A Review of Emerging Technology Trends in E-Commerce

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ABSTRACT: After several years of growth, ecommerce has become mainstream and matured. However, the new challenges require that tomorrow’s ecommerce system move beyond the basic functions such as a static website with electronic catalog and/or a shopping cart towards an intelligent, dynamic, and secure commerce system. Businesses are expecting to streamline their business processes and have an efficient information system so that they can share information and maximize business investments and opportunities. This research project attempts to explore the emerging technologies that can solve these issues such as systems integration and information sharing. Specifically, the nascent technologies introduced include application services, web services, grid computing, and their combinations. The potential factors that influence businesses to adopt ecommerce are discussed. Knowledge of these new technology trends will definitely help businesses in making strategic decisions and thus increase their business sustainability and competitiveness.

Keywords: Emerging Technology Trends, Application Service, Web Service, Grid Service, E-commerce, types, Advantages of e-commerce, Barriers of e-commerce

WELCOME TO THE E-COMMERCE

In the 12 years since it began in 1995, electronic commerce has grown in the United Stated from a standing start to a $225 billion retail business and a $3.6 trillion business-to-business juggernaut, bringing about enormous change in business firms, markers, and consumer behavior. Economics and business firms around the globe, In Europe, Asia, And Latin America, are being similarly affected. In the next five years, e-commerce in all of its forms is projected to continue growing at double digit rates, becoming the fastest-growing form of commerce in the world just as automobiles, airplanes, and electronics defined the twentieth century. “The rapid movement toward an e-commerce economy and society is being led by both established business firms such as walmart, IC Penney, and General Electric, and new entrepreneurial firms such as google, amazon, E*Trade, My space, facebook, Photobucket, and youtube. Everyone of Business and information technology need a through grounding in electronic Commerce in order to be effective and successful managers in the next decade”.(Pearson, 2008, p.5-13)

The focus of the 4th edition is on the breed of e-commerce services that have emerged since the last edition. These new online services provide social networking video and photo-sharing, and communication services, as well as a forum for online advertising that firms of all kinds are ancious to exploit. Sometimes called wed 2.0, new sites such as Facebook, My Space, Photobucket, Del.icio.us, Youtube, and Blinkx. Have grown explosively in the last two years.

The traditional forms of retail e-commerce and services also remain vital and continue to show double-digit growth. The defining characteristic of these firms over the last decade Is also a focus of this book. The defining characteristic of these firms is that they are profitable, sustainable, efficient, and innovative firms with powerful brand names. Many of these now-experienced retail and service firms such as eBay, Amazon E*Trade, profitable, and Expedia are survivors of the first era of e-commerce, from 1995 to spring 200. These surviving firms have evolved their business models, integrated their online and offline operations, and changed their revenue models to become profitable. Students must understand how to build these kinds of e-commerce businesses in order to help the business firms they manage to succeed in the e-commerce era.

It would be foolish to ignore the lessons learned in the early period of e-commerce. Like so many technology revolution in the past- automobiles, electricity, telephones, and biotechnology-there was an explosion of entrepreneurial efforts, followed by consolidation by consolidation. By 2005, the survivors of the early period were moving to establish profitable businesses while maintaining rapid growth in revenues. In 2007-2008,e-commerce is entering a new period of explosive entrepreneurial activity, quite similar it the early years of e-commerce. E-commerce is alive, will once again vibrant and exciting, and growing very fast at more than 20% a year,
bringing about extraordinary changes to markets, industries, individual businesses, and society as a whole, E-commerce is generating thousands, of new jobs for young managers in all fields from marketing to management, entrepreneurial studies, and information systems. Today, e-commerce technologies and financial muscle required for the long-term deployment of e-commerce technologies and methods. If you are work- ing in an established business, chances are the firm’s e-commerce capabilities and web presence are important factors for its success. If you want to start a new business, chances are very good that the knowledge you learn in this book will be very helpful.

