How E-commerce is Changing American Business

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Abstract— In this paper, we will introduce the history and evolution of E-commerce. Then, we are going to understand how E-commerce affects supply chain. Last but not least, based on the history of E-commerce, it is important to go through its future and be aware of some of the current innovations in the the E-commerce. Finally, being in a fast paced business environment in the U.S, it is reasonable to mention a real life example, which is Amazon, to be familiar with its impact on the world of business.

Part I: Introduction about E-commerce

Do you remember the last time you travelled to purchase a product? Or when you were waiting in a long line to book a flight? Electronic commerce, which is also written as e-commerce, is the exchange of trading in products or services by using the Internet. E-commerce relies on technologies such as mobile commerce, internet marketing, supply chain management, inventory management systems, online transaction processing, and Electronic Data Interchange (EDI). EDI is an old development, but EDI technology is improving to get rid of paper transactions across all parts of a business trading partner relationship; the relationship between the entities associated in the transfer of data (Ruth Andersen, 2012).

E-commerce businesses may utilize some or all of the options: Online shopping websites for retail sales which runs directly to consumers, such as Amazon.com, offering online marketplaces, which process third-party business-to-consumer, and lastly business-to-business (B2B) buying and selling. B2B businesses mostly deal with other businesses, as well as customers or suppliers. These purchasing or trading options provide competitive advantages for the business itself because some customers find shopping online to be more convenient than shopping traditionally.

History and Evolution

In the 1960s, companies were using simple computer networks in order to execute electronic transactions (123EDI, 2015). Companies share files, such as business documents, order forms, invoices, and shipping confirmation by utilizing EDI with another company's computer system. During the 1980s, EDI was not easy to be obtained by a customer due to its high price, but there were attempts made to simplify the digital exchange of information.

Early on, companies like CompuServe provided services, such as e-mail, chat rooms, and message, and was one of the first popular networking services in the United States for home computer users back in the mid of 1980s. Moreover, CompuServe was the pioneer in terms of commercial online service in the United States. Users were able to place items from 110 online merchants by using CompuServe that added a service called the Electronic Mall (Dave Rose, 2008). The idea of Electronic Mall was the first start of e-commerce even though it did not achieve great success early on.

Ten years later, in the early 1990s, Tim Berners-Lee, an English computer scientist also known as the inventor of the World Wide Web made a proposal about a hypertext-based web of information that allowed a user navigate using a simple interface named a browser (Tim Berners-Lee & Mark Fischetti, 1999). Sung-Chi Chu, Lawrence Leung, Yer Hui, Waiman Cheung describes the Internet as "The interconnections between businesses and individuals helped in creating the World Wide Web (WWW) and the advent of powerful search engines and Web sites turned the Web into a rich information resource" (2006). After the invention of WWW, the computer was not as costly as it had been before, and therefore it was easy to get connected.

Internet kept spreading into people's homes. In 1991, e-commerce developed when the Internet was available for commercial purposes. Therefore, many businesses created their websites as a competitive advantage.

In 1993, Mosaic was introduced to be the first global Web browser by Marc Andreesen at the National Center for Supercomputing Applications (NCSA) (Joyce Tagal, 2008). The security aspect is critical in the e-commerce world in order to secure customers' information when placing orders through the Internet. According to Extended Validation SSL Certificate, in 1994, in order to address customers' concerns over the internet security, The Secure Sockets Layer (SSL) Protocol was created by Netscape. SSL's ultimate goal is that personal information, such as names, addresses and credit card numbers can be encrypted between a client and a server (Dave Rose, 2008).

During 1994 and 1995, the first third-party services for processing online credit card sales started to happen, such as First Virtual and CyberCash, which were two of the most popular (Rose, 2008). In addition, Rose also mentioned that in 1995, a company called Verisign started evolving digital IDs, or certificates in order to verify the identity of online businesses. Eventually, Verisign transferred its focus to verifying that a Web site's e-commerce servers were well secured and encrypted.

Amazon and eBay are two companies that changed e-commerce in the mid-1990s. Most of the current e-commerce purchases are normally placed by the World Wide Web. Nowadays e-commerce offers electronic purchasing options that could allow everyone to purchase by using clicks. Amazon also is on the process of establishing the Amazon Air Prime in 2017. Consequently, the American businesses will be largely impacted due to the high growth in e-commerce. The next section will look at how e-commerce is shifting the world of supply chain management.

