Review on Electronic Commerce

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Abstract: Electronic commerce (e-commerce) is sharing business information, maintaining business relationships and conducting business transactions by means of telecommunications networks. In this paper, we present an overview of e-commerce. We compare on the traditional commerce and e-commerce. We also focus on the unique features and types of e-commerce. We mainly discuss technologies of e-commerce. At the end of this paper, we summarize the advantages and disadvantages of e-commerce.

Key words: E-commerce • Traditional commerce • E-commerce technologies

INTRODUCTION

E-commerce involves the undertaking of normal commercial, government, or personal activities by means of computers and telecommunications network; and includes a wide variety of activities involving the exchange of information, data or value-based exchanges between two or more parties [1-3].

In this paper, we compare between traditional commerce with e-commerce. We also present a survey of the unique features of e-commerce that help explain why we have so much interest in e-commerce.

The rest of the paper organized as follows. In section 2, we take a glance into the types of e-commerce. We outline the characteristic for each type of e-commerce and provide a comparison of the substantial differences between them. In section 3, we discuss widely on the types of e-commerce. Section 4 presents the technologies of e-commerce. Finally, section 5 summarizes the entire article including the advantages and disadvantages of e-commerce and suggests a future work.

MATERIALS AND METHODS

Traditional Commerce Versus Electronic Commerce:
Increased popularity and availability of Internet access make many traditional small businesses are considering e-commerce as a valid and profitable sales channel. However, e-commerce and traditional commerce are totally different and in order to decide whether it would be a suitable business or just a costly mistake, it is essential to identify the differences between these two types of commerce carefully. Table 1 shows the differences between traditional commerce and e-commerce.

Unique Features of E-commerce Technology:
E-commerce is extremely useful and makes people easier to perform business transactions on the Internet. We do not need to meet people or travel much to settle on business processes since e-commerce is introduced. There are 7 unique features that make e-commerce is so unique and preferable which is ubiquity, global reach, universal standards, richness, interactivity, information density and personalization/customization.
Table 1: Traditional commerce versus e-commerce

<table>
<thead>
<tr>
<th>Features</th>
<th>Traditional Commerce</th>
<th>Electronic Commerce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Interaction</td>
<td>Traditional commerce is often based around the face to face interaction. The customer has a chance to ask questions and the sales staff can respond to them immediately to ensure a satisfactory transaction.</td>
<td>E-Commerce does not offer direct interactions unless features such as related items or live chats are implemented. But it is rarely done.</td>
</tr>
<tr>
<td>Lower Cost</td>
<td>Higher costs needed such as for commercial space rent and opening an online store.</td>
<td>E-Commerce is usually much cheaper than maintaining a physical store in an equally popular location.</td>
</tr>
<tr>
<td>Reach</td>
<td>You are restricted to people who actually come to your shop. With an online shop, your business can be done with anybody living in a country you are able and willing to send mail to. No capability limits in an online store and you can have as many clients as your stock can serve.</td>
<td>With an online shop, your business can be done with anybody living in a country you are able and willing to send mail to. No capability limits in an online store and you can have as many clients as your stock can serve.</td>
</tr>
<tr>
<td>Returns Rate</td>
<td>The customer will be purchasing the product in person, where he will be able to touch and check the items, to make sure whether they are suitable or not and even try them on, which reduces the number of returning items or complaints due to an item not being as advertised on a catalogue.</td>
<td>Expect a significantly higher rate of returns if you start trading online as many will just order and try the items at home and will not hesitate to return them as they can do it by post without having to talk to anybody in person.</td>
</tr>
<tr>
<td>Credit Card Fraud</td>
<td>Traditional commerce is not totally secure, a sales attendant easily verify that the person buying something is actually the owner of the credit card, by asking for photographic ID.</td>
<td>The remote nature of e-commerce makes more difficult to detect fraud, which means due to fraud, stores can lose money.</td>
</tr>
</tbody>
</table>

