



TRANSPORTATION: LOGISTICS SERVICE PROVIDERS

/// VIEWPOINT PAPER



Creating an agile transportation enterprise to support global supply chains

The transportation sector is challenged by globalization, consolidation and the need for faster, more visible and more flexible supply chains. In response, astute providers are now seeking a more agile transportation enterprise. By adopting a service-oriented, alliance-based strategy to reach that objective, service providers can gain a competitive edge in today's transportation sector.

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Introduction

Speed, globalization and consolidation are all driving today's transportation marketplace.

As many shippers extend operations and thus their supply chains across markets and continents, their logistics providers have been forced to do the same. Logistics service providers and carriers - the companies that manage "inventory in motion" - have grown in size and reach through expansion and acquisition, expanding their service portfolio, their transportation and warehousing service network, and their supplier base. Between 1990 and 2004, worldwide exports grew from \$3.45 trillion to \$9.12 trillion, a 164 percent increase. In the same period, global imports grew from \$3.55 trillion to \$9.46 trillion, a 166 percent increase.¹ The U.S. third-party logistics (3PL) market grew from \$31 billion in 1996 to \$85 billion in 2004.² However, while U.S. supply chains became faster and cheaper over the last decade, product markdowns due to excess inventory actually rose from 10 to 30 percent of total units sold, and customer satisfaction with product availability fell.³

With the increase in the number of enterprises involved in global logistics, and the growth in the number of logistics processing points, supply chains have become less agile. Manufacturers and retailers want to develop "demand driven" supply chains, in which suppliers manufacture products in the shortest possible time with the least amount of inventory. To achieve this goal, transportation service providers need to improve visibility to orders in the supply chain. They must reduce inventories and improve demand response through improved collaboration with partners up and down the supply chain. Finally, they must improve the command and control structure within the enterprise to handle exceptions. In this paper, transportation service providers are described to include freight, rail, ocean shipping, trucking, air cargo, and third- and fourth-party logistics providers.

Achieving those objectives will be particularly difficult for transportation service providers who, because of their growth through acquisitions, now have multiple operating processes, multiple IT platforms and predominantly manual processes. At the same time, those providers often lack global visibility and are poorly integrated with suppliers and customers. Transportation organizations currently struggle with IT infrastructures made up of older platforms, nonredundant infrastructure, aging systems and multiple integration points. Legacy platforms are often difficult to enhance, difficult to grow, and difficult to interface with other internal enterprise applications and partner systems, resulting in added costs and waste to the supply chain. Legacy systems restrict a provider's ability to develop the support infrastructure required to deliver the service levels needed in today's competitive transport marketplace.

EDS, an HP company, proposes a new agile enterprise platform for transportation service providers. This approach leverages a proven transformational pathway, service-oriented architecture, and the power of an industrywide alliance to drive immediate and long-term ROI. Transportation providers, including some of the world's most successful companies, are now taking this pathway to add speed, visibility and profit to their transport businesses.

Transportation challenges

Transportation service providers face tremendous opportunities and challenges. Important changes are taking place in the retail, manufacturing and government sectors, in trade and transportation regulations, and in the overall global economy - thanks to the rapid growth of the BRIC (Brazil, Russia, India and China) countries. To meet those challenges, logistics providers and carriers must evolve themselves into more agile transportation enterprises.

The current state

Globalization continues to be a key driver in the transport sector. The growth of the World Trade Organization (WTO), the rapid growth of regional trading arrangements such as the North American Free Trade Agreement (NAFTA), the Central American Free Trade Agreement (CAFTA), the Association of Southeast Asian Nations (ASEAN) and the European Union (EU) - and the ongoing drive by manufacturers to

enhance their cost competitiveness are rapidly breaking down traditional national and geographic barriers. As supply chains get longer and as fuel costs, capacity and security concerns complicate transportation, the total cost of logistics is rising as a percent of cost of goods sold.

