# Leveraging Automation to Improve DSD & Route Accounting

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Accuracy and productivity lead to profitability in direct store delivery (DSD) and route accounting operations. Revenue and cash flow will improve appreciably if DSD sales representatives can make just one more stop per day. Reducing invoice and inventory errors also reduces operating expenses by saving time for mobile and administrative staff, and by improving inventory availability. The following data[1] highlights these opportunities:

- There are discrepancies on 10.5 percent of DSD invoices issued to small-format retailers, and 15.4 percent to supermarkets and other large-format stores. Store managers, DSD sales and delivery personnel and their administrators at headquarters spend thousands of unproductive hours resolving these disputes, which are preventable through more accurate ordering and invoicing.
- The average out-of-stock rate for DSD items is 7.4 percent, but jumps to 13.1 percent for promotional items.
- Out-of-stocks result in $6 billion in lost sales annually.
- The average supermarket can reduce DSD out-of-stocks by 2.9 percent and increase annual revenue by $75,000.
- Automated check-in processes can reduce DSD receiving time by 60 percent.
- Efficient DSD suppliers spend 13.8 fewer minutes than inefficient firms for each delivery to large-format stores and spend nearly twice as much time on merchandising.

Automating DSD operations is a proven practice to help solve these problems and gain the ensuing productivity and profitability benefits. Mobile computing applications can help prevent order-entry errors and assist DSD staff in managing inventory more accurately and efficiently. Many companies are using batch handheld computers and DEX connectivity, but in today's world, this use is not enough to provide sustainable operational and competitive advantages. This guide will show how operations can be enhanced with additional applications, wireless data communication, on-site invoice printing and other enhancements to reduce operating costs and improve efficiency and profitability.

## Finding Automation Opportunities

Automating the manual processes associated with ordering and invoicing with a mobile computing and printing solution can produce a full return on investment. This is because such a solution practically eliminates costly errors and allows DSD representatives more time to focus on sales and merchandising. For example, a coffee delivery company reduced the connection time required to send and receive order and delivery information from an average of 15 minutes to two minutes, enabling route personnel to spend more time servicing and selling customers. Another distributor calculated it saved three to four minutes per invoice by automating the process using mobile computers and printers. The few minutes saved at each stop enabled the company's delivery drivers to visit an average of one more customer per route per day, which improved turnover and cash flow.

1. Data taken from "Unleash the Power of DSD Driving DSD Supply Chain Efficiencies and Possibilities" Grocery Manufacturers of America (GMA), September 2005.

Most organizations can get much more out of mobility investments by automating additional tasks that leverage the automation system. Here's an example of how leveraging automation with additional features can result in significant benefits. Most mobile sales and delivery applications work well in batch mode. However, complementing the application with wide-area wireless connectivity can bring incremental benefits to operations. With real-time connectivity, orders are processed immediately, eliminating order lag-time and enabling faster order fulfillment and ultimately reducing the cash-to-cash cycle. This would give staff at the distribution center more time to pick and prepare orders and plan loads and deliveries. In addition, companies that implement real-time sales order entry frequently reduce labor and overtime expenses, and have more flexibility to accept late orders and changes because workflow is more balanced.

Mobile automation tends to provide the best return on investment when applied to areas laden with manual processes that cause bottlenecks and frequent errors. Each organization has its own specific opportunities, but there are some general questions that can be used to identify them such as:

- How much time do drivers spend preparing orders and invoices?
- Do you take advantage of DEX to cut driver check-in times?
- What happens in the office when handwritten orders or invoices aren't legible?
- How much time is spent on data entry, both at the customer site and in your own office?
- Do inaccurate orders cause problems with customers?
- How often do customers call about billing disputes?
- How long does it typically take to resolve these questions? Which departments are involved?
- Could you benefit if route drivers had more time available for merchandising and sales?
- Do you always have the documentation needed to settle invoice, return and credit disputes?
- What percentage of time do drivers and office staff spend handling exceptions?
- How do your out-of-stock rates compare with industry averages (7.4 percent for the top 25 DSD categories)?
- Would operations benefit if your sales and delivery staff could make a few more stops per day?
- How do your customers rate your customer service?

