White paper

Adopting Automated Data Collection For SMBs

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Finding and calculating the value of automated data capture technology at small and medium businesses

Introduction

Any business that would benefit by holding less inventory, decreasing mis-shipments and reducing errors should seriously consider implementing bar code systems and other forms of automated data collection (ADC) technology. Companies of all sizes apply bar code and wireless data collection systems to save labor, increase efficiency and cut operations costs. ADC is a proven productivity enhancer, and advancements in the technology have made such systems affordable and practical for more businesses than ever before.

Common errors and inefficiencies don't have to be part of business as usual. This paper exposes some of the hidden expenses that hamper profitability, and how accurate data collection can eliminate them. The examples and techniques presented show the link between quality information and efficient operations. When investing in ADC, small-to-medium sized businesses (SMBs) can earn a full and rapid return on investment through reduced expenses and increased productivity. This white paper will help show how by presenting ADC cost-justification guidelines and strategies.

Errors are everywhere – including the bottom line

Everyday mistakes and inefficiencies are a drain on profits, and often there are no systems or procedures in place to prevent them. Unfortunately, having good employees is not solely sufficient to prevent costly errors. Mistakes are human, and when they happen, they cost money. Studies have found that a skilled typist makes one error per every 300 keystrokes – consider how well your order-entry system would function at that accuracy rate. A whopping 36 percent of all orders in the consumer packaged goods industry contain errors, according to a 2003 study by the Grocery Manufacturers of America (GMA). What's more, grocers scan the UPC symbol on practically every item they sell, yet an average of 7.4 percent of items are out of stock at any given time because of poor inventory data collection and management throughout the supply chain. As a result, stores and manufacturers lose millions in sales.

Errors related to poor data collection and management are prevalent even where things much more valuable than profits are at stake – 8.6 percent of hospital wristbands contain erroneous data, and the U.S. Food and Drug Administration estimates that 4.3 percent of all patients admitted to hospitals suffer an adverse drug event because of a medication error. Preventable medical errors kill an estimated 98,000 Americans annually – which, in 2004, led the FDA to mandate bar code identification for all medications administered in hospitals by 2006.

These errors occur despite sophisticated safety procedures and software applications designed to provide information when it is needed. Bar code and other data collection systems help ensure that the information in software systems is accurate. With bar code and wireless communication systems, information can be collected and entered more quickly and accurately than by manual methods. And with better information, companies can manage materials, inventory, labor and other resources more efficiently. Updated computer systems and new software applications are not the answer; enterprise systems are only as good as the information that is put into them. That is why automated data collection systems generate such excellent value – they typically provide a rapid return on investment for the select application, and improve legacy systems by giving them timely, accurate data to work with.

Calculating the cost of errors

Some errors are so common that they are considered "business as usual," and their burden on profitability is overlooked. Take shipping errors, for example: Companies frequently hear from a customer that an order was missing an item. This error is usually resolved by simply picking the item from the warehouse and sending it as a rush shipment to the customer. Problem solved – but its impact remains. Failing to process the order correctly the first time resulted in a call to the customer service department, clerical labor to take the call and look up the order information, supervisor time to approve the new shipment, warehouse labor to pick the order, and additional shipping charges. Cash flow may also stall, because customers will often withhold payment until the error is resolved.

Various studies have calculated the cost of rectifying shipping errors at $35 to $70 per error. If errors cost only $35 to resolve and a company has a 95% shipment accuracy, then it incurs $175 in unnecessary expenses per 100 orders processed. However, these figures only measure the cost of reported errors. If extra or more valuable items are erroneously included in a shipment, customers may not report the error, but the impact will be reflected in inaccurate inventory and decreased profit margins. Error-cost estimates also fail to account for customer dissatisfaction and the possible loss of future business.

Companies that consider shipping errors a cost of doing business might be surprised at just how high the cost is. Consider the potential impact of expenses on profitability: if the company in the example above earned a healthy 25 percent profit margin, then it would need sales of $700 per 100 shipments to generate enough profit to offset the costs produced by a 95-percent-accurate shipping operation ($700 sales revenue x 0.25 profit margin = $175 profit). A single $35 error would require $140 in additional sales to offset, which means there is no profit when there are errors on orders of $140 or less. At a profit margin of 10.72 percent, which is the average for S&P 500 companies, a $35 shipping error would require $326.50 in additional sales to offset, or $1,632.50 per 100 orders at 95 percent shipment accuracy.

