (regardless of your actual position)?

Check here if you are _____ Retired or _____ Unemployed

- | | |
|---|--|
| ___ Agriculture, Forestry, Fishing, Hunting | ___ Mining |
| ___ Utilities | ___ Construction |
| ___ Computer, Electronics Manufacturing | <u>1</u> Other Manufacturing |
| ___ Wholesale | <u>1</u> Retail |
| ___ Transportation and Warehousing | ___ Publishing |
| ___ Software | <u>2</u> Telecommunications |
| ___ Information Services, Data Processing | ___ Broadcasting |
| ___ Other Information Industry | ___ Finance and Insurance |
| ___ College, University, Adult Education | ___ Real Estate, Rental and Leasing |
| ___ Primary/Secondary (K-12) Education | ___ Other Education Industry |
| <u>1</u> Health Care and Social Assistance | ___ Arts, Entertainment, and Recreation |
| ___ Hotel and Food Services | ___ Government and Public Administration |
| ___ Legal Services | ___ Scientific or Technical Services |
| ___ Homemaker | ___ Military |
| ___ Religious | <u>3</u> Other, _____ |

5. Have you been involved with any online learning activity in the past year? If so, in what capacity (i.e. organizer, participant)?

6. How comfortable do you feel using computers, in general?

- Very comfortable
- Somewhat comfortable
- Neither comfortable nor uncomfortable
- Somewhat uncomfortable
- Very uncomfortable

7. How comfortable do you feel using the Internet?

- Very comfortable
- Somewhat comfortable
- Neither comfortable nor uncomfortable
- Somewhat uncomfortable
- Very uncomfortable

8. How long have you been using the Internet (including using email, gopher, ftp, etc.)?

- Less than 6 months
- 6 to 12 months
- 1 to 3 years
- 4 to 6 years
- 7 years or more

9. How often do you use the Internet . . .

From home (including a home office)

7 Daily 1 Weekly ___ Monthly ___ Less than once a month Never

From school

8 Daily ___ Weekly ___ Monthly ___ Less than once a month ___ Never

From work

3 Daily ___ Weekly 1 Monthly ___ Less than once a month 4 Never

From a public terminal (i.e. a library)

___ Daily 1 Weekly ___ Monthly 2 Less than once a month 5 Never

From another location, _____

___ Daily ___ Weekly ___ Monthly 3 Less than once a month 5 Never10. What do you primarily use the Web for? (*Please check all that apply.*)6 Education7 Shopping/gathering product information3 Entertainment7 Work/Business3 Communication with others (not including email)8 Gathering information for personal needs4 Wasting time

___ Other

11. Please check all activities you have performed online:

- 8 ordered a product/service from a business, government or educational entity by filling out a form on the web
- 6 made a purchase online for more than \$100
- 7 created a web page
- 6 customized a web page for yourself (e.g. MyYahoo, CNN Custom News)
- 5 changed your browser's "startup" or "home" page
- 3 changed your "cookie" preferences
- 5 participated in an online chat or discussion (not including email)
- 5 listened to a radio broadcast online
- 3 made a telephone call online
- 4 used a nationwide online directory to find an address or telephone number
- 4 taken a seminar or class about the Web or Internet
- 3 bought a book to learn more about the Web or Internet

12. Would you use the Internet for an educational activity? Why or why not?

Appendix G: User Satisfaction Questionnaire

Source: The Questionnaire for User Interaction Satisfaction
Human-Computer Interaction Lab, University of Maryland, College Park

Instructions: Please circle the numbers which most appropriately reflect your impressions about using this computer system. Not Applicable = NA. If you have questions regarding the questionnaire, please ask Anna Kemp, the principal researcher.

PART 3: Overall User Reactions

3.1	Overall reactions to the system:	terrible 1 2 3 4 5 6 7 8 9	wonderful 1 2 3 4 5 6 7 8 9	NA
3.2		frustrating 1 2 3 4 5 6 7 8 9	satisfying 1 2 3 4 5 6 7 8 9	NA
3.3		dull 1 2 3 4 5 6 7 8 9	stimulating 1 2 3 4 5 6 7 8 9	NA
3.4		difficult 1 2 3 4 5 6 7 8 9	easy 1 2 3 4 5 6 7 8 9	NA
3.5		inadequate power 1 2 3 4 5 6 7 8 9	adequate power 1 2 3 4 5 6 7 8 9	NA
3.6		rigid 1 2 3 4 5 6 7 8 9	flexible 1 2 3 4 5 6 7 8 9	NA

