



Wireless, mobile & RFID solutions for Oracle



WHITEPAPER:

Calculating the ROI on ADC

Where to Look & How to Measure





Introduction

In an effort to help customers/prospects determine/estimate the return on investment associated with automated data collection (ADC), 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 readily calculate ROI.

We value your comments and suggestions on this whitepaper.
Please email your feedback to: info@rfsmart.com

Experts agree on ADC

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

Because organizations strong in warehousing, manufacturing and distribution were among the first to implement barcoding and automated data collection (ADC), more research has been conducted to validate ROI success in these environments.

One such study, conducted by the Wireless LAN Alliance (WLANA) examined 34 companies across six major industries to determine the degree and speed of ROI recovery from ADC. Findings included:

- 92%** Believe they receive economic benefits from ADC
- 92%** Will seek new areas to deploy wireless technology
- 97%** Say task completion is faster
- 100%** Reported achieving payback within a year.

Further they found that the average annual cost per user for an ADC system (\$4,550) is nearly \$11,500 less than the average annual benefit ADC brings on a per user basis (\$15,989).

Measurement approaches

The fact that ADC provides ROI benefit is clearly established. The challenge for most companies is identifying where their returns will occur and how to calculate them.

In performing a number of ROI analyses for ICS customers, we have learned that companies are interested in different areas and levels of detail when measuring their ROI on ADC. We have also learned that it does not take as long as most people envision to discover that an ADC solution has paid for itself.

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

Certainly, if Bacardi took into account other benefits of the system (such as the reduction in time spent reinspect-ing orders, the reduction in shipping errors, more efficient lot and serial number tracking, etc.) the true ROI would have been faster. In this case, however, the elimination of overtime costs alone was so large Bacardi did not feel the need to go into any greater detail.

Consistent with other technology-based ROI analyses, ADC provides both hard and soft expense savings, the most common of which are:

Hard Expense Savings

- Direct labor costs
- Inventory reduction
- Holding costs
- Warehouse costs
- Data entry
- Order handling
- Materials utilization
- Fixed asset savings
- Paper elimination
- Time-per-transaction

Soft Expense Savings

- Inventory accuracy
- Picking accuracy
- Shipping accuracy
- Indirect labor costs
- Customer retention
- Operational efficiency
- Real-time data access
- Overall productivity
- Less supervisory intervention

Knowing hard and soft savings, one can easily calculate more in-depth analyses:

- 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 % of sales
- Scrap materials as a % of sales
- And others.

Calculating the returns

In determining return on investment for ADC, a company will tend to focus on procedures that have proven to be inefficient or ineffective using paper as the process driver.

This is the right place to start, but there are typically many additional areas where measurable improvement has taken place. An open review of all affected areas will provide a more accurate measure of the true ROI.

The calculation examples provided 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.

Example A:

Reduction of Shipping Errors by 90%

Remedying a shipping error (sending the wrong products to a customer) involves the following components for most organizations:

Re-Fulfillment: The order must be recreated, usually with supervisory involvement:

Task Component	Qty.	Rate	Cost
Data entry correction	5 min.	\$18/hr.	\$1.50
Supervisor time	5 min.	30/hr.	2.50
Time to pick	5 min.	18/hr.	1.50
Time to move product	5 min.	18/hr.	1.50
Time to package	5 min.	18/hr.	1.50
Cost of packaging	1 unit	1.50/ea.	1.50
Re-Fulfillment Cost per Error			\$10.00

All labor costs are presented as fully-burdened rates.

