

An **Avery Dennison** White Paper



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Bottom Line Improvement Through Mobility

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Products and Services

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Introduction

Warehouse and Distribution Center operations are consistently asked to improve productivity while at the same time lowering operating costs.

Purpose

Using the criteria of return on investment, (ROI), this whitepaper focuses on the bottom line results of introducing mobile printing technology into various warehouse and distribution center processes.

Mobility Today

One of the hottest topics today is mobility. A quick search of the Internet reveals many examples of mobility.

Case Study – The Real World

Before going any further it would be helpful to review a hypothetical distribution center, and trace the flow of items and data through the facility.

A New Approach

As you can see from the above example, many distribution facilities have already invested in infrastructure such as wireless networks, portable data capture terminals and scanners to better track and update information on the items traveling through their building.

Application Details

In all of the more perfect examples, a small change to the printing function can result in large returns.

Wrap Up

In the same Venture Development Corporation study cited above, respondents to the VDC survey listed Portable Thermal Printing behind Stationary Thermal Transfer, Stationary Thermal Direct, and Laser printing when detailing their currently used bar code technology.(3)

Bottom Line Improvement Through Mobility

Introduction:

Warehouse and Distribution Center operations are consistently asked to improve productivity while at the same time lowering operating costs. The hard reality of the retail industry today is one of shrinking margins that require new and innovative ways of doing business to stay competitive. Adding overhead in the form of people or distribution facilities may have never been an optimal way of supporting growing retail chains, but in today's hyper-competitive market it is definitely not a consideration when planning for the future.

What warehouse and distribution center operators have discovered is that small improvements to an operation's performance can produce large dividends to the corporation's bottom line. Of course, many of these small improvements come through large expenditures in equipment and software. A quick perusal of an industry magazine will reveal a virtual alphabet soup of initiatives, programs, associations, and products that promise the distribution professional the most up-to-date performance boosters available today.

Purpose:

Using the criteria of return on investment, (ROI), this whitepaper focuses on the bottom line results of introducing mobile printing technology into various warehouse and distribution center processes.

Today:

One of the hottest topics today is mobility. A quick search of the Internet reveals many examples of mobility. Most people are aware of the increasing use of networked mobility products. Outside sales staff have always had some degree of mobility, and the use of cell-phone and data devices such as the Blackberry has increased this mobility. Field Service and IT departments are joining the mobility revolution also, using wireless laptops and satellite data links to communicate with a central office. The increased focus on mobility has translated to new products and applications that allow greater freedom and improved productivity.

Likewise, in distribution facility management, mobility is a major focus for improving productivity. The use of portable data entry terminals that can both capture and transmit

information has allowed warehouse/distribution workers to complete many of their tasks in remote locations and avoid the added time and cost of handling items multiple times. By communicating wirelessly, workers can complete their tasks as they are performed (e.g. scanning a barcode to update inventory when putting away or pulling) instead of moving items to a centralized location that is only used as a data entry point.

Investment in wireless networks and portable data terminals has been taking place for a number of years now. Most operations managers understand the benefits offered by mobile technology. In its annual study on the Global AIDC

Industry (Automated Identification and Data Capture), the Venture Development Corporation asked technology end users for their primary driver for investing in AIDC technology. Over 72% said Operations Improvement.(1) Of course there are concerns with technology investment, the primary one being how do I pay for the equipment/software.

Case Study – The Real World

Before going any further it would be helpful to review a hypothetical distribution center, and trace the flow of items and data through the facility.

Typically when an item arrives at an inbound dock door, the receiver knows what is coming, how many, etc. Many times the item will have external identification (barcoded label) that can be used to further identify or track the item. When received, the item could be routed for immediate shipping, sent to a work area, or moved to storage for future use. Many distribution facilities will attach their own identifier to the item (again through a barcoded label) before it is moved further through the facility. Typically this process is accomplished through a wireless data collector, scanning or receiving key entered information that is then used to drive a label printer located either in a central office or between a set of dock doors.

When the item is put away, most locations will scan a label with a portable data collector and also identify the location it has been directed to, either through scanning a shelf label or through key entry.

There are a number of ways to pick items that are needed for shipping. Entire volumes can be written on picking operations, but in general the steps for picking include identifying the item to be picked and the location it is being picked from, and then identifying the location that the item is destined for. The identification could take place through scanning or key entry, and an additional location destination label may be attached before it continues on. This label will normally be printed in a central location, and often is part of the pick paperwork. In some systems a “wave” of picks are released and sorted/collated for the workers who will actually perform the picking function.