**BUSINESS. TECHNOLOGY. SOCIETY.**

We believe that in order for business and technology everyone to really understand e-commerce, they must understand the relationships among commerce, they must understand the relationships among e-commerce business concerns, internet technology, and the social and legal context of e-commerce business. These three themes permeate all aspects of e-commerce.

“Given the continued growth and diffusion of e-commerce, everyone regardless of their major discipline must also understand the basic economic and business forces driving e-commerce. E-commerce is creating new electronic markets where prices are more transparent, markets are global, and trading is highly efficient, though not perfect. E-commerce is having a direct impact on the firm’s relationship with suppliers, customers, competitors, and partners, as well as how firms market products, advertise, and use brands. Whether you are interested in marketing and sales, design, production, finance, information systems, or logistics, you will need to know how e-commerce technologies can be used to reduce supply chain costs, increase production efficiency, and tighten the relationship with customers. This text is written to help you understand the fundamental business issues in e-commerce.” (Pearson, 2008, p.14-16)

We spend a considerable amount of effort analyzing the business models and strategies of “pure-play” online companies and established business now forging “bricks and clicks” business models. We explore why many early e-commerce firms failed and the strategic, financial, marketing, and organizational challenges they faced. We also describe how contemporary e-commerce firms learned from the mistakes of early firms, and how established firms are using e-commerce firms learned from the mistakes of early firms, and how established firms are using e-commerce to succeed. Above all, we attempt to bring a strong sense of business realism and sensitivity to the often exaggerated description of e-commerce. As founders of a dot.com company and participants in the e-commerce revolution, we have learned that the “E” in e-commerce does not stand for “easy”.

The web and e-commerce is causing a major revolution in marketing and advertising in united states. We spend two chapters discussing how marketing and advertising dollars are moving away from tradition al media, and towards online media, causing significant growth in search engine marketing, targeted display advertising and online rich media/video ads.

E-commerce is driven by internet technology, internet technology, and information technology in general, is perhaps the star of the show without the internet, e-commerce would be virtually nonexistent, accordingly, we provide three specific chapters on internet and e-commerce technology, and in every chapter be provide continuing coverage by illustrating how the topic of the chapter is being shaped by new information technologies, for instance, internet technology drives developments in security and payment system, marketing strategies and advertising, financial application, business-to-business trade and retail telecommunication technologies that lower business costs, new software languages such as XML that enable web 2.0, and new types of internet based information systems that support electronics business-to-business markets.

E-commerce is not only about business and technology, however the third part of the equation for understanding e-commerce is society. E-commerce and internet technologies have important social consequences that business leaders can ignore only at their peril. E-commerce has challenged our concepts of privacy, intellectual property, and even our ideas about national sovereignty and governance. Google, Amazon, and assorted advertising networks maintain profiles on millions of U.S. and foreign online shoppers. The proliferation of illegally copied music and videos on the internet, and the growth of social networking sites often based on displaying copyrights materials without permission, are challenging the intellectual property states- are demanding to control the content of web sites displayed within their borders for demanding that e-commerce sites pay sales taxes. As a result of these challenges to existing institutions, e-commerce and the internet are the subjects of increasing investigation, litigation, and legislation. Business leaders need to understand these societal developments, and they cannot afford to assume any longer market efficiency is the only consideration. In addition to an entire chapter devoted to social and legal implications of e-commerce, each chapter contains material highlighting the social implications of e-commerce.
Application services

Currently, information technologies/information systems are considered more as services than products. Especially in client/server architecture, the term "service" is used to indicate the ability to make a remote call. “With web and Internet technology, software can be hosted remotely on an application server and can be called a service by a client using a web browser. “With this concept of information service, business integration needs, and distributed computing technology, the way software applications are designed, architected, delivered and consumed is changing. Information service has a hierarchical structure that consists of several layers. It can either be software applications or components of applications. Among the service-oriented computing technologies, application services were introduced a few years ago. customers have generally been dissatisfied with ASP offerings, and many have seen their ASPs go out of business. (Wendy, et.al., 2007).