These questions are just the start, and can help kick-start the process to identify areas within your processes that can most benefit from automation.

Basic computer-assisted order entry and invoice generation provides universal benefits for DSD and route accounting operations by preventing erroneous SKU entries, issuing alerts for unusual quantities or other questionable input, automatically applying up-to-date pricing and discounts, and otherwise making data entry faster and more accurate. Many other features can be added to improve specific processes. As previously noted, wide-area wireless data connectivity can be extremely valuable for streamlining distribution operations, and can provide information to facilitate sales, help resolve billing and credit disputes, and can even eliminate the need to carry multiple devices (such as a cell phone) through built-in voice communication.

### Challenge: Improve Order Accuracy

Mobile computer-based electronic forms with drop-down menus, check-boxes and pre-populated customer data fields reduce the chances for data entry errors, while software safeguards validate input and issue alerts for questionable entries (e.g., incorrect SKUs, unusual quantities, etc.). Automated data collection with bar code readers, signature capture or digital imagers built into the computer further increases accuracy and error-proofs documentation. Applications can be supplemented with order histories and demand patterns that are either written into the applications themselves or accessed over a wireless connection to host computer systems.

Improving order entry has impact throughout the DSD and retailer organizations. The obvious impact is on error reduction and time savings for resolution and fulfillment. With mobile computers and printers, sales representatives can produce an order to review with the customer immediately, and electronically store a signed, time-stamp copy that can be used to quickly resolve future questions and disputes. Other results are less obvious. For example, real-time wireless connectivity lets sales representatives check inventory availability before accepting orders. This process leads to more accurate orders, better fill rates and reduced substitutions, which all contribute to higher customer satisfaction.

### Reduce Invoice Errors

Mobile automation is very effective for reducing invoice errors—an area where many organizations have room for improvement considering the average invoice error rate ranges from 10.5 to 15.4 percent[2]. The 10.5 percent discrepancy rate should generate 105 inquiries to customer service representatives (CSRs) or account managers per 1,000 orders filled. If calls take an average of 12 minutes to resolve (a conservative assumption, considering the time required for order lookup, investigation, credit authorization, and computer entry), the company would spend 21 hours per month resolving errors. At the average shipment error rate, DSD suppliers would need a full-time customer service representative dedicated to error resolution for approximately every 7,600 orders.

If CSRs earn $10 per hour, the direct labor cost for error resolution is $210 per month per 1,000 orders. If the company earns a healthy 10 percent margin, it must win $2,100 in new business to offset the cost of errors; at 5 percent margin the figure jumps to $4,200. The calculation does not include labor costs associated with returns processing, savings from preventing rush shipments and additional deliveries to fulfill orders, or lost revenue from unreported over-shipments.

2. Ibid.

## Improve Inventory Accuracy

Accurate orders are an important step to maintaining accurate inventory. Mobile automation further promotes inventory accuracy because it enables representatives to quickly count inventory by bar code scanning and validate accuracy with software applications. These benefits extend to returns and credit processing. Accurate orders, combined with accurate shelf and back-room inventory, helps retailers optimize their inventory and reduce costly out-of-stocks. Automation and improved processes can help retailers reduce out-of-stocks by an average of 2.9 percent and improve revenue by $75,000 annually per store, according to the Grocery Manufacturers of America (GMA).

## Raise Productivity

Automated data capture is not only more accurate than manual, it's also faster. That leads to increased productivity for route personnel. Saving just a little time on several process steps can have a strong and beneficial cumulative effect. The evolution of order entry processes at J.J. Taylor Companies provides a good example. J.J. Taylor is a beer distributor whose DSD reps make 15 to 20 stops per day. The company upgraded its handheld computing order-entry system to support real-time wireless networking. As a result, order communication time for sales reps was reduced by 65 percent, saving approximately a half hour per rep per day (see box for more details).

DSD personnel spend between 2.1 percent and 6.0 percent of their time in retail stores preparing invoices, according to a GMA study. The time may not seem significant, but the difference is—some drivers spend almost three times as much time on invoice preparation as others. Completing invoices quickly helps workers spend more time on activities that can strengthen relationships with customers and ultimately grow revenues; the same study found efficient DSD personnel spend 50 percent of their time in stores merchandising, compared to just 27 percent for inefficient operators.

