



Innovating with
Proven Technology to
Get Ahead in T&L

WHITE PAPER



Nearly all the transportation and distribution companies in a market are governed by the similar labor laws, pay the same fuel prices and share the same roads. So why are some much more successful than others? Winning T&L companies don't rely on cyclical business conditions to be successful. They can be profitable in any business conditions because they are differentiated, either in the services they offer customers or in their underlying business processes.

Differentiation comes through innovation, which has long been essential in the T&L industry. Innovation began thousands of years ago the first time someone used the wheel to move items from point A to point B. Since then, transportation innovation has changed how people around the world live and work, and made many millionaires along the way. Railways enabled commerce and population centers to develop away from major waterways; wagons and trucks extended the reach of transportation networks away from railroad hubs. The Pony Express was a disruptive force in the market and showed the commercial value of offering improved speed and convenience. Years later, Fred Smith adapted and modernized this concept and FedEx® was born. Today many of the innovations that started in the express delivery industry are now considered standard terms of delivery service. Customers expect same-day pickup and delivery and to track their shipments from door to door in real time. What was once differentiated is now expected, which drives the need to continue to innovate.

Even after all this innovation, T&L companies still have the opportunity to make disruptive innovations that alter their markets. A Canadian wholesale delivery company gained a cost advantage over its competitors by tweaking its proof-of-delivery (POD) procedure to save hours each day. A Belgian express delivery company can satisfy customer pickup requests on short notice by using GPS to automatically identify and dispatch the nearest driver. Other companies have adapted document scanning technology to automatically verify shipment addresses in the field, which saves hours in the line haul planning process and prevents costly misshipments. A growing range of exciting location-based services (LBS) can be put in place using the GPS systems that are already in use.

T&L operators will likely need to extract more benefit from technology and automation to remain competitive. However, they do not need the latest technology available today to meet their business needs, nor do they need to be the first to adopt tomorrow's technology to gain an advantage. Innovation in adapting today's technologies is more important to success than new technology development. Most T&L operators have the opportunity to make significant improvements to their operations by using common, proven technology in innovative new ways. Examples include making more use of legacy GPS systems to enhance visibility and introduce location-based business rules, to using a common capability like electronic signature capture to enable efficient new proof-of-delivery processes.

This white paper highlights how LTL carriers, courier services, 3PLs and other transportation & logistics companies have married technology and process changes to reduce costs, provide more visibility and increase efficiency, and presents other ideas for how companies can innovate to produce business value using technology solutions that are available today.

The Innovation Imperative

Innovation is what allows us to thrive when resources are limited or business conditions are challenging. For example, today there are more people living on the earth than at any point in history, but hunger and poverty rates are declining. Innovation in agriculture, healthcare and other areas make this possible. Telecommunications and PC penetration continue to rise, connecting remote areas of the world and bringing more people into the global economy. In IT, a rack of servers can be replaced with a single virtual machine, with no dropoff in performance but significant savings in space, power and cooling. For fleets, innovation has produced incremental improvements in fuel economy. Meanwhile, disruptive innovation in oil drilling and extraction techniques mean there is a real possibility that gasoline prices will trend down instead of up.

Disruptive innovation has also created new market opportunities for T&L providers. Consider how the disruptive effect that e-commerce had on retailing and how it has expanded the home delivery market. E-commerce has also raised expectations of T&L and other service providers. Most customers expect to be able to find what they want and to order it when they want (increasingly from a smart phone and tablet) and have it delivered where they want, by the next day. They also want to be able to track their order and shipment every step of the way. Not long ago companies offered customers self-service shipment tracking as a differentiating feature. Now it is a requirement to meet most customer service expectations.

