E-Commerce: Technology and Business Development

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History and Scope of E-Commerce

Briefly, e-commerce is the distributing, buying, selling, marketing, and servicing of goods and services over public and private computer networks (What). The concept has increased in scope over time to include all the business activities of the sales cycle (Definition). E-commerce is the result of the evolution and combination of commerce, information systems, and electronic networks. However, there is a continual debate on whether e-commerce is something new or if technology has simply been extended to fit current business practices (Kroenke).

The history of e-commerce is about how information technology has with time transformed business processes. It can be divided into three main aspects: the facilitation of commercial transactions, the development of information analysis, and the emergence of web commerce. The facilitation of commercial transactions includes EDI (Electronic Data Interchange) and EFT (Electronic Funds Transfer). Information analysis utilizes ERP (Enterprise Resource Planning), data mining and data warehousing. Web commerce involves features such as secure connections, e-shopping carts, and electronic payment services.

Commercial transactions were initially facilitated by EDI which is short for Electronic Data Interchange and it is “the transfer of data between different companies using networks, such as VANS or the Internet” (Webopedia). A VAN is a Value Added Network which is “a private network provider that leases communication lines to its subscribers” (Webopedia). While an increasing amount of companies is connecting to the Internet, EDI is becoming more and more important as an easy way for businesses to buy, sell, and trade information. An organization called the American National Standards Institute (ANSI) approved a set of
standards for EDI called X12 standards. X12 standards are used internationally and they formally describe many documents that are commonly exchanged among companies (Kroenke).

EDI is considered by most to be the beginnings of e-commerce since it is about business communities networking, and digitalizing business information. Some of the largest organizations have been investing in and developing EDI since the 1960s. However, it was not widely accepted until the 1980s (History). EDI never became as popular as e-commerce over the internet for three main reasons: its high costs which prevented small and medium-sized businesses from getting involved in e-commerce, its growth which was hindered by the slow development of standards, and the complexity of its applications which made it adaptable to only a small amount of users.

The Internet was born in 1969 when an organization of the Department of Defense, the Advanced Research Projects Agency was funding research of computer technology. The Internet could have ended up with limitations such as those of EDI had the World Wide Web not come about in the 1990s. The WWW became one of the most popular media along with print, radio, and TV but with a speed that had never before been seen. In 1995 and 1996 the Web users and the Web content were nearly doubled every couple of months. The technology of the Web and in telecommunications had stimulated the stock bubble of the 1990s and eventually, the NASDAQ went over 5,000 in the year 2000 before it went down to 1,200 in the year 2002 (History).
In addition to the technical infrastructures, the Web is also popular because of its low costs of access and because of the simplicity of creating HTML (Hypertext Markup Language), one of the obstacles in developing EDI. The Internet and Web overcame the technical difficulties of EDI, though they have not, however, solved the problem that e-commerce standards are developed slowly.

XML (Extensible Markup Language) provides a development tool to define the data interchange format in diverse business communities. It provides a better means than HTML so that organizations can exchange documents. Web Services offer an architecture that is flexible and effective for the implementation. Now many software programs can save documents in XML format. XML and Web Services will be the greatest influences in e-commerce in the next few years.

EFT stands for Electronic Funds Transfer which is a system that allows transferring money from one bank account directly into another bank account without using paper money (Dennis). These money transfers are carried out to make electronic payments and collections. One of the EFT programs that are most widely used is Direct Deposit by which the payroll is deposited directly into the employees’ bank accounts. Other common EFT transactions are performed with credit cards, debit cards, ATMs, Fedwires and POS (point-of-sale) transactions. Fedwire is a funds transfer system operated by the Federal Reserve Bank.

EFT transactions are processed by banks through the ACH (Automated Clearing House) network which is a secure transfer system which connects all the financial institutions in the U.S. EFT is becoming increasingly popular for paying bills online which is leading to a paperless world where the use of paper bills, checks, envelopes, and stamps is diminishing.
EFT is a key component of e-commerce because business is money and EFT moves money anywhere, at anytime.