Part II: E-commerce and Supply Chain Implications

Previous part of the paper has reflected the development of e-commerce from a network to exchange commodity between two student groups to the global phenomenon with approximately 251,979 million USD retail sales particularly in U.S. in first three quarters in 2015 (U.S. Census Bureau News). Being grounded firmly on the rapid development of technology and Internet, e-commerce will eventually dominate B2B (business-to-business), B2C (business-to-consumer) and C2C (consumer-to-consumer) transactions in close future. To take full advantage of all pros as well as deal with all the cons that this global phenomenon brings back, supply chain management need to understand well all the impacts that the growth of this sophisticated platform has on American business.

Global Economy – Opportunity or Threat?

With no Great Walls or physical border, the world in Internet era is a flat one. Features of Internet are versatile: Its connection powers the seamless flow of information; Its speed enables real-time communication and updates; Its coverage erases all the distance and borders among countries. With Internet, we have “a new global economy powered by technology, fueled by information and driven by knowledge”, (U.S. Department of Labor, 2015) which lays the foundation for development of e-commerce. Information era presents a wide range of supply selections, large and diversified pool of customers and increasing competitive rivalry on global level for business. This is both a challenge and opportunity for supply chain management team when the market that they are working in or serving is not limited within a nation. The fact that there is no physical boundary or distance in Internet world challenges the way business has been done and organizations have been structured in America and the world.

Lean structure – In-house or Outsource?

With the States’ economy that is still in recovery process from crisis and contains many uncertainties, flexibility as well as scalability is vital for a survival of business. To achieve that, the company must stay “lean”, asking supply chain management team to draw a “waste-elimination strategy” (Blanchard, p. 215). The surge in product demand today is in no way the security blanket for tomorrow’s sustainable success. The company cannot risk investing in facilities and expertise that do not contribute to its core competencies. E-commerce allows companies to retain the core of their businesses to be in house and outsource the rest by offering a wide range of competitive options ready to be integrated into organizations’ available supply chain. By doing that, companies can stay lean, limit their unnecessary costly investment and focus on what they are doing best and making more significant profits. For online transactions, e-billing and other financial tasks, companies are turning to stalwarts like IBM and EDS, as well as to several smaller and newer players. For running hardware and server systems, they might employ the services of Oracle, Sun, or one of dozens of less well-known providers. Most of these solutions are currently offered as an end-to-end, expandable and scalable solution, ensuring its growth with the pace of the company and compatibility with current or future IT system of the company. Taking advantage of time difference, English speaking professionals and reasonable cost in the country, American companies tend to outsource call centers in India to ensure that their customers receive the round-the-clock quality customer support. As companies stay “lean” by outsourcing, it is vital for supply chain managers to be the center that coordinate the outsources, making sure that all outsources’ systems are compatible with each other and all actors must stay interconnected with seamless flow of information exchange and be on the same page with access to the whole or a part of company’s real time database.

E-Procurement - Evolution of Procurement

The next impact that ecommerce has on American business in field of supply chain management is how organizations conduct procurement. Internet and its applications have drastically changed the way we “locate the one company out there that can provide needed product better than any one else” (Blanchard, p.56).

Baily has coined the term “e-procurement” (electronic procurement). In that, the sourcing process in digital era is described as “the business-to-business or business-to-consumer or business-to-government purchase and sale of supplies, work, and services through the Internet as well as other information and networking systems, such as electronic data interchange and enterprise resource planning". In short, transaction is conducted in real time on digital foundation. Decision is made in a situation with perfect information. This results in a more effective and less time and resources consuming procurement.

Sourcing platforms such as Alibaba, Global Sources and Search Engine such as Google, Bing are common options for procurement managers to browse for their needed materials. There is also procurement software such as SciQuest – Procure-to-Pay suite leaders allowing company "to establish, develop and maintain contract compliance and cost-effective processes for managing and controlling external spend" (Magic Quadrant by Gartner Inc., 2015) (SciQuest, 2015). The development of technology and cloud computing also enables to "keep your suppliers closer" as recommended by Blanchard (2010, p. 58). Blanchard also pointed out that only when treating suppliers as long-term partners and inseparable components of the mechanism, can supply chain managers promote relationship with the best in class suppliers. This can be easily attained by sharing transactional information with suppliers, which was done by Wal-Mart Stores Inc. and Dell Inc. for years. Sharing transaction information and cooperating with each other – both supplier and customer - on the basis of transparency and long-term development has never been made easier via Internet. Practicing that did save Ford more than $1 million (Blanchard, p. 59).

