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Mobile Enterprise Solutions

WHITEPAPER

The ROI on RF Data Collection:

Where to look & how to measure

RF-SMART® is a division of ICS, Inc.
1650 Prudential Drive, Suite 300
Jacksonville, FL 32207 USA
+1 (904) 399 8500 www.rfsmart.com

Executive Summary

Leading technology research organizations — including AMR, Gartner Research, The Meta Group and Venture Development Corp. — agree that utilizing real-time automated data collection (ADC, or often, RF) to feed information to an enterprise software system (ERP) substantially improves the return on investment for the entire ERP investment.

One such study, conducted by the Wireless LAN Alliance (WLANA) — a non-profit association of organizations involved in wireless technology — examined companies across six major industries to determine the degree and speed of ROI recovery from ADC. Some of the study's significant findings include:

92% of respondents believe they receive economic benefits from ADC
92% of respondents will seek new areas to deploy wireless technology
97% agree that task completion is faster
100% of respondents reported that they achieved payback within a year

Average annual cost per user $4,550
Average annual savings per user $15,989
Net benefit per user, per year $11,439
Source: Wireless LAN Alliance

The fact that ADC provides ROI benefit is clearly established. The challenge for most companies interested in determining the ROI on ADC is identifying *where* their returns occur and *how* to calculate those returns.

Measurement Approaches

Depending upon the level of detail desired, measuring the return on investment for a wireless data collection solution can be a time-intensive endeavor. However, it does not have to be.

For example, considering only the savings they achieved on reducing overtime costs, Bacardi Bottling Corp. established that their ADC solution (RF-SMART) paid for itself in just under 9 months.

Certainly, if Bacardi desired took into account other benefits of the system (such as the reduction in time spent re-inspecting orders, the reduction in shipping errors, more efficient lot and serial number tracking, etc.), the true ROI would have been larger and faster. In this case, however, eliminating overtime costs alone was substantial enough that they did not feel the need to go into greater detail.

For those who want to dig deeper—or wish to estimate their ROI prior to purchasing an ADC solution—this document provides example calculations for areas where ADC has proven to provide a payback.

Ideally a company will have a clear measure— across several areas—of what *not* having ADC costs their company. Following implementation, they can then measure the improvements and calculate their ROI.

Where to Look for a Return

Consistent with technology returns on investment, ADC provides both hard and soft expense savings that contribute to a company's ROI on technology. The most common areas for these savings include:

Hard Expense Savings

Direct Labor..... *Including benefits, taxes, and variable labor costs*
Inventory Reduction ..... *Based on having fast, reliable on-hand data*
Holding Costs ..... *Obsolescence, scrap, loss, deterioration, shrinkage*
Warehouse Costs ..... *Insurance, power, property taxes, physical counts, data entry, labor*
Data Entry ..... *Faster, verified transaction times*
Work Duplication ..... *Eliminate double-handling of every receipt, PO, WO…*
Materials Utilization..... *More efficient use of raw materials, reduced scrap*
System Expansion ..... *Adding RF access points and devices vs. cable and computer terminals*
Fixed Asset Savings ..... *Less equipment needed, reduced equipment loss*

Soft Expense Savings

Indirect Labor..... *Less supervisory intervention, faster management meetings*
Customer Retention..... *Better order accuracy retains customers; it is 5-10 times more expensive to acquire a customer than to keep one*
Operational Efficiency..... *Real-time data directs staff and materials*
Better, Faster Data..... *Real-time data yields better, faster decisions*
Inventory Accuracy ..... *Increases to nearly 100%; decreases absolute variance and stock levels*
Productivity..... *Increases in orders shipped and items manufactured per headcount*

The calculation of hard and soft savings can be used to develop more in-depth analyses of the value that ADC provides to the entire firm:

- Sales per head-count
- SG&A as a percentage of sales
- Labor head count
- Inventory turns
- Labor as a percentage of sales
- Product growth as a percentage of sales
- Scrap materials as a percentage of sales

Taking ROI calculation to that level of depth is beyond what most companies choose to pursue, but they can be very helpful in understanding the total impact of ADC.

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Calculating the Returns

In determining ROI, a good place to start is on procedures that are inefficient, inaccurate, or otherwise ineffective using paper as the process driver.

The calculation examples herein are provided to demonstrate how to measure specific hard and soft savings. These examples are intended to serve as a starting point for companies interested in determining their ROI.

Keep in mind that improving performance, operational efficiency or staff productivity in one area will usually add additional value up or down the materials management or manufacturing process chain.