An application service provider (ASP) is a supplier of application services. Application service provision represents an e-business model of supplying and consuming applications over computer networks. Applications provided by an ASP may be as simple as single software or as complex as an enterprise resource planning (ERP) system. An ASP assumes responsibility for buying, hosting, and maintaining a software application on its own facilities, publishes its user interfaces over computer networks, and provides its clients with shared access to the published user interfaces. The client organizations, on the other hand, subscribe and receive the application services through the Internet or a dedicated network connection as an alternative to hosting the same application in-house.

Web Services

Web Services are the current most promising technology and have been getting a lot of attention since 2003. “Different from ASP, where the whole systems or applications are provided as a service, Web Services provide components for use. These components do not have user interfaces. Instead, they have system or application programming interface (API). A service has a network-addressable interface. Because Web Services are small and independent components of applications, representing business functions or business services and accessible by another program remotely, Web Services stress interoperability and may be dynamically discovered and used”. To illustrate how a Web Service works, a typical Web Service model is shown in Figure 1.

In this model, there are four different standards involved. When a Web Service is created, it is registered through UDDI (Universal Description, Discovery and Integration), so that it can be easily discovered by users. The UDDI governs service publication and discovery. Each registered Web Service has a description, written in the WSDL (Web Service Definition Language), regarding the location of the service and what kind of operations (or methods) it has and how it can be used (like the Yellow Pages). All messages are written in XML (Extensible Markup Language)-based text, which follows SOAP (Simple Object Access Protocol) coding and formatting specifications, instead of cryptic binary strings. This mechanism enables Web Services to communicate with other applications that may be developed in different programming languages and reside on different platforms. Thus, Web Services are autonomous, platform-independent computational elements that can be described, published, discovered, orchestrated and programmed using standard protocols for the purpose of building networks of collaborating applications distributed within and across organizational boundaries. When a web application calls the Web Service, it does not communicate to the Web Service directly. Instead, the communication is accomplished through a proxy class on the local web server.

Grid computing

“Grid computing is the next logical step in distributed networking. Just as an electric power grid delivers energy on demand, grid computing
dynamically manages network, computing and storage resources to automatically support business processes across the IT infrastructure. “Although it has been popular tool in academia for many years, it has recently become more popular in industries (Carlino, Gore, Venturini & Warner 2006)” GRIDToday 2005 . With grid computing, an organization can transform its distributed and difficult-to-manage systems into a large virtual computer that can be set loose on problems and processes too complex for a single computer to handle efficiently. Grid computing is a new IT architecture, but is rapidly growing in popularity.” Forrester Research (Gillett 2004), “reports that 37% of enterprises are piloting, rolling out or have implemented some form of grid computing”. IDC calls grid computing the fifth generation of computing, after client-server and multi-tier. It is considered one of the key emerging technologies that will likely form the foundation of a new wave in IT. Grid technology is evolving rapidly. Standards, frameworks, implementations, and applications are changing on a constant basis. Because it is an emerging technology, grid computing can mean different things to different people. To define the specifications for grid computing, the Global Grid Forum (GGF) was formed. From the service perspective, grid computing allows you to unite pools of servers, storage systems, and networks into a single large system so you can deliver the power of multiple-systems resources to a single user point for a specific purpose. To a user, datafile, or an application, the system appears to be a single enormous virtual computing system. The systems linked in a grid might be in the same room or distributed around the world. They might be running different operating systems on many hardware platforms. They might even be owned by different organizations. Regardless of the depth of a grid’s resources, all the grid user experiences are the processing resources of a very large virtual computer.

The main resources grid computing is designed to give access to include, but are not limited to: -

• Computing/processing power.
• Data storage/networked file systems.
• Communications and bandwidth.
• Application software.

These information resources are shared based upon their availability, capability, and cost as well as the user’s quality of service (QoS) requirements.