Table 2: Unique features of e-commerce technology

<table>
<thead>
<tr>
<th>Features</th>
<th>Explanation</th>
</tr>
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<tbody>
<tr>
<td>Ubiquity</td>
<td>Internet/Web technology is available anytime and everywhere: at work, at home and elsewhere via mobile devices such as mobile phone, iPad, tab.</td>
</tr>
<tr>
<td>Global reach</td>
<td>The technology is around the earth and can reach across national boundaries.</td>
</tr>
<tr>
<td>Universal standards</td>
<td>Internet standards as one set of technology standards.</td>
</tr>
<tr>
<td>Richness</td>
<td>Video, audio and text messages are possible.</td>
</tr>
<tr>
<td>Interactivity</td>
<td>The technology works through interaction with the user.</td>
</tr>
<tr>
<td>Information density</td>
<td>The technology raises quality but reduces information costs.</td>
</tr>
<tr>
<td>Personalization/Customization</td>
<td>The technology allows personalized messages to be delivered to individuals as well as groups.</td>
</tr>
</tbody>
</table>

Table 2 explains each of the dimensions of e-commerce technology. In this section, we briefly describe the features of each technology and why we have so much interest in e-commerce [4-6].

**Ubiquity:** Ubiquity alters industry structure by creating new marketing channels and expanding the size of the overall market. Internet is available everywhere since it is built into other devices such as mobile phones. It creates new efficiencies in industrial operations and lowers transaction costs for the consumer and that is no necessary to consumer spend time and money in the market. The ubiquity of e-commerce lowers the cognitive energy, which defined as mental effort needed to complete a task. Humans seek options that require the minimum cognitive energy to transact in the marketplace.

**Global Reach:** Global reach is the technology reaches across geographic boundaries, around the earth. E-commerce technology is enabling a business to easily reach across cultural and national boundaries far more convenient and cost-effective than is true in traditional commerce. By lowering barriers to entry, but significantly expands market at the same time, it changes the industry structure. Global reach also lowers cost of the industry and firm operations through production and sales efficiencies. When comparing the older commerce technology with e-commerce technology, it clears that do not easily cross national boundaries to a global audience.

**Universal Standards:** Universal standard is a standard that is shared by all nations around the world [7]. E-commerce is made possible through the Internet and
World Wide Web. The universal standards of the Internet and e-commerce substantially lower market entry cost. Market entry cost is the cost merchants must pay just to bring their goods to market. The common standards reduce search costs the effort required to find the ideal products for consumers at the same time. Standards make it much easier to build a business from existing technologies thus reducing the entry costs. Hence, there is a lot of competitions.

**Richness:** Richness refers to the complexity and content of a message. An important part of e-commerce is advertising and branding. E-commerce can deliver video, animation, audio and others as much better than other technologies. Traditional market and small retail stores are able to provide personal, face to face service using aural and visual cues when making a sale, thus showing that they have accomplished richness. The richness of traditional markets makes them a commercial environment or powerful selling.

**Interactivity:** Interactivity refers to the technology raises quality but reduces information costs. Consumers are engaged in a dialogue that dynamically adjusts the experience to the individual and makes the consumer a co-participant in the process of delivering goods to the markets. Two-way communications between the merchant and the consumer is enabled with e-commerce. E-commerce technologies have changed the traditional tradeoff between reach and richness. The Internet and web can deliver, “rich” marketing messages with text, video and audio where traditional commerce technology such as radio, television, or magazines is not possible to do, to a million of audiences.

**Information Density:** Information density is the technology reduces information costs and raises the quality of information. As we consider and comparing the old way to share information via papers, mail and voice communication, the information processing, storage and communication costs drop dramatically. While the currency, accuracy and timeliness improve substantially. Furthermore, the information becomes plentiful, cheap and accurate. While the prices and costs become more transparent in e-commerce markets.

**Personalization/Customization:** Personalization or customization is the technology allows personalized messages to be delivered to groups as well as individuals. Personalization of marketing messages and customization of products and services is based on individual characteristic with the increasing in information density.