PART 4: Screen

4.1	Characters on the computer screen	hard to read 1 2 3 4 5 6 7 8 9	easy to read 1 2 3 4 5 6 7 8 9	NA
4.1.1	Image of characters	fuzzy 1 2 3 4 5 6 7 8 9	sharp 1 2 3 4 5 6 7 8 9	NA
4.1.2	Character shapes (fonts)	barely legible 1 2 3 4 5 6 7 8 9	very legible 1 2 3 4 5 6 7 8 9	NA
4.2	Highlighting on the screen	unhelpful 1 2 3 4 5 6 7 8 9	helpful 1 2 3 4 5 6 7 8 9	NA
4.2.1	Use of reverse video	unhelpful	helpful	

		1 2 3 4 5 6 7 8 9	NA
4.2.2	Use of blinking	unhelpful helpful 1 2 3 4 5 6 7 8 9	NA
4.2.3	Use of bolding	unhelpful helpful 1 2 3 4 5 6 7 8 9	NA
4.3	Screen layouts were helpful	never always 1 2 3 4 5 6 7 8 9	NA
4.3.1	Amount of information that can be displayed on screen	inadequate adequate 1 2 3 4 5 6 7 8 9	NA
4.3.2	Arrangement of information on screen	illogical logical 1 2 3 4 5 6 7 8 9	NA
4.4	Sequence of screens	confusing clear 1 2 3 4 5 6 7 8 9	NA
4.4.1	Next screen in a sequence	unpredictable predictable 1 2 3 4 5 6 7 8 9	NA
4.4.2	Going back to the previous screen	impossible easy 1 2 3 4 5 6 7 8 9	NA
4.4.3	Progression of work related tasks	confusing clearly marked 1 2 3 4 5 6 7 8 9	NA

Please write your comments about the screens here:

PART 5: Terminology and System Information

5.1	Use of terminology throughout system	inconsistent 1 2 3 4 5 6 7 8 9	consistent	NA
5.1.2	Work related terminology	inconsistent 1 2 3 4 5 6 7 8 9	consistent	NA
5.1.3	Computer terminology	inconsistent 1 2 3 4 5 6 7 8 9	consistent	NA
5.2	Terminology relates well to the work you are doing?	always 1 2 3 4 5 6 7 8 9	never	NA
5.3	Messages which appear on screen	inconsistent 1 2 3 4 5 6 7 8 9	consistent	NA
5.3.1	Position of instructions on the screen	inconsistent 1 2 3 4 5 6 7 8 9	Consistent	NA
5.4	Messages which appear on screen	confusing 1 2 3 4 5 6 7 8 9	clear	NA
5.4.1	Instructions for commands or functions	confusing 1 2 3 4 5 6 7 8 9	clear	NA
5.4.2	Instructions for correcting errors	confusing 1 2 3 4 5 6 7 8 9	clear	NA
5.5	Computer keeps you informed about what it is doing	never 1 2 3 4 5 6 7 8 9	always	NA
5.5.1	Animated cursors keep you informed	never 1 2 3 4 5 6 7 8 9	always	NA
5.5.2	Performing an operation leads to a predictable result	never 1 2 3 4 5 6 7 8 9	always	NA
5.5.4	Length of delay between operation	unacceptable 1 2 3 4 5 6 7 8 9	acceptable	NA

5.6 Error messages	unhelpful	helpful	
	1 2 3 4 5 6 7 8 9		NA

Please write your comments about terminology and system information here:

PART 6: Learning

6.1 Learning to operate the system	difficult	easy	
	1 2 3 4 5 6 7 8 9		NA
6.1.1 Getting started	difficult	easy	
	1 2 3 4 5 6 7 8 9		NA
6.1.2 Learning advanced features	difficult	easy	
	1 2 3 4 5 6 7 8 9		NA
6.1.3 Time to learn to use the system	slow	fast	
	1 2 3 4 5 6 7 8 9		NA
6.2 Exploration of features by trial and error	discouraging	encouraging	
	1 2 3 4 5 6 7 8 9		NA
6.2.1 Exploration of features	risky	safe	
	1 2 3 4 5 6 7 8 9		NA
6.2.2 Discovering new features	difficult	easy	
	1 2 3 4 5 6 7 8 9		NA
6.3 Remembering names and use of commands	difficult	easy	
	1 2 3 4 5 6 7 8 9		NA
6.4 Tasks can be performed in a straight-forward manner	never	always	
	1 2 3 4 5 6 7 8 9		NA

Appendix H: Task Attributes

- Tasks one and two pertain to general users.

Task Number 1 - What is ECB?

Paul Moore works for a mid-size consulting firm in their training division. His boss asked him to investigate lower-cost training methods. Because Paul believes that computerized training may be a possibility, he does a search on the Internet for training opportunities. ECB is one of the links retrieved by his search.

Task Number 2 - How can ECB benefit my company?