## Provide PoD

Many organizations have found wireless connectivity valuable for upgrading their proof-of-delivery (PoD) and customer service capabilities. In a common usage scenario, DSD reps have customers sign for orders or deliveries directly on the handheld computer screen, which electronically captures and digitizes the image. The complete transaction record, including the signature image, is then sent over a wireless network to the host computer system. Delivery, inventory and other records are updated instantly (rather than in batch at the end of the day), so customer service representatives have real-time access to the latest data. If customers call to check the status of a delivery or order, or dispute compliance with delivery windows, customer service reps

**Case in Point: J.J. Taylor**

J.J. Taylor is one of the largest beer distributors in the U.S. The company has automated and upgraded its DSD sales and delivery operations over the years, and currently uses handheld computers with wide-area wireless network connectivity, plus Bluetooth® connectivity to mobile printers to generate invoices and proof-of-delivery documentation.

The company's most recent technology refresh to mobile computers from Motorola and Zebra Technologies' mobile printers has provided benefits and generated positive ROI, even though operations were already automated and there were limited opportunities for major improvements. J.J. Taylor reported the following benefits:

- 65% reduction in order entry time through wireless communication.
- Improved mobile worker productivity.
- Increased order accuracy.
- Improved reliability; Bluetooth communication has eliminated cable repair and replacement costs.
- Streamlined DC operations.
- "Looking ahead, when we have fine-tuned our processes to start up the pallet-building system earlier, we'll be saving man-hours and costs, and that will translate to revenues." — said J.J. Taylor's MIS Manager

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can e-mail or fax the time-stamped delivery confirmation, complete with the customer's signature. Some companies have given their customers the ability to check these records themselves through a self-service Web site. Either approach improves responsiveness for customers; enables companies to reference accurate, up-to-date information; and reduces the time and effort required to check documentation.

### Shrink the Payment Cycle

Printing invoices at the time of delivery gives salespeople the opportunity to review them with customers, which helps prevent errors and disputes. The process can also help cash flow. The alternative to on-site invoicing is for route workers to turn in sheaves of paperwork to billing clerks at the end of each shift. This creates another opportunity for errors to enter the system as clerks re-record the billing information. More significantly, it also adds costly delays to the billing cycle. Consider a driver who finishes his Monday shift and turns his daily invoices into the billing department. In the best case, the information will be entered into the billing system and invoices mailed the next day. The customer will receive them in the mail two or three days later, a total of three to four days after the visit. Companies that follow this standard business practice are thus at a three or four day cash-cycle disadvantage compared with their competitors that bill on site. They also build postage expenses into each order.

The cash-cycle advantage can be accelerated significantly by using mobile printers to accept payment on delivery. Many companies routinely wait 30 days or more to pay invoices. Requiring payment on delivery eliminates the billing lag time and invoice processing delays, improving the cash cycle by at least a month. Mobile printers with integrated credit card readers make it convenient and simple to accept mobile payment and improve cash flow.

## Selecting the Right Solution

As you've seen, a broad range of automated sales, delivery and invoicing processes can provide value. The same goes for technology and devices that enable the automated processes. Businesses have improved responsiveness, productivity and profitability with devices ranging from simple cell phones to fully rugged, handheld Windows® computers with real-time connectivity. The main differentiators among product options are ruggedness and reliability, size and ease of use, input/output (I/O) support, wireless communications capabilities and management features. Total cost of ownership (TCO) varies significantly among mobile computers and peripherals used in DSD and route accounting—but perhaps not as you might think: More-rugged devices tend to be more expensive, but cost much less to own and operate than consumer-grade personal digital assistants (PDAs) and printers. The following sections provide brief overviews of the options, capabilities and differentiators for mobile computers, printers and their communications options.

### Mobile Computers

Handheld mobile computers are the preferred form factor for DSD and route accounting application, although vehicle-mounted models are also available, which are usually some form of notebook. Handheld computers can consolidate the number of devices users carry because they can provide computing, bar code scanning, signature capture plus voice and data communications functions in a single, reliable unit. Handhelds are available with a wide range of screen sizes and keypad configurations, and also differ greatly by ruggedness and support for different peripherals and communications options.