The transportation industry continues to grow organically and through acquisitions. Deutsche Post/DHL acquired Airborne Express in the United States and later acquired Exel Logistics. Eagle Logistics acquired Circle. Deutsche Bahn (German railroad) acquired Schenkers and BAX Global. Yellow merged with Roadway. The list goes on. Asset-based providers delivering 24x7 services have had to increase their work force to accommodate volume growth and have had to make large capital investments in fleets, terminals and infrastructure. However, growth-through-acquisition strategies have left many transportation providers with IT infrastructures that are overly complex and poorly integrated.

Since the introduction of just-in-time (JIT) inventory practices in the 1980s, companies in virtually every industry have worked to reduce inventory levels and overall production costs. Transportation has played a key role in this push to realize the benefits of JIT strategies. The ability to meet accelerated production and delivery schedules, and to ensure date- and time-specific deliveries with a high degree of inventory visibility, is a prime requirement for transportation carriers and 3PL providers.

Current and expected security mandates by the U.S. Transportation Security Administration and other governmental agencies around the world will put additional demands on transportation service providers. In one study, more than one of 10 international shipments was found to be late or incomplete. More stringent regulatory requirements will place additional burdens on cross-border logistics.

Unfortunately, many individual organizations still struggle with the limitations of fragmented operational models and platforms that are poorly equipped to meet these challenges. In one study, more than 60 percent of global companies were found to be still relying heavily on error-prone paper and spreadsheet-based supply chain processes.

To meet the demands of their dynamic sector, transport providers need a new and more agile business model. They must have communications and information systems capable of capturing and processing huge amounts of the near-real-time

data needed to plan and execute the variety of services they offer today and will develop in the future. They also need an operational environment capable of supporting standardized procure-to-pay and order-to-cash processes while still providing the flexibility to execute customer-specific work flows. The operational environment must interface smoothly with “edge” devices that monitor orders, shipments and moving assets. The solution should also integrate seamlessly with B2B gateways that support real-time interfaces with shippers and carriers, and with command and control centers that provide visibility to operational and financial exceptions.

Envisioned future state

To achieve this more streamlined and agile “future state,” most transportation organizations must undergo a fundamental, technology-based transformation. For example, leading retailers such as Wal-Mart are now championing the deployment of radio frequency identification (RFID) capabilities to track and optimize product flows. Transportation service providers will soon be required by manufacturers and retailers investing in RFID to provide information on orders and shipments in transit. Transportation companies must start planning now for the infrastructure, applications, manpower and processes needed to apply, read and manage data at touch points throughout the supply chain.

Future state business process architecture

Transportation providers must document and analyze their current business process work flows, identifying what is standard and common across regions and clients, and what needs to be region-specific or client-specific. They must then develop global process templates for their major service offerings (transportation, warehousing and customs brokerage) that standardize core processes while allowing room for region- or client-specific extensions. The global process templates help define the future state enterprise business process architecture that documents durable processes for every enterprise in areas such as customer experience, operations, sales and enterprise management. These templates also help define the key events and milestones that will be established and monitored for key business processes and the processes that will be used to manage exceptions.

Future state enterprise IT architecture

Transportation organizations must also analyze the current state of their applications and technology infrastructures. They must then develop a future state IT architecture that can support a collaborative, timely and coordinated response to key business events. The enterprise IT architecture defines the future state data architecture, security architecture, applications architecture, enterprise integration architecture and technology architecture.

To transition to the future state, transportation companies must move from their traditional heterogeneous environment (typically defined by poorly integrated legacy applications) to common platforms that are closely integrated and aligned with key business processes. This transformation often calls for a multiyear transformation plan over which business processes are standardized and improved, and the IT applications and technology infrastructure that supports the business process is rationalized and modernized.

By transforming their IT infrastructure in this way, transport providers can achieve the agility needed to more quickly respond to customer demand and market changes. They can enjoy greater business continuity, higher levels of redundancy, and enhanced internal and external service performance. Those changes translate directly into a lower total cost of ownership, a clearer focus on mission-critical objectives and a more competitive position in the demanding global economy.

