I. Introduction

Technology has changed the ways that business is conducted. As electronic commerce becomes a larger form of business, the technology and interface that is used needs to be more friendly and easier to use. The following paper will attempt to discuss these issues.

Section II of the paper will give a brief background of electronic commerce and its potential. Section III will compare different web site genres and how they attempt to attract customers to their sites. This section will also discuss how other e-commerce companies are attempting to make the customers Internet experience and usage more enjoyable and efficient. Section IV will discuss what the future of e-commerce may look like through the products of a company called Extempo Systems whose intelligent agent's technology may allow for new applications in the marketplace. Section V will conclude the paper.

II. Electronic Commerce

Commerce has evolved over the times due to technology. Take for example, Sears Roebuck who was a company that was started in 1886 originally as a watch retailer. Sears realized how the country was populated sporadically, which led them to pioneer the mail order catalogs. As the country settled down and mass transportation such as the automobile became more prevalent, Sears started its first retail chain in 1925. More recently, the company has embraced the Internet and made their products available over the Internet. This example shows how technology can change consumer behaviors. The introduction of the postal system allowed mail order catalogs to be successful. The advent of automobiles and the freeway system allowed retail chains to be more accessible to consumers. And now the proliferation of the Internet has allowed e-commerce to take off.

An example of the success of e-commerce is Dell Computer's direct buying strategy. The company was started in 1984 as a direct seller of computers. Most of these sales were conducted over the phone and mail order. With the spread of the Internet, Dell has moved more of its sales to the Internet. About fifty percent of the company's sales and technical support are done through the Internet now.

Dell's example exemplifies what e-commerce is, the buying and selling of products and services by businesses and consumers over the Internet. Having transactions over the Internet will reduce transaction costs. The Internet will enable more transactions to occur. For example, Amazon will be able to give its visitors information about what other people who ordered a certain book also purchased, which could lead to more sales. A traditional brick and mortar bookstore would not be able to do this. Another benefit of e-commerce is that services and products can be integrated into a more complete cycle. For example, a Dell customer can now purchase his computer, check his computer's shipping information, obtain customer support, and purchase any other accessories all from Dell's web site. Previously, the customer may have had to buy his computer from

one retailer and obtain support through the phone. In other words, the process was not as smooth and convenient as the current model. Other benefits of e-commerce is that consumers can shop 24 hours, customize products, compare prices, obtain more information, and have a better relationship with the seller.

E-commerce can be broken down into three categories – business to business, business to consumer, and consumer to consumer. The Sears and Dell examples demonstrated business to consumer e-commerce. Consumer to consumer e-commerce occurs when individuals make transactions among themselves. Ebay is probably the most well known consumer to consumer e-commerce company. Business to business e-commerce is when businesses make transactions among themselves. According to the Forrester Research Group, all three categories will make up a 1.3 trillion dollar market by the year 2003. Of that 1.3 trillion dollars, ten percent will represent the business to consumer and consumer to consumer segments.

Regardless of how you classify these e-commerce companies, they all can be classified as an infomediary. An infomediary is a combination of an information provider and intermediary whose purpose is to be a market for buyers and sellers by providing the necessary information and transaction mechanisms. The result is a greater amount of efficiency and cost savings for all participants. Defining what an infomediary is important because the next section will compare business to consumer e-commerce companies. Essentially, all these companies want to become an infomediary in some way.

III. Comparison of Web Sites

According to Chapter 6 of "Social Influence", four mechanisms of social influence exist. The most obvious influential method is explicit pressure, which uses incentives, threats, requests, or demands to obtain compliance. The second method is implicit pressure, which is pressure through what people think other's expectations are. The third method is environmental pressure, which occurs though the physical structure of the setting. The final method is persuasive pressure, which is the use of words to influence another's opinions or feelings. Explaining these social influence mechanisms is important since they will be applied to how certain e-commerce genres influence their potential customers. The first genre will be the incentives e-commerce companies who use explicit pressure by giving financial reward to their users. The second group will be the medical e-commerce companies who use persuasive pressure by providing expert advice and information. The third comparison is among the woman's e-commerce companies who use implicit pressure by using social norms and expectations of women. The last subsection is about how other e-commerce companies use different strategies in obtaining customers.