Consider the potential savings for companies that actually tackle their shipping errors: one such company, Super D, a music and entertainment wholesaler in Irvine, CA, improved its warehouse-inventory accuracy from 93 percent to 99.7 percent after implementing a wireless bar code data collection system. As a result, warehouse costs as a percentage of sales fell from 4 percent to 1.8 percent, which produced $1 million in first-year savings.

These examples should give an idea of the cost of errors, but they do not explain how ADC technology can prevent such errors. ADC makes it cost effective to collect and verify information quickly. The best opportunities to reduce expenses with ADC are in operations that are consistently error prone, and in operations where users manually collect or re-enter information. Following are several criteria to consider when evaluating whether ADC will be an effective cost-saving tool.

Select an application
The first step in building a strong cost justification for ADC technology is to select an appropriate application. Most companies have many areas where they could use bar coding, but it's best to begin with just one. Focused starter systems can produce a rapid return on investment and give companies a key platform for later expansion. Frequently inaccurate processes and those that require users to manually record information are good places to begin bar coding. When assessing the return on investment for an automated system, it is important to remember that current processes also have associated costs. A rough estimate of these costs can be determined by looking at the time it takes to complete manual processes (both for the worker and for any clerical work related to recording the task) and multiplying the results by either the volume of transactions or the number of workers who perform the task. This estimate provides a useful basis for measuring the value of an automated system.

The next step is to estimate the time and cost required to complete the same tasks with an automated system. Quantifying labor and cost savings can be challenging, but an experienced ADC integrator can help detail the potential time savings that a bar code system can provide, as well as the potential impacts that might arise for other operations. The following formulation should also provide a pretty good estimate of the time savings produced by a bar code system:

> [Time required to complete transaction manually] – [Time required to complete transaction with bar coding] = time saved per transaction.
> [Time saved per transaction] x [number of transactions per day/week/month (choose a time period that accurately reflects the workload and won't be skewed by daily or seasonal fluctuations)] = Time savings opportunity (call it N, and express it in hours).
> N ÷ 2,000 hours (an aggressive estimate of the number of hours a full-time employee works in a year, calculated as 40 hours a week for 50 weeks) = the amount of full-time equivalent (FTE) employees the system is worth.

Having performed such a formulation, the system may not always appear to be highly valuable at first glance. However, this simple analysis does not take into account the accuracy improvements that the data collection system provides, and does not fully reflect the true cost of labor savings (benefits and other expenses aren't factored). Furthermore, a data collection system can grow in value over time as volume increases, whereas manual systems grow in costs when they experience increases in volume, because more labor is needed.

Such scalability was a major reason that Premium Distributing decided on a wireless data collection
upgrade. As the Southern California beverage distributor saw its business expanding, it planned to expand its warehouse space to keep pace. The company implemented an ADC system, yet did not increase its headcount, despite adding 40,000 more square feet to its warehouse operations, and processing more orders each day.

Many companies first install bar code systems for shipping or inventory management because these manual processes are slow and often produce errors that can be expensive to resolve. A bar code shipment-verification system is a good place to start: shipping errors are a common problem, and relatively simple systems can prevent errors. Inventory-control applications also offer high savings potential. Companies that use bar code scanning to record material receipt, inventory transfers, and shipping typically report inventory accuracy rates of 99 percent and higher. With accurate knowledge of inventory on hand, companies can then reduce their safety stocks. This frees a tremendous amount of capital that was previously tied up in inventory. A distributor that holds $1 million worth of inventory can generate $10,000 in free cash for each one percent reduction in safety stock.

Measuring hard and soft benefits
Once an understanding is developed of how an automated data capture system can improve operations, the next step is to measure the further impact that the system can have. The time savings calculation above is one example; additional hard benefits can be calculated and quantified. Soft benefits like improved customer service should be identified and considered, without being overstated.