The transformational path

Perhaps the hardest part of the journey to becoming an agile enterprise is the transformation from current state to future state. To manage this process effectively, organizations must develop an enterprise transformation plan that encompasses a business transformation plan and an IT transformation plan.

The business transformation plan is used to manage the process changes, organizational changes and technology changes that need to be made to achieve the global process template. Key activities include validation of the global process template by key stakeholders, establishment of a change management group, development of training materials, personnel training, implementation of IT applications and technology infrastructures, and phased implementation of the new business processes. The business transformation

plan will help transform transportation companies to an agile environment that supports electronic booking of services, scheduling of pickups and deliveries for transportation services, real-time tracking of service status, electronic billing and payment processing, and electronic claims management. Operations, sales, marketing and back-office functions such as HR, finance and accounting will also have similar transformation plans all geared toward rapid response to processing of customer orders, close interactions with suppliers, event management and rapid financial processing.

The IT transformation plan supports the business transformation plan and lays out the initiatives/programs needed to transform the applications and IT infrastructures. The IT transformation plan includes initiatives for improving electronic links with suppliers and customers, applications and infrastructure rationalization, applications and infrastructure modernization, and implementation of new technologies for “edge” data capture. The IT transformation plan also guides the implementation of work flow management, business rules engines, exception management engines, operational data stores and data warehouses to support business intelligence initiatives.

The transformation plans provide the framework for scheduling and managing enterprise transformations. Successful enterprise transformation depends on the development and execution of well-defined transformation plans. Even more critical is the commitment of the executive team, and their resolve to stay on the transformation journey over a multiyear period.

Creating an agile transportation enterprise

Supply chain: integration and visibility

We have always recognized the importance of data (from partners and from in-house operations) to manage supply chains. Good real-time data is critical, but even more critical is the ability to analyze that data to identify the response to exceptions and the ability to execute the actions with supply chain partners. To do that, enterprises need to develop collaborative platforms with key supply chain partners - platforms that enable actions to be quickly communicated to partners and partners can respond. A good example would be an urgent need to replenish a manufacturing plan with inbound parts, requiring the rerouting of an ocean container.

Recognizing the demand signal and translating it into action is the key to this new transportation environment. In fact, in many respects, data has become the critical level to control inventory in the supply chain, and visibility is now a key competitive advantage for many transportation service providers. Edge computing devices can now be used to capture and forward detailed information about shipment locations, estimated delivery times, resource status and many other supply chain details.

By more efficiently capturing and managing information on every aspect of transport operations – and by making that data easily and instantly available to customers, suppliers and partners – providers can pull the world toward their data chain and gain a keen advantage over their competitors. To do this, providers will need to develop standardized data, robust platforms, application-specific devices and seamless interfaces.

