E-LOGISTICS & E-FULFILLMENT: BEYOND THE "BUY" BUTTON

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UNCTAD WORKSHOP

25-27 JUNE 2002

CURAÇAO

Executive Summary

E-Logistics applies the concepts of logistics electronically to those aspects of business conducted via the Internet. E-fulfillment can be defined as the integration of people, processes and technology to ensure customer satisfaction before, during and after the online buying experience. These activities are the most critical for successful electronic commerce. E-businesses can utilize various methods for handling these functions, including performing them in-house, outsourcing to a third-party logistics provider (3PL), or drop-shipping—each having distinct pros and cons. The key to a successful outsourcing relationship includes understanding the process, specifying objectives, establishing internal procedures for evaluating performance against objectives, and deploying systems that help to manage the function effectively.

Although there are no true end-to-end e-logistics and e-fulfillment software applications available currently, a number of separate solutions can be implemented. Emerging data exchange standards based on XML are key to addressing issues of data and systems integration when implementing these solutions.

Developing countries face a number of challenges when implementing e-commerce, notably economic and educational barriers, lack of ICT infrastructure, high telecommunications costs, lack of payment mechanisms, security and trust issues, channel conflicts, and translation/localization problems. These issues are compounded when attempting to carry out e-logistics and e-fulfillment by the challenges of poor delivery logistics, complex global trade regulations, high tariffs, international terrorism and physical security concerns, and geographical obstacles.

Logistics

"Logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet customers' requirements." (Council of Logistics Management)

E-Commerce Logistics

E-Commerce logistics, or e-Logistics, therefore, is applying the concepts of logistics electronically to those aspects of business conducted via the Internet.

E-Fulfillment

E-fulfillment can be defined as the integration of people, processes and technology to ensure customer satisfaction before, during and after the online buying experience. Note that fulfillment differs from delivery in that delivery means merely unloading physical goods at a specific location. Fulfillment means meeting customer expectations, which involves an e-fulfillment provider serving the last kilometer between vendor and customer.

Introduction

E-commerce logistics and e-fulfillment represent the myriad activities that are needed to ensure the customer gets what the customer wants when the customer wants it. They are the least glamorous but most critical functions in electronic commerce. They can also be the most expensive. E-businesses fail to recognize that often up to 40 percent of their cost of goods sold is buried in fulfillment and back-end logistics. In fact, most online merchants are unaware of what their total costs are. This lack of knowledge is directly responsible for the failure of many e-commerce businesses during the past two years.

The Importance of E-Logistics and E-Fulfillment

Electronic commerce not only revolutionized the way goods are sold, but how they are delivered. The tenets of one-to-one marketing that online firms are adopting must be carried over to their fulfillment operations, and this is creating mass-scale chaos. Customers demand customized products delivered at very high speed with complete order flexibility and convenience. Today's online customers want to be able to track their orders instantly from the moment they click the Buy button until the moment the package arrives on their doorstep, and be able to reroute packages, determine delivery costs and time-in-transit, and break up their orders for multiple ship-to addresses. The shift of power from the seller to the buyer is creating a new era of expectations, and buyers - whether they are consumers or businesses – say they will not tolerate experiences such as partial shipments of goods on an "installment" basis, poor product return policies, or surprise backorders.

The Unique Challenges Posed by E-Commerce

The most common form of logistics has traditionally been based on moving large shipments of items in bulk to select strategic customers in a few geographic locations. Shipments have also been tracked traditionally by container, pallet, or other unit of bulk measurement, not by individual item or parcel. Manufacturers have backed up their trucks to loading docks at retail stores or distribution facilities, relying on those entities to deliver the goods through the final links of the supply

chain to the individual customer. Often the various links of the supply chain have had limited visibility into the operations of one another. The capability for end-to-end visibility of a package from manufacturer to customer has been virtually nonexistent in a traditional logistics environment.

With the advent of electronic commerce, however, traditional logistics is being radically transformed. Electronic commerce demands an agile, high-velocity, granular approach to logistics. The typical electronic commerce customer is an unknown entity who orders products on an individual basis, according to impulse, seasonal demand, price and convenience. A manufacturer or online merchant must be able to customize an individual order; ship it directly to the buyer anywhere in the world; track the whereabouts of the item at any given time along the supply chain; handle customer inquiries; handle product returns (reverse logistics); and even offer gift wrapping - all at ten times the speed and at a fraction of the cost of traditional shipping and fulfillment.

