Electronic Commerce

Hong-Mei Chen, Ph.D.
Department of IT Management, Shidler College of Business
University of Hawaii at Manoa
hmchen@hawaii.edu

OUTLINE

1. Introduction
2. Definitions
3. EC Types
4. EC Evolution and Key Technologies
   - 4.1. Phase I : Pre-Netscape EC (1970-1994)
   - 4.2. Phase II: Web 1.0 (1994 -2005)
   - 4.3. Phase III: Web 2.0 (2005+)
5. EC Business Models and Strategies
   - 5.1. Models based on Source of Revenue
   - 5.2. Models based on EC Types
   - 5.3. Web 2.0 Business Models
6. Threats to EC development
   - 6.1. Regulatory Threats to EC
     - 6.1.1. Taxation
     - 6.1.2. EC Surveillance
     - 6.1.3. Censorship
     - 6.1.4. Net Neutrality
   - 6.2. Ethical Issues
     - 6.2.1. Privacy
     - 6.2.2. Intellectual Property Protection
   - 6.3. Security Issues
7. Conclusions
8. Glossary
9. References

KEYWORDS

EC, e-commerce, c-commerce, I-commerce, m-commerce, e-business models and strategies, Web 1.0, Web 2.0, EC evolution, Network effect, Wikinomics, mass collaboration

ABSTRACT

Electronic commerce (EC), buying and selling of products or services over electronic systems such as the Internet and other computer networks, has impacted businesses globally and become a way of life for over 1 billion of people in the "flat" world today. EC has experienced explosive growth in the last decade. It has evolved through three phases, marked by the enabling technologies from the pre-Netscape phase, to Web 1.0 (1994 to 2005), to the Web 2.0+ (2005+) phase today. EC impacts significantly on people, businesses, industries and their competitive landscapes. A new industrial order is being built by EC and it is offering companies unprecedented opportunities for innovative business models and strategies. Despite regulatory, ethical, and security issues threatening EC development, it is expected to grow continuously and substantially.

1. Introduction

Electronic commerce (EC) impacts on how people live, work, learn and play today. Each day countless individuals—perhaps as many as over 1 billion—around the world enter the digital realm via the Internet to do various tasks (Internet World Stats, January 2008). For example, in any given day, a typical user might send email to Facebook "friends" about his new bike, pay bills on-line, purchase airline tickets, watch CNN news, trade stocks, watch a video on YouTube, Google someone who is interviewing with his company, have a web conference with co-workers at another university, and play computer games with someone in Spain. According to the Census Bureau of the U.S. Department of Commerce (2008), the third quarter 2007 EC estimate increased 19.3

percent from the third quarter of 2006, and EC is projected to grow at double-digit rates continuously, becoming the fastest growing form of commerce in the world.

For the past decade, the EC technological advancement has been extraordinary and enabled many innovative EC business models. Taking advantage of the Web's characteristics (including ubiquity, global reach, standard interface, interactivity, and information/media richness, etc.), companies are able to mass-customize their products, simulating old-fashion one-to-one marketing using personalization technology such as recommender systems, with the efficiency of serving millions of customers all at once and at all hours. EC is fundamentally transforming businesses practices in many industries, creating "Long Tail" (Anderson, 2004) markets for goods and services that could not previously be offered or sold in a profitable way, and opening up markets to new competitors coming from different locations and industries. Long tail refers to a niche strategy enabled by the low distribution and inventory costs of EC. Businesses can realize significant revenue out of selling small volumes of larger number of hard-to-find items or "non-hit" items to many customers, instead of only selling large volumes of a limited number of popular items.

Value chains are experiencing drastic reconfigurations and business processes are being automated or re-engineered as the costs of reaching suppliers and customers are reduced and information asymmetries (when one party has more or better information than another party) are lessened. Efficiencies in the supply chain encourage globalization, and lower prices for consumers. Furthermore, the recent new wave of EC technology, termed Web 2.0, has brought EC to a new era, labeled as Wikinomics. Web 2.0 business models

center around monetizing social networks, mass collaboration or crowd-sourcing. The Web creates for companies a new and critical arena for dynamic capabilities—innovative combinations and linking of skills, competences, and resources from inside and outside of the firm's boundaries—but the multi-network power, efficacy, and reach of the Web 2.0 tools and platforms available to accelerate this transformation is unprecedented (Shuen 2008).

This chapter aims at providing a broad introduction to EC, focusing on its most recent development. The chapter is organized as follows. Section 2 discusses various definitions of EC. Section 3 describes types of EC. Section 4 describes three phases of EC evolution: pre-Netscape phase, Web 1.0 Phase (1994 to 2005) and Web 2.0+ Phase (2005+). The key technologies enable the EC evolution will be briefly introduced. EC business models and contemporary strategies will be discussed in Section 5. Regulatory, ethical and security issues threatening EC development will be presented in Section 6. Section 7 concludes this chapter with remarks on the future of EC.

2. Definitions

Electronic Commerce commonly known as **e-commerce** or **eCommerce**, is conventionally defined as the buying and selling of products or services over electronic systems such as the Internet and other computer networks. Some define EC broadly as the equivalent of **e-business**, which refers to the conduct of business over computer networks (Turban et al. 2008). E-business is not limited to commercial activities of buying and selling but also non-commercial activities such as collaboration with business

partners, coordination within a firm and servicing customers online. Thus, e-business, with the broadest scope of EC, include a range of intra-, inter-, and cross-organizational interactions over computer networks, going beyond the conventional EC definition above.

A term that has recently emerged**—collaborative commerce** or **c-commerce—**is used to specifically address a broad category of non-sales EC activities where groups or businesses communicate or collaborate online. Bititci, Martinez, Albores & Parung (2004, p. 266) observe that collaborative enterprises or networks 'create new and unique value propositions by complementing, integrating and leveraging each other's capabilities and competencies'. C-commerce represents the coming together of both IT and social networks: obtaining sustainable competitive advantage from the maximization of value adding benefits obtained by working collaboratively with others via IT. The collaborations between business and community depend upon the willingness of businesses to network and share information as well as their ability to accept business culture changes. C-commerce demands a new approach by firms incorporating new relationships, new assumptions, trust and a shift in culture that values partnerships.

