The Recurring Costs of Passive RFID:

Hidden Costs that Hurt Your Business and Your Budget

Introduction

True or false? Passive RFID asset tracking solutions are cheaper than active solutions.

False.

Like urban legends, this is a persistent myth that captures the imagination but not the truth.

In this case, the persistent perception about passive RFID costs is based solely on the comparison of RFID tag prices. At first blush, it seems to make sense. After all, it's reasonable to assume that because passive RFID tags typically cost less than active RFID tags, the resulting complete solution will also be more affordable.

When the total cost of ownership of both solutions is realized, however, it becomes obvious that active RFID solutions can be between 40 to 60 percent less expensive than a comparable solution that uses passive RFID.

Looking Behind the Curtain: Revealing the Real Wizard

Passive RIFD tags do not have an internal power source. Therefore, a passive RFID reader is required to "energize" them. This is done manually in one of two ways: by either passing the tags through a fixed portal or by hand-scanning each tag using a handheld passive reader. Typically, successful tag reads require that the reader be within a few feet of the passive tags.

In contrast, active tags are self-powered. They independently transmit information to an active reader regardless of the proximity between that tag and reader. As a result, a single active RFID reader covers a very large area, eliminating the need for the reader to be close to the active tags from which they are receiving data.

Why is this important to take into account when thinking about purchasing an RFID asset tracking solution?

Because the process of gathering asset data using passive RFID tags is a manual process, passive tags must either move physically through a portal [a type of reader] or be hand scanned in order to gather tag information. Such manual processes inflict high labor costs. Moreover, because of the human error typically introduced into hand scanning, such processes are error prone, inaccurate and outdated the minute the scan is done.

Conversely, once deployed, an active solution is fully automated: On its own, it provides a constant flow of asset inventory data to a reader. The result: reduced, or even eliminated, manual costs associated with inventory and audit processes and find-and-fix searches. Moreover, because there is no human intervention involved when a reader receives data automatically, the resulting information gathered is error free.

The Total Cost of Ownership: A Head to Head Comparison

Let's take a closer look at the total costs for each of these approaches over the life span of the assets being tracked.

We'll begin with a typical distributed asset tracking example* (actual customer data; customer identity withheld by request). A financial services company is located in a commercial office building with some 1,600 assets it needs to inventory twice a year. Because these assets include PCs, projectors, and other electronic devices, a passive RFID tag solution will need tags that are specifically designed to perform well on metal. Passive tags of this sort typically cost about $3.50 per tag. Doing the math, that comes to a total tag purchase of $5,600.

A passive reader for this solution can range from $2,500 for several hand-held scanners (if the customer will be gathering data using hand held scanners) to $20,000 for four fixed portals (if the customer will be gather data using portals). Therefore, the initial cost to deploy the passive solution will range from $8,100 to $25,600.

However, initial deployment is just the start of the total cost of ownership (TCO) of any solution. To illustrate this point, let's model the most inexpensive approach.

It's time to conduct the first inventory. The process of physically locating 1,600 assets, distributed throughout an office complex, would take five people one week using handheld passive RFID readers[1]. If we assume that the average burden rate for the people conducting the inventory is $75/hour, the passive method would cost $15,000 in inventory labor.

Because the passive RFID based approach relies on manual processes, which are, by definition, imprecise, assets will be missed in this initial inventory process. If 15 percent of the assets are not located, this will require another manual process, a follow on reconciliation that will add another $27,000 in labor costs[2]. Now the total inventory-related cost for the first year is $42,000. Assuming that the customer does not grow and replaces assets on a four-year cycle, this $42,000 cost will recur each year.

But there's more. On an ongoing basis, assets will need to be located for maintenance and other reasons. The inventory is a "snapshot" at the point in time when the inventory was taken. The asset repository loses accuracy as devices are moved from the place where they were at inventory time. If the asset repository is 85% accurate on average and one-third of the devices need to be located uring a given year, then people will have to search for 80 devices during

1 Assumes 7.5 minutes on average to find and inventory each asset with passive tags and readers.
2 Assumes 90 minutes on average to disposition and reconcile an asset.

the year. If the average search time required is one hour, then that's another $6,000 in labor costs.

Some assets won't be found at all. Let's say 0.5% of the assets are lost and have to be replaced—that will be eight assets. If the average asset cost is $1,000, that adds $8,000. Manual updates to the asset repository add another $1,300. New tags for newly purchased assets are $1,400.

The total for all of these operational costs is approximately $58,700. This is a recurring cost each year, so the total over Year 0 through Year 5 will be $352,200.

Add back in the initial product and installation costs, and the grand total for the passive system over five years is $382,200.

Now, we'll look at a deployment for the same scenario using an RF Code active RFID system. The active RFID tags will cost approximately $16 each. Total tag cost is $25,600. Let's assume the customer needs 10 active RFID readers, which will cost about $1,000 per reader, for a total of $10,000 in reader costs. The control software will cost approximately $13,100 including support. Hardware extended warranty will be approximately $1,600. The cost to deploy the system occurs in Year 0—the time to install 1,600 tags and 10 readers is estimated at 274 hours, or $20,550. Total first year hardware, software, and deployment cost for the active RFID solution: $70,850.

