
7 IMMUTABLE LAWS OF COLLABORATIVE LOGISTICS

BY DR. C. JOHN LANGLEY, JR.

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INTRODUCTION

Not so long ago, we began to understand that relationships were the key to a successful business. Since then, organizations across the globe have discovered just how difficult and challenging it is to form and sustain these working relationships. While the need for these relationships still exists, it's become apparent that the model we've been following is incomplete. Collaboration is the missing link.

When two or more organizations agree to work together, synergy is a common outcome. This is readily apparent, for instance, when buyers and sellers agree to share point-of-sale product information, so as to better understand demand in the marketplace. Taking this phenomenon one major step further, the essence of collaboration suggests that competencies are created when collaborative activity actually takes place. An example of this might be the sharing of retail space by two firms, each carrying seasonally popular lines of merchandise. By collaborating on the ownership and utilization of retail space, each is able to achieve its own objectives and also reinforce the ambitions of the other.

The idea of collaboration is not one that always comes naturally to organizations, especially between companies offering the same or similar products or services. While most competition occurs in the marketplace itself, the lack of certain types of collaboration among competing firms sometimes creates inefficiencies which are experienced by all. In terms of a logistics example, consider that consumer product manufacturers sometimes go to great lengths to ensure their products are not transported from plants to customers' distribution centers with products of competing firms. While this policy has a certain logic, it creates logistical cost inefficiencies that could be mitigated if the competitors shared vehicle capacity for movements having similar needs. In this way, collaboration could be responsible for significant cost savings. Also, it makes sense, considering that retailers routinely co-mingle competing products as they are transported from distribution centers to retail stores. When organizations refuse to collaborate, real losses may easily outweigh perceived gains.

In addition, as firms intensify their efforts to examine and understand their own core competencies, the need to collaborate with other organizations will become more and more apparent. Given the complexity and dynamic nature of today's rapidly changing business world, it is a mistake for any one firm to try to "go it alone." Working closely with other organizations is a concept that is rapidly gaining acceptance among market leaders who understand that collaboration is imperative to their continued success.

The purpose of this paper is to describe the collaborative environment now evolving, particularly within the scope of logistics. The 7 Immutable Laws of Collaborative Logistics identify priorities for true collaboration in which organizations across the entire supply chain can thrive in unison.

FOREWORD

BY DR. MICHAEL HAMMER

It usually takes a period of some years until the real significance and value of a new technology is understood. At first, radio was seen as just wireless telegraphy, the electric motor as a substitute for the water wheel, and the PC as nothing more than a small mainframe. The same is true for the Internet. The first generation of business Internet applications centered on the on-line brochure; this was followed by business-to-consumer (B2C) e-commerce and business-to-business (B2B) e-procurement and more recently by industry exchanges. While these latter have some value, in retrospect they will be seen as nothing more than peripheral phenomena. The real payoff of the Internet is to be found in its enabling of business collaboration.

Put most simply and generally, collaboration occurs when companies work together for mutual benefit. Collaboration goes beyond vague expressions of partnership and aligned interest. It means that companies leverage each other on an operational basis so that together they perform better than they did separately. It is the power of the Internet, which allows companies to readily transact with each other and to access each other's information, that makes collaboration a reality. Here too there has been a learning curve at work. The first wave of Internet-enabled collaboration worked up and down the supply chain, as companies collaborated with their customers, suppliers, and intermediaries. By streamlining transactions and sharing information, these companies drove out costs, reduced cycle times, and eliminated inventories. But Internet-enabled collaboration also extends laterally, to enterprises with which a company previously had no relationship. One illustration of this is so-called "demand aggregation," in which two customers of the same supplier combine their purchases in order to get more favorable prices. It is noteworthy that the business lexicon has no existing phrase to describe the relationship between these two customers, so let's invent one: complementary customers (co-customers, for short).