**Major characteristics of e-commerce that impose
new requirements on logistics services**

- Larger number of small parcels or packages due to a larger number of buyers making direct orders and a larger number of sellers than in traditional trade;
- Large numbers of on-line customers, mostly unknown to the sellers;
- Demand for shipments is much more unpredictable and unstable since it originates from more numerous customers;
- Origins and destinations of shipments are more widely dispersed, given that more buyers place direct orders with producers and distributors and more sellers access buyers globally;
- Accountability for shipments extends through the entire supply chain, compared with traditional logistics in which accountability is limited to single links of the supply chain;
- Customers have high expectations about quality of services and demand fast delivery of shipments;
- Higher incidence of cargoes returned to the supplier than in traditional trade;
- Greater demand for and availability of information covering transactions over entire supply chain, thus allowing on-line shipment tracking and other supply chain management functions;
- Greater focus on one-to-one marketing, which creates demand for customized delivery and post-transaction customer services;
- Greater complexity in fulfilling international orders than in traditional trade, thus preventing some retailers and service providers from being involved in international e-commerce;
- The emergence of demand for on-line processing of shipments, including cargo booking, bills of lading/airway bills, freight payment, rate quotation, landed price calculations and tariff management;
- Substantial increase in the volume of small shipments, leading to growth of demand for warehousing transport and other logistics infrastructure that can handle larger volumes of small shipments;
- Greater scope for customer self-service.

Fig. 1 Major characteristics of e-commerce that impose new requirements on logistics services
Source: UNCTAD E-Commerce and Development Report 2001

These fundamental differences in traditional logistics versus commerce site logistics are the foundation of the complete shift that is being seen in the e-logistics landscape (See Figure 1). Opportunities are arising all along the e-logistics continuum to better service customers, whether the customer is another business or a consumer.

Options for Handling E-Fulfillment and E-Logistics

Online businesses have three options for handling e-logistics and e-fulfillment: they can perform the functions themselves in-house, they can outsource the functions to a third-party, or they can use drop-shipping.

There are some definite arguments in favor of outsourcing. When distribution is not a company's core competency, outsourcing the function can help a company grow by allowing it to focus on its mission-critical activities. Businesses that outsource e-fulfillment can also deploy sites quickly, with minimal capital investment, while maintaining the confidence that customers will receive the level of service they expect. If an e-business is successful, the ability to handle large volumes very quickly becomes of paramount importance. By outsourcing, an e-business is able to plug into the third-party's infrastructure, which should be robust enough to handle the increased activity.

Outsourcing also alleviates the need to hire internal logistics and fulfillment staff, and to build and equip expensive warehouses. Third-party providers have the advantage of capturing and processing the details of thousands of transactions. The sheer quantity of data can be very useful for trending and improving sales and customer service. In fact, a new type of third-party providers, Logistics Visibility Providers (LVPs), specialize in capturing, cleansing, verifying and analyzing the data from all other logistics service providers in order to facilitate supply chain visibility.

There are also some distinct disadvantages to outsourcing, chief among them being the loss of control. Regardless of whom an e-business outsources to, it is still responsible for the quality of the customer relationship, and it is liable if anything goes awry. The truth is, few logistics outsourcers have figured out how to do e-commerce fulfillment well.

Qualified e-logistics providers must depend on integrated IT systems and complex software to manage the dynamic flow of products. The quality of information must be much better than that of traditional outsourcers, so that companies can have visibility into their supply chains. Better information also reduces inventory throughout the supply chain, enabling companies to react quickly to market changes. But better supply chain visibility changes the face of physical distribution. Since companies do not need to stock as much inventory, e-logistics providers must store and transport unit-sized shipments rather than traditional pallet-sized shipments. This requires a complete overhaul of business processes.