Passive vs. Active - Asset Inventory & Tracking Costs

Legend: ■ Passive Costs ■ RF Code Costs

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Passive Costs	~$90,000	~$58,700	~$58,700	~$58,700	~$58,700	~$58,700
RF Code Costs	~$70,850	~$6,000	~$6,000	~$6,000	~$6,000	~$6,000
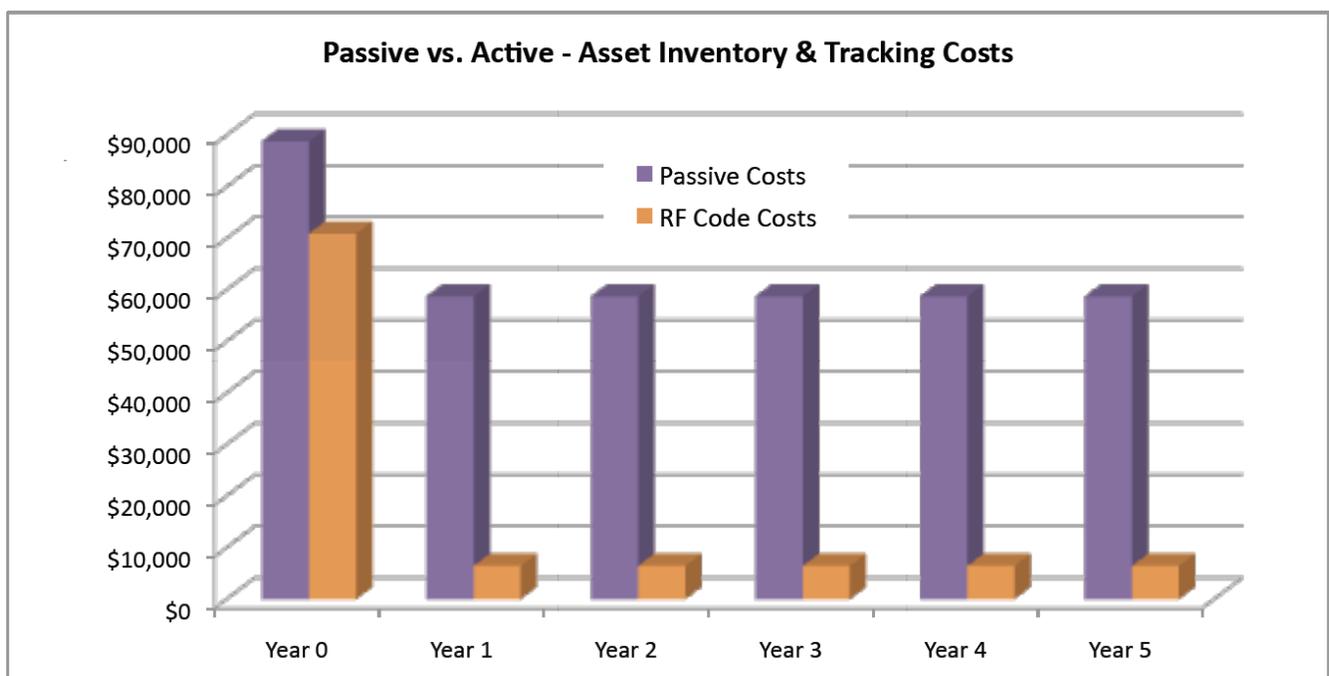
The total cost to deploy the active RFID system is less than the cost of deploying the passive system plus first-year operational costs for inventory and reconciliation, locating misplaced assets, and manual asset repository updates. In less than one year, the RF Code active RFID system has paid for itself relative to a passive system.

In the ensuing years, the organization will avoid the $58,700 per year costs incurred using a manual passive system. The only costs of the RF Code automated tracking system will be for tags for new assets that come on stream.

If 25% of the assets turn over each year, that would be $6,400 per year. Over the five years, the total cost of ownership of the RF Code system would be $102,900, a savings of $279,300 compared with the manual passive system.

It is important to remember that most of the savings can be expressed in time as well as money. In this example, the IT organization would spend 70 fewer man-days per year performing inventory collection and reconciliation tasks with an active RFID solution than with the passive implementation. Another 12 days would be saved by eliminating equipment searches and manual asset repository updates. The recovered time can be used to provision servers, update device configurations, implement new applications, enhance security, and execute other projects that contribute to IT's primary mission.

Conclusion: Passive RFID is 100 to 200 percent more expensive than Active RFID for asset tracking and management of distributed IT assets.

Summary

Passive RFID solutions may appear less expensive than active RFID solutions when you compare only the cost of the infrastructure. However, as you've seen, that is only a small part of the total cost of ownership of an asset management solution. You must compare the price of both approaches across the life of the assets. When the total lifespan of a managed asset is taken into account, it becomes clear that not only is active RFID the more affordable solution, it is also offers significant benefits that passive RFID solutions cannot. By completely eliminating manual processes from the system, it is significantly more accurate and provides instant change notification whenever assets move. With active RFID you don't periodically take inventory, you always have inventory.

RFCODE