Return to Inventory: Returned orders must be inspected and returned to inventory:

Task Component	Qty.	Rate	Cost
Data entry	5 min.	\$18/hr.	\$1.50
Time to unpackage	5 min.	18/hr.	1.50
Time to inspect	5 min.	30/hr.	2.50
Time to move product	5 min.	18/hr.	1.50
Time to restock	5 min.	18/hr.	1.50
Inbound Return Cost per Error			\$8.50

Shipping Expense: Each order is sent out and then returned, usually at a lower rate:

Task Component	Cost
Cost to ship order out	\$100.00
Cost to return (via lower rate)	50.00
Shipping Costs per Error	\$150.00

Summary: Lost revenue per Shipping Error

Component	Cost
Re-fulfillment of the order	\$10.00
Inspection/return to inventory	8.50
Shipping (out & back)	150.00
Cost per Shipment Error	\$168.50

Assuming the company averages 10 incorrect orders per month, the summary of lost revenue per year is calculated as follows:

Annual savings from eliminating 90% of shipping errors:

Component	Cost or Qty.
Errors per month	10
X Cost per error (\$168.50)	\$1,685
X 12 months	20,220
X 90%	18,198
Annual Shipment Error	\$18,198

By eliminating 90% of shipping errors, this company would save **\$18,198** per year — all of which counts toward the project ROI.

Quality data collection solutions accomplish this type of improvement by verifying the item, location, the order number, and other critical data at the time of fulfillment, thereby eliminating mistakes before they occur.



Example B:
Replacing Physical Inventories With RF Cycle Counting

Like many organizations, this example company takes four physical inventories per year, usually on weekends or at other “down” times when overtime labor costs apply.

Conservatively (based upon customer experiences), each physical inventory takes six floor employees and one supervisor 16 hours (each) to complete. In addition, two data entry personnel spend 6 hours each keying in the data.

Using ADC-driven cycle counting, which can be conducted without any increase in daily inventory management costs, many firms eliminate all four physical inventories.

Let's assume, however, that this company still wants to conduct one physical inventory per year. By reducing the number of physical inventories by three, the company will annually save:

Process Component	Qty.	OT Rate	Cost
OT man-hours	96 hrs.	\$27/hr.	\$2,592
OT supervisor hours	16 hrs.	45/hr.	720
OT data entry hours	12 hrs.	27/hr.	324
X3 eliminated P.I.s	n/a	n/a	X3
<i>Annual Phys. Inv. Reduction Savings</i>			\$10,908

In addition to the \$10,908 in annual savings, the company will also have more accurate data.

Example C:
Inventory Carrying Costs

Assume the company has historically had inventory valued at \$5 million per year, including a safety stock of 10% (\$500,000) that has been maintained due to the inaccuracy and unreliability of their data.

After implementing data collection, the company has the confidence to reduce its safety stock by \$300,000 (from \$500,000 to \$200,000). This reduction in safety stock annually saves the company:

Inv. Cost Component	Reduced Inv.	Rate	Savings
Carrying Cost Rate	\$300,000	25%	\$75,000

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.

Example D:
Soft Cost Savings

Management has determined they have lost five large orders over the last year representing \$200,000 in sales.

The orders were lost because the system showed that items were in stock and available when they were not. As a result, the company could not meet the customers' needs and they went to a competitor instead.

Assuming a gross margin of 20%, these missed sales cost the company:

$$\$200,000 \times 20\% = \$40,000 \text{ in missed revenue annually}$$

Calculating ROI

ROI is a measure of the average annual income increase (savings) as a percentage of project cost. Most companies have a target ROI for projects of 50% annually, which means a project will pay for itself in two years. As the Wireless LAN Alliance study points out, ADC often provides an ROI under one year.

Using the example calculations (Examples A-D, above), the ROI for this company is calculated as follows:

Reduced shipping errors by 90%	\$18,198
Reduced physical inventories by 75%	10,908
Reduced inventory carrying costs	75,000
Shipments not missed due to bad data	40,000
Avg. Annual Income Increase	\$144,106

For a system that costs \$125,000 (including software, hardware, user licenses, implementation and training), the annual rate of return is:

$$\text{Annual Rate of Return} = 144,106 / 125,000 = 1.15\%$$

This means that after the first year, the system will have paid for itself 1.15 times.

Assuming all operational costs and revenues remain constant, the investment will pay for itself 5.75 times (5 X 1.15) over 5 years – representing increased revenues of \$720,530 (\$144,106 X 5) over the depreciable life of the system.

For more information, contact your representative or visit us at <http://www.rfsmart.com>