Co-suppliers also have enormous opportunities for collaboration, and many of these center on logistics. Since logistics assets are inherently discrete, of fixed size, and geographically constrained, it is extremely difficult if not impossible for a single enterprise to optimize its use of these assets. The results are well known: less-than-truckload shipments, paying spot rates, and little opportunities for backhaul, or reverse direction, movements. If only two shippers could know what each other is doing, they could leverage each other in innumerable ways: planning routes, consolidating shipments, arranging backhauls and more. The payoffs start with lower costs but extend into even more important areas such as reliability, shorter cycle times, and greater flexibility. Multiply these benefits many-fold as more players get involved. All that is needed is a place on the Internet where communities of shippers and carriers can do business together. Now there is: Nistevo.com.

We are privileged to be witnessing the dawn of the collaborative age and in particular the emergence of collaborative logistics; yet any new era is always fraught with uncertainty. Dr. John Langley's 7 Immutable Laws of Collaborative Logistics offer companies a set of sound guidelines to steer their way through this unfamiliar landscape. Managers who follow its principles will realize enormous payoffs; perhaps more importantly, they will be leading their company into new and powerful ways of doing business.

*LOGISTICS AND
THE INTERNET*

The Internet has had significant impacts on logistics, largely due to its capacity to make data and information exchange easier and more affordable. In addition, the development and growth of e-commerce has instigated the need for greater competencies in logistics planning and execution. According to estimates developed by Forrester Research, the B2C and B2B markets could grow to \$108 billion and more than \$1.3 trillion over the next three years. There now exist incredible opportunities for organizations to enhance supply chain efficiencies through Web-based technology. Logistics activities and processes are first in line to benefit from these improved capabilities

Also, the Internet is quickly becoming a tool for streamlining business relationships. Shippers want increasingly consistent service, predictable capacity, and lower freight charges on a unit cost basis. Carriers are interested in expanding revenue opportunities and asset utilization. Through the agility and efficiency of Web-based technology, everyone in the supply chain has the potential to achieve those objectives. However, we cannot rely on technology alone. Only when implemented through collaborative efforts will technology deliver the desired efficiencies.

*COLLABORATION
MANDATE*

Excellence in logistics is a must for many shipper firms, with the consistent delivery of product to the customer viewed as an ongoing, strategic objective. Concurrently, many transport providers have stated repeatedly that they are operating on thin or non-existent margins, with little or no room for price negotiation. Thus, the e-commerce winners will be those companies that can deliver more efficient solutions that impact both the buy and sell side of the equation. For the shipper, that translates to increased product velocity in the logistics pipeline while reducing logistics unit costs. For the carrier, it means a dramatic improvement in logistics asset utilization and improved transaction efficiencies.

The key is the development of Collaborative Logistics Networks between and among shippers and carriers, and suppliers and customers. The Internet has become the key enabler for shippers and carriers to collaborate for mutual benefit. Winning e-commerce solutions will be integrated with shippers' ERP and order systems, delivering forward visibility to demand for logistics services to carriers, while efficiently re-circulating and sharing excess capacity through collaborative networks.

The importance of Collaborative Logistics Networks is reinforced when one looks at the significance of logistics to firms in today's supply chain arena. According to Robert V. Delaney of Cass Information Systems, Inc., in his 11th Annual "State of Logistics Report," the annual cost in 1999 of our nation's business logistics systems increased to \$921 billion, or the equivalent of 9.9 percent of U.S. Gross Domestic Product. Major components of this total include \$332 billion representing the cost of carrying inventory (including warehousing), and \$449 billion representing transportation, 81.2 percent of which relates directly to trucking. Considering the significant role that logistics plays in the overall economy, any improvements in efficiency or effectiveness due to collaborative logistics priorities will be welcome.

CONFUSION IN
THE MARKET

Interestingly, Robert Delaney's 11th Annual "State of Logistics Report" is titled "Logistics and the Internet: In the Frantic Search for Space, It is Still About Relationships." In this report he offers a provocative discussion of the impact of technology on logistics operations and decision-making. Although he concedes that the available technology will exhibit great power and improved efficiencies, he very strongly asserts the continued need for the development and sustainability of meaningful and effective relationships. I propose that only through collaboration can these types of relationships both emerge and thrive.