One unique area that sometimes comes into play is what many term the “rework” or “value-add” area. Items are routed to this area (either inbound before put-away or after picking before shipping) where employees perform various tasks to them. These tasks may include changing quantities in a carton, adding/deleting parts, or labeling/identifying the items through price ticketing or identification hang-tags. In some warehouse operations, this area may touch as many as 50% of the items traveling through the facility.

The last area for an item to travel through is the shipping area. This area is used to consolidate items destined for the same receiver and either stage (accumulate in a special area) or direct load (move to a trailer or container) the items for shipping. If the item has not already received an identifier (shipping label) with its destination it will get one here. This will most likely be created in a central printing office, or possibly from a shared printer that is located between dock doors. The identifier could be on an individual item, or on a pallet that has been built from the individual items. Most distribution facilities will capture the items that are being shipped by using a data capture device that will scan or accept key entry of shipping data.

A New Approach:

As you can see from the above example, many distribution facilities have already invested in infrastructure such as wireless networks, portable data capture terminals and scanners to better track and update information on the items traveling through their building. This is a very important area given the large investment in inventory that most facilities handle. In fact, as of mid-2005, the Council of Supply Chain Management Professionals (CSCMP) estimated that between \$1.2 and \$3 trillion in inventory was being stockpiled in the global supply chain. The CSCMP also estimated that 20% of all orders were filled imperfectly, leading to lost sales and lower margins.(2)

While there are many factors that could contribute to the errors identified (creating a need for safety stockpiles), one of the causes is simple miss-labeling of items due to lack of physical control of the item between the time it is identified (scanned) and routed (labeled). It would be logical therefore that closely tying the data capture function to the label printing and application function would reduce not only errors, but the need for excessive inventory stockpiles.

Since the data collection function has been “mobilized” in the majority of distribution facilities, it also then makes sense to mobilize the printing/labeling function to tie these two functions together.

Let’s return to the case study above, and apply this mobile printing philosophy to the flow of items through the facility.

Case Study – A More Perfect World:

In our example above, the receiving function was used to check-in and verify the items arriving with the aid of a portable data collector. The items were then further identified with a label used to route the item through the facility. In our more perfect world, this label would be printed at the time the item was scanned or entered into the system, without the receiver needing to leave the items to get the labels. It also might be possible to automate the data capture scanning and the new label application to the item on a powered conveyor. So, two ways to improve the mobility of this area would be to either bring the label printer to the area being worked (through a mobile powered cart device) or to move the items to the printer and automate the procedure (through a label/printer/applicator device).

In our example of item put-away, it would be possible to replace the labeling of each item at receiving and only label those items going to storage. This could be accomplished by a portable printer that was carried by the put-away staff, or mounted on the fork truck used for put-away. The advantage here would be that only those items being stored are labeled, and by labeling during the put-away process the congestion often associated with the receiving dock could be minimized.

Similar to put-away, the picking operation could be aided by portable printing carried out by the picking staff. By printing and labeling items as they are picked, the bottle-neck of a “wave” office is reduced, and the multiple touches of picking documents is likewise reduced. Personal printers or equipment mounted printers could both be deployed here.

The “rework” or “value-add” area offers unique challenges that are often as different as the individuals who are staffing this area. It seems that every person in a value-add operation has their own unique way of accomplishing item marking. The one constant is that they must take the time to match printed labels/tags with the items that they are to be applied to. This area is also one of the prime jobs that pay incentives for high piece counts. While increasing through-put does not always mean errors, this should be a major concern. By utilizing mobile or distributed printing in this area, complete control of the item being labeled is maintained at all times. This alone can reduce processing errors.

As with the above areas, the shipping function can be improved through the use of mobile printing. Moving printers to mobile carts allows workers to stay with the items being marked, reducing the need for matching labels to items. In some environments, moving the printing function to the shipping area and labeling the items with a label printer applicator as they move on a conveyor will increase capacity while lowering processing time.

Application Details:

In all of the more perfect examples, a small change to the printing function can result in large returns. Delving deeper into the specifics of the mobile printing philosophy reveals some inspiring savings. The following information has been consolidated from actual observed operations. First lets review the receiving options identified.