**Types of E-Commerce:** Many e-commerce business model and more are being invented every day. There are many different types of e-commerce and many different ways to characterize them. The five main types of e-commerce is Business-to-Business (B2B), Business-to-Consumer (B2C), Consumer-to-Consumer (C2C), Peer-to-Peer (P2P) and Mobile commerce (M-commerce).

**Business-to-Business (B2B):** Business-to-Business (B2B) e-commerce, in which businesses focus on selling to other businesses, is the largest form of e-commerce. An e-commerce company can deal with suppliers or distributors or agents, which these transactions usually carried out through Electronic Data Interchange (EDI).

In general, B2Bs require high security needs. For instance, manufacturers and wholesalers are examples of B2B companies. Companies are able to improve the efficiency of several common business functions, which includes supplier management, inventory management and payment management with the help of B2B e-commerce.

B2B e-commerce enabled business applications where companies are able to better control their supplier costs by reducing purchase order processing costs and cycle times. Thus, increase the benefit of being able to process more purchasing orders in the same amount of time but at a lesser cost. E-commerce technology can also serve to shorten the order-ship-bill cycle of inventory management by linking business partners together with the company to provide faster data access. To reduce inventory levels and improves upon the ability of the company to provide “just-in-time” service, businesses tracking order shipments electronically thus can improve their inventory auditing capabilities.

To improve the efficiency of managing payments between a business and its partners and also distributors, this e-commerce technology is being used. Companies are able to lower the number of clerical errors and increase the speed of processing invoices by processing payments electronically, which results in lower transaction fees.

**Business-to-Consumer (B2C):** Business-to-Consumer (B2C) e-commerce, in which online businesses attempt to reach individual consumers. Portals such as Yahoo.com and MSN.com offer users useful Web search tools and
many services such as news, email, instant messaging, shopping and others. By charging advertisers for ad placement, collecting referral fees for steering customers to other sites and charging for premium service portals can generate a massive revenue.

Besides that, content providers are a part of B2C business models. Content providers make money by charging subscription fees in distributing information content, such as digital news, also provides music, photos, video and artwork over the Web.

Community providers are sites that create a digital online environment where people with similar interests can communicate with like-minded people, exchange opinions and receive interest-related information. To create a fast, convenient, one-stop site where users can focus on their most significant concerns and interests, this type of sites is created.

**Consumer-to-Consumer (C2C):** Consumer-to-Consumer (C2C) e-commerce provides a way for consumers to sell to each other, with the help of an online market maker. This type of e-commerce technology promotes the opportunity for consumers to transact goods or services to other consumers.

The C2C e-commerce models the exchange systems with a modified form of deal making. A large virtual consumer trading community is developed for the deal making purpose. The rules of this community to compete are operated by the customer itself, check and decide his own basic transaction prices.

In C2C e-commerce, only the product for the market is prepared by consumers and they place the product for auction or sale on their own. However, to make the products can be easily displayed, discovered and paid for, consumer depends on the market maker to provide a catalogue and search engine. For instance, eBay.com provides a market space where consumers can sell goods directly to other consumers.

**Peer-to-Peer (P2P):** Peer-to-Peer (P2P) e-commerce enables Internet users to share files and computer resources directly without having to go through a central Web server. No intermediary is required in peer-to-peer’s purest form.

Since 1999, entrepreneurs and venture capitalists have attempted to adapt various aspects of peer-to-peer technology into P2P e-commerce. One of the examples of a peer-to-peer freeware software application is Gnutella, which typically without any charge, permits users to directly exchange musical tracks. Perhaps the most well-known example of peer-to-peer e-commerce is Napster.com, which aid Internet users in finding and sharing MP3 files, although purists note that Napster is only partially peer-to-peer because it relies on a central database to show which users are sharing music files.

In 2000, Napster was sued by the Recording Industry of America, a trade organization of the largest recording companies, for violating copyright law by allowing Napster members to exchange copyrighted music tracks without compensation to the copyright holders.