While these expectations have helped grow the delivery market, they have also raised fulfillment pressure. Expectations for faster delivery and more visibility have extended to business-to-business customers. Meanwhile, market conditions continue to become more difficult. Operators all over the world face strong fuel efficiency requirements, more worker-friendly labor laws and other regulation. With staffing pressure, regulations and customer expectations all increasing, distribution efficiency, velocity and visibility have never been more important for T&L companies. A business-as-usual approach will put companies on a path to going out of business. Innovation provides a path away from business as usual, as the following examples highlight.

Innovating With Proven T&L Technology

Companies in the T&L industry have many opportunities to use innovation to remain viable and improve their competitiveness. Innovation can come without the risks associated with emerging, unproven technologies or expensive proprietary systems. By focusing on process improvements, transportation companies around the world have innovated by taking advantage of low-risk, affordable and proven technologies like wireless communication, digital imaging and electronic signature capture. While these tools may not seem cutting edge, they can cut substantial amounts of time, errors and cost out of T&L operations.

T&L operators have more proven building blocks to work with than ever before. These include reliable mobile computers in a variety of configurations, wireless options that can provide real-time connectivity to dispatch, order management, inventory and other applications to help serve customers, convenient options for capturing electronic signatures and scanning and processing documents in the field, plus multiple automated data capture options including bar code scanning,

OCR and RFID. There are also software tools to help your developers integrate these capabilities into your operations, plus experienced solution providers to help. With so many resources available it is an excellent time for T&L operators to refresh their operations. Innovation can be tactical and provide a rapid return on investment, as the following examples highlight.

Cutting Paper Cuts Costs

A Turkish letter and package delivery company did not need cutting-edge technology to cut a substantial amount of time and cost from its operations. The company switched from recording deliveries by paper to recording them on handheld computers. For pickups, drivers scan a bar code on the package instead of entering the details on a form. These processes represented innovation in the Turkish market. For Aras, the process and technology changed reduced the time drivers took to record a delivery by an average of 116 seconds. Drivers average 60 transactions per day, so the handheld computers produced approximately two hours in daily time savings, which was enough time to complete additional deliveries during a shift. Aras estimated that replacing manual data entry with computer entry and bar code scanning prevents 150 data entry errors per day. The company experienced a 30 percent reduction in customer service calls, which it attributes to fewer errors. The system paid for itself within a year, and provided a three-year return on investment of 185 percent, while also enabling more productivity and higher customer service levels (see the complete case study at www.intermec.com/learning/content_library/case_studies/csArasCargo.aspx).

Proof of Delivery Improvements

Noble, a Canadian wholesale supplier that operates a fleet of 200 trucks and 53 branch locations, provides another example of how innovating processes with common tools can create strong business value. Company drivers deliver plumbing, HVAC and other industrial supply goods to customers, get signatures for deliveries, and return to their branch each night. Previously the confirmation slips were turned in at the branch, where an office employee would scan them the next day. Some slips would be lost or damaged, leaving Noble with proof-of-delivery documentation for approximately 80 percent of its orders.

Scanning the confirmation slips took about 10 minutes at each branch, for a total of approximately eight hours each night throughout the network, and a similar amount of time was spent retrieving POD information to prepare invoices. Separately, Noble customer service representatives spent approximately four hours on the phone each day answering customer calls, most of which were inquiries about delivery status. Not having proof of delivery documentation for 20 percent of deliveries made it difficult to resolve some customer service issues.

Noble was expanding and felt its paper-based processes were a barrier to growth. The company deployed handheld computers to its drivers to automate the delivery and confirmation processes. The handhelds have two basic applications. The first is the driver's daily delivery instructions, including a suggested order for deliveries and a complete manifest of goods in the order. Drivers have the flexibility to override the suggested delivery order in response to traffic or other conditions. The second application is electronic proof of delivery. Customers now sign for the order on the computer screen instead of on paper, and the transaction is instantly reported to Noble's customer service system over a wireless network.

POD Creates Transparency

VISA Global Logistics has grown to become Australia's largest freight forwarder. The company made a simple change to its delivery process by implementing electronic signature capture, which has improved efficiency and customer service.