There are several well-intentioned and respected organizations currently offering Internet-based logistics solutions. However, none of them create efficiencies across the entire supply chain, primarily because their approach is not truly collaborative. An overview of the current Internet-based models is as follows:

- *Auction Exchanges* – Shippers and carriers already working together are using the Internet as a tool to automate and increase the speed of their business transactions.
- *Carrier Alliances* – Co-supplier networks are offering syndicated services to better serve a customer base.
- *Manufacturer Alliances* – Organizations from every vertical market are creating vertical marketplaces accessible via the Internet.
- *Application Providers* – Many application developers are offering logistics software that they claim will create efficiencies, despite the inability of the application to allow collaboration outside of the organization's four walls.

The business purpose for collaboration is to gain efficiencies, such as performing better at the same cost or performing at the same level at a lower cost. Clearly, a more robust and comprehensive model is required than those described above to support true collaboration across the entire supply chain.

THE NEED FOR NEUTRAL
COLLABORATIVE
LOGISTICS NETWORKS

Collaborative Logistics creates a synergistic environment in which the sum of the parts is greater than the whole. It's a business practice that encourages individual organizations to share information and resources for the benefit of all. Cooperative in nature, Collaborative Logistics is supported through a robust network that allows members to pool resources for greater efficiencies. The degree to which organizations share information and resources depends on their needs and the rules established jointly by members. The more an organization participates, the greater the potential benefits. Also, these networks must be able to provide an unbiased infrastructure for each link in the supply chain – not just shippers, and not just carriers – that establishes an on-line environment for true collaboration.

As logistics networks evolve to encompass a collaborative approach across the entire supply chain, potential participants will have to make difficult decisions: Which collaborative environment is the best fit for our organization? Which network will best meet our needs? To answer these questions, companies need criteria to evaluate the services offered. The following "7 Immutable Laws of Collaborative Logistics" define those criteria.

THE 7 LAWS:

THE FIRST LAW:

Members of an alliance must be able to share gains and losses equitably, and the outcome of the collaboration must be quantifiably beneficial to everyone.

MUST RESULT IN REAL AND RECOGNIZED BENEFITS TO ALL MEMBERS.

For collaboration to be successful, all members of a specific collaboration must be able to quantify the benefit they are enjoying from the process. This rule applies equally to both shippers and to carriers. Ideally, each member would be able to compare favorably the gains and losses of a collaborative effort with those of a similar but independent activity. Before this comparison is possible, however, members need to know their actual gains and losses. Furthermore, they must believe those gains and losses have been shared equitably among all members in accordance with the details of a mutually agreeable business process.

Members of a collaborative community benefit from the ability to share resources without individually incurring all of the associated costs. The objective is to maximize benefits while minimizing costs. For example, fractional jet ownership makes travel more convenient for members without requiring each member to assume full financial responsibility for the ownership of a jet aircraft.

When resources are shared, each firm must agree on a method of equitably allocating the gains and losses. In the case of fractional jet ownership, it is not unusual for owners to agree up-front to share equally the fixed costs of ownership, and to be responsible individually for pro-rata shares of operating expenses. The latter may be accomplished, for example, by relating operating expenses to the number of hours actually used by each owner. When damage to the interior occurs, maybe in the form of a tear to the fabric on a passenger seat, then the allocation of costs becomes more difficult. Does the member who last used the jet pay the cost of repairing the seat? Or does the membership split the costs, since no one may have liked the color of the seat fabric, anyway?

Likewise, Collaborative Logistics Networks must allow members to establish “rules of engagement” which define the equitable allocation of gains and losses. These rules are essentially a mutually agreeable business process that members will use to allocate gains and losses. There is no unique formula for the development of these rules. One collaborative community may establish a process that ensures that the actions of individual members never compromise the benefits to other members; another may agree to allocate all gains and losses equally among all members.