**Mobile Commerce (M-commerce):** Mobile commerce (M-commerce) refers to the use of wireless digital devices to enable transactions on the Web. Many types of transaction can be conducted by mobile consumers, including stock trade, in store price comparisons, banking, travel reservations and more. These transactions processes through electronic store searches and electronic point-of-sale capabilities, which enabled by Computer-mediated networks. Dashes-top mobile devices, personal digital assistants or Smartphones are examples of other mobile devices [8].

Younger generations who use mobile phones more than any other age group targeted by device vendors. To promote the advancement of e-commerce to m-commerce such that users can shop online from their phones, make online vendors collaborate with prominent names in the telecommunications industry. Most of these advances are accomplished through sophisticated application designs that are constantly evolving [9].

The adaptation of websites to make them easier to use with a smaller screen sizes is one of the features of m-commerce sites. Other adaptations are including the removal of large graphics and the optimization of fonts for easier viewing and ergonomics.

**RESULTS AND DISCUSSION**

Technologies of E-Commerce: Many technologies are found to be used in e-commerce; the most common are Electronic Data Interchange (EDI), bar codes, Internet, World Wide Web, product data exchange and Electronic Funds Transfer (EFT).

**Electronic Data Interchange (EDI):** Electronic Data Interchange (EDI) is the computer-to-computer exchange of structured business information in a standard electronic format. Information [10]. Software programs
translated the information stored on one computer program into a standard EDI format for transmission to one or more trading partners. By using software programs, the trading partners’ computers translate the information into a form they can understand. Without any human intervention, EDI efficiently flows directly out of a sender’s computer system directly into a receiver’s computer system but somehow to flow in this most efficient manner is not always possible for EDI. EDI often used for routine business documents like invoices and not used for non-routine business documents like complicated contracts.

Figure 1 shows a business process with and without EDI. It is clearly shown that the business process without EDI is much slower than the EDI process. The process without EDI includes substantially more to human intervention to move business information from one company to another. Moreover, this process requires workforce of employees to handle a printed generated form and mail it. Next, the data re-keys by the recipient into another computer for internal processing. Otherwise, the EDI process is more efficient and save manpower where there is no paperwork and human intervention but the information is transmitted directly to another computer.

By using EDI process, the speed can be increased as the data can move directly out of a computer system and transmitted to another with little to no delay. Furthermore, the data is not re-keyed thus errors can be reduced and increases accuracy. EDI standards can specify where the data can be found and how they will be formatted. Besides, the information sent via mail is much likely to lose information that the information transmitted through EDI process. The security level is high since only authorized users can access EDI and unauthorized users cannot change the data easily.

**Bar Codes:** The European Article Numbering Association (EAN) established in 1977 [11]. Steadily, EAN numbers began to use outside of Europe and as a result, EAN became the International Article Numbering Association, known as EAN International. Numbering organizations are national associations that provide full EAN system implementation support which one of its responsible is to provide training on numbering, bar coding and EDI to their member companies. Furthermore, the EAN numbers which are used in identifying items can be represented by standard bar codes in representing information so that it can be easily read by computers.

The data can be captured automatically, quickly and securely, thus allow numbers to be encoded in the machine-readable form. A scanner can read the numeric value of the code printed below the bar code symbol. Figures 2 and 3 show EAN-8 and EAN-13 numbers represented by bar codes respectively. To ensure a correct scanning, the black bars are set against a white background as a safest representation of articles numbers. The other components of bar code are the size and the light margins at the end of each bar code.
The network is growing extremely fast and more useful and as more people have access to the Internet. The Internet is found out to be useful for many applications such as electronic mail and World Wide Web. The File Transfer Protocol (FTP) is most likely to be necessary for most businesses, whereas it provides an easy method of copying files from and to any computer that is on the Internet.