When a delivery is signed for the mobile application automatically generates a POD notification and e-mails it to the customer over a 3G network. The transaction is also recorded at VISA Global Logistics headquarters. That way, information at the VISA headquarters, customer headquarters and the customer's receiving dock are all in synch.

"The new devices have proven to be much more reliable than our older hardware and our driver KPI reports indicate an improved success rate of jobs that have been confirmed using the handheld devices," said Garth Harris, director of VISA Global Logistics. "Our office staff are not having to spend time updating job information from drivers' run sheets and we have accurate and transparent data for billing transport services to our customers." (See the complete case study at www.intermec.com/learning/content_library/case_studies/cs-Visa-Global-Logistics.aspx).

"This has been great from a customer service perspective, because often people will call and not realize that someone from their company has already signed for their package; our representatives can now tell them exactly who signed for packages and at what time," said Tod Querenqesser, project manager for Noble.

Neither the route instruction or POD applications require the latest wireless networking protocols, mobile computing operating systems or other bleeding-edge technologies, but both have had a big impact on operations.

For Noble, electronic proof of delivery saves 16 hours daily in scanning and retrieval time, eliminates the lag between when goods are delivered and when the delivery is recorded, and has improved customer service while reducing labor costs.

"This system has allowed us to refocus approximately 15 full-time staff on bettering our customer service rather than spending time on data entry," Querenqesser said. Expansion is what motivated Noble to innovate its processes, and now the company is servicing more customers and regions with less support staff. After these successes the company plans to continue to innovate – next it will explore how the GPS capabilities in the handheld computers could enable additional process enhancements. (See the complete Noble case study at: www.intermec.com/public-files/case-studies/en/cs-noble.pdf).

Noble saved time and reduced processing costs primarily by taking advantage of the on-screen signature capture capability of its handheld computers. The following sections present examples of other processes that can be improved with other common mobile technologies.

Leveraging GPS

Noble and VISA Global Logistics improved customer service by providing electronic, real-time notification of proof of delivery, which is valued by customers because goods in incoming shipments are often needed immediately to complete the day's tasks. Other companies that make time-sensitive deliveries have gone even further to keep customers up-to-date by providing real-time visibility for in-transit shipments. In many cases, T&L operators can provide in-transit visibility to customers by leveraging the location data they already receive from in-vehicle GPS devices and sharing it with customers. This level of tracking and reporting used to be associated with large international parcel couriers, but is now available to companies of all sizes because continued innovation has made the technology affordable and easy to use. GPS is finding its way into even small fleets, because it is very affordable and typically pays for itself in a few months by leading to fuel and time savings.

There are several ways to use existing GPS capabilities to improve operations and offer new services. Many companies that began using GPS for navigation assistance later expanded into using the collected data to analyze performance and optimize routes. Some went further and used GPS data to drive dynamic rerouting (especially on high-volume, multi-stop routes), either by helping a dispatcher to make decisions or by feeding data to an automated routing and scheduling system. The experience at a Belgian express delivery company, shows the value of finding new uses for GPS data.

Euro-Sprinters receives customer pickup requests throughout the day. When a pickup request comes in, Euro-Sprinters' software system checks the GPS location of all drivers (which is provided by the GPS radio in the handheld computers they carry), calculates each driver's estimated time to reach the customer site, and presents the information to a dispatcher to make an assignment. Drivers get pickup instructions via the cellular radio in the handheld, customers sign on screen to confirm the pickup, and the transaction updates Euro-Sprinters' tracking system in near real time. The computers also automatically send periodic location and ETA updates that customers can track (see the full case study at www.intermec.com/docs/about_us/realtime_magazine/Fall_08/euro-sprinters.pdf). These system and process changes have improved responsiveness and visibility, and companies continue to find new ways to leverage GPS.