Rugged devices range from consumer-class PDAs to fully sealed units that can be immersed in water and withstand multiple six-foot drops to concrete. Ruggedness and reliability are key considerations when selecting products for DSD and route accounting operations, because if the equipment fails while the user is out in the field, the mobile worker will be hampered and service commitments will be threatened. In fact, lost productivity from failed devices costs organizations more than three times as much as the devices themselves, according to research firm Venture Development Corp. (VDC)[3]. That is a major reason ruggedized handhelds and peripherals are supplanting consumer-grade electronics for DSD and route accounting operations.

Peripheral and I/O support is another important consideration. At the very least, the mobile computer must have the connection ports, card slots or Bluetooth® connectivity to support bar code readers, digital cameras, printers and other peripherals workers user. Ideally some of these features will be integrated into the device itself. Integrated functionality improves reliability and convenience by reducing the number of devices—and appropriate batteries—that need to be carried and maintained, and eliminating the chance of damage and failure from cables connecting computers and peripherals.

Management features are an overlooked aspect of mobile computers. Deploying, configuring, troubleshooting and updating mobile assets can be very time-consuming for the IT department unless remote management capabilities are available. Some enterprise mobile computers can be supported remotely and offer management software that lets a single administrator monitor and manage mobile devices that may be deployed across the country. Consider management requirements when comparing mobile computing products.

## Mobile Printers

Printers used to support DSD and route accounting operations are typically mobile thermal printers that can be worn on a belt or strap, secured in the vehicle, or mounted within a portable work pad; or they are vehicle-mounted ink jet or impact models. Thermal has displaced impact as the dominant print technology used in DSD and route accounting because of its outstanding reliability, ease of use and superior total cost of ownership. Thermal printers are available to suit a variety of mobile operations, whether users prefer vehicle-mounted or portable units, cable or wireless connectivity, and other features. Some mobile printers also support remote management.

Mobile printers are able to print text, logos, graphics, and bar codes on long-lasting forms, receipts and labels of different sizes and thicknesses. Some models have integrated magnetic stripe readers for payment card processing. The key printer performance criteria for DSD and route accounting are durability, battery life and interface flexibility so the printer can be used with mobile computers, cell phones, bar code readers and other devices.

Thermal printers provide operating cost advantages compared to other technologies. One Zebra customer performed an analysis to compare the costs of legacy 8.5-by-11 inch invoices with 4-by-6 inch invoices produced on a Zebra mobile thermal printer. The thermal media cost was measured at 2.7¢ per invoice, compared to 6¢ for full sheets used in inkjet or impact printers-making the thermal media 45 percent less expensive. Companies that use multi-part forms could save even more.

3. "Mobile Device Downtime Destroys Workforce Productivity," Venture Development Corp., July 2007.

Mobile printers can interface with mobile computers or host applications through a variety of connectivity methods. Cables are one option for connecting mobile devices, but they are prone to damage in DSD and route accounting operations. Bluetooth can be used instead of a cable to connect the printer and mobile computer. Printers may also have a direct connection to 802.11-standard wireless networks. DSD and route accounting technicians can access wireless networks when they are in their own company facilities to receive their daily assignments and instructions, download customer lists and inventory records, and transfer transaction data at the end of the shift.

### Connectivity

Connectivity issues to consider include: how the mobile computer will interface with a mobile printer or other peripherals; whether wireless voice or data communication is needed; how workflows will be impacted if devices are out of coverage; and whether GPS or location-based services will be part of the solution. Wide-area voice and data communication, wireless LAN and Bluetooth wireless communication are all available in any combination on a single handheld computer. Mobile printers offer Bluetooth and wireless LAN connectivity. Many real-world implementations include multiple wireless interfaces, and some do combine all four. Below is a brief guide to the common wireless connectivity methods used in DSD and route accounting.