Ultimately, benefits need to be expressed in terms of how they will effect business operations or finances, not just as the number of reduced keystrokes or errors. For example, you may calculate that workers can record items in a shipment 35 percent faster by bar code scanning than by handwriting the information on a packing list. Take this information and conclude the labor savings that bar code scanning will produce in the shipping department; or express this as: "With bar code scanning, we could handle X more shipments per week without adding any labor to the shipping department."

Hard benefits can include savings in labor, materials, reduced inventory, and lower overall operating expenses by reducing fixed assets and improving labor efficiency. Soft benefits may include: increased sales due to better management information, reduced inventory shortfalls, and up-to-date product-availability information; improved morale thanks to reducing or even eliminating boring, repetitive data entry tasks; and increased customer satisfaction and retention from higher quality, faster response and improved accuracy. Following are some ideas for identifying and calculating common benefits from ADC systems.

Identifying labor savings
The most common area of savings from automated data collection is labor costs. Entering data with a bar code scan saves time compared to pencil and paper, which makes workers more productive. Once data is scanned, it can easily be shared among different applications and computer systems, with no need for clerical data entry. When gauging the potential labor savings of an ADC system be sure to consider the effects on both point-of-activity and back-office operations.

Here is an example of how a simple ADC system can produce labor savings, and how to measure them. Let's say you are going to install a time and attendance system that will eliminate hand keying the payroll data. Currently, two people in the payroll department spend an average of 20 hours per week each, or 1,040 hours per year each (20 hours/week x 52 weeks/year), entering payroll data. The new automated system that records employee time by scanning a bar code on an ID card will completely eliminate this task. Assuming that the average earnings of these data entry clerks are $8.65 per hour, plus taxes and benefits of 25 percent, the variable cost of this labor is $10.81 per hour. Thus the total annual labor savings from automating this data entry is $22,500 per year (2,080 hours x $10.81/hour).

Arthur Schuman Inc., a cheese importer and distributor, received even more dramatic labor savings after implementing an ADC system to improve its product tracking. Previously, the company would shut down operations for four days a year while a team of employees took a physical inventory. Now all incoming and outgoing products are identified through bar code scanning. Scanning makes it convenient to track every product movement, so inventory accuracy has improved. Now the annual inventory can be completed in just eight hours, with no shutdown required. Arthur Schuman estimated that the ability to conduct business as usual plus the labor savings that the bar code system provided saved the company a total of $1.2 million annually. Inventory turns nearly doubled in the first year.

It is also important to note that if ADC applications are justified by labor savings, then it is crucial to explain what the company will do with people whose jobs are affected by automation. For instance, can the department reduce overtime, or eliminate part-time or contract positions? Can employees be reassigned to more valuable activity? Can business growth be supported without increasing headcount? Is normal turnover high enough that attrition will eliminate the problem? In other words, labor savings need not entail painful cuts in the labor force.

Identifying inventory benefits

As the Super D and Arthur Schuman examples show, improving inventory accuracy can produce a variety of benefits including lower labor requirements, increased turns, reduced storage needs and better fill rates. Benefits can be identified and calculated for other parts of the operation as well. Factors to consider include:

- Inventory financing and interest expenses;
- The property and capital-asset expenses associated with operating the warehouse, including insurance, utilities, property taxes and equipment taxes;
- Holding and carrying costs, shrinkage, and write-downs.

Many companies have a rule-of-thumb they use to calculate the cost of carrying inventory. Depending on the industry, these costs range from 15 percent to 35 percent. Find out if your company has a generally accepted inventory-carrying cost percentage. If not, ask your finance department and your warehouse manager to help estimate your company's variable cost of maintaining inventory. You cannot go wrong using a conservative figure such as 15 percent. Most companies use 25 percent.

Managers understand that reducing inventory saves money. A few simple calculations can show how much benefit inventory reduction can create. The following exercise illustrates how an inventory reduction can cut carrying costs.