As an example, let’s look at some issues facing a manufacturer of styrofoam coolers and another of bottled water, both wanting to ship their goods to the same geographic area. Assuming there is an opportunity for gained efficiencies since neither is able to fill an entire truck, the concept of collaboration may appear to have some merit. First, however, the two parties need to establish their rules of engagement. The manufacturer of styrofoam coolers states that the bottled water firm should pay 50% more of the shipping costs because of the significant weight of the water. However, the bottled water firm believes the styrofoam cooler manufacturer should pay 50% more, because the coolers take up so much space. By working together to establish rules of engagement, each collaborating member gains an understanding of the other members’ business objectives. With this understanding comes the insight necessary either to strengthen or disengage from partnerships, depending on the details of each situation.

As the level of collaboration increases, so do the benefits and the risks. By establishing rules of engagement at the start of the collaboration and modifying them as the relationship continues, network members are better equipped to preserve their individual business objectives. Just as critical as the development of the rules of engagement is their enforcement. Each community must continually measure the compliance of its members and make this information available to the entire community.

Another important message to communicate is the result of the collaboration. As the quantifiable benefits of collaboration are reported back to the community, each member gains confidence in the relationship and will likely increase the organization's level of commitment.

SUMMARY

- Define Rules of Engagement
- Track network gains/losses
- Allocate
- Measure
- Enforce

THE SECOND LAW:

MUST ALLOW MEMBERS TO DYNAMICALLY CREATE, MEASURE AND EVOLVE COLLABORATIVE PARTNERSHIPS.

Unlike many e-commerce initiatives that focus on business functionality and neglect the activities associated with creating and evolving a network of members, Collaborative Logistics Networks are dynamic. Their flexible framework encourages partnerships to form and reform organically. In fact, Collaborative Logistics creates a fluid environment that can enhance an organization's process of innovation and evolution.

Participants must be able to organically engage in partnering activities that offer value to each member within a short period of time.

Successful networks must allow participants to easily and efficiently engage in a number of partnering activities in order to attract and maintain members. Members must be able to quickly:

- *Investigate* – Understand the value proposition prior to joining the network.
- *Integrate* – Synchronize individual firm business process with those of the network.
- *Acclimate* – Find potential partners on the network that may add value.
- *Negotiate* – Establish the rules of engagement with a collection of partners.
- *Cooperate* – Share resources according to the rules of engagement, transact on the network creating gains via shared resources.
- *Evaluate* – Measure the benefit/cost of collaboration for each member firm.
- *Regenerate* – Extend or regenerate the collaboration assuming it has benefited each of the member firms.

Through involvement in these seven staged activities, members can determine how much value the Collaborative Logistics Network offers to their business. As long as the gains are greater than the losses, a member will be inclined to remain on the network and maintain such alliances with other members.

Historically, organizations have tended to believe that successful relationships required long-term commitment. Today, permanent relationships are no longer always feasible or appropriate. Over time an organization evolves in different directions, with each significant change requiring a new set of partners who offer a better strategic fit. A Collaborative Logistics Network must be sufficiently robust to allow members to adapt their collaborative efforts to their changing needs. Through the comprehensive set of activities described above, members gain the insight necessary to establish relationships that are most beneficial at that time in the organization's evolution.

THE THIRD LAW:

Collaborative Logistics extends the baseline model to allow for buyer-to-buyer and seller-to-seller collaborations – even between competitors – to create improved efficiencies.

MUST SUPPORT CO-BUYER AND CO-SELLER RELATIONSHIPS.

Before we begin, it should be stated that the “co” means collaborative-buyer and collaborative-seller, not collusion. Typical e-commerce marketplaces focus on buyer to seller collaboration. However, by gathering buyers and connecting them to a supplier base, that baseline model serves only to promote and reinforce the traditional adversarial relationships that exist between many buyers and sellers. Furthermore, it is one where efficiency improvements are challenging to achieve, principally because it is not a truly collaborative environment in which participants share information and resources equally.