Incentives E-commerce Comparison

Cybergold allows consumers to earn cash online that can be deposited into their checking account, use it to pay off credit card balances, or buy items on the Cybergold Spend pages. The company claims to be the only place in the world where money earned online can be spent online. Cybergold brings advertisers who use incentives-based marketing its community of demographically desirable consumers. The company offers members a multitude of services such as search, chat, email and games.

MyPoints allow their customers to earn points every time they are on the Internet. The company finds out what you like and will tailor offers to those specific interests with points. These points can be then redeemed. The company has a program called BonusMail, which sends emails to customers. Customers will be rewarded with points

for just reading these messages. If the customers take advantage of these messages, then they will receive more points. The different methods of earning points include shopping with specific vendors, reading those email messages, filling out surveys, taking advantage of trial offers, checking out web sites, and referring friends to the program. With these points, the customer can redeem them from a specific list of vendor partners.

Netcentives develops online rewards and loyalty programs that lead to marketing solutions that maximize the consumer-merchant relationship. The company uses its technology to allow companies to efficiently target and reward their audiences. Netcentives provides ClickRewards, which is the only Web loyalty program to reward consumers with frequent flyer miles on all ten major U.S. airlines. By shopping with merchants in the Netcentives network, customers will earn frequent flyer miles. Netcentives also offers ClickRewards@Work that rewards frequent flyer miles to employees, partners, vendors or anyone else through a company's intranet, extranet or the Internet.

All three companies utilize incentives as the main way of attracting customers. The distinguishing factor between these companies and any other e-commerce companies who provide rewards or incentives would be their network and rewards. So, if a customer likes the vendor companies that Cybergold provides more than MyPoints, then he will be more likely join Cybergold. However, if a customer were interested in only obtaining more frequent flyer miles, then he would join Netcentives over Cybergold. As a result, the rewards and relationships that these incentives e-commerce companies have may be more important than their services since they all have the basic user interface and concept. One final note is that all three companies have a privacy policy that ensures the customers that his personal information will not be distributed or sold.

Medical E-commerce Comparison

drkoop.com is based on the vision of Dr. C. Everett Koop, the former U.S. Surgeon General, who believes that people should be empowered to better manage their personal health with comprehensive, trusted information. The company strives to be the most

trusted and complete source of consumer healthcare information and services on the Internet. drkoop.com is a consumer-focused interactive Web site that provides users with comprehensive healthcare information on a wide variety of subjects, as well as access to medical databases, other publications, real-time medical news, interactive communities, interactive tools and opportunities to purchase healthcare-related products and services online. The company provides information content from well established health-related institutes, has interactive communities that allow users to share experiences with others, provides online transactions of medical products and services, and has interactive tools that allow consumers to search for drug information.

drugstore.com, inc. is a leading online drugstore: a retail store and information site for health, beauty, wellness, personal care, and pharmacy products. The company offers thousands of brand-name products, has in-depth product information, allows customers to interact with customer service representatives by phone or e-mail, offers private e-mail access to pharmacists and beauty experts. The company has strategic relationships with Rite Aid Corporation and General Nutrition Companies, Inc. (GNC), which allows customers to order prescription drugs online for same-day pickup at a conveniently located Rite Aid drugstore and the exclusive right to be the online provider of GNC-branded products.

WebMD is the first end-to-end Internet healthcare company connecting physicians and consumers to the entire healthcare industry. The company's mission is to lead the evolution of healthcare and empower its participants by delivering revolutionary improvements to the way physicians, consumers, and healthcare institutions communicate, share information, and conduct transactions. The company has partnerships with strategic healthcare, technology, and media partnerships to promote its services. Physicians and other healthcare providers use WebMD services to simplify the clinical and business process of healthcare and to achieve timely access to information, faster and more convenient service, and the ability to deliver higher-quality and more affordable care. The company also supports a healthy doctor and patient relationship by connecting physicians and consumers to the healthcare industry.

All three companies utilize persuasive pressure as the main way of attracting customers. drkoop.com has the former surgeon general, drugstore.com has partnerships with Rite Aid and GNC, and WebMD has strategic partnerships with various companies. The average person takes his personal health issues and concerns quite seriously. As a result, the most successful medical e-commerce companies will have to have a solid reputation of having dependable information and resources for their customers. Ease of use and aesthetics of the web site will probably be less important than the information content and reputation.