There are two ways to get access to the Internet which are via Online Services and Internet Service Providers (ISP). Before the Internet grew as popular as today, Online services has already started. A large amount of content, e-mail, Internet Access and many services on their own are provided. While ISP does not provide content like Online Services but these are specialized in providing Internet services which some provide these services either to the companies' general public, other ISP’s or some do all of these activities. The differences between Online Services and ISP are simplified in Table 3.

**Internet**: The Internet is a decentralized global network of millions of diverse computers and computer networks [12]. These networks can communicate with each other because they are using a common communications protocol called TCP/IP. A good communication between people and businesses used the Internet as a tool.

**World Wide Web**: The World Wide Web or Web, is a collection of documents written and encoded with the Hypertext Markup Language (HTML) [13]. A user may ask for these documents and can be displayed on the user’s local computer with the aid of browser, although the document can be on a computer and on a totally

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**Table 3: Online services and Internet service providers**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Online Services</th>
<th>Internet Service Providers</th>
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</thead>
<tbody>
<tr>
<td>Costs</td>
<td>Service Fees</td>
<td>Service Fees</td>
</tr>
<tr>
<td></td>
<td>Fixed monthly fee for a certain amount of on-line time.</td>
<td>Fixed monthly fee for dial-up service. No limit on the number of hours on-line. If the user has a permanent connection, sometimes there is a maximum amount of bandwidth used. This is typically measured in bytes moved over the line. If the user exceeds that bandwidth, the ISP begins to charge more.</td>
</tr>
<tr>
<td>Phone Costs</td>
<td>Most Online Services have local phone connections (Points of Presence or POP’s) in many places across the country. If the closest POP is not a local call however, the user will pay the Long Distance charges.</td>
<td>Phone Costs</td>
</tr>
<tr>
<td></td>
<td>The On Line Service will send the user the software with which to access the service. This is usually extremely easy to install and use.</td>
<td>You would typically find an ISP with a local POP. Some ISP’s are very large and operate nationally (such as ATT) and some are quite small and operate only in one area. The larger size does not necessarily mean better service.</td>
</tr>
<tr>
<td>Ease of Implementation</td>
<td>Some ISP’s (those that typically deals with the general public) will provide software that will make it easy for first-time users to access the Internet. But many do not provide that service. Quite frequently the ISP will only provide a phone number, an access code and an e-mail address. The user then has to figure out how to connect to the ISP and via the ISP to the Internet.</td>
<td>Some ISP’s (those that typically deals with the general public) will provide software that will make it easy for first-time users to access the Internet. But many do not provide that service. Quite frequently the ISP will only provide a phone number, an access code and an e-mail address. The user then has to figure out how to connect to the ISP and via the ISP to the Internet.</td>
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Table 3: Continued

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<tr>
<th>Issue</th>
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<th>Internet Service Providers</th>
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<tbody>
<tr>
<td>Support</td>
<td>The On Line Services provide extensive support services for first-time users and on-going support for experienced users. This help can be extended via e-mail or via phone (many have set-up 800 numbers for this purpose).</td>
<td>There is a vast range of support from ISP’s. Some provide the first-time user support to the general public, via e-mail and/or the phone. But many ISP’s will in fact filter out first-time users by not providing that sort of service at all. The first-time user would have extremely difficult time hooking up to the ISP and connecting to the Internet on his own.</td>
</tr>
<tr>
<td>Reliability</td>
<td>On Line Services are quite reliable, although they sometimes oversubscribe. Because they are usually quite large, they have a redundant system and they plan for growth.</td>
<td>When it comes to reliability not all ISPs are created equal. Issues to watch out for include:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oversubscription: Sometimes an ISP will take on more users than its servers and/or the phone lines can handle. This results in busy signals when you are trying to call in or very slow performance once you connect.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Machine Reliability: Computers are mechanical devices and any mechanical device can break. Computers run software and software bugs often arise for seemingly no reason. Thus it is important to choose an ISP who has a reputation for reliable technology and a staff that can solve problems when they inevitably arise.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Redundant Gateways to the Internet: Disaster happens. When a connection to the Internet is lost some ISPs will be able to reroute traffic via an alternative gateway and some will not.</td>
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</table>