Improved Vision and Forecast of Product Demand

Last but not least, the most significant change that e-commerce has brought back is to advance how companies approach its customers and forecast their demands. E-commerce powered by Internet has rocketed the evolution of exchange platform: Turning it from a simple selling and buying stop to a sophisticated system with the ability to transform to fit with customers' taste as well as follow up and analyze the real customers.

Tools and software such as Google Analytics and Tableau when being accompanied with websites and mobile apps helps track and report traffic, enabling business executives to have a better vision of their "actual" audiences who are interested in as well as buying their products, services. Social media such as Facebook (popular in U.S. and the world) and Weibo (popular in China) also provide analysis tool allowing business owners to have better visual about who are interested in their products and services.

Accumulating understanding about customers' behaviors on companies' own sites, online shopping's websites, search engines, social media or via loyalty program on physical stores allow companies to build up customers' database and take use of this understanding to better serve customers and react more quickly and effectively to customers' need. It is also essential for company to prepare product's demand forecast. Due to Blanchard (2010), "accurately forecasting product demand is probably the single most important – and most challenging – measurement of a company's supply chain proficiency" (p.44). Significant intelligence about customers that e-commerce brings about via technology helps companies with more accurate and reliable estimated number.

Moreover, this real time input when being added and analyzed in Enterprise Resource Planning (ERP) software will help provide a real time comprehensive view of core business processes. Supply chain managers will find this a significant advancement when allowing them to better their job as to ensure smooth coordination among different departments.

Part III: Future of E-commerce Systems & Mobile E-commerce

As e-commerce continues to develop it will become much more difficult to define and track. For example, if a customer finds a product that is out of stock but uses an in-store terminal to order it online to be shipped to their home, is this an e-commerce transaction? Today e-commerce accounts for about 9% of total retail sales in the United States and about 15%-20% globally, but these numbers will be tougher to track as these complex scenarios become more common. One thing we know for certain is that e-commerce will continue to grow. (Harvard Business Review)

Advanced technology will be an important part of this growth. As previously mentioned, companies like Amazon are experimenting with drone technology to offer drone delivery service in the future. Amazon's proposed Prime Air "Octocopter" could deliver packages to homes within 30 minutes. This type of service still requires more testing and legal approval from government agencies which will consider the safety and security of this service, but the technology exists and it is only a matter of time before it is implemented. Amazon hopes to gain legal approval and have this service in place within the next five years. If successful, other companies will certainly be investing in this technology right away. Smartphone technology is also likely to play a large role in e-commerce moving forward. The majority of cellular phones in the United States today are smartphones, and approximately 40% of Americans have some type of tablet as well. Customers will be able to scan the barcode of a product in-store using their phone and immediately compare the price to other stores. This type of technology already exists and will become common in the near future. There can even be television screens showing special promotions which can also be scanned and purchased online to be shipped to a home via a smartphone. This incredible amount of information and price transparency will be great news for customers who are looking to save money, but bad news for retailers looking to make the highest profit. (Harvard Business Review)

The term Omni-channel retailing is starting to be used to recognize the many different channels of sales that retailers are using. As Omni-channel retailing becomes more common, companies will need to rethink their entire strategy. For example, if more than 50% of sales are coming from outside of a traditional retail store, should a company be opening new stores? They also need to consider what these stores will look like. Maybe they can open smaller stores with samples of each product, and the customer can order the product to be shipped to their home using their smartphone if they like. This would save the company money in shipping expenses by not having to ship such a high volume of product to the store (HBR). A smaller store would also require fewer employees which would save money on employee wages. Companies would even save money in rent by having smaller stores. Traditional stores are not going anywhere anytime soon, but they will certainly be changing in appearance. The traditional shopping experience can often feel like a chore for many customers. That is why companies are beginning to make the experience more interactive and exciting. A chain called Jordan's Furniture has been known to create a special in-store experience filled with light show, food courts, and theatres. (Harvard Business Review) This is an expensive undertaking and certainly not the marketing strategy of every company, but it is not far-fetched to think we will see some of these elements added to traditional stores.