The pervasive use of Internet for e-commerce activity has led to an even narrower definition of e-commerce, which is "the use of the Internet and the Web to transact business. More formally digitally enabled commercial transactions between and among organizations and individuals." (Laudon and Traver, 2007, p. 10) This is termed **Internet EC or I-commerce** (Turban et al. 2008, p. 5). Non-Internet EC uses computer networks such as Value-added networks (VAN, networks that add communications to existing common carriers) or such company networks as Local Area Network (LAN)

using web technology (e.g., intranet). Currently US Census use Internet EC as their basis for economic reports on EC. (U.S. Department of Commerce, 2007)

One fast growing area of EC is **mobile commerce**. This refers to the use of wireless networks and handheld devices (e.g. a mobile phone, PDA, or smartphone as well as other emerging mobile equipment such as dashtop mobile devices) while on the move to conduct commerce. M**obile commerce (m-commerce or mCommerce) is sometimes referred as U-commerce,** owing to the ubiquitous nature of its services. Tiwari and Buse (2007, p. 33) define Mobile Commerce as "any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device."

There are two types of EC companies. In contrast to *brick-and-mortar* (traditional physical, old economy) businesses, a company can be a *pure-play* company in EC, where no physical storefront exists, such as Amazon.com. A company can be a *click-and-brick* or *click-and-mortar*, where the EC channel is in addition to the physical stores. For example OfficeDepot.com is an additional commerce channel for the more traditional OfficeDepot chain of stores.

3. EC Types

EC is commonly categorized by the relationships among participants:

- Business to Business (B2B): This refers to EC activities among businesses: Businesses selling to or buying from other businesses. For example: Wal-Mart has extensive B2B relationships with its network of distributors. Today about 94% EC volume in the US is in this category according to Commerce Department statistics and its annual volume has reached $1.5 trillion in 2005 (U.S. Department of Commerce, 2007).
- Business to Consumer (B2C): This refers to EC activities where online businesses reach individual consumers. This is the most common type of EC that an individual experiences. A common example is a person ordering from Amazon.com. E-commerce retail sales in the third quarter of 2007 reached US $34.7 billion, accounted for 3.4 percent of total sales (U.S. Department of Commerce, 2008). Total retail Internet trade in 2007 is over US$140 billion. Note that these US census numbers are low estimates as they do not account for non-Internet or non-sales EC activities.
- Consumer to Consumer (C2C): Consumers can buy from or sell to other consumers directly with the help of an online market maker such as eBay.com.
- Exchange to Exchange (E2E): An exchange is a public electronic market with many buyers and sellers. An exchange usually serves a single vertical industry such as steel, polymers, or aluminum and focuses on the exchange of direct inputs to production and short-term contract or spot purchasing. On the Internet, E2E has been used to mean the exchange of information or transactions between Web sites that themselves serve as exchanges or brokers for goods and services between businesses. E2E can be thought of as a form of B2B.

- Government to Citizen (G2C), Government to Business (G2B) and Government to Government (G2G): a government buys from or provides services to a citizen (G2C) or a business (G2B) or another government entity (G2G).
- Business to Employee (B2E): Companies provide services for their employees such as sending in resumes for human resources purposes, filing travel reports online or coordinating work schedules.

In addition, there are other types of EC, such as B2B2C (B2B connecting with B2C). Many such variations can be found.

- Peer-to-peer applications (P2P): this actually refers to the P2P technology used for afore-mentioned types of EC. This technology enables networked peer computers to share data files and processing with each other directly; there is no intermediary required. Napster.com, which was established to aid Internet users in finding and sharing online music files, was the most well-known example of this type but failed due to legal issues. BitTorrent.com is a more recent example.

4. EC Evolution and Key Technologies

Information technology (IT) has revolutionized the business landscape worldwide. The use of EC technologies, including Internet and WWW, has spawned new business models and strategies. EC has grown explosively and the evolution of EC can be categorized into three stages: Pre-Netscape (1970-1994), Web 1.0 (1994-2005), and Web 2.0+ (2005+). The definition of EC is therefore expanding from a narrow scope (I-commerce)

to broader scope (e-business), as discussed in the previous section, according to the technological evolution path. The major time line is depicted in Table 1.

Table 1: EC Evolution Timeline

EC Phase I	1973	Email was invented by Ray Tomlinson of BBN.
	1990	Tim Berners-Lee created the first World Wide Web browser and server on a NeXT computer
EC Phase II	1994	Netscape released the Navigator browser in October under the code name Mozilla. Pizza Hut offered pizza ordering on its Web page. The first online bank opened. Attempts to offer flower delivery and magazine subscriptions online. "Adult" materials were also commercially available, as were cars and bikes. In late 1994 Netscape 1.0 introduced SSL encryption which made transactions secure.
	1995	Jeff Bezos launched Amazon.com. The first commercial 24 hr. internet only radio stations "Radio HK" and NetRadio started broadcasting. Dell and Cisco began to aggressively use the Internet for commercial transactions. eBay was founded by computer programmer Pierre Omidyar as AuctionWeb.
	1998	Electronic postal stamps can be purchased and downloaded for printing from the Web.
	1999	Business.com was sold for US $7.5 million (it was purchased in 1997 for US $150,000); The peer-to-peer filesharing software "Napster" was launched; Myspace.com was incepted; Google.com, still in beta, was answering 10,000 search queries each day.
	2000	The dot-com bust; Web size estimates surpass 1 billion pages, up from 300 million in 1998; wireless Internet access begins.
	2002	eBay purchased Paypal for US$1.5 billion.
	2003	Amazon.com: first-ever full-year profit announced.
	2004	MySpace was sold to News corporation (FOX news) for US $580 million.
EC Phase III	2005	YouTube debuted in Nov. 2005; Facebook.com begins and gains instant popularity; eBay purchases Skype for US $2.6 billion on Oct. 14, 2005.

	2006	YouTube was purchased by Google for US$1.65 billion on Nov. 13, 2006
	2008	Microsoft offered to buy Yahoo.com for $46 billion.

4.1 EC phase I: Pre-Netscape

EC Phase I begins with the inception of IT use in business and ends with the introduction of the Netscape browser on Aug. 1994. EC applications were initially developed in the early 1970s. These were applications such as Electronic Funds Transfer (EFT) where funds could be transferred electronically, and EDI (Electronic Data Interchange) where documents such as purchase orders, invoices, and electronic payments could be transferred between firms doing business together. Many new EC applications followed, ranging from stock trading to airline ticket reservation systems through EDI. These systems at the time were primarily used to facilitate business transactions via proprietary networks, called inter-organizational systems (IOSs). EDI technology continued to evolve into Phase II, where EDI applications could be performed via Internet. This is called Internet EDI. However, evidence from wholesalers in 2005 indicates that B2B EC relies overwhelmingly on proprietary EDI systems (U.S. Department of Commerce, 2008).