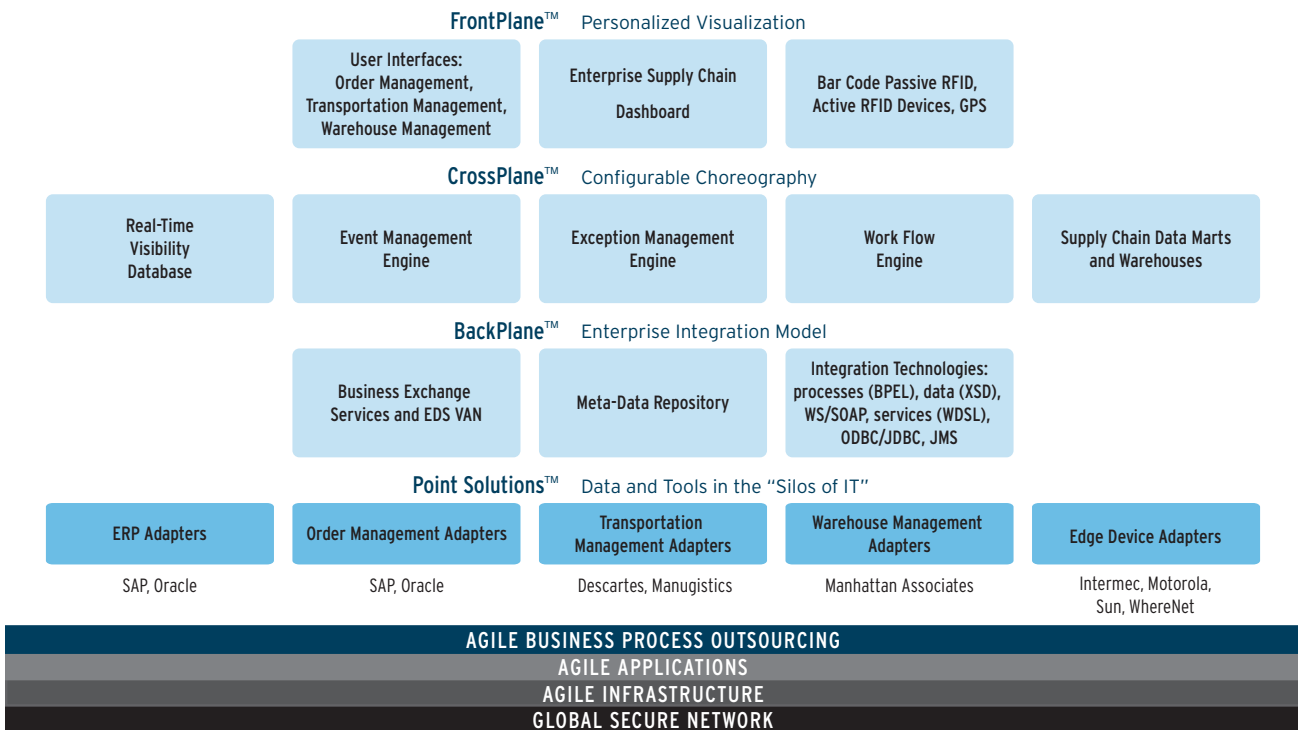
There is also a clear need for transportation carriers across all modes to get maximum performance and use from their current assets, including fleets, buildings, IT infrastructure, partnerships and labor. To gain the optimum value from

current investments, legacy assets must be carefully analyzed, updated and extended when possible, and replaced when necessary. Optimized asset utilization is a key to any transformation toward becoming a more agile enterprise, and application modernization will be a vital competitive advantage in tomorrow’s transportation sector.

The agile enterprise platform

Another key step in establishing an agile transportation enterprise is creating a stable, integrated and flexible technology, applications and business process infrastructure. To provide the speed and flexibility needed in today’s transportation environment, the agile enterprise platform uses a layered applications architecture featuring a front plane, cross plane and back plane (see Figure 1). The front plane is the presentation layer with the intranet portal that provides access to these things: all enterprise applications; the edge device readers to read and process RFID, GPS and bar code events; and the B2B gateway that is used to collaborate with enterprise partners.

Figure 1: Agile transportation enterprise architecture



The cross plane has the business rules repository, the enterprise SOA services that provide the various services, the work flow manager to track and monitor enterprise workflows, the exception manager service to process exception events, and the operational data stores for real-time operational data.

The back plane has the data warehouses and the point solution adapters to existing enterprise systems so information can be sent and received from existing point solutions.