E-commerce has even started to penetrate markets that most people would not imagine to be shopped online. One of our most basic needs in life is food, and grocery stores are just starting to be hit by e-commerce. Virtual grocery stores already exist and tend to be more popular in Europe and Asia. Customers can order common staple foods online to be delivered to their home. In fact, this concept has never really gone out of style in countries like India. Now it is just becoming digitalized. With such a high population density in Asian countries, it makes economic sense to deliver food to large condominiums at once. Obviously there are some challenges that come with shipping food. Perishable foods are the main concern, but this should not generally be a problem in very large cities where deliveries are short and concentrated. This would be much more challenging in America or Canada where people tend to be much more spread out. This type of service would likely launch in a large city like New York or Toronto where many deliveries could be made without having to travel too far, part of the reason such a system is more effective in highly integrated countries in Europe. Even if these services become popular, they will likely never overtake a traditional grocery store. People like to be able to see and smell their food, particularly when it is not just staple foods like bread or milk. Personal care products on the other hand are much more likely to be purchased online. Items like shampoo, soap, toothpaste, and laundry detergent do not need to be seen to determine the quality. Other non-perishable products such as pet food and baby wipes also have great potential to be purchased online. Grocery stores can maximize their sales by combining their online store and traditional store. Some ideas for doing this are providing online coupons, in-store mobile device offers, mobile price checks and comparisons, and complete lists of items in stock. The stores that create the best grocery shopping apps will have the most success in this industry in the future.

Overall, the future of e-commerce is hard to make precise predictions about. We know that there is a tremendous amount of new technology available and that many companies are looking at how to implement it. E-commerce is growing quickly but is difficult to track on a large scale. In the past five years there has been massive change and the next five years are sure to be just as transformational. We will likely see ourselves using some of the technology and services mentioned in the near future. The next section will overview the term "The Amazon Effect", and look at more particular aspects of American business that are changing with e-commerce.

Part IV: "The Amazon Effect"

The emergence of e-commerce and dramatic influence on American business is underlined with recent trends in the industry. Office supply superstore Staples closed down 46 stores in 2013, and Radio Shack announced 1,100 stores closing the same year (Lunden, 2014). Staples CEO Ron Sargent announced that more than 50% of their sales are generated online, with a focus on developing their online presence, they will be able to focus their resources to meet changing customer demands while reducing costs and improve efficiency (Lunden, 2014).

Impact on American trucking & 3PL's

The "Amazon Effect" points to the shift from brick and mortar retail stores to the exploding virtual retail world with no boundaries, where store locations are irrelevant (Shorr, 2015). Amazon survived the dot-com bubble, and began offering two-day shipping in 2005, as well as free shipping for orders over $25 (Shorr, 2015). The result of less customers shopping at retail stores is a burden that logistics companies have had to carry. The impact on shipping is also requiring shipping and transport companies to adapt to the enormous volume of online purchases through companies like Amazon, and The U.S. Department of Transportation projects a 45% increase to 29 billion tons by 2040 (Shorr, 2015). In response to the $636 million increase in shipping costs, Amazon has increased the number of fulfillment centers in central, strategic areas near densely populated areas across the United States. Of course, with a shipping cost reduction from 5.1% of revenue to 4.7% of revenue, 3PL providers such as UPS and FedEx take a loss, since the establishment of fulfilment centers has made the logistics of Amazon more efficient. Other challenges faced by shippers is the vast complexity and number the products offered on

Amazon, since most customers enjoy the luxury of packaging desired products to reach the minimal price tag to receive free shipping (Lieb, 2014). With the emergence of e-commerce, another phenomenon has also increased in America: "reverse-logistics". Leaders in this area, such as GENCO, has seen revenues skyrocket to over $2 billion in 2014. Brick-and-mortar retailers have seen a 50% traffic reduction across the board since 2010. The appeal of online business is substantial, including the lack of overhead that brick and mortar retailers have.

Today, many view that the evolution of Amazon has lead it to become more characteristically like a 3PL company than an e-commerce company, and now has 145 warehouses around the world and 84 in the United States (Lieb, 2014). Amazon has revolutionized supply chain management with its high-speed delivery programs and has subsequently increased customer service level expectations, raising the bar for companies that supposedly claim this to be their core competency like UPS, USPS, and FedEx. Amazon is also forcing other 3PLs to create plans and implement strategies that will support the rising number of online retailers and business to business solutions (Lieb, 2014).