In the case of a distribution facility that is receiving 7,000 items in a day, small time-savings can make a big difference. If the process is one of printing labels at a remote printer, collating them, walking to get the labels, and then returning and matching the correct label to the correct item, the amount of time wasted may be as little as 9.6 seconds per item (this is an average as most facilities will process many items in a “batch” of goods). That does not seem like much time to be saved, but if this takes place every day for a year, the annual time wasted accumulates to 4,853 hours. With an average distribution facility hourly wage of \$11.00 plus 25% for employee overhead, that 9.6 seconds becomes \$66,733 wasted in a year on labor alone. This does not take into consideration the dollars saved in error reduction and lowered inventory carrying costs.

Let’s review another receiving example In a distribution facility that is receiving 9,000 items a day, but moving the items to holding areas where they wait for label printing, it is not uncommon for the amount of wasted time to be greater than two minutes per item. If these items could have been moved via conveyor through an identification/labeling station, the mobility factor could save 78,000 annual hours at the minimal two minute level. When the hourly employee wage is applied to this scenario, the annual savings is greater than \$1 million. Certainly, this is a significant improvement to any bottom line.

The put-away and picking operations are very similar in nature, the major difference being the direction the item is traveling. In either case, it is possible to streamline the operation with mobile printing solutions. In a distribution facility that is geared toward pallet movement, a change to point-of-application printing can save 140 seconds per pallet in time spent walking to a central printing location, returning to the pallet area, and matching label to pallet. In an operation that is processing 2,000 pallets a day, a change to mobile printing would result in a yearly savings of \$278,000.

The rework or value-add area normally has much higher item counts, due to the fact that they are processing individual pieces instead of boxes or cartons of goods. An operation that is marking items with new tags or labels might process 100,000 items in a day. If you save a modest 1.8 seconds per item through elimination of matching labels to goods, collating labels, and transporting labels to the work station, this operation with mobile printing could save 13,000 hours in a year or more than \$178,000. As noted in the application example detailed earlier, because this is often an incentive paid area, the real savings would realistically be greater due to the elimination of a major source of errors (wrong label on item) that is a direct result of the old process of matching remotely produced labels.

The last area to address is the shipping function. Following the same improvement process as used in the previous examples, a shipping operation that is using a central printing

function which requires workers to walk to/from a print room and the shipping dock could easily save 30 seconds per item shipped. If these items were pallets and 2,000 of them were shipped in a day, the annual savings in walk time alone would be 4,300 hours. Mobile printing would then save the distribution facility nearly \$60,000 in a year.

If the distribution facility was shipping individual items, the number of items might be higher, and the time wasted per item lower (more batch processing), however the savings would continue to be significant. In an example with 7,000 items being shipped daily, and time spent walking, matching, and collating averaging 13 seconds per item, the annual hours that could be reclaimed by mobile printing would equate to 6,500 hours per year. Annual savings would then be in excess of \$89,000. Again, this would be savings of wages alone, and does not include the improved accuracy that would be achieved.

As you can see from the application details discussed above, the savings from wages alone can have a significant impact on a distribution facility's bottom line. In most cases, the added savings from reduced inventory safety levels, elimination of processing errors, better inventory tracking data, and the elimination of re-processing or re-shipping of items can be double this amount or even more.

Wrap Up:

In the same Venture Development Corporation study cited above, respondents to the VDC survey listed Portable Thermal Printing behind Stationary Thermal Transfer, Stationary Thermal Direct, and Laser printing when detailing their currently used bar code technology.(3) With the positive savings potential noted in the application details section above, the focus should be shifting to mobility, and portable printing applications.

Portable printing applications can improve productivity and bring positive results to the bottom line with minimal impact on the distribution facility. Considerations such as training, scalability, and visibility are easily addressed by implementation of mobile/distributed printing systems that in most cases are extensions of technology already in use. The fact that these systems can be easily and quickly deployed translates to success in the area in which distribution facilities are evaluated: improved productivity while lowering operating costs. The fact that these improvements can be achieved in many cases with a minimal investment compared to the investment in the network/data collection infrastructure is added incentive to start evaluating the current operation now!

**For more extensive details on
Avery Dennison's Bottom Line white paper,
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(1) Venture Development Corporation, AIDC Global Industry Business Planning Service 2006

(2) CLM 2004 Survey, Council of Supply Chain Management Professionals

(3) Venture Development Corporation, AIDC Global Industry Business Planning Service 2006