Performing E-Logistics and E-Fulfillment In-house

Some firms consider overhauling their own businesses and doing the logistics and fulfillment themselves. If a business has an existing infrastructure, warehouses and customer service center, it can probably retool itself for in-house e-logistics, but it should hire outside expertise to determine how robust its existing logistics platform is and what revisions need to be made. Although orders may be initiated via a website, unless the firm has done an extensive amount of systems integration, much of that data must be manually input into other supply chain management, planning, warehouse-management, and logistics systems. The logistics platform will also have to address content management, application development, cross-function integration, business intelligence, and mobile Internet access. The platform must also enable suppliers and customers to retrieve information about the demand picture, forecasts, delivery dates, shipment tracking, and other necessary data. Once those systems are in place, however, accessing the information strictly through a PC

in the office is no longer sufficient. Data must also be available through PDAs and other wireless devices.

Assuming a business does not have the time, money, and expertise or desire to carry out e-logistics and e-fulfillment in-house, it can evaluate the types of outsourcing. Categories of outsourcers include third-party logistics (3PL) providers, fourth-party logistics providers (4PLs), fulfillment service providers (FSPs), lead logistics providers (LLPs), logistics exchanges (LXs), and logistics visibility providers (LVPs).

Nonasset-based and Asset-based Providers

E-businesses seeking 3PLs may choose from two different types of service providers: nonasset-based and asset-based. The nonasset-based providers perform only the engineering services directly. In addition to designing the system, they coordinate the hiring of appropriate transportation and distribution service providers. One advantage of dealing with a nonasset-based 3PL is that the 3PL is independent of the carriers and warehouses bidding to perform the services. The 3PL is free to develop the most efficient and effective system under the circumstances and then to manage the selection of the service providers best suited to implement the system. The approach relies on analysis, computer systems and metrics. Application Service Providers (ASPs), logistics exchanges (LXs), marketplaces, and logistics visibility providers (LVPs) can also be considered types of nonasset-based providers. ShipXact, ClickLogistics, Bid Freight Global, BulkNet, FreightMatrix, KewillNet, and Nistevo are some leading players in this category.

The asset-based providers, many of whom are owned and operated by the largest and best carriers and warehouses, also perform the engineering services. However, the system design assumes that the system will rely principally on vehicles, employees and facilities owned and operated by the service provider. Airborne Logistics Services, DHL, Emery, Fedex, UPS, TNT Post Group, and USCO are examples of third-party logistics providers. Fingerhut Business Services, Hanover Direct's Keystone Fulfillment, SubmitOrder.com, and PMSI are some major fulfillment service providers (FSPs).

Drop-Shipping

The idea of drop-shipping packages directly to the end user is also appealing to companies looking to streamline the delivery process. And, as more companies post inventory, shipment tracking, and product-availability information on the Web, the drop-ship process gets easier because the necessary data is easy to find and access.

With drop-shipping fulfillment, a company sells a product, charges the customer, generates a purchase order, and sends the purchase order to the manufacturer or supplier, who then fulfills the order by shipping the product directly to the customer. Since the company never took possession of the product, the company does not incur any of the costs associated with storing or purchasing the product.

There are a number of risks when an e-business uses drop-shipping as its sole means of fulfillment. First, there is the issue of product returns—called reverse logistics. If an e-business has not set up the capability for 24/7 customer service, customers are forced to deal directly with the manufacturer of the specific product they want to return. Often these manufacturers are not equipped to handle customer service calls, so the customer will invariably call the e-merchant to complain.

In addition, the e-business is held liable for upholding legal regulations concerning delivery times, warranties and other policies, regardless of the manufacturer's

delivery problems. Then there is the issue of partial shipments. With drop-shipping, customers may receive groups of packages from various suppliers at different times. The shipping costs will be exorbitant for all of these multiple packages, unless the e-merchant has set up mechanisms for shipment consolidation. There are also the attendant tracking and tracing challenges—particularly if a product requires assembly and the pieces come from various locations.

Fourth-Party Logistics Providers

Fourth-Party Logistics Providers, or 4PLs, are integrators that manage a company's supply chain from end to end, often hiring subcontractors. Another term for a 4PL is a Lead Logistics Provider (LLP).

The prototypical 4PL not only locates and manages specialized service providers, but also advises on the design of the entire process. 4PLs have several other distinguishing characteristics: reliance on sophisticated information technology systems to link up closely with the shipper's organization, and creation of a separate organization—perhaps a joint venture between the shipper and the 4PL—dedicated to managing that shipper's supply chain.