Geofencing emerged where GPS data was used to enforce adherence to pre-defined routes. Innovative businesses have built on the concept and created a wide range of location-based services to improve distribution operations. These range from simple actions like automatically applying a location stamp to all transactions completed on a mobile computer, to notifying dispatchers of driver locations, to even automatically locking vehicle doors when the vehicle enters a high-crime area.

Imaging Adds Documentation, Reduces Paperwork Processing Time

The innovation of integrating a camera into mobile computers has led to many process innovations in how deliveries are documented and billed. One of the simplest and most effective is to use the computer to capture a document image, including the proof of delivery signature that proves goods were delivered. Some organizations are doing much more, by using the handheld computer as a document scanner so bill of lading documents, manifests, invoices and other forms can be captured, processed and communicated in real time.

Taking a picture is a fast, low-tech process that can support T&L operations in several beneficial ways, particularly for revenue assurance. Digital images (which can be automatically stamped with the date, time and location of where they were taken) are very effective for preventing disputes and ensuring payment by providing visual documentation of a consignment's condition at pickup and delivery. But if done in a standalone manner by using a consumer digital camera, integrating the image into enterprise applications and records systems can be a nightmare. Cameras provide only raw image files, with no context about how the image relates to the activity that was performed. When imaging is integrated into the mobile computer and mobile application, images are automatically indexed. Indexing associates the image with a specific transaction and makes it easy to organize and store images and to quickly retrieve the specific image that is needed. Without indexing, clerks and drivers need to manually review and interpret dozens or hundreds of images to find what they need. Using an integrated camera makes the photo part of the data stream, adding to the value of the process without the risk of loss and error inherent to manual processes.

Imaging can be especially valuable for home-delivery operations. If no signature is required, the image can be used to document where the parcel was left and that it was in good condition. Drivers can also document conditions that prevented delivery, such as a locked gate or a threatening dog.

Logistics companies commonly use imagers to read 1D and 2D bar codes and most of these applications are well known. There is still room for continued innovation in bar code imaging, particularly for companies in EDI relationships. While EDI and web service platforms are widely used, they are often ineffective because trucks tend to arrive ahead of their corresponding EDI messages. 2D shipping labels can provide the documentation needed to efficiently receive shipments whether or not EDI or other records are available. The space available for 2D bar codes on shipping labels is sufficient to encode Advance Ship Notice (ASN) data, so it can be scanned as an alternative to receiving a prior electronic submission. For these applications it is necessary to use a bar code imager, rather than a general purpose digital camera. Bar code imagers have optimized optics and decoding algorithms that enable processing 2D symbols much more quickly and reliably than cameras, and give the user the ability to process poor quality and damaged symbols. Accuracy and speed are essential in T&L operations, so optimized bar code imagers are key to ensuring that bar code-based processes run smoothly.

See Intermec's white papers, *Transportation Operations: Clear Cash Flow Roadblocks with Enhanced Mobile Document Imaging* and *Imaging Adds Visibility to Transportation* to learn more about the system requirements, use cases, cost benefits and productivity advantages of using enhanced mobile document imaging in transportation operations.

Advanced Document Imaging

Mobile imagers give workers a fast and reliable way to convert paper documents into electronic forms. Combining mobile imaging with wireless communication gives back-end system the documentation they need to start various processes (route planning, order picking, invoicing, answering customer service inquiries, etc.) hours or even days earlier than when paper-based processes are used. Transmitting document images wirelessly not only gives office workers a head start, it also saves considerable data entry time and prevents manual data entry errors.

Document imagers can be used as digital cameras, but digital cameras can't provide true document imaging. Some imagers and computers simply present an image of the scanned document, while others have software that enables them to digitize and process information from forms. To avoid confusion, in this paper *document imaging* and *enhanced mobile document imaging* refer to systems that capture documents and save them in formats that can be processed automatically. *Document photography* refers to systems that capture a raw image of the document, which can be viewed and stored, but data on the document image must be entered and processed manually. Cameras in the field today can perform document photography, but higher-quality optics and specialized software are needed for true document imaging. Software is available to extract addresses and other key information from paper forms and process the information electronically but this can only be done from high quality document images. Document photos cannot reliably attain this level of quality.