Woman's E-commerce Comparison

iVillage is the leading women's network online providing practical solutions and everyday support for women between the ages of 25 and 54. iVillage.com is organized into branded communities that focus on issues of most importance to women and provide interactive services, peer support and online access to experts through 15 content channels and several shopping areas. The company portrays women as a main reason for Internet growth. Women comprise 45% of all Internet users according to Jupiter, control or influence over 80% of all purchase decisions according to Ad Age, and will account for approximately 47% of online sales by 2000 according to Jupiter.

oxygen.com is a blend of web sites and TV that's designed to serve women better than they've ever been served before. The company has different sites that focus on typical women issues such as health, cooking, marriage, and other issues. The company plans to have a TV complement that will leverage the Internet and TV into a powerful tool for women's personal and professional growth. The company also has as its investors, omni-media talk show host Oprah Winfrey and the Carsey-Werner-Mandabach Company who have produced shows that include Roseanne, Third Rock from the Sun, and more. As a result, oxygen.com can leverage these additional resources.

Women.com is a leading network for wired women who were the first online company to recognize the potential of women on the Web. The company's goal is to provide a unique

blend of content, community, commerce and services that serves the diverse needs of today's online woman. The company's network is comprised of more than 100,000 pages of content organized into 20 topical channels, including career, entertainment, family, health, home, horoscopes, garden, pregnancy, technology and Internet, and weddings. The company is also a proprietary newsstand that features thirteen of the world's leading women's magazines.

All three companies utilize implicit pressure as the main way of attracting visitors. Many of the issues and topics that these sites deal with are ones that are imposed upon them through implicit pressure. For example, diets, infidelity, and financial independence are topics that are covered fairly extensively by all three sites. All three sites have similar user interface and ease of use standards. As a result, the most successful woman's e-commerce companies will have to be able to relate to most women's needs and issues.

Other E-commerce Companies

Abacus provides its members with consumer buying information, technology and statistical modeling in an effort to substantially improve the profitability and performance of its consumer development programs. Abacus estimates that it saved its members over $25 million in postal and other charges by indicating customers who were highly unlikely to respond to a member's mailing, thus reducing the amount of unwanted mail to consumers. DoubleClick, who is the global Internet Advertising Solutions company that make advertising work on the Internet for Web publishers and Web advertisers, recently bought out Abacus.

Alexa learns and improves over time with the collective participation of its users. Alexa is the first Internet software product that learns from people. This intelligent navigation service provides a continuous source of relevant recommendations of where to go next on the Web. Alexa's technology provides a new approach to a major problem with the Internet, the inability to find information quickly and easily. The company was recently bought out by America Online.

Deja.com has a similar idea as Alexa. The company offers visitors the opportunity to engage in meaningful discussions on a plethora of topics, reference ratings from peers on thousands of products and services to help make buying decisions, and guide their way through the online retailing maze through contextual e-commerce links.

R U Sure has the mission to alleviate the time consuming burden of online shopping and help the shopper find exactly what he is looking for at the best available price. Currently, in order to conduct comparative shopping the user must go to a comparative shopping site, pursue a search, and then go to the specified site. R U Sure's goal is to lessen the burden of online shopping by supplying all the tools needed to shop efficiently and economically. The company has a shopping agent that helps find better prices on the Internet for the desired products. The shopping agent will be the companion and guide while the customer shops, and will be on the lookout for the best deals and provide the shopper with comparative and competitive prices.

All these companies have different models and missions. Abacus's products are not even obvious to end-users. However, its products will allow web users to be better matched to advertisers' products and services. Alexa allows users to better navigate the Internet through its collaborative filtering technology. Deja.com, on the other hand, allows its users to find products and services that are similar to other users who have similar characteristics. R U Sure provides its users with a comparative-shopping agent that finds the best price for them. All these companies use technologies and user interface tools that make the web users to have a more pleasant and efficient surfing experience.

IV. Extempo Systems

The previous section went over how most e-commerce companies are dealing with their critical interface and customer issues. The following section will introduce how the future of e-commerce may look like through artificial intelligent agents.

Extempo Systems

Building on foundational intelligent-agent research carried out at Stanford University, Extempo has created a software technology to bring interactive characters to life on the web. This innovative technology translates compelling functional, human, and social qualities to applications in e-commerce, learning, and entertainment. The company provides characters that offer easy and natural interaction through conversation and gesture along with the color and warmth of their distinctive Personas. Barbara Hayes-Roth, Perry W. Thorndyke, Robert van Gent, and Vaughan Johnson founded Extempo in September 1995.