Software Applications that Support E-Logistics and E-Fulfillment

In e-logistics, the movement of data is the precursor to moving funds and physical goods. A company that cannot move data instantly, easily and without errors, is doomed to failure. How a company handles data should be such a high priority that it should determine everything from the software packages a company buys to the database systems it uses.

Systems integration must be made a priority from the beginning. Too often, a company will buy systems in a haphazard way, based upon isolated functions within a company. Often the same data is manually input multiple times into multiple systems, creating multiple chances for errors. In e-commerce, trying to piece together a group of "point solutions" does not work – the old way of operating in isolated information silos must be completely dismantled. This usually requires outside expertise to analyze the business processes in each department in an organization, and to start creating communications amongst the various functions.

Once a company has its database and integration issues settled, it needs to deal with another key issue of e-logistics: the movement of data and conveying of instructions between the many different entities involved in buying, selling and shipping goods. This is why XML—the Extensible Markup Language—was invented.

XML

XML is a cross between HTML—a universal open language that is available to anyone with a Web browser—and the functionality of Electronic Data Interchange (EDI). XML allows the creation of documents that function as both applications and carriers of data.

Pressure for adopting XML has been coming from those companies who, for years, have been using Electronic Data Interchange (EDI) as their means of exchanging messages with suppliers, manufacturers and customers. The upside of EDI is that an EDI message can both notify a supplier that product levels at a remote location are low and trigger shipment levels of products from the supplier to the location. This has made EDI a widely used tool for large organizations from automobile manufacturers to Wal-Mart. The downside is that EDI is rigid, complex, expensive to deploy and maintain, and is beyond the reach of most smaller companies. Much work remains to be done on XML, but the language's fundamental capabilities make

it a perfect fit for the world of e-logistics, where data and action are so intimately entwined it is often almost impossible to separate them.

Lack of Integration

A truly integrated, end-to-end e-logistics and e-fulfillment solution would provide a "glass pipeline" with total real-time visibility and movement of data, funds and goods—in forward and reverse directions—throughout the supply chain. Unfortunately, no "off the shelf" software applications exist, in major part due to the sheer number and complexity of the functions required.

Most software applications address some combination of the following functions listed in Figure 2 (applications often overlap into multiple function categories):

Order Entry and Management
- Order entry systems
- Authentication services
- Anti-fraud screening
- Credit card pre-authorization and processing
- Local currency billing
- Export control screening (Denied Parties Lists in the U.S.)
- Sales tax and VAT. calculations

Logistics Services
- Integrated distribution and warehousing
- Reverse logistics/returns management
- Package tracking and tracing
- Warehouse management systems
- Multi-modal transportation management
- Supply chain management
- Routing and scheduling
- Requisitioning and procurement
- Partnership relationship management
- Inventory accounting
- Inventory management
- Billing and invoicing
- Trade planning
- Trade compliance
- Materials compliance
- Customs clearance applications
- Carrier contract and shipment management
- Logistics documentation
- In-transit and receipt of goods management

Landed Cost Engines
- Exchange calculators
- Duty calculators
- Tax calculators
- Shipping cost engines
- Exception handling

Customer Service Suites
- Email handling
- Call routing and tracking
- Customer relationship management
- Fulfillment house messaging
- Help desk applications
- Workflow management

Figure 2 Representative functions in e-logistics and e-fulfillment software

Leading software applications providers include Arzoon, Borderfree, Celarix, ClearCross, Descartes, Escalate, Kewill, Exel, i2, InterBiz, Manugistics, Optum, Vastera, Xporta, and Yantra.

The list of functions outlined above is not meant to be an exhaustive list, and more applications are being developed rapidly throughout the industry. There are trends toward the development of totally integrated application suites and methodologies. Collaborative Planning, Forecasting and Replenishment (CPFR) and Collaborative Transportation Management (CTM) are examples. Some industry leaders are even championing a new term, Logistics Resource Management (LRM), as a domain separate from supply chain management (SCM) and customer relationship management (CRM). The issue of integration among applications as well as integration with existing legacy systems will continue to be a major challenge as XML standards and other issues are being resolved.

E-Logistics in Developing Countries

Before describing the obstacles that developing countries face in handling e-logistics and e-fulfillment, it is interesting to note that a large percentage of merchants in a developed country (in this case the U.S.) are still unable (and/or unwilling) to fulfill orders internationally.