One of the most beneficial uses of mobile document imaging in the transportation industry is to capture bills of lading and manifests upon receipt by the driver then send the electronic image to headquarters for processing. This process provides several major benefits. First, it provides critical information needed for downstream planning and optimization. Second it shortens the billing cycle, because the billing department does not need to wait for a driver to return with paper documentation to begin preparing an invoice. Third, the process enables the organization to work with electronic records instead of paper documents. Electronic forms are more accurate and cost less to prepare, process and archive.

Shipment Address Validation

Drivers can use a handheld computer with enhanced imager to scan the shipping labels of the shipments they are picking up. Image processing software can then extract the address data, validate the information and populate the required records, and could direct a mobile printer to generate a bar code shipping label for the item. Using the imager and software to capture and communicate address information saves time for drivers and prevents manual data entry errors. Addresses can also be validated against a database to add additional data such as the delivery address type (commercial, residential or rural), notes, special delivery instructions or other details that enrich the process.

Validating the address at the time of pickup provides several financial benefits and saves time at the distribution center. In a typical operation, the driver arrives at the pickup location, reads the shipping label on a pallet and key enters the address, or at minimum the destination postal code, into a handheld computer. Manual data entry often produces errors (Aras estimated its couriers made an error approximately every 397 transactions, resulting in approximately 150 errors per day). When addresses are entered incorrectly shipping errors can easily follow, resulting in a major drain on profitability. Address validation in the field protects revenue in another way too. By making sure the address is correct, the carrier can also help make sure the shipment is billed correctly (for example, residential deliveries may be billed at a different rate than deliveries to commercial locations). Finally, on-site address validation cuts time out of the transportation process. When the correct information is captured in the field and recorded in real time, route planning can begin immediately, rather than when the consignment is brought to the cross dock or distribution center for processing.

The shipment address validation example shows that opportunities to innovate are all around. Organizations already record the ship-to addresses of their consignments in one way or another. By innovating the process to validate the address in the field and record it in real time, some organizations have reduced their shipping errors, improved billing accuracy and reduced dwell time for their consignments. These improvements were made possible by innovations in imaging and document scanning technology.

Conclusion

All T&L companies face labor challenges, cost instability and rising service expectations. Innovation is how companies can successfully meet these challenges, and is what will differentiate successful T&L operators. There is a clear link between innovation and business value in the transportation & logistics industry. There are also many ways for T&L companies to get business value by innovating, as this white paper has highlighted.

T&L companies are winning customers and improving profitability by taking a fresh look at their operations. By examining basic functions like how pickups are made, how addresses are entered and how deliveries are completed, companies have imagined new services and business processes that are setting them apart in their markets. Often, the new approaches have led to new business.

Effective innovation does not require taking risks on unproven technology. Implementing new technology itself without process changes is often a waste. Some of the most effective new processes being used in the transportation & logistics industry today make innovative use of proven technologies like mobile computing, imaging, GPS and other wireless communication to create sustainable business benefits. Innovating by introducing document scanning processing capabilities to the mobile environment creates more opportunities to eliminate paperwork and cut errors and cost out of operations.

Intermec has helped companies in all segments of the T&L industry innovate and improve their operations with technology for more than 40 years. Intermec systems enable companies to accurately track every item throughout their supply chain and improve efficiency, saving immeasurable hours in cross docking, yard management and pick-up and delivery operations. Intermec's mobile computers, RFID systems, bar-code scanners and imagers and Vocollect Voice solutions deliver real-time information exactly where it's needed so companies have complete and timely visibility of their goods at all times. Visit www.intermec.com/solutions/transportation/index.aspx for more information about our solutions for different industry segments and work processes and to access additional white papers, case studies and videos about logistic and technology topics.

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