Table 4: Worldwide collection of electronic documents

<table>
<thead>
<tr>
<th>Collections</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web site</td>
<td>Collection of related web pages and associated items.</td>
</tr>
<tr>
<td>Web server</td>
<td>A computer that delivers requested Web pages to your computer.</td>
</tr>
<tr>
<td>Web 2.0</td>
<td>Refer to the web sites that provide a means for users to interact.</td>
</tr>
<tr>
<td>Web browser</td>
<td>Allows users to access Web pages and Web 2.0 programs.</td>
</tr>
</tbody>
</table>

different network elsewhere in the world. Many different kinds of the information contained in HTML documents such as text, pictures, video, sound and pointers, which take users immediately to other web pages. Web pages are continually available through the Internet which may call up pages from anywhere in the world. The ability to jump from site to site that creates the term "World Wide Web". Many people, especially people new to the Internet Browsing, would feel that exploring the Web can be a fascinating activity. So far the most heavily used applications on the Internet is the World Wide Web. Table 4 explains each Worldwide collection of electronic documents [14].

**Product Data Exchange:** Product data refers to any data that is needed to describe a product. The data may be in graphical form, such as pictures, drawings and CAD files. Otherwise the data may be character based (numbers and letters), such as in the case of specifications, bills of material, manufacturing instructions, engineering change notices and test results [15].

In two main ways, the product data exchange differs from other types of business communications. First, because graphics are involved users must contend with large computer files and with problems of...
compatibility between software applications. Second, version control extremely quickly gets extremely complicated. Product designs, even late in the development cycle, are subject to a great deal of change and because manufacturing processes are involved, even small product changes can have significant consequences for getting a product into production.

Electronic Funds Transfer (EFT): Electronic funds transfer (EFT) is the electronic exchange, transfer of money from one account to another, either within a single financial institution or across multiple institutions, through computer-based systems [16].

Transfers through automated teller machines, point-of-sale terminals and automated clearing house systems are a part of EFT services. Besides EFT also include telephone bill-payment plans and remote banking programs.

Through the Automated Clearing House (ACH) network [17], the transactions are processed by the bank. ACH network is the secure transfer system that connects all U.S. financial institutions. Usually less than a day after the scheduled payment date, funds are transferred electronically from one bank account to the billing company's bank for payments. The growing use of EFT for online bill payment can reduce checks, stamps, envelopes and paper bills use. EFT may reduce administrative costs, increased efficiency, simplified bookkeeping and greater security.

CONCLUSION

E-commerce is alive, well and growing extremely fast thus brings about many changes in markets, industries, individual businesses and society. A lot of new jobs in all fields from marketing to management, entrepreneurial studies and information systems are generated when e-commerce is introduced. Nowadays, for the long-term deployment of e-commerce technologies and methods, e-commerce has become a part of the established businesses that have market brands and financial muscle required. E-commerce may increase sales and decrease the sale costs and it can also identify new suppliers and business partners. It increases the speed and accuracy that reduces costs on both sides of transactions and businesses can exchange information. Buyers also provided with a wide range of choices than traditional commerce and can identifies an easier way to customize the level of detail in the information they obtain about a prospective purchase. Thus without waiting for a much longer time, they can instantly access to detailed information on the Web. However, many products and services require more potential buyers and willing to buy through the Internet. Costs and benefits have been hard to quantify. To create an effective e-commerce, many firms had trouble recruiting and retaining employees with the technological, design and business process skills needed. Besides, firms also face cultural and legal obstacles to conducting e-commerce. Hence, we believe that e-commerce brings extraordinary changes which contribute more to the latest developments. As a future work, we will conduct a survey by focusing onways to tackle theproblemsandobstaclesin implementing e-commerce systemso thatallcan benefit from the development ofinformation technology.

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