Along with the facilitation of commercial transactions, information analysis has been further developed. ERP or Enterprise Resource Planning is, for the most part, software that runs off a single database and tries to integrate all the departments and functions in a company in one computer system that can serve the particular needs of all the departments (Koch). The purpose is for the different departments to be able to efficiently coordinate the obtaining and utilization of the company’s resources. ERP is mostly useful for the order fulfillment process, reason why it is often called the back-office software. The Customer Relationship Management (CRM) software is what handles the up-front selling process. The idea of ERP is that for example when a customer service representative enters a customer order, he or she can access all the information he or she needs to fulfill the order. The representative can see the customer’s credit rating and purchase history from the finance module, the availability of inventory in the warehouse module and the shipping schedule in the logistics module. Employees of all the departments can access, see, and update information; the departments are communicated, and the order fulfillment process flows more smoothly and efficiently. In addition, the same way ERP works in one direction together with CRM to attend to customers, it also works in the other direction with the SRM (Supplier Relationship Management) system to interact with the company’s suppliers.

Information analysis is key to the success of any organization. Data mining is for the most part “the process of analyzing data from different perspectives and summarizing it into useful information” (Data-mining). This information is used to increase revenue and reduce
costs. Data-mining software is used to analyze data from different angles and dimensions, and categorize and summarize relationships that are identified, that is, to find correlations and patterns in the data. Data warehousing centralizes data management and retrieval which is especially helpful for large organizations with many departments, branches, and even business overseas. Data mining assists in managerial and strategic decisions in all departments but also in customer service. For example, online businesses such as Amazon and Netflix keep track off and analyze their customers’ purchases, preferences, and ratings. The data-mining systems of these companies take note of customers’ spending habits and opinions and suggest books and movies which leads to strengthening customer loyalty, targeting promotions, and ultimately, increasing sales.

Web commerce is carried out mainly through the World Wide Web and also email. Companies attract customers to their websites through web banners, email, and even printed media, radio or television. Their websites include accounts, shopping carts and secure connections to receive electronic payments. Their customers can themselves set up their own account, fill electronic shopping carts and pay online. The websites commonly work with the company’s customer relationship management system which helps customize the customer’s experience every time he or she goes online.

Today e-commerce covers a very wide range of business processes and activities such as e-banking, offshore manufacturing, and e-logistics.

Electronic banking is a process that allows customers to perform banking transactions without stepping into the actual brick-and-mortar bank. The forms of e-banking can be referred to as: “personal computer (PC) banking, Internet banking, virtual banking, online banking,
home banking, remote electronic banking, and phone banking” (Insley). However, the designations that are most frequently used are PC banking and Internet or online banking.

PC banking enables people to carry out bank transactions using a PC via its modem. The bank usually offers its customer a proprietary financial software program that allows him or her to execute financial transactions from his or her own computer at home. The customer can then connect to the bank, download data, and run programs. Currently, most banks offer a PC banking system by which customers can view their checking and savings account balances and credit card statements, pay their bills, and transfer funds from one account to another.

Internet banking or online banking is an outgrowth of PC banking. The customer can access his or her accounts with a browser that runs on the bank’s World Wide Web server, and not on the user’s PC. By means of this kind of banking customers can do the same transactions than can be done with PC banking plus pay mortgages, purchase financial instruments and certificates of deposit.

A true Internet bank is one that let’s retail customers see their account balances and do some transactions. Other names for an Internet bank are virtual bank, cyber bank, net bank, interactive bank, and web bank. Banks first advertised on the Internet, and then created informational or interactive web sites. Finally they moved forward to transactional web sites. However, some banks still do not offer transactional banking services though they are announcing they will be doing so in the future. On the other hand, Internet banks are ahead of the game as they have lower operational and transactional costs and can capture and retain increasingly sophisticated customers who want to connect anywhere at anytime.
Off-shore manufacturing is assembling or completely manufacturing in another country where materials and labor are cheaper and then exporting them to import them into the manufacturing company’s home country (What). E-commerce has helped with off-shore manufacturing in many ways such as in facilitating the research of laws, taxes, and regulations and the obtaining, preparing, and presenting of taxes and commercial documents (What).