#### Wireless Wide Area Networks (WWANs)

Public and private wireless wide area networks enable real-time communications for workers outside the building. If the public WWANs (e.g., cell phone networks, which offer voice and data services) will be used, determine which networks you want to use or which networks might offer you the best value prior to narrowing your device selection. Alternatively, a private wireless wide area network can be implemented when complete control over volume and capacity is required—for example, a utility that wants to ensure mobile communications capabilities, even in the event of a major storm or other natural disaster.

#### Wireless Local Area Networks (WLANs)

When an 802.11a/b/g/n radio is integrated into the device, enterprises can control which networks are used at what times for connectivity. While workers in the field will always be dependent upon the WWAN connection, devices with a WLAN radio enable enterprises to configure devices to automatically switch to the enterprise wireless LAN for more cost-effective voice and data services when employees return to the building.

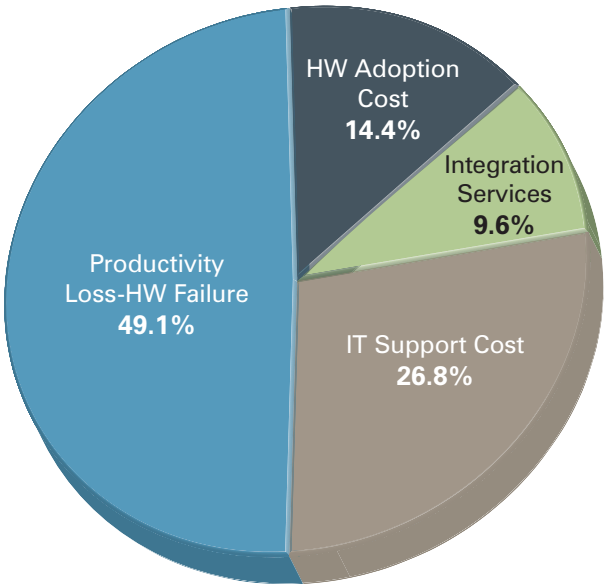
#### Wireless Personal Area Networks (WPANs)

The integration of a third radio, the WPAN or Bluetooth radio, gives workers the ability to wirelessly connect to personal devices—from headsets to printers. Cable purchasing and repair costs are eliminated, so is the risk of cable failure, and the lack of physical wired connections to personal devices can improve worker safety.

## Total Cost of Ownership Considerations

The best-known component of total cost of ownership is the price paid for mobile equipment—which is also perhaps the most overrated measure of TCO. Equipment reliability and support requirements each have much more effect on TCO than acquisition costs. As Figure 1 shows, lost productivity resulting from unreliable equipment costs organizations more than three times as much as they pay for their mobile devices, and support expenses are nearly twice as high.

Figure 1: Mobile Computer TCO Contribution




*Source: Venture Development Corporation.*

When evaluating mobile computers and printers for DSD and route accounting operations, it is important to understand how their design and features will impact reliability, productivity and support.

Reliability, not initial cost, should be the key requirement for equipment issued to DSD and route accounting workers. Some organizations choose to deploy consumer-grade PDAs and printers with the full expectation the hardware will have to be replaced in a year. The rationale is that two off-the-shelf PDAs will cost less to purchase than a rugged mobile computer designed and optimized for DSD and route accounting operations. Experience and the VDC research shows that the "low-cost" consumer-grade equipment actually costs organizations much more. For example, PDAs commonly stop working after they're dropped; enterprise-class handheld computers withstand certain levels of drops to concrete. If the PDA stops working, or if a connector is damaged so a peripheral printer can't be used, the user has to complete work manually and may need to return to the base office for a replacement unit. Either way, productivity dips, work schedules and customer service are threatened, and the worker has his or her time wasted. These "soft" costs related to productivity begin to show why hardware reliability is a critical factor in TCO. As VDC stated when it released its research:

> *"The findings of the research clearly indicated a lower TCO for rugged mobile computers in comparison to non-rugged or consumer/commercial-grade mobile computers for many applications because of the significantly higher failure rates of non-rugged hardware."*

Support costs are another significant component of TCO and are also hard to measure. Organizations may frequently want to update mobile computers with new product lists and customer files, enhancements to software applications, or security upgrades; or perform routine cleanups and maintenance. Such activity optimizes the computer, but the frequency of such changes depends on how convenient they are for IT support staff to execute. Remote management capabilities built into mobile computers and peripherals help minimize TCO by saving support time and making it practical to maintain and optimize equipment. Similarly, computers and peripherals that are proven to work well together and integrate easily with enterprise IT standards also help TCO by reducing integration and support requirements.