Assume that a warehouse maintains a finished-goods inventory of $4 million per year, which includes a 10 percent buffer (valued at $400,000) for safety stock. A bar code system that improves inventory accuracy will thus free $40,000 in capital previously tied up in inventory for each one percent reduction in safety stock that it enables. Bar code inventory-control systems typically improve inventory accuracy to greater than 99 percent, but for this example we will be conservative and assume that the company only reduces its safety stock by half (to a five percent buffer, assuming 95 percent inventory accuracy). Therefore, the value of its buffer stock is reduced by $200,000. However, the reduction provides more than $200,000 in savings, because inventory financing, holding costs and warehouse expenses are also reduced. The following savings are possible:

- Financing relief: 10% x $200,000 = $20,000 per year
- Warehouse expense reduction: 5% x $200,000 = $10,000
- Holding cost reduction: 5% x $200,000 = $10,000

These savings add up to an additional $40,000 per year. When added to the cash freed from the safety stock reduction, the total savings is $240,000.

More sophisticated financial analysis tools like "net present value" (NPV) will forecast income and cash flow statements, while return-on-investment calculations can measure the cost and impact of projects. See Intermec's white paper Cost Justification of an Automated Data Capture System to learn how to apply these calculations.

Presenting soft benefits

The soft benefits that ADC systems provide cannot easily be expressed and quantified through financial analysis alone. Soft benefits such as better information, improved quality and better customer service should be considered during cost justification, but their impact should be conservatively stated. Relating soft benefits to common business experiences or a recent event will help increase understanding and acceptance of what the system can do. For example, if the company has implemented a quality-improvement initiative, try to find ways to express how the ADC system could improve quality. If an error resulted in an unnecessary rush order or a lost customer describe how an ADC system could prevent such future errors. Your customer gets what he wants the first time around, improving overall satisfaction.

Imagine, for instance, a sales manager who mentions that in the past year, three orders worth a total of $50,000 were lost because the company could not deliver product to customers on the needed date. The inventory system had indicated that the items were in stock, so the customer had been promised a specific delivery date. Yet when the orders were scheduled to be picked, the product was not in the warehouse. And so the customers went elsewhere when the shipping date was delayed. Bad information in the inventory system cost the company $50,000 in direct revenue. Showing how an ADC system could have prevented these losses is a more powerful demonstration than simply claiming that the company will benefit from a system through increased customer service and satisfaction.

Having made this caveat, it is still important to include slippery variables like "customer satisfaction" in any ADC strategy. Though difficult to quantify, factors like quality and customer satisfaction have the potential to yield greater long-term returns than hard benefits, when, for instance, customer satisfaction translates into repeat business and brand loyalty. Finding ways to account for these factors in concert with strategies to reap hard benefits may ultimately yield the greatest returns of all.

CONCLUSION

Ultimately, real productivity gains and cost savings are the keys to successfully cost-justifying capital projects. Unlike other technologies, automated data collection is one of the easiest investments to justify. After measuring the cost of errors and examining how ADC systems can eliminate these costs, many businesses conclude that they can no longer afford to conduct "business as usual."

Intermec Technologies Corp. has helped many small and medium businesses successfully implement automated data collection systems. Intermec, a UNOVA Inc. (NYSE:UNA) company, is a leader in global supply chain solutions and also leads the development, manufacture and integration of wired and wireless automated data collection, RFID (radio frequency identification), mobile computing systems, bar code printers and label media. The company's products and services are used by customers in many industries to improve productivity, quality, and responsiveness of business operations, from supply chain management and enterprise resource planning to field sales and service. Visit www.intermec.com to learn more and download complete case studies on the Super D, Premium Distributing and Arthur Schuman systems that were referenced in this paper.

Intermec EasyADC is a turnkey system of Intermec hardware, software, and services that is designed to help small-to-medium sized companies automate inventory management, shipping and receiving, and other key business processes. The basic EasyADC System includes two handheld data collection terminals, a wireless access point, a bar code label printer, two rolls of labels and one year of product service and support. EasyADC also features pre-configured interfaces for leading software applications used by small and medium businesses. The pre-configured interfaces take the complexity, time and expense out of integrating data collection into business operations. Intermec supports rapid integration into Microsoft® Business Solutions Great PlainsÒ and Navision® enterprise resource planning applications, SAP® Business One integrated business management system for SMBs, and other leading software. EasyADC is easily expandable to support future growth. For more information about EasyADC, visit www.intermec.com.

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