**Distinct categories of e-commerce:** E-commerce, which primarily refers to buying, selling, marketing and servicing of products or services over internet is classified into B2B (Business to Business), B2C (Business to Consumer) and C2C (Consumer to Consumer) and C2B(Consumer to Business). Four distinct categories of electronic commerce can be identified as follows:

**Business-to-business (B2B):**

B2B transactions are largely between industrial manufacturers, partners, and retailers or between companies. Business-to-Business refers to the full spectrum of e-commerce that can occur between two organizations. Among other activities, B2B ecommerce includes purchasing and procurement, supplier management, inventory management, channel management, sales activities, payment management, and service and support. “According to Outlook Business magazine (May 20, 2010), “the total B2B transactions in India in the year 2010 are likely to be US$150 billion and B2B marketplaces could account for $25 to $40 billion out of that. India’s largest B2B portal Tradeindia, maintained by Infocom Network Ltd, also stated that e-commerce transactions in India show a growth rate of 40 percent to 50 percent and will soon reach the $150 billion mark.” (Mandal, Rupesh (2010). In near future, e-commerce is going to play a major role in multimedia, entertainment and fashion industry. The foreign branded companies are eager to take full advantage of the growing Indian market and are trying to create market for their products over the net. Gucci Co. an Italian iconic fashion and leather goods label is eager to make its hold in India with Business to business transactions. Some of the key B2B exchanges in India are tradeindia.com, mateax.net.com, Alibaba.com, AuctionIndia.com, Indiamart.com, TeaAuction.com, MetalJunction.com, Chemdex(www.chemdex.com), Fastparts(www.fastparts.com), and freeMarkets(www.freemarkets.com) etc.

**Business-to-Consumer (B2C):**

B2C transactions take place directly between business establishments and consumers. Although business-to-business transactions play an important part in e-commerce market, a share of e-commerce revenues in developing countries like India is generated from business to consumer transactions. Business-to-Consumer e-commerce refers to exchanges between businesses and consumers, e.g., Amazon.com, Yahoo.com and Schwab.com. Similar transactions that occur in business-to-business e-commerce also take place in the business-to-consumer context. For instance, as with smaller business-to-business, transactions that
relate to the “back office” of the customer (i.e., inventory management at the home) are often not tracked electronically. However, all customer-facing, or “front office” activities are typically tracked. These include sales activities, consumer search, frequently asked questions and service and support. Railway and Airlines have played a vital role in e-commerce transactions in India. “Travel portals are exploding in India. Recently, Make My Trip.com has shown Rs 1500 crores of turnover. Travel alone constituted 50% of Rs 6800 crore online market in 2012-13” (Wikipedia). In India, online services like ticketing, banking, tax payment, bill payment, hotel room booking, entertainment, online games, matrimonial sites, job sites, etc. are showing signs of development in business-to-customer transactions. There has been tremendous boost in the online business with the stock exchange coming online. Online valentine gifts and Diwali gifts are also becoming popular along with the birthday cakes. No doubt, the total value of the B2B transactions is much larger than that of the B2C transactions, because typically B2B transactions are of much greater value than B2C transactions. It seems that the B2C market in India will take time to grow as compared to the B2B market.

**Consumer-to-Consumer (C2C):**

C2C sites don't form a very high portion of web-based commerce. Most visible examples are the auction sites. Basically, if some one has something to sell, then he gets it listed at an auction sites and others can bid for it. Consumer-to-Consumer exchanges involve transactions between and among consumers. These exchanges may or may not include third-party involvement as in the case of the auction-exchange

eBay. Other activities include: classified ads(e.g., www.numberoneclassifieds.com), games (www.heat.net), jobs (www.monster.com), Web-based communication(www.icq.com), and personal services(e.g.,Yahoo!Personals, webpersonals.com).

**Consumer-to-Business (C2B):**

Consumers can band together to form and present themselves as a buyer group to businesses in a consumer-to-business relationship. These groups may be economically motivated as with the demand aggregator, Mercata.com, or socially oriented as with cause-related advocacy at voxcap.com.