4.2 EC phase II: Web 1.0

The commercial use of the Internet, the advent of the World Wide Web, the ease of use of web browsers and other technological advances in the early 1990s brought about

wide-spread use and rapid expansion of EC applications—the term 'electronic commerce' was coined at that time. EC Phase II is marked by the introduction of the commercial Netscape browser, coincided with Windows 95 and plug-and-play architecture. Previously there had been other browsers, such as Mosaic, which had much smaller numbers of users. Web browser technology allowed individual users and businesses access to different networks using a single type of interface and made the Web a viable platform for B2B EC as well as for B2C EC Businesses flocked to the Web, attracted by the ease of setting up electronic storefronts and the potential access to a global market of Internet subscribers. Laudon and Traver (2007) estimate that more $120 billion was invested in 12,450 Internet start-up companies between 1998 and 2000, a period of significant growth in EC. Despite the highly publicized dot-com failures in 2000 and 2001, EC sales of goods and services to consumers have grown steadily. A number of e-commerce web sites began to report profits in 2002 and 2003, including Expedia, eBay, and Amazon,. Growth in other parts of the world, and especially Europe, was equally impressive. Large numbers of B2B electronic marketplaces were created to help match buyers and sellers in many industries, and by early 2000 more than 750 B2B e-markets were operating worldwide (U.S. Department of Commerce, 2000).

In Phase II, technology for EC platform and applications began to expand and mature, such as payment systems, communication systems and security systems. Significant technology-driven business innovation was developed. It took a few years after the launch of Netscape and many rounds of technology improvements for customers to broadly adopt the Web-based technology for EC, for instance, feeling comfortable using their credit cards online. Established encryption methods such as Secure Sockets Layer

(SSL), a protocol developed by Netscape Communications Corporation, were used to encode credit card numbers and other information to foil would-be thieves. Online or electronic Customer Relationship Management (CRM) systems started to flourish in late 1999 in an attempt to imitate one-to-one marketing as experienced in old-fashioned offline business relationships (Chen, Chen and Kazman, 2007). One well known example of CRM personalization software is the recommender system pioneered by Amazon.com in 1999. Many interactive tools were offered by businesses during this phase, such as live chat using VoIP (Voice over IP) technology. Google was still in its Beta version back in 1999, but in less than 5 years, it has grown to become a verb of everyday language, that is "I Googled…". In addition, the wireless Internet widely available (by 2000) completed the "last-mile" of Internet access and enabled more business innovations in m-commerce. EC field in this phase was experiencing consolidation as companies test different business models and organizational structures. Pure-play EC companies, including Amazon.com, were expanding operations and generating increasing sales. Amazon.com finally showed a profit for the first time in 2003. As shown in the timeline, many dotcom company's valuation have increased from several millions to hundred of millions to billions today, all in less than a decade. Yahoo was recently offered a takeover bid of $46 Billion by Microsoft. Google's market capitalization was over $140 billion in the year 2007.

4.3 EC phase III: Web 2.0+

Phase III of EC evolution is roughly marked by the year of 2005. This year heralded the debut of YouTube.com, in Nov. 2005. YouTube was one of the fastest growing social

networking sites on the Web, and was ranked the 5th most popular website in 2006, far outpacing even MySpace's spectacular rate of growth. Users upload 70,000 new videos to the site every day and users were watching 100 million videos every day by the end of 2006. The technology employed—high quality video display with the scalability to million of users—has been a primary factor in its success. This advanced technology capability as well as its fast pace of adoption, popularity and the influence of YouTube.com was a significant indication that a new era of EC had begun.

New phenomena in this phase have been described by new terms such as mass collaboration, Wikinomics, crowdsourcing, folksonomy, prosumer, mashups, etc. These developments have been so numerous and so powerful that they have been described as a "tsunami" by many. The power of social networking and its network effect is beginning to have an impact on EC and is quickly being exploited and monetized by corporations. Ordinary people can now control, use, remix, and share information on the Web through a new array of technologies: blogs, wikis, podcasts, RSS, social bookmarking, social software, etc. Syndication tools like RSS (which means Rich Site Summary or Really Simple Syndication) enable sites to keep users up to date without requiring them to check in regularly. RSS is now being used to push not just notices of new blog entries, but also all kinds of data updates, including stock quotes, weather data, and photo availability. Mash-ups allow a site to create new services by combining its content (e.g. maps) with another site's contents (e.g. one of the first mash-ups, HousingMaps.com, showed houses for sale that by locating them on a map; a mash-up between Craigslist and Google Maps). User tagging of content (e.g., folksonomy) such as photos and videos allows it to be

searched and more easily incorporated into other sites (e.g. users' photos from a photo-sharing site like Flickr might be brought into a news site to enhance coverage).

The phenomenon and array of technologies that propelled the development in this phase was collectively referred to as “Web 2.0,” a term coined by Tim O’Reilly in 2005. According to O'Reilly: "Web 2.0 is the business revolution in the computer industry caused by the move to the Internet as platform, and an attempt to understand the rules for success on that new platform." (O’Reilly, 2005) O’Reilly argued that the web had become a platform, with software above the level of a single device, leveraging the power of the "Long Tail", and with data as a driving force. Web 2.0 data can be remixed or “mashed up,” often through Web-service interfaces. According to O'Reilly, Web 2.0 is an “architecture of participation” where users can contribute website content to add value that creates network effects. Web 2.0 applications are delivered and used by users entirely through a browser. It includes a richer, more interactive, user-friendly interface based on Ajax (Asynchronous JavaScript and XML) or other similar frameworks. Users own the data on the site and exercise control over that data. Based on Web 2.0 principles, the more that users contribute, the more popular and valuable a Web 2.0 site becomes. Web 2.0 technologies tend to foster innovation in the assembly of systems and sites composed by pulling together features from distributed, independent developers (a kind of "open source" development and an end to the software-adoption cycle (the so-called "perpetual beta"). Web 2.0 technology allegedly encourages *lightweight business models* enabled by syndication of content and of service and by ease of picking-up by early adopters. For example, a new service like housingmaps.com was built simply by snapping together two existing services, that is, ‘innovation by assembly.’

Housingmaps.com has a lightweight business model and it doesn't have a revenue model (yet)--but for many small-scale services like Housingmaps, Google AdSense (or perhaps Amazon associates fees, or both) provides the snap-in equivalent of a revenue model.

Tim O'Reilly provided examples of companies or products that embody these principles of Web 2.0-ness (See Table 2).