Logistics is managing overall, how resources are moved to where they are needed. It refers to how a company acquires, transports, and stores resources along the supply chain. If a company has an efficient supply chain and proper logistical procedures, it can cut costs and increase efficiency (E-logistics). Postal and shipping services such as the United Parcel Service (UPS), FedEx, and the United States Postal Service (USPS) are popular examples of e-logistics. They have set in places systems that allow for their drivers, branches, and website to interact and stay permanently updated as to the whereabouts of a package. Additionally, these companies have even empowered their customers to keep track of their own packages by visiting the company’s website and entering a package’s tracking number.

To succeed in e-commerce is not easy, however, if well tackled; it can lead to a highly lucrative business. The success factors of e-commerce are similar to any business endeavor: a good product, a competent management team, good post-sales services, a well-organized business structure and network infrastructure, and a secured, well-designed website. It must also perform technical and organizational aspects and be customer-oriented.

The success of an e-commerce business relies on various factors that must be considered when setting up or expanding into e-commerce. These factors include security, design of the website and good categorization for optimal customer experience, and a well run logistics
system. As in any business, you approach and e-commerce business in that same fashion. It should be well planned out and researched.

In an e-commerce business one of the most important parts of a site is security. If the customer can’t trust the site then there will be very few people that will go there to shop. According to an article, “[f]raudsters will divert approximately US$3.6 billion from U.S. e-commerce in 2007, a 20 percent increase over 2006” (Morphy). Customers are always at risk of fraud on e-commerce websites and creating a secure website is paramount to a successful e-commerce business.

An e-commerce website is secured when it uses the HTTPS protocol which protects the information that is being sent from others and is protected through SSL. SSL uses PKI and digital certificates to ensure privacy and authentication. SSL is all about encryption and protecting that information. With an SSL certificate which is a digital certificate, the browser examines the signed certificate and determines whether or not it’s authentic (Economic). An SSL certificate can be created using sites such as Verisign.com or GoDaddy.com. It is possible to sign your own certificate but that would defeat the purpose of a secure site.

Security doesn’t just stop with protecting customer information but with protecting oneself in the e-commerce business. One thing that e-commerce businesses should be on the lookout for is click fraud. Click fraud is a “collection of scams and deceptions that inflate advertising bills for thousands of companies of all sizes [and it is] the single biggest threat to the Internet’s advertising gold mine” which Google and Yahoo depend on. (Grow). The way click fraud works is that e-businesses can advertise through Google and Yahoo and based on the number of clicks to their site, that e-business would have to pay Google and Yahoo. The problem is that many companies are being robbed by clicks that are not legitimate. In the case of Martin
Fleischmann, a 40-year-old entrepreneur, he had his company MostChoice.com and he would pay for each click to his site that he got. However he notice suspicious clicks that were connected to arbitrary websites and in 2006 he calculated that it cost his business more than $100,000 since 2003 (Grow).

While security is an important part of an e-commerce site along with being able to avoid e-commerce fraud; the attitudes of consumers towards privacy and security have changed over the last few years. People aren’t as concerned with security and privacy as they used to be because more and more consumers are shopping online. This year, the Monday after Thanksgiving also known as cyber Monday, traffic to many of the largest shopping Web sites soared 37 percent over last years Cyber Monday.(ODonnell). More people are shopping online and for many of them the main factor that concerns them is the website experience relative to locating and buying things from the site.

The design of the site is just as important as the security because it is a big determinant in whether or not a potential customer will do business with you again. Careful planning of the site is important and one way to help improve the design of the site is through web analytics. There are a number of companies that have used web analytics to their advantage. Web analytics helps improve page design, layouts and other factors that effect how visitors interact with the site (Analyzing). When Bath and Body Works implemented a new analytics and tracking program using LIVEmark technology and the services of Coremetrics, it allowed Bath and Body Works to identify important areas on their site that needed to be improved. LIVEmark collects “ata rom more than 400 eRetail brands and is designed to shed light on the most important areas that an eCommerce store can enhance or make better” (Analyzing). The implementation of Coremetrics analytics solution helped Bath and Body Works increase its number of visitors that reach a
product page by 13 percent, increase it site search visitor conversions by 31% and an ten-fold increase in the overall average order size. (Analyzing)

In the case of C28.com, since the implementation of Web analytics on their site, they have kept more shoppers on their pages for longer periods of time in contrast to past years. Due to the fact that C28.com deals with Christian themed products such as shoes and clothing, web analytics helped the C28 choose the best images that their shoppers would prefer to see while navigating the site. By using Google Analytics, one of the free web based analytics and tracking software available the C28 was able to determine that some of their images were causing a 25 percent abandonment rate on some of its products and over 30 percent increase in page abandonment on other items (Analyzing).