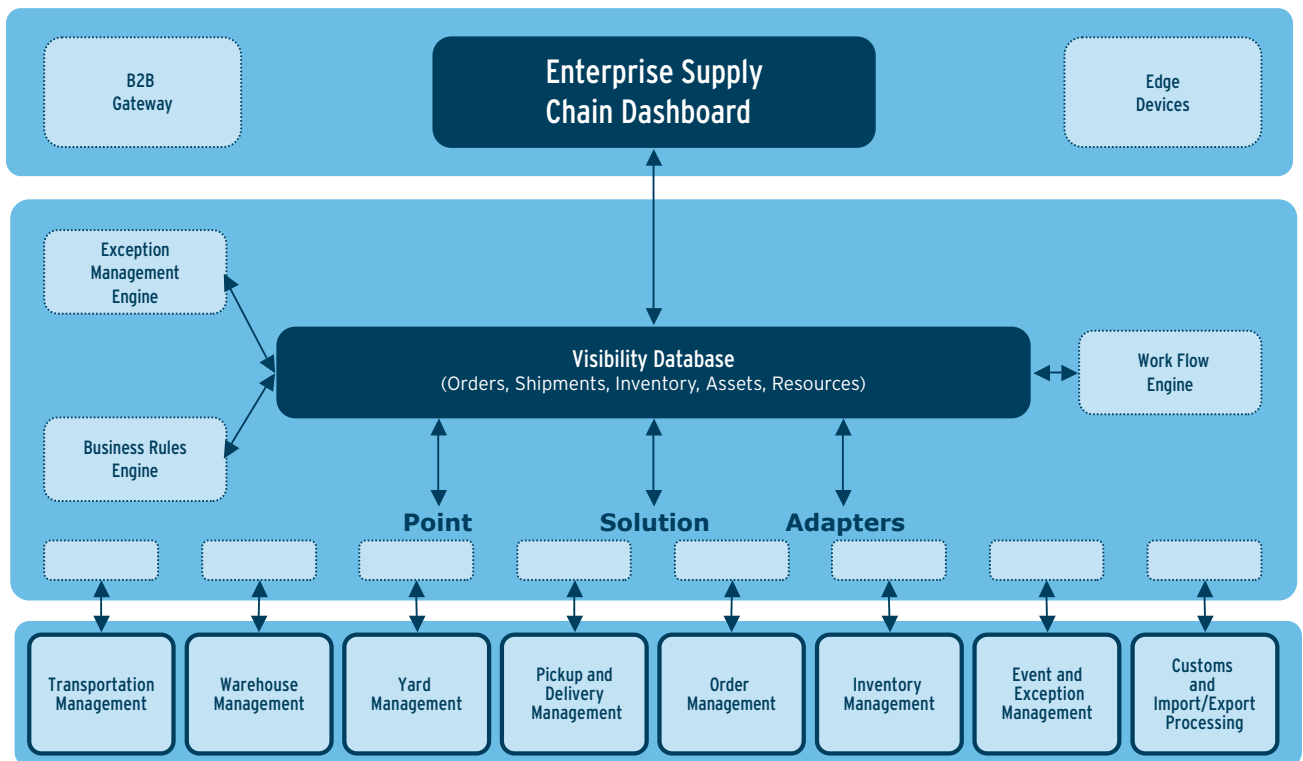
Supporting the agile applications platform is an agile technology infrastructure that features virtual servers, automated applications and server monitoring, utility-based provisioning and billing controls, self-executing predictive monitoring and controls, and replicable globally standardized tools and processes. The technology infrastructure rests on a secure, global network layer consisting of hardware, network software and telecom carrier-based access, WAN, and wireless services.

At the top of the agile applications and technology platform is the agile business processing platform - service delivery centers that support multiple products and services through standardized robust processes. The service delivery centers use real-time dashboards to monitor service delivery and automated key performance indicators to measure performance.

Service Oriented Architecture

The agile enterprise platform is based on an applications and technology infrastructure built using Service Oriented Architecture (SOA). SOA leverages Web services technologies such as hypertext transfer protocol (HTTP), extensible markup language (XML) and simple object access protocol (SOAP) to develop components that can provide well-defined services (to compute, accept or retrieve data) with a well-defined application program interface (API) that can be invoked by other applications within an enterprise or across enterprises.

Figure 2: Supply chain visibility and collaboration platform



SOA provides transportation enterprises several benefits: the ability to provide new interfaces to existing legacy systems so they can interact with other enterprise applications using current communication protocols; the ability to decompose enterprise applications into a set of well-defined services for edge data processing, business rule processing, enterprise data processing, collaboration with suppliers and customers and event management; the ability to plan and execute special customer requirements; and the ability to introduce new products and services quickly by defining new business rules and new work flows. SOA-based architectures are particularly important for transportation enterprises, because they need to be event driven (responsive to demand and capacity changes) and flexible (responsive to special customer requirements).