Table 2: Web 1.0 vs. Web 2.0 Examples (2005)

Web 1.0		**Web 2.0**
DoubleClick	-->	Google AdSense
Ofoto	-->	Flickr
Akamai	-->	BitTorrent
mp3.com	-->	Napster
Britannica Online	-->	Wikipedia
personal websites	-->	Blogging
evite	-->	upcoming.org and EVDB
domain name speculation	-->	search engine optimization
page views	-->	cost per click
screen scraping	-->	web services
publishing	-->	Participation
content management systems	-->	Wikis
directories (taxonomy)	-->	tagging ("folksonomy")
stickiness	-->	Syndication

In this age, the power of the consumer has risen to a new height (Chen & Vargo, 2008). Better collaboration between the masses of customers, suppliers, enterprises, partners or competitors is becoming an urgent, strategic focus for firms to compete in this new era.

5. EC Business Models and Strategies

One of the major characteristics of EC is that it enables new ways of doing business, that is, the creation of new business models or the reinvention of tried-and-true models.

Rappa (2008) defines a business model as the "method of doing business by which a company can sustain itself—that is, generate revenue. The business model spells-out how a company makes money by specifying where it is positioned in the value chain." Many definitions (Timmers, 1998; Weill and Vitale, 2001; Afuah and Tucci, 2001; McKay and Marshall,2004) exist for what a business model is, thus resulting in many different classifications and taxonomies of EC business models in the research literature. However, different models are sufficient to illustrate the range of approaches of doing business stimulated by EC capabilities. We have seen many new Internet business models being played out in the Phase II EC and currently Web 2.0 opens up a range of new business models based on a fundamentally different view of how businesses, customers and partners interact.

5.1 EC Business Models based on Source of Revenue

The following 9 EC business models and its subtypes (shown in Table 3) are the most commonly cited classification by revenue model first proposed in 1999 by Rappa (2004):

1. **Brokerage Model.** Brokers are market-makers: they bring buyers and sellers together and facilitate transactions. Brokers play a frequent role in B2B, B2C and C2C markets. Usually a broker charges a fee or commission for each transaction it enables. The formula for fees can vary.
2. **Advertising Model.** The web advertising model is an extension of the traditional media broadcast model. The broadcaster, in this case, a web site, provides content (usually, but not necessarily, for free) and services (like email, IM, blogs) mixed with

advertising messages in the form of banner ads. The banner ads may be the major or sole source of revenue for the broadcaster. The broadcaster may be a content creator or a distributor of content created elsewhere. The advertising model works best when the volume of viewer traffic is large or highly specialized.

3. **Infomediary Model.** Data about consumers and their consumption habits are valuable, especially when that information is carefully analyzed and used to target marketing campaigns. Independently collected data about producers and their products are useful to consumers when considering a purchase. Some firms function as infomediaries (information intermediaries) assisting buyers and/or sellers understand a given market.
4. **Merchant Model.** These are wholesalers and retailers of goods and services. Sales may be made based on list prices or through auction.
5. **Manufacturer (Direct) Model.** The manufacturer or "direct model", it is predicated on the power of the web to allow a manufacturer (i.e., a company that creates a product or service) to reach buyers directly and thereby compress the distribution channel. The manufacturer model can be based on efficiency, improved customer service, and a better understanding of customer preferences.
6. **Affiliate Model.** In contrast to the generalized portal, which seeks to drive a high volume of traffic to one site, the affiliate model, provides purchase opportunities wherever people may be surfing. It does this by offering financial incentives (in the form of a percentage of revenue) to affiliated partner sites. The affiliates provide purchase-point click-through to the merchant. It is a pay-for-performance model -- if an affiliate does not generate sales, it represents no cost to the merchant. The affiliate

model is inherently well-suited to the web, which explains its popularity. Variations include banner exchange, pay-per-click, and revenue sharing programs.

7. **Community Model.** The viability of the community model is based on user loyalty. Users have a high investment in both time and emotion in these communities. Revenue can be based on the sale of ancillary products and services or voluntary contributions; or revenue may be tied to contextual advertising and subscriptions for premium services. The Internet is inherently suited to community business models and today this is one of the more fertile areas of development, as seen in rise of social networking.
8. **Subscription Model.** Users are charged a periodic -- daily, monthly or annual -- fee to subscribe to a service. It is not uncommon for sites to combine free content with "premium" (i.e., subscriber- or member-only) content. Subscription fees are incurred irrespective of actual usage rates. Subscription and advertising models are frequently combined.
9. **Utility Model.** The utility or "on-demand" model is based on metering usage, or a "pay as you go" approach. Unlike subscriber services, metered services are based on actual usage rates.

Table 3. Rappa's EC Business Models based on Source of Revenue (reproduced with permission from the author; Rappa 2004)

Type of Model	Subtypes and examples
Brokerage Model	**Marketplace Exchange** -- offers a full range of services covering the transaction process, from market assessment to negotiation and fulfillment. Exchanges operate independently or are backed by an industry consortium. [**Orbitz**, **ChemConnect**] **Buy/Sell Fulfillment** -- takes customer orders to buy or sell a product or service, including terms like price and delivery. [CarsDirect, Respond.com]