Order Picking Accuracy

The average company experiences anywhere between a 94% to 98% picking accuracy rate. While that sounds pretty good, consider that somewhere between 2% and 6% of their orders are *wrong*, and wrong orders are expensive. Here's what happens:

- An employee goes and picks the wrong item(s) for a customer order
- Another employee packages the item(s), labels the package, and affixes postage
- The customer gets the package, is unhappy, and ships it back (on your dime)
- Someone receives the package back, puts everything away, then picks the right item(s)
- The right items are packed and shipped again.

For most companies an error costs at least $20, which includes pick and re-pick time, shipping two ways, twice the packaging, supervisor time, customer service rep time, and re-stocking. For this example, let's assume a company ships 2,500 orders/day, currently has a 97.5% picking accuracy rate, and improves order accuracy by 1.5% to 99% using RF data collection

ROI EXAMPLE:

2,500 orders per day x **97.5%** accuracy = 62.5 errors/day
62.5 incorrect orders x $20 each = loss of $1,250/day

2,500 orders per day x **99%** accuracy = 25 errors/day
25 incorrect orders x $20 each = loss of $500/day

This 1.5% improvement in picking accuracy saves:
$1,250/day - $500/day = net profit gain of $750/day or $198,000 annually

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Inventory Carrying Costs

This example company has inventory valued at $20 million which includes a safety stock of 8% ($1,600,000). While carrying some safety stock can be strategic, most companies can reduce their safety stock with better inventory accuracy. Companies that use ADC know exactly—in real-time—what has been received, where it was put away, who put it there and when, how much of that product is on-hand and available-to-pick, etc. As a result, companies can reduce inventory while still meeting service objectives.

After implementing data collection, the example company has the confidence to reduce its safety stock by 40%:

ROI EXAMPLE

$1,600,000 in safety stock X 40% reduction = $960,000
$960,000 x 25% (carrying cost*) = $160,000 in annual savings

**According to APICS, carrying costs – which include insurance, taxes, loss, damage, obsolescence, and other related costs of maintaining inventory – represent up to 35% of the value of the inventory. In this example, 25% is used.*

Worker Productivity & Direct Labor Costs

By scanning data there is no need to have clerks manually enter information at a later time. The information they enter includes receipts, transfers, picks, adjustments, counts and more. Most companies can eliminate 2-3 data entry positions or re-deploy those people to more value-oriented positions. Eliminating even one such position represents a savings of around $25,000 per year.

By eliminating paperwork in manufacturing and distribution environments, people simply become more productive and efficient. They do not have to write down data, they just scan. They do not have to go back and forth to the office to retrieve or turn in paperwork. They don't have to call or visit someone to ask where things are. They don't have to go ask what they should do next.

According to the Wireless LAN Alliance, ADC increases productivity up to 15% or more. Using voice, productivity increases jump to 25% or even 30% because both hands are free.

A 15% increase in productivity means that the same amount of work can be accomplished using 15% fewer people or that the same number of people can accomplish 15% more work. An example company with 16 "floor" warehouse employees could save:

ROI EXAMPLE

16 x $28,000 per year (burdened) = $448,000
$448,000 x 15% savings = $67,200 annually
Plus one data entry clerk position = $25,000 per year
Direct labor savings = $67,200 + $25,000 = $92,200

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Replacing Physical Inventories With RF Cycle Counting

Many organizations take four physical inventories per year, usually on weekends or at other "down" times when overtime labor costs apply. Based on our customers' experiences, each inventory takes about 10 counters, 2 supervisors and 2 data entry clerks (16 hrs. each at time-and-a-half).

Assuming a company still wants to conduct one physical inventory per year, reducing physical inventories by three, the company will save:

ROI EXAMPLE

10 counters x 16 hours x $28/hr (OT) = $4,480
2 supervisors x 16 hours x $50/hr (OT) = $1,600
10 data entry clerks x 16 hours x $22/hr (OT) = $704
Total labor cost per physical inventory = $6,784
Eliminating three physical inventories per year = $20,352

Calculating ROI

Using the calculations above, the annual ROI for the example company is as follows:

Improved picking accuracy $198,000
Increased inventory accuracy 160,000
Direct labor savings..... 92,200
Reduction of physical inventories..... 20,352

ANNUAL SAVINGS $470,552

NOTES:

The calculations do not take into account:

- *The costs (tangible or intangible) of how a shipment error affects a customer's future buying behavior*
- *That productivity increases with data collection usage (static productivity is assumed herein)*
- *That inventory data accuracy increases*
- *That labor costs increase over time*
- *That new data entry errors can surface when correcting mistakes, accepting returns, etc.*
- *That no reductions in staff (e.g., data entry, warehouse employees, or cost accountants)have taken place*