Web analytics is not only helpful in designing the layout of a website but it also helps e-businesses “improve their ad spend and conversion rate from sponsored listing programs like Google AdWords (Analyzing). Online merchant, Golfballs.com found out through using web analytics software Omniture that proper analysis of what happens when AdWords referred visitors arrive on their site could allow them to double their revenue generated from AdWords visitors. They also were able to analyze the “bail rate” of visitors and build a website with more relevant pages and increase conversion by redesigning the checkout button appearance and placement (Analyzing). When a customer bails on pages on the site, it means that those pages need to be redesigned to make them relevant to people searches.

For small businesses there is a variety of free web analytics software available such as GoogleAnalytics and those that you can pay for like ClickTracks. The most important thing about web analytics is know what the information you gather means or otherwise it will not help improve your e-commerce site. While web analytics is a helpful tool, when companies
implement such tools they fail to take into consideration the search logs and search results pages. Web analytics tracks the most important parts needed for search analytics which are Search Entry Pages, Time Tracking, SERP Click – Through Rates, and Bail Rates.

Search Entry Pages are the pages from which the customer entered to access the site. The value of this information is to track where users search and thus understanding how these potential costumers reach your site via their Search Engine Results Pages - SERP. Time Tracking is the amount of time that a user will spend on the search engine results pages base on the design of page and query. SERP Click-Through Rates is the number of times consumers click on links created by the search engine results pages (Arnold). And Bail Rates are the rates at which users leaves the search engine results page without clicking on any links. According to Improving Customer Service With Search Analytics, “80 percent of users will immediately leave your Web site if they conduct a search and do not like your SERP. The bail rate is the percentage of times that this occurs.” These factors through web analytics help create a solid search analytics and in turn creating a better consumer experience on e-commerce sites.

Consumer usability of the e-commerce site is vital to maintain a successful e-commerce business. If a consumer cannot adequately navigate and find what he or she is looking for then the site is at risk of losing a majority of potential business. Everything down to the smallest detail is important in the design of an e-commerce site especially in checkout. If a customer is experiencing difficulty or confusion when trying to purchase a product, they can be deterred from continuing with the purchase. Including making available the opportunity to use a coupon while purchasing can sway someone from continuing with the process because they feel bad that they don’t have a coupon.
The design of the page that makes it a pleasurable experience for the customer is important and so is being able to access the online store or even be able to checkout and purchase the product. Not having the right server or method to make the product available will cause a loss of business. On one of the biggest online shopping days of 2007, the Monday after Thanksgiving which is known as Cyber Monday, Yahoo’s Merchant Service had outages that cost many merchants a lot of business. Many customers were ready to checkout and problems with the servers did not allow the transactions to happen which caused many customers to turn away and angered many merchants who lost a great deal of business (ODonnell). Selecting a right server to make sure your online store runs smoothly is vital to its success. Whether it is doing it yourself or opting for online merchant services like Yahoo’s Merchant Service, they are all important decisions in running a successful e-commerce business.

We are all aware of e-commerce. We have been bombarded by TV and radio ads, read news stories about the shift to e-commerce companies, and many of us have direct personal experience with e-commerce from purchases we make on the Web. The information you just read, was meant to give you a much deeper understanding of what e-commerce is, as well as what is needed in order to create and maintain an e-commerce company. The following portion will better explain the technology behind e-commerce and forming an e-commerce business.