In one survey conducted by Forrester Research, 46 percent of the interviewees said they turn away international orders because they do not have processes in place to fill them. Obstacles range from an inability to handle direct international orders, to language and cultural barriers that hinder basic communications, to varying stages of Internet adoption and infrastructure.

In another study, Forrester Research found that 85 percent of the firms they surveyed could not fill international orders because of the complexities of shipping across borders. Of the 15 percent that did handle global orders, most ship only to a few countries in Europe and Asia where they can fill orders out of local warehouses. Three-quarters of the firms that didn't ship globally stated the main reason was system inability to register international addresses accurately or price total delivery cost.

The same group cited a sizable list of fulfillment challenges facing them by the year 2003. These challenges include distributing globally, lowering fulfillment costs, managing volumes, accepting online returns, decreasing order-to-receipt cycles, increasing order visibility, projecting demand forecasts, and a host of other issues.

Barriers to Global E-Commerce Logistics and Fulfillment

While developed countries find the aspects of global e-commerce logistics and e-fulfillment daunting, for less developed countries the obstacles can seem insurmountable. Below is a brief overview of some of the challenges these countries face, with a particular focus on Latin America and the Caribbean. An exhaustive discussion of all of the obstacles faced and strategies for solving them can be found in UNCTAD's "Electronic Commerce Strategies for Development: The Basic Elements of an Enabling Environment for E-Commerce," Geneva, 2002.

Economic and Educational Barriers

A major barrier to wide-scale adoption of e-commerce and its associated activities is the lack of Internet use, economic resources and standards of education in developing countries. In many Latin American countries, the average price of a personal computer still represents as much as half of the per capita income (Kuwayama 2001). According to eMarketer, only 10 to 15 percent of the population has the resources to actively use the Internet and shop online, and these "Internet elite" are educated, cosmopolitan and technologically advanced users.

Most of the world still does not use credit cards. Not only are the payment mechanisms lacking, there are deeply ingrained cultural issues and significant levels of fraudulent activity. The high rate of stolen credit card number usage, particularly in Eastern Europe, adds risk to international credit card payments. Many Europeans prefer debit cards to credit cards, and the Japanese and Chinese only use their credit cards on a very limited basis.

In Latin America, for example, 18 percent of Brazilians and 22 percent of Mexicans hold credit cards, so B2C commerce has been limited. Compared to the U.S., where there are 1.8 cards per person, only the wealthy in Latin America hold credit cards to any significant degree. Among upper income citizens, penetration rates are 37 percent in Brazil, 94 percent in Mexico, 96 percent in Argentina, and 41 percent in Chile. Throughout the entire population, however, the percent of people with credit cards is substantially lower.

According to a survey by MORI-USA of 9,200 urban residents of 11 Latin countries (excluding Chile) nearly half of the respondents said they would be willing to buy products over the Internet if they had a credit card and Internet access, while 40 percent said that online banking and bill-paying was very useful. However, at present, fewer than 30 percent of Latin Americans have bank accounts, credit card and bank fraud is not uncommon, and many people still queue at banks to pay bills in person (Cohen 2000).

Some countries are using a form of vouchers that are paid for at public institutions in lieu of credit cards to cover purchases made online. As in the United States, many other alternative payment schemes have met with limited success.

These are some of the reasons the majority of e-commerce revenues in less developed countries is coming from business to business (B2B) rather than business to consumer (B2C) sales. B2B sales transactions are typically conducted using terms and conditions, which frequently revolve around purchase orders and other commitments to pay for rendered services and delivered goods.

Lack of ICT Infrastructure

The Internet remains beyond the reach of most of the world population, as most countries have poorly developed telecommunications infrastructures and limited availability of personal computers or other access devices.

In Latin America, for example, Internet capacity is not evenly spread out throughout the region. Brazil, Argentina and Mexico, comprise more than 80 percent of the region's 8 million Internet users. Brazil alone accounts for 60 percent of e-commerce revenues. There are only 21 telephones per one hundred people in Argentina, 11 per hundred in Brazil and 10 per hundred in Mexico. Broadband is in short supply in almost every country south of the U.S. border.