Sara Jones just received a postcard brochure from ECB advertising their upcoming Tom Peters event. She works for a large bank in human resources and realizes a number of employees may be interested in this presentation. She notices ECB's Web address and decides to find out more about the company and what they have to offer.

- What are the time constraints on the tasks?

Typically these tasks will not be constrained by time because they focus on gathering information, which the user may or may not use to support another task.

- Is system use mandatory or discretionary?

System use is discretionary.

- How important are the tasks?

Because the goal of each task is to locate information, the importance of this information to the user depends on how it will be used. If a user's job (e.g. a corporate training coordinator) relies on finding the information, the task will be very important. If the user is surfing the Internet, the task may be less important.

- Where are the tasks performed?

The task will typically be performed in an office or a home.

- What is the relationship between the users and the data?

The user is attempting to gather information that may be utilized to support another task outside the system.

- What other tools does the user have?

The user typically has access to a telephone and a computer.

- What is the turnover rate among users?

The user performing these tasks will change on a daily basis.

- How complex are the tasks? How difficult are the tasks?

The tasks are not complex. It can be difficult to locate the original information source, but once it has been located, the tasks can be completed with ease.

- How structured are the tasks?

The tasks are mainly unstructured because the user can utilize numerous methods to retrieve the information. Additionally, each time the task is performed, a different method may be used.

- What training will be provided? How are the tasks learned?

The tasks are learned by trial and error and/or repetition.

- What happens when things go wrong?

If the user initially receives incorrect information, s/he will need to repeat the task activities. If the user forgets/loses the information, s/he will need to repeat the task activities.

- Tasks 3-4 pertain to actions performed by the attendees. The facilitator population may or may not perform these tasks depending on their level of interest in ECB beyond the facilitating process.

Task Number 3 - Attending an event.

Sally Stone, a software designer, has signed up to participate in an ECB online learning activity. She will participate in the event with a group organized by the facilitator, John Trow. However, she would like to know more about the speaker, and John suggests registering on the ECB Web site and reviewing the attendee information.

Task Number 4 - Participating in an Online Discussion

Jack Spear attended an online event yesterday and would like to ask a follow-up question. He goes to the Web site address provided during the event and locates the discussion forum. After reviewing some of the forum posts, he decides to ask his question. He then realizes he must register to contribute to the discussion.

- What are the time constraints on the tasks?

Typically these tasks will not be constrained by time because they focus gathering information and participating at the user's pace.

- Is system use mandatory or discretionary?

System use is mandatory.

- How important are the tasks?

Because the goal of each task is to participate in either an event or a discussion, the importance of completing the task will likely be high. If the user has spent

money to attend the event, it will be very important. If the user is contributing to the online discussion, the task may be less important.

- Where are the tasks performed?

The task will typically be performed in an office.

- What is the relationship between the users and the data?

The user is attempting to gain information that will be used to support a task within the system.

- What other tools does the user have?

The user typically has access to a telephone and a computer.

- What is the turnover rate among users?

The user performing these tasks will remain constant. Users will be added daily.

- How complex are the tasks? How difficult are the tasks?

The tasks are not complex. It can be difficult to locate the appropriate location at which to complete the task, but the tasks themselves can be completed with ease.

- How structured are the tasks?

The tasks are structured because the user must follow the prescribed guidelines for registering and participating in the discussion forum.

- What training will be provided? How are the tasks learned?

The tasks are learned by trial and error and/or repetition. Alternatively, a facilitator may train the attendee.

- What happens when things go wrong?

If the user receives incorrect information, s/he will need to repeat the task or call ECB. If the user forgets/loses the information, s/he will need to repeat the task.

- Tasks 5-6 specifically pertain to facilitators.

Task Number 5 - Training to Host an Event

Jane Briggs, an executive secretary, has been asked to organize 12 people to attend an online ECB event. She notifies ECB that she is the facilitator, receives the facilitator's materials, and attends the online facilitator training class.

Task Number 6 - Hosting an Event

Now that she has been trained, Jane must host the event. She needs to schedule the conference room and contact audio-visual to ensure the appropriate equipment will be available. She also invites her attendees and prepares a follow-up satisfaction questionnaire. The day of the event, she must log in to the ECB event server and actively participate with her attendees.

- What are the time constraints on the tasks?

Typically tasks are constrained by time because they focus gathering information for an event that will be held at a specific time.

- Is system use mandatory or discretionary?

System use is mandatory.

- How important are the tasks?

Because the goal of each task is to organize an event for multiple people, the importance of this information to the user will likely be high.

- Where are the tasks performed?

The task will typically be performed in an office.

- What is the relationship between the users and the data?

The user is attempting to gain information that will be used to support a task within the system.

- What other tools does the user have?

The user must have access to a telephone and a computer.

- What is the turnover rate among users?

The user performing these tasks will be the same, and additional users will be added daily.