Like with any type of company, the success of an e-commerce company weighs heavily on market research and analysis. This is the process of systematically gathering, recording and analyzing data and information about customers, competitors and the market. Variables like age, gender, location, and income level can help to estimate what percentage of the population will purchase a particular product or service and at what price. It can be found out what market characteristics a target market has. In learning more about current and potential customers, the
goal is to help businesses make better decisions about the development and marketing of new products. Market research is generally either primary or secondary. In secondary research, the company uses information compiled from other sources that appears applicable to a new or existing product. Primary market research involves testing such as focus groups, surveys, field tests, interviews or observation, conducted or tailored specifically to that product. Generally, market research can provide confirmation that there is a market for an idea, and that a successful launch and growth are possible. Through thorough research and analysis, an e-commerce company can make a more informed decision when it comes to launching a new product or service, expanding into a new market, fine tuning existing products, or creating a new business plan. E-commerce needs to also form a good business plan. A formal statement of a set of business goals, the reasons why they are believed attainable, and the plan for reaching those goals. It may also contain background information about the organization or team attempting to reach those goals. The format of a business plan depends on its presentation context. It is not uncommon for businesses, especially start-ups to have three or four formats for the same business plan:

- an "elevator pitch" - a three minute summary of the business plan's executive summary. This is often used as a teaser to awaken the interest of potential funders, customers, or strategic partners.
- an oral presentation - a hopefully entertaining slide show and oral narrative that is meant to trigger discussion and interest potential investors in reading the written presentation. The content of the presentation is usually limited to the executive summary and a few key
graphs showing financial trends and key decision making benchmarks. If a new product is being proposed and time permits, a demonstration of the product may also be included.

- a written presentation for external stakeholders - a detailed, well written, and pleasingly formatted plan targeted at external stakeholders.
- an internal operational plan - a detailed plan describing planning details that are needed by management but may not be of interest to external stakeholders. Such plans have a somewhat higher degree

According to E-commerce Digest.com, the number one reason that most e-businesses fail, is that the business plan is not properly researched and implemented. This is why it is crucial to make the correct decision as to how you are going to write or have write your business plan. You can write it yourself, using basic research information from the internet, surveys, or the government. Do the research yourself, but employ a software package such as Business Plan Pro or Outlook, to set out the document in a more professional manner. Apply to a government body, which provides free business guidance. Further more, you could look in your local business directory to find a firm of professionals. This option is going to cost you between $3,000 and $10,000 on average, but this might just be many well spent to have the job done right. Hiring such a team will also most likely raise the confidence of potential investors. A business plan is only as good as the research and thought put into it. So you can see that it is important to choose the right option for plan development. An Internet business plan is no different than other business plans, and they fail for the same reasons: under-funding, under-researched markets, over-optimistic hopes, and poor implementation. An internet company needs to remember to take the planning as
far as possible, but don’t substitute planning for action. You can really only see if a plan works
by trying it out. Successful e-commerce also requires a good management team armed with an
IT strategy to help build new software products, add value to the business, and service the
customers. As businesses online experience grows and becomes more complicated, managers
need to balance two goals that often conflict: building organizational structures for E-commerce
that maintain control, while still moving quickly enough to keep pace with fast-moving markets.
There are several key areas that can cause problems within an e-commerce company, unless
managers and their teams keep their eyes on them. These areas include maintaining channel
harmony. For example, a company may have retail, telephone-based, and Web channels. If it
plays its cards right, it can gain a much stronger position by providing customers with the ability
to choose how, when, and where they do business. In addition, Success on the Internet demands
that managers plan before building. Managers leading their first E-commerce initiative often
make incorrect assumptions about the time, cost, and difficulty of doing business online. Some
things that might seem out of your league may be technically rather easy to implement.
Unfortunately, the functions that you see on big consumer sites are often difficult to achieve and
may be beyond your company’s resources. This brings me to the point about formulating
strategic and organizational formulas for successful management of web sites. Technologists
need to sit in on strategy meetings. If technologists are ordered to execute a business vision
without having been included in its formulation, opportunities will invariably be missed.
Business managers new to Internet business need to be connected to a technology expert when
deciding what to attempt online. Further more, management teams need to consider performance
measures. Service-level agreements are important when making deals with vendors, and
internally in large companies when setting up interdepartmental processes. When well-
constructed, SLAs can save you. This may sound pretty obvious, but it's surprising how many companies, from huge businesses to little shops, pay major setup costs and recurring fees but still receive terrible service. Even more surprising is how many of these abused customers have no recourse because the terms of service stated in the SLA are too vague. Clarifying the expected performance of a service provider lets a customer measure performance and have some recourse if it's not delivered.