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<tr>
<th>TYPE OF E-COMMERCE EXAMPLE</th>
<th>MAJOR TYPES OF E-COMMERCE</th>
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<tbody>
<tr>
<td>B2C-Business-to-Consumer</td>
<td>Amazon is a general merchandiser that sells consumer</td>
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<tr>
<td>B2B- Business-to-Business</td>
<td>Foodtrader is an independent third party commodity exchange, auctions provider, and market information source that serve the food and agricultural industry</td>
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<tr>
<td>C2C- Consumer-to-Consumer</td>
<td>On a large number of web auctions sites such as eBay, and listing sites as craigslists, Consumers can auction or sell goods directly to other consumers.</td>
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<tr>
<td>P2P- Peer to Peer</td>
<td>Bittorrent is a software application that permits consumers to share videos and other high bandwidth content with one another directly, without the intervention of a market maker as in C2 e-commerce</td>
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<tr>
<td>M-commerce-Mobile Commerce</td>
<td>Wireless mobile devices such as PDAs (personal digital assistants) and cell phone can be used to conduct commercial transactions.</td>
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Advantages of E-Commerce to Businesses in India:

There is a rising awareness among the business community in India about the opportunities offered by e-commerce. Ease of Internet access and navigation are the critical factors that will result in rapid adoption of Net commerce. Safe and secure payment modes are crucial also along with the need to invent and popularize innovations such as Mobile Commerce. India Reports provides accurate and easy to understand India specific reports that capture trends, map business landscapes and custom-made reports for specific needs. The other reports available on India Reports are on retail, outsourcing, tourism, food and other emerging sectors in India. E-commerce provides a new venue for connecting with consumers and conducting transactions. Virtual stores operate 24 hours a day, 7 days a week. Many virtual retailers represent a single company while others, such as Top Online Shopping (toponlineshopping.com), represent a consortium of companies.

**Global Trade :**

“E-commerce is one of the major factors in the globalization of business. Other factors include decreases in trade barriers, globalization of capital markets, the movement toward International Financial Reporting Standards (IFRS), and Internet financial reporting. Internet financial reporting has been particularly helpful to e-commerce companies IFRS is a global standard for accounting and financial reporting.” (Smith, et.al., 2005).
The annual growth rate of e-commerce globally has been estimated as high as 28 percent, while some individual countries have much higher growth rates. For example, in India, which has a younger than average market, the e-commerce growth rate has been projected as high as 51 percent.

Virtual Businesses:
As a result of e-commerce, business firms now have the ability to become virtual businesses. A virtual business is a modular structure of multiple individual business firms connected via online computer technology. The individual firms making up the virtual business are networked, which enables sharing of skills, costs, and access to markets. An individual business firm contributes only its core competencies. The value of a virtual business is that they have the flexibility required to seize new opportunities and be competitive in a complex market.

Lower search costs:
The Internet is likely to bring about low search costs and high price transparency. When competitors simply publish their prices on the Internet, it is possible to design search engines that will monitor prices across different websites, and this will be further facilitated by the growth of protocols such as XML. Such price transparency may facilitate collusion. Internet technology could potentially offer an ideal micro-climate for collusion, due to increased communication and transparency in the market, as well as the potential for more frequent market interactions. In particular, collusion concerns may arise with respect to market design and ownership within both online marketplaces and joint Internet sales ventures.

Increased power of downstream players
The growth of e-commerce may further strengthen the market position of downstream buyers relative to suppliers. Firstly, lower search and switching costs will increase the credibility of buyers’ threats to switch supplier, and thus increase their bargaining power. Secondly, buying clubs and careful market design may also improve their buying power. Thirdly, the widening of geographic retail markets may facilitate the development of global retailers. These will tend to have far greater bargaining power with suppliers than traditional local or national retailers.