	Demand Collection System -- the patented "name-your-price" model pioneered by Priceline.com. Prospective buyer makes a final (binding) bid for a specified good or service, and the broker arranges fulfillment. [**Priceline.com**] **Auction Broker** -- conducts auctions for sellers (individuals or merchants). Broker charges the seller a listing fee and commission scaled with the value of the transaction. Auctions vary widely in terms of the offering and bidding rules. [**eBay**] **Transaction Broker** -- provides a third-party payment mechanism for buyers and sellers to settle a transaction. [**PayPal**, Escrow.com] **Distributor** -- is a catalog operation that connects a large number of product manufacturers with volume and retail buyers. Broker facilitates business transactions between franchised distributors and their trading partners. **Search Agent** -- a software agent or "robot" used to search-out the price and availability for a good or service specified by the buyer, or to locate hard to find information. **Virtual Marketplace** -- or virtual mall, a hosting service for online merchants that charges setup, monthly listing, and/or transaction fees. May also provide automated transaction and relationship marketing services. [zShops and Merchant Services at **Amazon.com**]
Advertising Model	**Portal** -- usually a search engine that may include varied content or services. A high volume of user traffic makes advertising profitable and permits further diversification of site services. A personalized portal allows customization of the interface and content to the user. A niche portal cultivates a well-defined user demographic. [**Yahoo!**] **Classifieds** -- list items for sale or wanted for purchase. Listing fees are common, but there also may be a membership fee. [**Monster.com**, **Craigslist**, Match.com] **User Registration** -- content-based sites that are free to access but require users to register and provide demographic data. Registration allows inter-session tracking of user surfing habits and thereby generates data of potential value in targeted advertising campaigns. [**NYTimes**] **Query-based Paid Placement** -- sells favorable link positioning (i.e., sponsored links) or advertising keyed to particular search terms in a user query, such as Overture's trademark "pay-for-performance" model. [**Google**, **Overture**] **Contextual Advertising / Behavioral Marketing** -- freeware developers who bundle adware with their product. For example, a browser extension that automates authentication and form fill-ins, also delivers advertising links or pop-ups as the user surfs the web. Contextual advertisers can sell targeted advertising based on an individual user's surfing activity. **Content-Targeted Advertising** -- pioneered by Google, it extends the precision of search advertising to the rest of the web. Google identifies the meaning of a web page and then automatically delivers relevant ads when a user visits that page. [**Google**] **Intromercials** -- animated full-screen ads placed at the entry of a site before a user reaches the intended content. [CBS MarketWatch] **Ultramercials** -- interactive online ads that require the user to respond intermittently in order to wade through the message before reaching the intended content. [Salon in cooperation with Mercedes-Benz]
Infomediary Model	**Advertising Networks** -- feed banner ads to a network of member sites, thereby enabling advertisers to deploy large marketing campaigns. Ad networks collect data about web users that can be used to analyze marketing effectiveness. [**DoubleClick**] **Audience Measurement Services** -- online audience market research agencies. [**Nielsen//Netratings**] **Incentive Marketing** -- customer loyalty program that provides incentives to customers such as redeemable points or coupons for making purchases from associated retailers. Data collected about users is sold for targeted advertising. [**Coolsavings**] **Metamediary** -- facilitates transactions between buyer and sellers by providing comprehensive information and ancillary services, without being involved in the actual exchange of goods or services between the parties. [Edmunds]
Merchant Model	**Virtual Merchant** --or e-tailer, is a retail merchant that operates solely over the web. [**Amazon.com**] **Catalog Merchant** -- mail-order business with a web-based catalog. Combines mail, telephone and online ordering. [**Lands' End**] **Click and Mortar** -- traditional brick-and-mortar retail establishment with web storefront. [Barnes & Noble] **Bit Vendor** -- a merchant that deals strictly in digital products and services and, in its purest form, conducts both sales and distribution over the web. [**Apple iTunes Music Store**]
Manufacturer (Direct) Model	**Purchase** -- the sale of a product in which the right of ownership is transferred to the buyer.

	Lease -- in exchange for a rental fee, the buyer receives the right to use the product under a "terms of use" agreement. The product is returned to the seller upon expiration or default of the lease agreement. One type of agreement may include a right of purchase upon expiration of the lease. **License** -- the sale of a product that involves only the transfer of usage rights to the buyer, in accordance with a "terms of use" agreement. Ownership rights remain with the manufacturer (e.g., with software licensing). **Brand Integrated Content** -- in contrast to the sponsored-content approach (i.e., the advertising model), brand-integrated content is created by the manufacturer itself for the sole basis of product placement.
Affiliate Model	**Banner Exchange** -- trades banner placement among a network of affiliated sites. **Pay-per-click** -- site that pays affiliates for a user click-through. **Revenue Sharing** -- offers a percent-of-sale commission based on a user click-through in which the user subsequently purchases a product.
Community Model	**Open Source** -- software developed collaboratively by a global community of programmers who share code openly. Instead of licensing code for a fee, open source relies on revenue generated from related services like systems integration, product support, tutorials and user documentation. [**Red Hat**] **Open Content** -- openly accessible content developed collaboratively by a global community of contributors who work voluntarily. [**Wikipedia**] **Public Broadcasting** -- user-supported model used by not-for-profit radio and television broadcasting extended to the web. A community of users support the site through voluntary donations. [The Classical Station (WCPE.org)] **Social Networking Services** -- sites that provide individuals with the ability to connect to other individuals along a defined common interest (professional, hobby, romance). Social networking services can provide opportunities for contextual advertising and subscriptions for premium services. [**Flickr**, Friendster, Orkut]
Subscription Model	**Content Services** -- provide text, audio, or video content to users who subscribe for a fee to gain access to the service. [**Listen.com**, **Netflix**] **Person-to-Person Networking Services** -- are conduits for the distribution of user-submitted information, such as individuals searching for former schoolmates. [**Classmates**] **Trust Services** -- come in the form of membership associations that abide by an explicit code of conduct, and in which members pay a subscription fee. [**Truste**] **Internet Services Providers** -- offer network connectivity and related services on a monthly subscription. [**America Online**]
Utility Model	**Metered Usage** -- measures and bills users based on actual usage of a service. **Metered Subscriptions** -- allows subscribers to purchase access to content in metered portions (e.g., numbers of pages viewed). [**Slashdot**]

5.2 EC Business Models by EC Types and Strategies

One company may employ a combination of different revenue models and some models may be limited to a specific EC category: B2B, B2C, etc. Laudon and Traver (2007) divide models by their consumer versus business focus and the scope of products and services. B2C business models are classified into 7 types: Portal, E-Tailer, Content Provider, Transaction Broker, Market Creator, Service Provider, and Community Provider. Each of the business model classified here can incorporate one or more of the

revenue models that were described above. For instance, portals offer an integrated package of content and services, and can be horizontal (general, targeting all users) or vertical (focused on a specific subject matter or market segment) or they may offer search services (such as Google.com). The revenue models used for Portals can include advertising, subscription fees, transactions, and affiliated referral fees. In the B2B arena, two broad types of models are classified based on the network used:

- Net Marketplace: *E-Distributor* (e.g, Staples.com, offering electronic catalogues representing thousands of suppliers, the Amazon.com for an entire industry), *E-Procurement* (e.g., Perfectcommerce.com, B2B intermediaries offering a range of procurement services, including the licensing of procurement software that supports a range of value-added services. They do not own the supplies, but offer the catalogues of thousands of suppliers from whom they also obtain fees and commissions.), *Exchange* (e.g., E-steel.com, vertical industry orientation) and *Industry Consortia* (e.g., Covisint.com, vertical industry e-market open to select suppliers for buying firms to support long term relationships with their suppliers).
- Private Industrial Network: These networks may be for a single firm (e.g., Wal-Mart; a company-owned network to coordinate supply chains with a limited set of partners) or may be industry-wide (e.g., 1SYNC, an industry-owned network to set standards, coordinate supply and logistics for a industry).