If an Internet company wants to employ team members from different geographical locations then they are going to have to form a virtual team. This is a team that works across time, space, and organizational boundaries with links strengthened by web technology. Software that improves the ease of communication often includes features such as presence awareness, instant messaging, and web conferencing. These tools allow team members to be accessible to their teams 24 hours a day. Software applications that organize team tasks and documents also improve their teams' efficiency. These programs consist of a central location where all members can access important documents to the team, track progress made, assign tasks, and even provide calendars with key dates and timelines to keep all members current. There are many software programs for virtual teams, such as Lotus software by IBM, NetMeeting by Microsoft, Facilitate.com by Facilitate.com, Thinktank by GroupSystems, and many more. Software of this type is a fast-developing area, so organizations should look often for software programs that suit the size and functionality of their teams.

An e-commerce company needs to be able to perform transactions online. One of the first elements addressed in e-commerce transactions is how to guarantee that a valid contract has been entered between the parties. Assessing the validity of contracts is complicated in the Internet environment because the contracts are paperless. Digital signatures are therefore essential in
helping to promote e-commerce because they ensure that all parties have entered in a binding contractual agreement. Digital signatures are essential to protect the authenticity, integrity and privacy of online transactions. Online enterprises need to ensure that they receive accurate and verifiable information regarding the person who attempts to use their services. One of the largest problems for online enterprises is fraud, and online signatures are a very helpful security measure.

An e-commerce site, and probably any website, should contain some form of user agreement or a listing of the terms and conditions of use of the website called the terms of service or TOS. The TOS grants the user a license to use the website under the terms specified or simply states that by using the website, the user is agreeing to be bound by the provisions of the TOS. Terms of Use agreements are generally established through the use of clickwraps. On the internet, the agreement is shown to the web user who then must click an “agree” or “I accept” button to access the website. Thus these agreements are called click throughs or clickwraps.

An e-business also needs to be able to send and receive payments. Most of e-commerce payments are done by credit card. There are two general types of payment systems available. For an e-commerce site of any significant size, the Operator will need to open a Merchant Account and choose an online payment processing service such as CyberCash. A smaller site a system like PayPal or MoneyZap may be more cost effective. The third party collects the funds for the website operator using its own merchant account and then deposits the funds into the website operator's account. It will cost $400-600 to open a merchant account plus yearly account maintenance fees. In the past, card numbers were transferred securely between the customer and merchant through independent payment gateways. Such independent payment gateways are still used by most small and home businesses. A payment gateway is an e-commerce application
service provider service that authorizes payments for e-business. It is the equivalent of a physical POS terminal. Payment gateways encrypt sensitive information, such as credit card numbers, to ensure that information passes securely between the customer and the merchant.

American Express has also introduced a new type of payment technology in its one-time-use credit card numbers. This new option would allow American Express cardholders to enroll in its Private Payments program. This new program allows AmEx cardholders to use their Private Payments number whenever they enter an online transaction. This Private Payment number could be used at any site that accepts AmEx because the Private Payment number is linked to the card holder's actual AmEx account.

The last line of importance that many e-commerce businesses overlook is having the right logistics system in place. The logistic system can be a determinant factor in the success of an e-commerce business. Being able to manage inventory and ship products on time is key to customer satisfaction. For the most part, when it comes to big businesses they have automated logistics systems that are able to handle orders and send that information to the rightful suppliers for fast and effective delivery of the product. However when it comes to small businesses, their logistic system is very important because it is more prone to human error. Making errors and causing unhappy customers will doom the e-commerce business because of unreliability.
Works Cited


http://www.anderson.ucla.edu/faculty/jason.frand/teacher/technologies/palace/datamining.htm