Barriers to e-commerce in India:
Some of the infrastructural barriers responsible for slow growth of ecommerce in India are as follows:

i). Payment Collection: When get paid by net banking, one has to end up giving a significant share of revenue (4% or more) even with a business of thin margin. This effectively means one parting away with almost half of profits. Fraudulent charges, charge backs etc. all become merchant’s responsibility and hence to be accounted for in the business model.

ii). Logistics: Businesses have to deliver the product, safe and secure, in the hands of the right guy in right time frame. Regular post doesn’t offer an acceptable service level; couriers have high charges and limited reach. Initially, one might had to take insurance for high value shipped articles increasing the cost.

iii). Vendor Management: However advanced system may be, vendor will have to come down and deal in an inefficient system for inventory management. This will slow down drastically. Most of them won’t carry any digital data for their products. No nice looking photographs, no digital data sheet, no mechanism to check for daily prices, availability to keep your site updated.

iv). Taxation: Octroi, entry tax, VAT and lots of state specific forms which accompany them. This can be confusing at times with lots of exceptions and special rules.

v). Excessive pricing in e-commerce markets:
Over the short term, excessive pricing is unlikely to be a major issue for e-commerce companies. Few e-commerce operations are currently making any profits, let alone excessive profits. Over the longer term, however, excessive pricing may become a serious concern for those e-commerce companies that develop dominant positions in their relevant markets.

vi). Collusion: One of the most widely held competition concerns relating to e-commerce is that it may facilitate such collusive behaviour. Much of the recent discussion of this issue has focussed on the development of B2B online marketplaces that are co-owned by a number of significant market participants.

More generally, there are a number of characteristics of e-commerce that might be expected to facilitate collusion, even in the absence of joint ventures and online marketplaces.

vii). Cyber crime in E-Commerce: Cyber crime is a key alarm that consumers have regarding e-commerce. No one wants to become a victim of cyber crime, which is a real hazard to e-commerce. Cyber crime is an e-crime. Cyber crime is a criminal act that involves computers and networks. Cyber crime includes criminal acts such as computer viruses, phishing, and denial of service attacks that cause e-commerce websites to lose revenues. Understanding and defending against cyber crime is critical for companies involved in e-commerce.

CONCLUSION:
In this paper we discussed ASP, Web Services, grid computing, and grid service. All these new
technologies share the same vision: managing complexity, enabling common languages through open industry standards and improving your business through virtualization and automation of IT-based services. They are not exclusive to each other. Rather, they are complementary. First, ASP usually offers large, complete applications with little customization. They are used by common users. Web Services are small components designed to solve special business problems. Although they have published programming interfaces that have better interoperability, to integrate the service into applications requires advanced programming skills. Which technology the business should adopt or purchase depends on many factors. Besides the technical factors discussed in the paper, there are also many non-technical factors. Generally, the most significant of such factors are: business leaders' support, budget, privacy and security. In E-commerce, security is important to build trust and compliance with law. However, the credit card companies have not come together to agree on a standard approach to security, and that could mean slower adoption of anti-fraud too. The bursting of the dotcom bubble has made several companies apprehend that doing business on the Internet is not as easy at it sounds. Undoubtedly, the power of the Internet to reach any part of the world holds terrific potential for enhancing international trade and boosting global economy. However, just as every coin has a flip side; it has been observed that doing business on the Internet also has risks and legal issues associated with it. The rapid pace of e-commerce development has generally left the legal system struggling to keep up and gasping for breath. In much the same way as companies doing ecommerce must invent new business procedures and rules, the legal system is trying to adapt existing laws to fit new settings where it is simply unclear how these laws will apply. In the midst of this legal turmoil, India is one of the few countries across the globe that has enacted an e-commerce legislation. However, much more is needed to effectively regulate the tangled web. Effective risk management strategies coupled with adequate legal documentation will go a long way in protecting e-commerce companies. Although the Internet is a goldmine, without adequate legal protection, it could become a landmine. Nevertheless, with the rapid expansion of internet, e-commerce is set to play a very important role in the 21st century, the new opportunities that will be thrown open, will be accessible to both large corporations and small companies. The role of government should be to provide a legal framework for e-commerce so that while domestic and international trade are allowed to expand their horizons, basic rights such as privacy, intellectual property, prevention of fraud, consumer protection etc are all taken care of.

References


eGRID Business Technology and Society 2008, Pearson Pg. 14-16


Mandal, Rupesh (2010, May20), “Do you know that e-commerce transactions in India are to reach $150 bn in 2010?”