## Solution Provider Success Criteria

It is one thing to recognize the product types and features that will be reliable and return value, but quite another to sift through the many choices and determine which ones will perform best in your actual, specific working conditions. Experienced solutions providers are extremely helpful in making these assessments—but choosing a provider can be just as hard as specifying the system.

Motorola and Zebra each foster strong partner ecosystems that can provide a wide variety of expertise—from technical to operational as well as system integration and support. Based on our experience with hundreds of successful DSD and route accounting deployments, we recommend you engage a solution provider that meets the following criteria:

- **A successful track record with your specific industry and application**—Each mobile work environment is unique. The way specific business processes, documentation requirements and other workflow issues are handled has a strong impact on productivity and system value. Experienced providers can suggest process changes, software functions and product features to help your DSD and route accounting staff maximize productivity.

- **Reference customers**—Experienced providers should have no problem putting you in touch with customers who have systems similar to the one you are considering. Speaking with these customers provides valuable insight for your own system planning, as well as an opportunity to validate the solution provider's qualifications.

- **Support for multiple product lines and customization abilities**—You may not need a customized solution, but you need a partner who can provide one or can offer multiple product options. This ensures you'll get the system that best meets your workers' needs—instead of having your processes changed to fit a limited, inflexible solution offering.

- **Longevity**—Experience is very valuable, and so is a long-term commitment to customers and the market. Make sure your prospective solution provider intends to stay involved in your industry and application, can provide prompt service and support, and will keep you updated on technology changes and suggested system enhancements.

## Conclusion

Automating DSD and route accounting operations provides proven value to businesses by enabling processes that improve efficiency, reduce costs and increase revenues. Basic automated order entry, delivery confirmation and invoicing provide good business value. The benefits and ROI can grow substantially by leveraging computing, printing and wireless communications capabilities to automate additional activities. Even small reductions in error and out-of-stock rates can produce cumulative savings that quickly justify the investment.

This white paper has identified the major opportunities, benefits, technologies and TCO issues for DSD and route accounting operations. Visit the Motorola (www.motorola.com/enterprise) and Zebra (www.zebra.com) Web sites for additional white papers on specific system components and applications, plus customer case studies and other resources.

Motorola offers true end-to-end mobility solutions for DSD and route accounting and more that include: a comprehensive portfolio of mobile devices with extensive wireless communications capabilities; affiliations with the leading wireless public network providers; a portfolio of private wide area and local area network infrastructure; a partner channel delivering best-in-class applications; and a complete range of pre- and post-deployment services to help you get and keep your mobility solutions up and running at peak performance. And when you choose Motorola, you choose the strength only an industry leader can offer, with proven technology in successful customer deployments in many industries around the world.

To find out how Motorola can streamline your DSD and route accounting operations, please visit us on the Web at www.motorola/com/enterprise or call us at +1 866 416 8593.

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GLOBAL/AMERICAS HEADQUARTERS
Zebra Technologies Corporation
333 Corporate Woods Parkway
Vernon Hills, IL 60061-3109 U.S.A.
T: +1 847 793 2600 or
+1 800 423 0442
F: +1 847 913 8766

EMEA HEADQUARTERS
Zebra Technologies Europe Limited
Dukes Meadow
Millboard Road
Bourne End
Buckinghamshire SL8 5XF, UK
T: +44 (0)1628 556000
F: +44 (0)1628 556001

ASIA-PACIFIC HEADQUARTERS
Zebra Technologies Asia Pacific, LLC
120 Robinson Road
#06-01 Parakou Building
Singapore 068913
T: +65 6858 0722
F: +65 6885 0838

OTHER LOCATIONS
USA
California, Rhode Island, Texas, Wisconsin
EUROPE
France, Germany, Italy, Netherlands, Poland, Spain, Sweden
ASIA-PACIFIC
Australia, China, Japan, South Korea
LATIN AMERICA
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