Consequently, Internet access costs and slow interconnects remain a significant barrier for most users. The availability of new free ISPs helps, but Latin Americans still dial in and pay for their telephone calls by the minute. Due to high telephone costs, Internet users ration their online time and a large part of the population is unable to afford connecting at all (Cohen 2000).

Security, Privacy and Trust

Countries wishing to build an e-commerce infrastructure must also address the issues of digital security, privacy and trust. Existing legal frameworks in many countries have no provisions for ensuring that electronic transactions will be legally valid, binding and enforceable. This is coupled with lack of policies and technical

provisions for the protection, privacy and use of personal data collected online. These obstacles will continue to severely hamper the adoption of e-commerce and e-logistics in developing countries.

Channel Conflicts

An e-business cannot sell a product online without disclosing its price, and this can trigger some channel conflicts, especially when a globalized site makes pricing disparities apparent. If businesses or consumers in one country see they can buy the same product in another country for less, it can have significant ramifications, especially when purchasing for large companies. In addition, the issue of Internet taxation can present some built-in competitive pricing conflicts. If a customer can buy a product on the Web from a country that has a very favorable exchange rate and will not charge sales tax, that total cost savings will be a great incentive for the purchaser.

There may also be other factors that contribute to foreign online purchasing. For example, nearly 75 percent of Latin American online buyers shop at U.S.-based Internet sites. This may be due to the cosmopolitan characteristics of those advanced Internet users, it may reflect the limited availability of local online products, or may be a function of the types of goods bought by the wealthy "early adopters"—electronics, English language books, computer software and hardware, etc. Until Internet shoppers shift their buying to their own domestic sites, the growth of locally based retail e-commerce merchants will be hindered.

Localization/Globalization of Content

Although almost 75 percent of Web pages are in English, English should not be considered the "official" language of the Internet. Taking into account the difficulty in classifying various dialects as languages, approximately 5,000 languages can be heard today around the world. Of these, only 1.8 percent is commonly used in international trade—a small percentage that translates into 90 languages. Currently, almost 90 percent of the world's top companies fail to respond adequately to e-mail messages sent in a foreign language, according to an IDC/WorldLingo joint study.

Localizing sites so that the content reflects the language and culture of the region is extremely important for enabling the adoption of e-commerce in developing countries. Having a localized site demonstrates the commitment made by an e-business to its regional and global distribution channel, suppliers and partners. In addition, e-businesses must also be able to exchange financial information in a variety of currencies and account for currency fluctuations among trading partners. Countries also use different formats for weights, measures, dates, telephone numbers, addresses, and other common information.

Global Trade Management

E-businesses must be able to comply with a variety of complex regulations to engage in global trade. Customs requires that all imports be coded and categorized, and because these codes vary among countries, codes must also be harmonized from country to country. Restricted-party screening regulations apply to products that cannot be imported between specific countries due to national security, health and environment reasons. In addition, countries and localities have different licensing requirements and charge different duties, value-added taxes, and fees. International trade also involves complex processes for financing, risk management, and financial settlement.

Most developed countries have tremendous problems complying with the necessary regulations. In fact, Forrester estimates that 46 percent of international orders to U.S. e-commerce sites go unfulfilled because businesses cannot handle the necessary procedures. These challenges are intensified for developing countries. According to AMR Research, none of today's packaged applications offer multi-enterprise services and software that automate the transportation and e-logistics management needs of a global trading network.

Delivery Logistics

Customs regulations and import duties, which vary from country to country, often delay the arrival of goods or make them prohibitively expensive. And, once a product clears customs, it still has to make its way the last kilometer to the customer's door. Unlike the European community, which has minimized the logistical costs of buying across borders in Europe through the European Union and use of the Euro, trade across countries in Latin America is still mired in bureaucracy and large tariffs. Delivery systems in Latin America are notoriously unreliable and slow.

International Terrorism and Security Concerns

The terrorist attacks on the United States on 11 September 2001 deeply affected the aviation industry and other modes of international transportation.

In employment, roughly 200,000 jobs were lost in Europe and the U.S. in the aviation industry alone. Swissair and Sabena have all but collapsed since the terrorist attacks and other large carriers, such as British Airways and KLM are suffering major losses. Total air traffic within Europe fell by over 10 percent in September and October 2001, while traffic from Europe to America and Asia fell by 35 percent and 17 percent, respectively (Kerr 2001).