- How complex are the tasks? How difficult are the tasks?

The tasks are not complex. It can be difficult to locate the appropriate location at which to complete the task, but the tasks themselves can be completed with ease.

- How structured are the tasks?

The tasks are structured because the user must follow the prescribed guidelines for participating in an event.

- What training will be provided? How are the tasks learned?

Yes. ECB provides a facilitator's guide and extensive online information.

- What happens when things go wrong?

If the user initially receives incorrect information, s/he will need to repeat the task activities or call ECB. If the user forgets and/or loses the information, s/he will need to repeat the task activities.

Appendix I: Navigational Efficiency Test

Question	Tab Menu	Left Menu	Target	Reasoning	Mean
A1. Who are the founders of ECB?	1 - SP	2 SP Team	2	Given the tab menu options, Sales Pitch is the most logical place to look for company information.	1.75
A2. Is Belk Stores an ECB customer?	1 - SP Client	1 Industry	2	The participant should recognize that s/he is in the correct area (Sales Pitch) for company information. However, s/he may consider Press Room as a viable option, which would add a hop to the count.	1.13
A3. Why is ECB different from other online learning opportunities?	1 - SP Why	2 Present Why	3	It is not obvious where to look for this answer. Given the previous answer locations, the Sales Pitch would be the most likely place, but the participant may consider the Overview before looking under Presentation.	3.63
A4. Does ECB have any marketing jobs available?	1 - SP Careers	2 About Careers	2	After answering the three previous questions within the Sales Pitch area, the participant should either remember seeing the Careers section or deduce its location.	2.13
A5. Do you have to login to review ECB's archived events?	1 - AE	2 Home AE	2	One of the tab menus is called Archived Events. The participant should recognize it immediately.	1.38

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Question	Tab Menu	Left Menu	Target	Reasoning	Mean
B1. How much does it cost to attend a Tom Peters event?	1 Link	1 Link	1	This is one of three featured links on the home page. It is meant to be noticed.	2.25
B2. Name two other events offered by ECB in the last year.	1 - LE All	1 All	2	The participant may look at Archived Events first. Otherwise, s/he should notice the All Events heading on the left side of the screen or utilize the Live Events tab to locate Find All Events.	2.25
B3. You want to attend an event. You realize you must register as a site user first. Register yourself online.	3 - LE Attend Login Register	4 Participate Attend Login Register	5	Although the question provides a significant clue that the answer is located under Attend, the participant may not recognize the hint immediately and search for a registration area instead.	4.50
B4. Now that you are registered, how many events are being held in May?		1 Schedule	1	Once the registration has been completed, a menu appears in the middle of the screen with seven options. View Scheduled Events is one of the options.	2.13
B5. You are the facilitator for an event. What size monitor does ECB recommend?	3 LE Participate Room	3 LE Participate Room	4	Because the participant is still in the registered user area, finding the facilitator information under Live Events may require an additional hop.	4.38
B6. You have moved and need to update your address in your ECB profile.	3 - LE Attend Login Profile	3 Attend Login Profile	4	This question is a memory exercise. The participant should have learned the location of the profile when registering in question B3 and reviewing the attendee menu in B4.	4.25

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Question	Tab Menu	Left Menu	Target	Reasoning	Mean
C1. I want to see a demo of ECB's service. How do I obtain a demo code?	1 – SP Presentation	2 SP Presentation	2	This question is a memory exercise. The participant should either remember seeing the Presentation option under Sales Pitch or realize the Sales Pitch contains this kind of information.	2.25
C2. You have attended a live event and you would like to view the post-event discussion. Search for messages that contain the key words "return call." Who posted the message?	3 – LE Discussion Search Find	4 LE Follow-up Search Find	5	The participant may look under Archived Events before looking in Live Events for the discussion forum.	4.5
C3. You would like to update your discussion forum preferences to show topics from the last 45 days. After this preference is submitted, where are you?	NA	3 Return Preferences Submit	3	After locating the answer to the previous question, the participant should either remember seeing the Preference option or deduce its location	3
C4. You would like to find some success stories from others that have participated in live events. What have others said about the ECB experience?	2 LE Success	CANNOT From LE	3	It is not obvious where to look for this answer. The Sales Pitch would be the most likely, but incorrect, location. Additionally, the left menu does not include Success Stories as an option. The participant must rely on the Live Events tab to locate this information.	4
C5. On what date was Deloitte and Touche named as the title sponsor for ECB's Master's of the Internet conference?	1 – SP Press Room	2 SP Press Room	3	This question is a memory exercise. The participant should either remember seeing the Press Room or realize the Sales Pitch contains this kind of information. However, s/he may target Sponsor Events as an option for this information, which would add a hop to the count.	3.75

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