Collaborative Logistics extends the buyer-seller model to allow for buyer-to-buyer and seller-to-seller collaborations. In fact, it even encourages collaboration between competitors. This is a model that some organizations may not readily accept. However, it is one they must adopt in order to maximize efficiencies in the future. Organizations must be open to establishing a more collaborative approach with other organizations – even those that share the same customer base. Then, once they have worked together to create improved efficiencies, they can focus on competitive strategies.

For instance, two large packaged goods companies have recently forged an alliance in which they share excess carrier capacity to move product more efficiently and cost-effectively. On the truck, they're collaborative partners. On the shelf at the grocery store, however, they're still aggressive competitors.

Buyer-to-Buyer Collaborative Example:

Three large manufacturers collaborate in a given set of lanes to share private fleet capacity. As a result, asset utilization, cost reduction and service levels increase for all three parties. Considering some of the industry-specific, multiple company procurement initiatives in existence today (e.g., automotive, chemical, etc.), I expect this form of collaboration to grow in terms of acceptance and usage.

Seller-to-Seller Collaborative Example:

A group of carriers work together to offer shared capacity with two manufacturers, establishing long-term agreements that result in efficiencies along the entire supply chain. Examples of this include “vessel-sharing agreements” which have been utilized in the ocean shipping industry for some time, and an emerging number of such relationships among firms in, for example, the domestic U.S. trucking business.

THE FOURTH LAW:

Members must be able to establish public, private and semi-private relationships that allow them to choose the most viable alliances and limit risk.

MUST PROVIDE A FLEXIBLE SECURITY MODEL.

Current logistics service marketplaces focus on public markets for logistics services. Public marketplaces allow all members equal access and provide the best liquidity. Private marketplaces, on the other hand, typically allow members to selectively collaborate with a subset of the membership that is known to meet service and volume requirements.

A Collaborative Logistics Network must offer a combination of both public and private markets. It must allow members to quickly and easily establish public, private and semi-private relationships between themselves and other members. At a transaction-by-transaction level, members need to have the flexibility to limit their exposure in data-sensitive situations; most participants want to be able to choose their partners, not have the network determine what it thinks is an appropriate match. Conversely, members should also be able to share information openly to gain more forward visibility in the supply chain. Each member's operational data, which resides in a single repository on the network, is also available publicly to all participants.

This flexibility allows members to collaborate with different groups of partners or within markets in different areas of the country or world. An important feature of multiple collaborations is the ability for members to form their own alliances within the membership and to limit risk. Members select their level of involvement and determine the viability of collaboration in part by performing comparative analyses of measurements such as the prospective partner's Key Performance Indicators.

Example: A large shipper decides to share backhaul capacity. However, allowing its capacity to be shared publicly exposes the shipper to a variety of partner performance risks. In order to ensure that the rewards of collaborating outweigh these risks, the shipper needs to carefully select partners for a private network with compatible strategies and objectives, supply chain performance criteria, and acceptable statements of financial position.

THE FIFTH LAW:

MUST SUPPORT COLLABORATION ACROSS ALL STAGES OF BUSINESS PROCESS INTEGRATION.

A Collaborative Logistics Network that supports all stages of business process integration for all members, and offers expanded options and fluid partnerships.