The increased security concerns throughout the world since the attacks are having pronounced affects on all aspects of e-logistics and e-fulfillment, as costs for increased security measures are cutting into razor-thin margins, and are creating delays in shipments, extra paperwork and extra customs controls.

The full implications for less developed countries are still unclear, but the generally increased nervousness throughout the world may create additional barriers to the import and export of goods from those countries to the developed nations.

Geographical Challenges

Geography often plays a key role in determining the size of economic areas and markets in regions and countries. For example, one big difference between North and South America is the absence of a fertile central plain in South America that stimulates settlement and could act as a bridge between the two heavily populated coastal zones. The Amazon basin was a deterrent to settlement, and only in the pampas of Argentina is there the kind of territory that could "bridge" east and west, precisely where the Andes Mountains are the highest and most difficult to traverse. Even today, only one mountain pass remains open year-round between Argentina and Chile, and trucks have to detour about 1,500 miles during the worst of the winter season. Geographic isolation such as this has been compounded by bureaucratic controls and practices that have made trade more difficult and by protection of local transportation sectors (especially air and sea transportation) and a poorly developed infrastructure (Sachs 2001).

Conclusion

Many businesses are realizing that e-logistics and e-fulfillment are critical to their growth and success in e-commerce. They are also realizing the unique complexities and challenges of these activities versus those of traditional logistics and fulfillment. The obstacles that developing countries face in implementing e-commerce are made even greater by the additional challenges of delivering the goods ordered online, and by meeting customer expectations after the sale. It is anticipated that many of the same technologies and improved business practices that will facilitate improved e-logistics and e-fulfillment will allow many participants – be they companies or governments – to cooperate more closely than ever before.

The improvements underway are bringing about an environment many are calling collaborative commerce, the successor to e-commerce. As collaboration among participants increases, proportionately large increases in trade and development are sure to follow. This makes current examinations into the nature, function and benefits of e-commerce logistics and e-fulfillment to be necessary steps in the evolution of international trade and commerce.

References and bibliography

Bayles, D. (2001). *E-Commerce Logistics and Fulfillment: Delivering the Goods*, Upper Saddle River, NJ, U.S.A., Prentice Hall PTR.

Bayles, D. (1998). *Extranets: Building the Business-to-Business Web*, Upper Saddle River, NJ, U.S.A., Prentice Hall PTR.

Bhise, H, et al. (2000). "The duel for the doorstep," *McKinsey Quarterly* 2000, Number 2.

Cohen, N. (2000) *eCommerce in Latin America*, New York, NY, U.S.A., eMarketer.

Fahrenwald, B. and D. Wise. (2000). "Logistics and fulfillment: e-commerce meets the material world" *Business Week*, June 26, 2000.

Kerr, F. (2001). *Technology Utilization and Collaboration within the Transportation Industry*, First Conferences Ltd., Eyefortransport, www.eyefortransport.com.

Kuwayama, M. (2001). "E-commerce and export promotion policies for Small and Medium Sized Enterprises: East Asian and Latin American Experiences." CEPAL, Santiago de Chile, October, 2001.

Mello, A. (2001). "Global E-Business: Walking the Talk." *Enterprise*, www.zdnet.com, November 14, 2001.

McCullough, S. et al. (1999) *Mastering Commerce Logistics*. Cambridge, MA, U.S.A. Forrester Research, Inc.

Ntoko, A. (2000). "E-Business: a technology strategy for developing countries." Electronic Commerce for Developing Countries (EC-DC), Telecommunications Development Bureau, International Telecommunication Union, June 2000.

Sachs, J. and J. Vial, (2002), "Can Latin America Compete?" *The Latin American Competitiveness Report 2001-2002*, World Economic Forum.

UNCTAD, (2002). *Electronic Commerce Strategies for Development: The Basic Elements of an Enabling Environment for E-Commerce*. Background Paper. Commission on Enterprise, Business Facilitation and Development, Expert Meeting on Electronic Commerce Strategies for Development. Geneva, 10–12 July 2002

World Trade Executive (2000). "E-Commerce—the Latin American Gold Rush: Will the Internet Pan Out?" Latin Advisory, World Trade Executive, Inc., July/August 2000, Volume 1 Issue 6.