Laudon and Traver (2007) did not offer subtypes for C2C, P2P and mobile EC business models.

Turban et.al. (2008) list 20 commonly used EC business models, mixing source of revenue, EC types and competitive strategies in their classification. For instance, the Deep discounting model implies low cost strategy, the Product and Service Customization model implies a differentiation strategy, and the Direct Marketing, the Viral Marketing and the Affiliate Marketing models are straightforward marketing strategies.

5.3 Web 2.0 Business Models

The above models included Web 2.0 business models in the traditional categories of "community model" or viral marketing. Tapscott and Williams (2007) argue in their book *Wikinomics: How Mass Collaboration Changes Everything* that the economy of "the new web" depends on mass collaboration. The prospective Internet-based economy that they term "Wikinomics" depends on the principles of openness, peering, sharing, and acting globally. They have explicitly identified seven Web 2.0 business-models with high level strategies embedded, summarized in Table 4 below.

Table 4. Web 2.0 Business Models (Tapscott and Williams, 2007)

Model	**Description**	**Examples**
Peer pioneers	Self-organizing, voluntary, nonmonetary communities that Collaboratively produce open source goods and services.	Linux, Wikipedia, IBM support for Linux
Ideagoras	Generating ideas for innovations with the help of social networking platforms that bring together questions and solutions to problems.	Network, Eureka Medical, YourEncore, Innovation Relay Centers, P&G, yet2.com
Prosumers	Based on the principle of user generated content and products. Consumers become producers.	Second Life, Lego Mindstorms, Music Mashups, Creative Commons, YouTube, Slashdot, digg

New Alexandrians	Collaborative open access production of scientific knowledge	Google Print, arXiv, Human Genome Project, Single Nucleotide Polymorphisms (SNP) Consortium, Intel's Open University Network
Platforms for Participation	Creation of business partnerships by opening of software services and databases via an application programming interface (API). Existing platforms or applications are combined or integrated with other ones.	HousingMaps, CheapGas, Developer communities of eBay, Google, Amazon; PeopleFinder, BBC Creative Archive, Amazon, Scorecard, Neighborhood Knowledge California
Global Plant Floor	Physical products are modularized and production is globally outsourced so that products are co- created by many contributing actors that work in parallel	BMW, Lifan, Boeing
Wiki Workplace	Usage of blogs, wikis, chatrooms, peer-topeer-networks, podcasts, etc. across departmental and organizational boundaries in order to collaborate and form ad hoc communities.	Geek Squad, Best Buy, Socialtext, Google 20% rule

These models of competition all share one thing in common: "These new forms . . . enable firms to harvest external knowledge, resources, and scale that were all previously impossible. Whether your business is closer to Boeing or P&G, or more like YouTube or Flickr, there are vast pools of external talent that you can tap with the right approach. Companies that adopt these models can drive important changes in their industries and rewrite the rules of competition" (p. 269). These models are not so different from the ones shown earlier in this section. The difference is that Wikinomics strategies are more subtle in exploiting free or cheap labor as the contributors truly enjoy their tasks; the term "crowdsourcing" is the one of the terms that describes these strategies. "Companies can design and assemble products with their customers, and in some cases customers can do the majority of the value creation" (p. 289).

In sum, EC has enabled new business models and changed the competitive landscape for all kinds of companies—and it continues to change the landscape. Companies may be forced to—and can much more easily than ever before—change or combine different business models to align with technological advancements and to leverage firm

capabilities for competitive advantage. The Web creates a new and critical arena for dynamic capabilities—innovative combinations linking skills, competences, and resources from inside and outside of the firm's boundaries—but the multi-network power, efficacy, and reach of the Web 2.0 tools and platforms available to accelerate this transformation is unprecedented (Shuen, 2008).

6. THREATS TO EC DEVELOPMENT

As e-commerce transactions have grown in number and value EC developments are facing pervasive regulatory, ethical and security issues. Regulatory issues discussed in this section include taxation, EC surveillance, censorship and Net neutrality issues. Ethical issues include privacy and intellectual property. These issues not only threaten EC today, but will also shape future EC development.

6. 1 Regulatory Threats to E-Commerce

6.1. 1 Taxation

Because the Internet transcends national, state or provincial boundaries, the issue of sales taxes on goods or services purchased over the Internet poses a problem for many governments that rely on sales tax revenue to fund government programs and services. The Internet is largely a tax-free zone. One study reported in 2001 found that state and local governments in the United States lost an estimated $13.3 billion in uncollected sales taxes on Internet purchases made that year. State and local governments have been lobbying the U.S. Congress to impose some kind of uniform sales tax that all e-commerce businesses would be required to pay. E-commerce businesses, however, have lobbied

against such measures, arguing that it would impose a heavy burden on them. In 1998, congress passed the Internet Tax Freedom Act, which placed a moratorium on "multiple or discriminatory taxes on electronic commerce" as well as on Internet access. The moratorium has since been extended three times, in 2001, 2004 and 2007 to extend for another 7 years. The European Union (EU) already has a method for taxing business-to-business transactions over the Internet. EU companies are required to collect tax on sales but U.S. companies are not. This has given American companies a huge edge in transnational EC.

6.1. 2 EC Surveillance

Government or law enforcement authorities have long claimed the right under numerous statutes to monitor any form of electronic communications pursuant to court orders and judicial review. The USA PATRIOT Act, introduced after the Sept. 11th terrorist attacks in 200l, strengthened the ability of law enforcement agencies to monitor EC users without their knowledge. In 2004, a Privacy and Civil Liberties Oversight Board in the office of the President was created to ensure anti-terrorism laws do not decimate other privacy protection laws.

6.1.3 Censorship

Censorship is the governmental attempt to control Internet traffic and limit citizens from viewing its contents. For instance, China and North Korea set strict guidelines on what can be viewed and certain key words and topics are blocked as search terms. In 1998, the US Congress passed the Children's Online Protection Act (COPA) which made it a

felony criminal offense to communicate for 'commercial purposes . . . any material harmful to minors." In 2001, the Children's Internet Protection Act (CIPA) required schools and libraries in the United States to install "technology protection measures" (filtering software) in an effort to shield children from pornography. In many countries, the debate continues about the rights of the individual versus the right of the society.