Terminology and Technology Background

A bot is an artificial semi-intelligent agent/robot, which are software-controlled interactive characters. These have been seen in interactive entertainment products and have been used in education and training products as well. These characters appear artificial and robotic due to its limited ranges of behavior.

Extempo has developed improvisational characters (imps) that can improvise their own actions, producing varying and lifelike behavior either autonomously or under the direction of users or other product components. The characters could physically and verbally respond to match actions with speech. Characters are built on Extempo's component-based Imp Architecture that is written in C++. Each imp's mind comprises of three pairs of plug-and-play components, that include a competence component (code) and a content component (database), persona competence and content components

provide all the facets of the character's identity, and application components provide the knowledge that are needed to perform a particular role.

These bots and imps are also referred as avatars, whose concept originates from Indian mythology where it stands for a half deity who descends to earth in human form. These modern avatars are complex software modules to make the virtual world more human.

IBM is heading a group that is drafting a proposal for the Standardization of Avatars throughout VRML-scripted landscapes. This would enable a user to maintain a consistent and cohesive avatar as one travels from one world to another. Vital information would stay embedded in the avatar and not need to be re-established upon entering a new world.

Current and Future Applications

The current e-commerce market is fairly limited to a strictly self-service environment. These environments do not convey the positive benefits of active, skillful, personal-touch customer care. As a result, customers navigate web sites alone with unknowing, unfeeling machines that can frustrate people and discourage transactions.

An imp's personality can be based upon the current scenario and goals, recent events and its own recent behavior, interactions with other characters, directions from a human user, or its assigned role in a product. The imp's functionality can be found as actors in game or story products, tutors and educators in education and training products, and avatars in on-line communities, virtual worlds, and role-playing games. The biggest potential of the uses of imps is as marketing, sales, and service representatives in e-commerce by predicting consumer behavior and selling products.

Extempo has an imp named Erin the Bartender who basically runs an on-line bar community. Another Extempo imp is Jennifer James who specializes in selling automobiles over the Internet. Extempo has an imp, named Max, in the form of a dog that answers queries from visitors at www.PeopleWeb.com. In general, Extempo's imps

can interact directly with people in two-way conversations, be embodied in graphical, audio, textual, or other media, have role-specific expertise in addition to more general social skills, and have individual identities and personalities and everyday knowledge.

Bots could revolutionize the way homes, offices, and web sites are managed. By learning a person's background, a bot could make simple decisions such as recording favorite television programs, turning off lights when rooms are empty, and sending out electronic orders to the local supermarket when the refrigerator is empty. Bots could also boost electronic commerce by offering better service than in the off-line world or complement their email/telephone customer support centers. Extempo has found that interactive bots can improve customer attraction, satisfaction, and retention by offering friendly, personalized one-to-one service.

These bots can also better track and predict consumer patterns by creating virtual shops, populating them with bots that are programmed to execute certain shopping behaviors. Bots may also be found in the medical field in the future to monitor simulated patients in intensive care units and to test new drugs. Bots can also be used for data mining to search Internet sites for specific content such as business intelligence, competitor's price change, or potential new business. Such bots were the technology foundation for companies like Deja.com and R U Sure that were profiled in the previous section. These bots can help companies get to know their customers better since customers tend to supply more information about themselves in the context of a friendly, social setting. Companies will pay well to introduce more warmth to the web to attract more customers and to make computers friendlier.

V. Conclusion

Electronic commerce will no doubt be a large market in the future marketplace. As a result, companies need to have a more intimate and friendly relationship with their customers to be successful. The current e-commerce web sites can sometimes be difficult to navigate and to use. E-commerce companies like Cybergold (monetary reward) or drugstore.com (needed medical information) may be successful more due to their incentives or content system, than their user interface and friendliness. However, as e-commerce becomes more competitive and lucrative, establishing and maintaining relationships with current and prospective customers become more important.

As a result, intelligent agents/bots/imps may be the solution for these e-commerce companies. Companies like Extempo Systems will be able to provide these friendly agents and tools that will allow customers to have a more relaxed shopping and using experience over the Internet.

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