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The SOA-based applications platform for a transportation provider will include services that address the following needs:

- Support data exchange with legacy platforms
- Support the entire customer life cycle - from discovery of product offerings to booking, tracking, billing, payment and claims processing
- Support electronic communications with suppliers
- Support electronic communications with government entities
- Manage and process edge events (bar codes, RFID)
- Support operations including order management, order execution, work flow management, event management and exception processing
- Manage HR, finance and accounting processes
- Monitor and manage applications

SOA can also be used to manage the technology infrastructure for a transportation enterprise through services for server monitoring, authentication, applications monitoring, network monitoring and exception management. The SOA combines best-of-breed applications development, methods and tools, business insight, systems integration expertise and composite solutions to deliver a proven, leveraged environment for transportation providers.

A long-term approach

To achieve immediate and long-term benefits, transportation service providers should take a holistic, enterprisewide approach to IT modernization. As shown in Figure 3, organizations should stabilize data-related standards and operations, modernize IT operations, then leverage more advanced solutions and capabilities to modernize and transform their businesses.

For most organizations, this transition will be a multiyear initiative designed to guide the evolution toward a more agile and profitable enterprise. This phased approach is crafted to reduce waste and costs in the earliest stages, thereby delivering immediate savings and both near-term and long-term return on investment.

Choosing a pathway: proprietary versus alliances

Transportation providers can take one of two available pathways toward a more agile enterprise structure. One route calls for deploying highly proprietary solutions built largely on single-source hardware, software and service capabilities. But as many transport-oriented organizations have learned, the proprietary approach can be inflexible and difficult to scale.

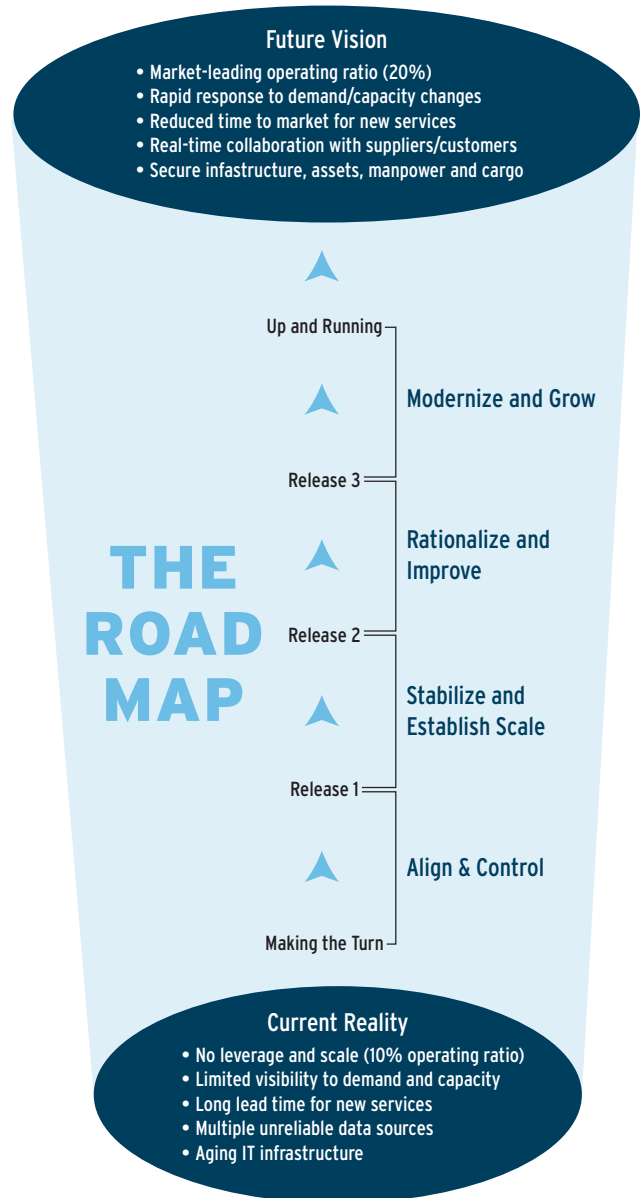
The alternative is a more adaptable, alliance-based strategy that draws upon the technologies, people and processes of a wide range of leading IT, services and transport supply chain companies. This nonproprietary approach is more capable of responding to changes in market demand, new company strategies and the opportunities created by emerging technologies.