6.1.4 Net Neutrality

Currently, data sent over the Internet is handled in a neutral manner. All traffic is treated the same way. ISPs and telephone companies have argued for prioritization as traditional Internet traffic (e.g., e-mail) suffers due to competition with high bandwidth applications, such as video. For example, they argue that YouTube.com is not paying their fair share for their high bandwidth video application and should be de-prioritized in the net traffic. This threatens to bring in more regulations on Net usage.

6. 2 Ethical issues

6.2.1 Privacy

EC sites routinely collect a variety of information from or about consumers who visit their sites and make purchases (profiling) to understand the customer better (behavior targeting) and to implement their personalization strategies. The more personal or precise the information collected, the more individual privacy is potentially invaded. To put customers at ease, many EC stores post "privacy statements" that explain their policy of sharing (or not sharing) customer information with other businesses. This privacy policy may include refusing to give the customer's name and e-mail address to

companies that send unsolicited and unwanted commercial e-mail messages, often known as junk mail or spam. In 2003 the U.S. Congress passed legislation designed to curb spam. The new law made it illegal for senders of unsolicited commercial e-mail to disguise their identity by using false return addresses or misleading subject lines. The law also prohibited the gathering of e-mail addresses from Web sites. Sponsors of the legislation estimated that the incredible growth in spam, representing about half of all e-mails, cost Internet access providers $9 billion annually in technology-related expenses necessary to handle the increased volume of mail. Clogged in-boxes also annoyed consumers and made it difficult to distinguish between solicited and unsolicited commercial e-mail messages.

There are privacy-enhancing technologies for protecting user privacy during interactions with websites. Most of these tools emphasize security – the ability of individuals to protect their communications and files from illegitimate snoopers. Others include spyware blockers, cookie blockers, pop-up controls on browsers, anonymous surfing, disk/file erasing programs, policy generators, privacy policy reader, public key encryption, etc. This issue continues to be a tug-of-war between advertisers and marketers versus consumers.

6.2.2 Intellectual property rights

Intellectual property encompasses all the tangible and intangible products of the human mind. Common types of intellectual property include copyrights, patents and trademarks. Digital media differs from books and other media in terms of ease of replication, transmission and alteration, and the difficulty in classifying a software work as

establishing uniqueness. EC permits millions of people to make perfect copies of digital works. The Digital Millennium Copyright Act (DMCA) of 1998 is the first major effort to adjust copyright laws to the Internet age. Napster failed due to copyright issues and YouTube is still in court for similar issues, when customers violate copyrights. EC companies are relying on technology to detecting user violations. For instance, YouTube uses robots to scan the "tags" of the user-submitted contents for violations. Digital Rights Management (DRM) systems are technology-enabled protection measures that allow a vendor of digital content to control the materials and restrict their usage. For instance, Apple limits a song downloaded from their iTunes store to be copied up to 5 times by using a proprietary file format. Some software self-destructs after a specific number of uses. However, DRM systems may restrict the fair (non-commercial) uses of material by individuals and it requires the users to reveal their identity, which may cause privacy concerns.

Patents are very different from copyrights because patents protect an idea itself, and not just the expression of an idea. In 1998, a legal decision allowed "business method" patents to be conferred. For instance, Amazon.com patented one-click purchasing in 1999; and Priceline.com patented buyer-driven "name your price" sales in 1999. Priceline sued Microsoft and Expedia for copying its patented business methods and it won. In August 2005 Research In Motion Corporation, the creator of the BlackBerry handheld device, was ordered to pay NTP corporation, a patent company, $53.7 million in damages. The two companies settled outside the court for $612.5 million in March of 2006.

Trademarks are used to identify and distinguish goods and to indicate their source. In Nov. 1999, the Anticybersquatting Consumer Protection Act (ACPA) was passed in the U.S. Congress. ACPA creates civil penalties for anyone who registers an Internet domain name that is identical, confusingly similar or "dilutive" of a trademark. It proscribes using "bad faith" domain names to extort money from the owners of the existing trademark (cybersquatting) or using the bad faith domain to divert Web traffic to the bad faith domain that could harm the good will represented by the trademark, create market confusion, tarnish or disparage the mark (cyberpiracy).

There are debates about how IP laws might impede human progress, including EC development. There are problems as to how effectively the law can be enforced and many are concerned about the high price that society would pay for protecting intellectual property.

6.3 Security Issues

In the earliest years of EC, fears that credit card information would be intercepted while in transit over the Internet prompted most online stores to implement secure servers relying on the Secure Sockets Layer (SSL) transmission. EC security today involves much more than just securing transmissions but also protecting against fraud and other crimes. EC fraud has grown even faster than EC itself. Fraudulent orders represent about 1% of incoming B2C orders. A common fraud scheme is "Phishing": using emails or pop-up messages to deceive victims into disclosing sensitive information such as

passwords. Extortion rings have pried hundreds of thousands of dollars from online sports betting Web sites. Any site refusing to pay protection fees was threatened with Zombie computers, which are computers taken over by hackers and then used to attack other computers. Fake escrow company websites steal buyers' deposits. Click fraud is a common concern for advertisers and search vendors alike. Click fraud scams and deceptions inflate advertising bills for thousands of companies of all sizes by the use of online robots programmed to click on advertisers' links.

Major crimes such as stealing customer information or credit card numbers from e-tailors' databases have caused many consumers to worry. One critical EC security challenge is to authenticate both consumers and online stores, preserve the confidentiality of information related to online transactions, and to ensure the integrity of transaction-related information. Currently, there are consumer protection laws, third-party Assurance services such as TRUSTe, Web Trust, etc. Many advanced technologies for authentication—such as two-factor biometric controls for online transactions—are implemented. Security measures impose inconvenience on consumers (such as the prolonged login-in process for authentication) and additional costs for business, all constraining EC development.

7. CONCLUSIONS

This chapter has provided a broad overview of EC including its key concepts and its evolution through three phases: Pre-Netscape, Web 1.0 and Web 2.0+. We are witnessing a new EC era (EC Phase III) that was never imagined before. With powerful

Web 2.0 technology, the power of consumers has risen and a new industry order is being built. We introduced new business models and strategies which are enabled by advanced EC technologies. We then examined critical regulatory (e.g., taxation, EC surveillance, censorship and Net neutrality), ethical (e.g., privacy and intellectual property) and security issues that impact on future EC development.