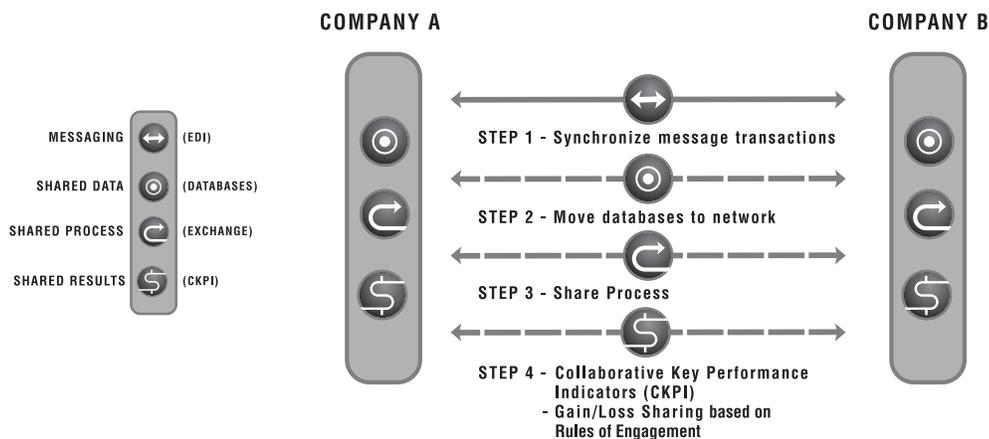
Organizations will be in different stages of business process integration as they join in collaborative efforts. Depending on factors such as volume and the scope of their infrastructure, organizations fall within one of four stages of integration.

- *Stage 1: Messaging* – Able to synchronize their individual business processes through messaging transactions such as EDI and XML.
- *Stage 2: Shared Data* – Able to share historical data for reporting and process validation.
- *Stage 3: Shared Process* – Able to create and share a single business process to be used by all members, across multiple enterprises.
- *Stage 4: Shared Results* – Able to establish and automate cost- and gain-sharing agreements.

Collaboration is easiest when organizations are operating at the same stage of integration. However, collaborations are also possible between organizations at different ends of the spectrum. A Collaborative Logistics Network must be able to support the enterprise needs of all members, regardless of the extent to which their capabilities are automated. By doing so, the network greatly increases the options available to all members.

Although it would be very difficult for a large packaged goods company in stage 4 to share profits with a small carrier that is limited only to EDI messaging, collaboration is still possible and even desirable. For instance, the small carrier may be able to offer a special service to the large manufacturer, who in turn offers consistent volume to fill the carrier's empty cargo space.

By supporting collaboration across the spectrum, the member network can offer expanded options and fluid partnerships that extend traditional buyer/seller contracts. The combination of long-term alliances established within a private network and short-term partnerships formed via a public or semi-private network represents a powerful set of collaborative tools for all members, at all stages.



THE SIXTH LAW:

Robust collaborations depend on an open network that is connected to other logistics and procurement networks within the same and across different industries.

MUST SUPPORT OPEN INTEGRATION WITH OTHER SERVICES.

From procurement to credit, the growth of B2B network services has exploded as the Internet emerges as a tool for conducting commerce. As these network services mature, they naturally migrate toward either a vertical or horizontal market focus. An interesting side effect of network services is that its vertical/horizontal bias may be affected as much by its membership as it is by any other attribute.

This phenomenon is apparent in the marketplace as large corporations in a particular vertical industry form “exchanges” that will build or buy network services on behalf of its members. While the B2B network service market is in its infancy, it is clear that no single network will provide a complete set of services for every company in the global economy. Accordingly, B2B network services will need to “federate” in order to allow customers to pick and choose services from a variety of suppliers.

Because logistics is a horizontal market, a Collaborative Logistics Network must both provide logistic functionality for the vertical procurement network and facilitate logistics collaboration between vertical procurement networks. This is achievable only if the network is open to connect to other logistics and procurement networks, within the same and across different industries.

Each network delivers a uniquely powerful set of tools to members. As links between networks grow, the greater the potential gain to their members. Even networks offering similar services must be able to join the federation, because to exclude anyone is to limit the scope of options and the resulting benefits and value. In a Collaborative Logistics environment, the sum of the parts is greater than the whole when the network supports open integration with other services.

THE SEVENTH LAW:

Members gain the ability to create efficiencies when they have complete visibility to the entire process flow between all alliance partners.

- *Information*
- *Products*
- *Assets*
- *Documents*
- *Capital*

MUST SUPPORT COLLABORATION AROUND ALL FIVE OF THE ESSENTIAL LOGISTICS FLOWS.