The benefits of agility

Transportation service providers can leverage the agile enterprise approach to achieve true end-to-end supply chain capabilities. Agility translates directly into a faster, more competitive transportation organization capable of responding more effectively to customer needs and market changes.

The agile model enables transportation providers to align their IT services more closely to their underlying business goals. It provides a flexible yet stable infrastructure capable of anticipating and responding to a dynamic transportation environment. This approach enables transportation companies to address compressed product life cycles and the challenges caused by international shipping congestion. In fact, organizations in virtually any segment of the transportation sector can leverage these strategies to provide superior, accountable service and delivery performance.

Figure 3: Transformation road map



By adopting a rational transformational plan, transport-oriented companies can leverage their existing IT infrastructure, while taking a phased approach to modernization. At the same time, the transformative methods described in this paper yield immediate cost reductions and an accelerated return on investment. Those results, in turn, give transportation providers a sustainable market advantage and the ability to outperform their less-agile competitors.

Enabling transformation

EDS brings unique transformational capabilities to transportation service providers. We offer a large and proven global footprint, an established and ongoing investment in the agile enterprise platform, and industry-leading architecture design, platforms, globally standard tools and processes. EDS has assembled a comprehensive suite of solutions to support the agile transportation enterprise, including applications outsourcing, IT management, integration and testing services.

By deploying standardized platforms and applications, EDS enables transportation providers to employ consistent, globally shared data and to operate as a “single company” across business units, regions and sectors. Global data access and superior decision support tools enable providers to improve their processes, to accelerate the design and deployment of new products, and to deliver more reliable and cost-effective end-to-end transportation services.

EDS brings deep and diverse experience in helping transportation service providers meet the challenges of transformation. Our alliance-based approach provides ongoing access to multiple IT perspectives and the latest in proven supply chain technologies. EDS works with key companies - including Microsoft, Cisco Systems, SAP, Sun Microsystems, Oracle, TIBCO and others - to deliver a simplified and automated infrastructure environment and scalable support and services.

Our “transform to agility” approach has been proved with successful applications for an international airline, a global automotive manufacturer, a large freight forwarder and other world-class organizations, as well as our own evolution into an agile enterprise.

Conclusion

Today's transportation industry is faster, more global and more competitive than ever before. Customers increasingly seek out transportation providers who can do more than deliver efficient service at a competitive cost. Customers now demand supply chains that are more responsive, more visible and more intelligent. To compete in this environment, transportation service providers must retool their organizations to be flexible and transparent. Those providers need more than single-point IT fixes. They need a comprehensive, transformational approach that links IT to their business objectives, automates their operations, accelerates the supply chain and streamlines their business. As we have seen, this approach can be taken in a stepped approach that delivers measurable benefits at every stage.

EDS believes today's transportation provider must build an agile enterprise platform designed specifically to maximize savings, to drive end-to-end efficiencies while enhancing service quality and to free management to focus on the company's core competencies. Transportation service providers can achieve those objectives by following a market-tested transformational pathway, by adopting service-oriented solutions and by leveraging an alliance of industry-leading partners.

By transforming themselves into more agile enterprises, providers can meet the demands of today's more competitive transportation sector.

Footnotes

- 1 World Trade Organization
- 2 Dr. C. John Langley Jr., Georgia Tech
- 3 “The Triple-A Supply Chain,” Jau L. Lee, Harvard Business School Publishing, 2004

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About EDS

EDS, an HP company, is a leading global technology services provider, delivering business solutions to its customers. EDS founded the information technology outsourcing industry more than 46 years ago. Today, EDS delivers a broad portfolio of information technology and business process outsourcing services to customers in the manufacturing, financial services, healthcare, communications, energy, transportation, and consumer and retail industries, and to governments around the world.

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