EC is expected to grow continuously and many believe that Phase III is just the beginning of yet another revolution. With the optimism surrounding the future of EC, new technology concepts, tentative termed Web 3.0 as the evolutionary stage of the Web that follows Web 2.0, is starting to form (Borland, 2007). Currently, the technical and social possibility for realizing Web 3.0 is still highly speculative and views surrounding future Web 3.0 development vary greatly. Nonetheless, it is believed that Web 3.0 or next generation EC technology would extend what we see today (Web 2.0) to be even more intelligent and more portable, to provide more personal, faster and far-flung connectivity, more powerful search engines, new Web services that work entirely within a browser window, and more clout for everyday people. Regulatory, ethical and security issues that threaten EC development will continue to be debated and new EC threats will continue to arise as EC continues to break new ground.

GLOSSARY

Authentication. The process of confirming user identity or data origin and integrity.

Collaborative commerce or **c-commerce.** A broad category of non-sales electronic commerce activities where groups or businesses communicate or collaborate online.

Crowdsourcing. Use of everyday people as cheap labor force.

E-business. The conduct of business over computer networks

Electronic Commerce (**e-commerce** or **eCommerce)**. The buying and selling of products or services over electronic systems such as the Internet and other computer networks; can be as broad as e-business and as narrow as Internet Commerce.

EDI. Electronic Document Interchange; software application for transmitting business documents over computer networks automatically.

Folksonomy. Taxonomy provided by users or website content tagged by "folks" or users.

Internet EC or I-commerce. The use of the Internet and the Web to transact business. More formally digitally enabled commercial transactions between and among organizations and individuals.

Long tail. The consumer demographic that buys hard-to-find items or "non-hit" items which are in the "long tail" of a statistical distribution.

Mashups. A web application that combines data and/or functionality from more than one source.

M**obile commerce (m-commerce or mCommerce).** Any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device.

Mass collaboration. A form of collective action that occurs when large numbers of people work independently on a single project, often modular in its nature. Such projects typically take place on the internet using social software and computer-supported collaboration tools such as wiki technologies.

Network effect. The value of a good or service increases as more people use that good or service.

RSS. Rich Site Summary or Really Simple Syndication; it enable sites to keep users up to date without requiring them to check in regularly.

Prosumer. Producer and Consumer is the same person; a customer who contributes to the creation of the products or services he/she then consumes.

Wikinomics. Internet-based economy that depends on mass collaboration based on the principles of openness, peering, sharing, and acting globally.

U-commerce. Same as Mobile Commerce; the name refers the ubiquitous (anywhere any time) nature of its services.

REFERENCES

Afuah, A. and C. Tucci (2001). *Internet Business Models and Strategies: Text and Cases*. New York, NY: McGraw-Hill Irwin.

Anderson, C. (2006). *The Long Tail: Why the Future of Business is Selling Less of More.* New York: Hyperion.

Borland, J. (2007) "A Smarter Web." *www.technologyreview.com*, March 12. http://www.technologyreview.com/Infotech/18306/page1/ (Accessed Feb. 8, 2008)

Bititci, U., Martinez, V., Albores, P. and Parung, J. (2004).'Creating and managing value in collaborative networks', *International Journal of Physical Distribution and Logistics Management,* vol 34(3),251-268.

Chen H., Chen Q., and Kazman R. (2007) "The Affective and Cognitive Impacts of Perceived Touch on Online Cstomers' Intention to Return in the Web-based eCRM environment," *Journal of Electronic Commerce in Organizations*, 5(1), 69-91, January-March.

Chen H. and Vargo S. L. "An Alternate Logic for Electronic Customer Relationship Management." Special issue on *Marketing Transformation to the New e-Business Environment: Emerging Trends, Approaches and Challenges*, *International Journal of Business Environment*, vol. 2(2): 116-132, 2008.

CNN Money (2006). "BlackBerry maker, NTP ink $612 million settlement

Research in Motion averts shutdown of wireless e-mail service, announces fourth-quarter warning." March 3, 2006: 7:29 PM.
http://money.cnn.com/2006/03/03/technology/rimm_ntp/ (Accessed: Jan. 31, 2008)

Friedman, T. L. (2006) *The World is Flat: a Brief History of the Twenty-First Century,* New York: Farrar, Straus and Giroux.

Internet World Stats (2008). "1,319,520,109 Internet users in the world Internet by December 2007, a penetration rate of 20.0 % worldwide." http://www.internetworldstats.com/ (Accessed Feb. 8, 2008)

Laudon, K. and C. Traver (2007). *E-commerce: Business, technology, society, 3rd Edition*. Boston: Addison-Wesley.

McKay, J., and P. Marshall (2004). *Strategic Management of E-business*, Milton, Qld., Australia: John Wiley and Sons, 2004.

O'Reilly, T. (2005). "What is Web 2.0? Design patterns and business models for the next generation of software."
http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html
(Accessed: January, 2008)

Rappa, M. (2004). "The Utility Business Model and the Future of Computing Services," IBM Systems Journal, Vol. 43, No. 1, pp. 32-42.
(An updated version of Rappa's business model taxonomy is maintained on the web at http://digitalenterprise.org.)

Shuen A. (2008). *The Web 2.0 Strategy Guide: Making Web 2.0 Work*, O'Reilly Media.

Surowiecki, J. (2004) *The Wisdom of Crowds: Why the Many are Smarter than the Few and How Collective Wisdom Shapes Business, Economies, Societies, and Nations*, Doubleday.

Tapscott D. and A. D. Williams (2007), *Wikinomics: How Mass Collaboration Changes Everything,* New York: Penguin.

Timmers, P. (1998). "Business models for electronic markets," *Electronic Markets*, 8 (2), 3-8.

Tiwari, R. and Buse, S. (2007): *The Mobile Commerce Prospects: A Strategic Analysis of Opportunities in the Banking Sector*, Hamburg: Hamburg University Press.

Turban, E., King, D., McKay, J., Marshall P., Lee, J., & Viehland, D. (2008). *Electronic Commerce 2008: A Managerial Perspective*. Upper Saddle River, NJ: Prentice-Hall.

US Department of Commerce (2000). *Digital economy 2000*. US Department of Commerce. https://www.esa.doc.gov/Reports/DIGITAL.pdf (Accessed: July 6, 2006)

U.S. Department of Commerce (2007). 2005 e-commerce multi-sector report. *U.S. Census Bureau E-Stats*. http://www.census.gov/eos/www/2005/2005reportfinal.pdf (Accessed: Jan. 31, 2008)

U.S. Department of Commerce. (2008). Quarterly retail e-commerce sales: 3rd Quarter 2007. http://www.census.gov/mrts/www/data/html/07Q3.html (Accessed: Jan. 31, 2008)