Logistics extends far beyond the movement of products between companies. As defined traditionally, logistics is the process of getting the “right product to the right place at the right time in the right condition for the right price.” More recently, most popular definitions of logistics have focused on a wide range of flows that characterize the complete logistics process.

Collaborative Logistics provides complete visibility to the entire process flow, from beginning to end, to all participants. Members gain forward visibility throughout the supply chain, as well as the ability to create efficiencies as they establish and modify their rules of engagement with alliance partners. To equip member organizations for optimal performance, a Collaborative Logistics Network must support meaningful collaboration between participants as they move through five relevant areas of process flow:

- *Information* – Logistics is an information business. While shippers have become accustomed to sharing forecast information with their suppliers, they have not considered sharing forecast information with their logistics service providers. Access to information in advance allows better synchronization of the logistics service supply chain with the product pipeline. In addition, information drives the remaining four areas of the process flow.
- *Products* – Increased visibility helps members to solve asset redistribution problems, develop accurate raw material supply forecasts, and drive down costs.
- *Assets* – Collaborative Logistics allows members to reduce expenses by sharing logistics services assets such as a truck, trailer, warehouse, or container.
- *Documents* – The logistics process is driven by required documentation, from domestic bills of lading to international letters of credit. Each member in a Collaborative Logistics Network must have access to documents to enable synchronization with real-time process flows. Furthermore, each member must be able to modify these documents for real-time synchronization.
- *Capital* – E-commerce affects and is affected by the logistics process. Electronic payment is a critical component of any Collaborative Logistics Network. Results may include improved working capital, increased asset utilization, and enhanced profitability.

CONCLUSION

The need to work closely with other organizations is rapidly gaining acceptance. Although some organizations may find it challenging to meaningfully buy into the idea of collaborating with customers, suppliers, and even competitors, many are quickly adopting changes to accomplish this objective. Considering the imperative on creating value for the end-user customer or consumer, the need for collaborative relationships cannot be overstated.

With consistent delivery of products having been identified as an ongoing objective for many firms, excellence in logistics has taken its place as a core business priority. Thus, understanding and acceptance of the “7 Immutable Laws of Collaborative Logistics” will become essential to the conduct of business today. In addition to the flows of product, the principles underlying Collaborative Logistics will help significantly to improve flows of information, assets, documents, and capital.

In essence, the benefits of collaboration occur when companies work together for mutual benefit. As collaborative efforts gain momentum, and as Collaborative Logistics is recognized as a strategic priority, participating members will be well-positioned to reinforce their core competencies. With the Internet’s capacity to connect individuals and networks, a huge barrier to collaboration has been removed. Much of the remaining barriers are psychological, and those who are not willing to transcend outmoded practices will be left behind as the rest of the world joins together for mutual benefit.

ABOUT DR. C. JOHN LANGLEY, JR.

Dr. C. John Langley, Jr., is the John H. "Red" Dove Distinguished Professor of Logistics and Transportation at the University of Tennessee. He received the Ph.D. degree from Penn State's Business Logistics Program.

His teaching and research interests are in the area of integrated supply chain management, third party logistics, total quality management and transportation marketing and strategy. He is a frequent contributor to the academic journals, and is the co-author of several texts in the fields of logistics and supply chain management. Included are *Creating Logistics Value*, published by the Council of Logistics Management, *The Management of Business Logistics*, a 6th edition textbook published for use in university classes and by logistics executives, and *Traffic Management: Planning, Operations, and Control*. He has traveled recently to Asia, Europe, and the Middle East on logistics-related visits.

Dr. Langley served on the Executive Committee of the Council of Logistics Management from 1984 through 1992, and was president of the national organization from 1990-1991. He has been involved with a number of significant U.S. and global corporations as a consultant and advisor, and currently serves on the Board of Directors of Averitt Express, Inc., and Landair Transportation, Inc. In 1993 he was the recipient of the Council of Logistics Management's Distinguished Service Award.

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