The Intelligent Consumer

Today's educated consumers are becoming comfortable with online shopping, and also increasingly conscious of competitor pricing and comparisons. Price transparency has become even more prominent in recent years, and to remain competitive with Amazon, Best Buy and Target have offered price matching relative to Amazon (Kennedy, 2014). The online platform such as Amazon allows side-by-side price comparisons of the same product with multiple merchants. Amazon has continually pushed competitors to offer higher levels of service to remain competitive, and can be seen with Best Buy's recent added option of same day delivery in the California Area (Kennedy, 2014).

Amazon's Outsourcing & Sustainability

Inventory management for a company like Amazon plays a pivotal role to sustain reputation, and high level of customer service and order fulfillment (Charania, 2014). However, as many modern e-commerce companies have done, Amazon has outsourced its inventory management, which had originally cost them $50 million annually. Before outsourcing, sales were still increasing, but inventory was increasing faster; an almost 650% increase (Charania, 2014). Companies have taken Amazon's lead, realizing that in some cases the cost of holding exceeded the cost of outsourcing. The decision to outsource allowed them concentrate on customer service and core competencies while also preventing a blockage in working capital, and help reduce inventory (Charania, 2014).

Amazon's first-mover advantage in the ecommerce landscape has given them remarkable reach, and has come inherent responsibility as a leader that connects supplier and buyers around the world (Kennedy, 2013). Many view them as a greener option, since they do not have the traditional storefront, and do not require the vast amount of land and resources to support brick and mortar locations. In 2005, Amazon introduced amazon Prime, a subscription program for customers to pay $99 yearly in exchange for free two-day shipping. To maintain sustainability and realizing the jump in shipping volume, CEO Jeff Bezos was required to make underlying changes to the locations of distribution centers and also increase collaboration with their vast number of suppliers (Kennedy, 2013).

Impact on B2B

The Amazon Effect extends also to impact the way business to business sales are taking place, with an estimated $1.1 trillion e-commerce sales projected for 2020. What's more, 88% of surveyed executives buy their business products online (Meyers, 2015). Companies were surveyed and determined that they value quick and simple ways of obtaining products and services to support their business. However, so far B2B has not been as heavily impacted by the growth of e-commerce as consumer goods, since 92% of executives still wished the online purchasing of business products were as simple and efficient as buying consumer products online (Meyers, 2015).

Impact on Small Business

The Amazon Effect goes further in its influence on small businesses around the United States. For instance, David Moore, a small business owner in Indianapolis, points out that today's consumers still value the expertise and specific information of products that can be gained by visiting a brick and mortar retailer, however after gaining this expertise, customers ultimately go back and make their purchase online through retailers like Amazon (Altman, 2015). With the tremendously low margins on which Amazon offers combined with their ability to offer free shipping and absorb those costs, online prices in some cases are cheaper than those that even small retailers pay their suppliers.

In contrast to small businesses, today even Wal-Mart dwarfs in comparison to the sheer volume of Amazon's e-commerce revenue, with Wal-Mart managing $7.7 billion, while Amazon bringing in $61 billion (Banker, 2013). But these big companies, including Macy's, Best Buy, Ann Inc, and Home Depot are managing the enormous shift to e-commerce and the "Amazon Effect" with a more hybrid, Omni-channel approach. With respect to fulfilment, this means instead of shipping online orders from warehouses hundreds of miles away, they simply route the order to a store nearby (Banker, 2013). However, managing individual store inventories in such a complex way requires the retailers to execute a "perfect order", which means implementing a smaller form of a warehouse management system in individual locations, and Wal-Mart has already invested $430 million on a global distributed order management system (DOM) (Banker, 2013). With the introduction of dimensional weight this year, large retailers have understood the importance in investing early to prepare, and an Omni-channel distribution strategy would allow for a retailer to be dynamic by shipping from a nearby store to lower shipping costs (Lieb, 2014).

E-commerce has emerged in recent years as a viable, easy, and cost-effective way for consumers to purchase their goods from home. However, the profound impact of the "Amazon Effect" has been shown to affect American businesses from giants like Wal-Mart to local small businesses. The effect on the volume of American shipping and trucking with the explosion of online purchases have put trucking at a premium. Larger corporations that traditionally have been brick-and-mortar retailers that do not share Amazon's dominance and online presence, have adopted hybrid strategies to achieve order fulfilment, using their existing locations as mini warehouses to minimize shipping costs, in an attempt to match free shipping and two-day shipping offers from Amazon.

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