A CIO's guide to Building Value
by Automating Data Center Operations

The Leader in Remote Asset Tracking

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Automating Data Center Operation for Dramatic Benefit

There are few proven ways for CIOs to do something "dramatic". When McKinsey says "dramatically different" they are implying that a CIO's future and, in turn his company's future depends on how aggressively she can lead the pack and change business operations. No longer is a CIO's job safe by "doing what we've always done". Old methods that have been used to reduce risk and create level playing fields reward timidity and keep innovation out. An original center of innovation has become one of the most rigid bureaucracies in many organizations. The economic crisis has changed the rules and unless CIOs change the way IT departments operate, they'll be passengers on the bus they used to drive. Some will be asked to get off the bus altogether. That's a message coming across loud and clear; especially in publicly traded companies.

According to a March 2009 report in CIO magazine nearly one in four CIOs get fired for not moving an IT organization forward – the odds are higher the bigger and more demanding the company. "43 percent of IT heads at companies over $1 billion or more in sales left involuntarily, versus 29 percent at mid-market companies of $100 million to $1 billion and 23 percent at small companies of less than $100 million in sales."

The key to effecting operational change by doing something disruptive often hinges around automation. For example look at the back-up function in a data center – remember when someone manually loaded reel-toreel tapes and then took a magic marker and stuck a hand written label on it? Today there are robotic tape libraries that run at dizzying speeds during scheduled times. Those tape robots automate what used to be a heavily manual process. The same evolution has happened with run book automation, power distribution and dynamic routing technologies; all automation strategies which have provided transformational value.

One interesting place that is still largely unharvested by automation is asset management. For 35 years the ordinary bar code has been the way of doing business. It automates the capturing of data, through a visual scan, but it is still as manual as putting the reel-to-reel tapes on by hand. It's only been the past 18 months that a new technology has finally lived up to its hype and enabled asset management automation with significant ROI.

Measuring hype is how the analysts at the Gartner Group make a living. They have a framework for evaluating technology called the "hype curve". For those of you who have never seen it, it is well worth investigating. The thesis Gartner ascribes to is that all technology, when first introduced, is full of possibility and potential. Press and people are abuzz when they first hear about it. Whatever the technology is, however, it never immediately lives up to it's potential (MP3, blade servers, HDTV, the Internet). The hype creates overinflated expectations because new technology is not sufficiently developed.

Radio frequency identification (RFID) has been on the ugly side of Gartner's hype curve since 2003, because it had not yet lived up to its potential. There was no global standard, RFID tags didn't work on metal, equipment was both fickle and expensive. Many of you may remember two years ago an IBM sales guy trying to convince you to put a battery powered RFID tag the size of a car entry fob that cost $15 on each server in your data center! No wonder Gartner didn't think the technology was ready for prime time.

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The Hype Cycle – Promoting RFID After All These Years

In August 2009 Gartner's Hype Curve, for the first time ever, called RFID "Transformational" its highest rating of technology impact on an organization. The reason that RFID is now on the powerful side of the hype curve is there is tangible ROI at a time when people need it most.

RFID technology has improved dramatically, there is an international ISO standard, Financial Services, Aerospace and Health Care industries are all customizing it to their needs and the costs have come down to pennies a server. The conclusion is plain to see; using skilled, expensive labor to manually count (whether with human readable or barcodes) is as wasteful today as using a typerwriter and carbon paper would be to send memos within your organization.

For those CIOs who are jaded by that Big Blue sales person and any early attempts they may have had with RFID, understanding the proven economics first is key and then they can learn about the technology and how to make it work with 99.99% reliability. Through multiple data center deployments it is easy to put metrics around various processes and tasks. Putting system administrators (sysadmins) on a stopwatch is the best way to get real ROI data. It's measurable and manageable, and you know what it costs.

Here is a high-level overview of the business process of a typical data center Quake Global has worked in for process change through RFID. This analysis assumes it is a 50,000 square feet data center with mixed technology. Here is the amount of time to execute each step in the receiving process alone:

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Process	Time
Data center receives the new hardware from manufacturer at dock	20
New hardware brought to storeroom, removed from box, identification verified	30
Barcode tag associated with Arriba system entered and Excel spreadsheet updated with new hardware and asset tag number	30
Bar code asset tag is applied, the asset is put back in the box and re-taped, asset is put on storage shelf	25
Check in personnel send an email to internal client who ordered the hardware and creates an additional entry into Excel spreadsheet	18
Hardware orderer sends an email to procisioning team asking for server to be configured and racked.	10
Provisioning team creates a Remedy ticket for the provisioning team to rack the item entry into Excel notifying of pending provisioning	10
Item found in the storeroom, removed from box and identity is verified unit is powered up	20
Item check into data vault and racked	57
Remedy trouble ticket created showing item racked and location, Excel file updated manually with location and date of set-up	23
Server provisioned and verified by KVMing into actual server	73
Excel spreadsheet updated that server is configured, provisioned and ready to be handed over. Remedy ticket created to notify provisioning team of go-live. Sysadmin composes an email and sends it to internal client with logon information	35
Sysadmin at end of each month creates list of equipment that went live and sends notification to finance so internal cost allocation (billing) can take place	10
Server inventoried for audit purposes later on	30
Total time using manual/bar code	391

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Now let's look at what an award-winning CIO might do with RFID:

Process	Time
Data center receives the new hardware from manufacturer (RFID tag is factory applied by Dell, HP, Brocade on the actual device). Manfucacturer sends advanced shipping notification (ASN) to clients Arriba system so RFID network is expecting a specific RFID tag. Dock door portal reads tag and shows either the number of items read or a simple green light.	8
New hardware brought to storeroom green light on portal verifies contents and employee puts item on storage shelf	5
Ariba automatically updated when the item passes through the store-room or receiving portal. That update also initiates an automated email to the internal client letting them know item arrived. The accounts payable team receives verification item has been received and generates payment to vendor. The Remedy system creates a work order automatically and sends notification to provisioning team to rack and stack. All information automatically updated in Excel, Oracle, or database of choice with no human intervention	0
Item removed from box and visually verified, powered up	8
Item brought to data vault and racked	57
Sysadmin scans rack and servers in the rack to show provisioning is complete	10
Server provisioned remotely	60
Database automatically updated and server turned over to user. If internal billing is required automatically begin billing cycle	0
Server inventoried for audit purposes later on	5
Total time using RFID automation	152

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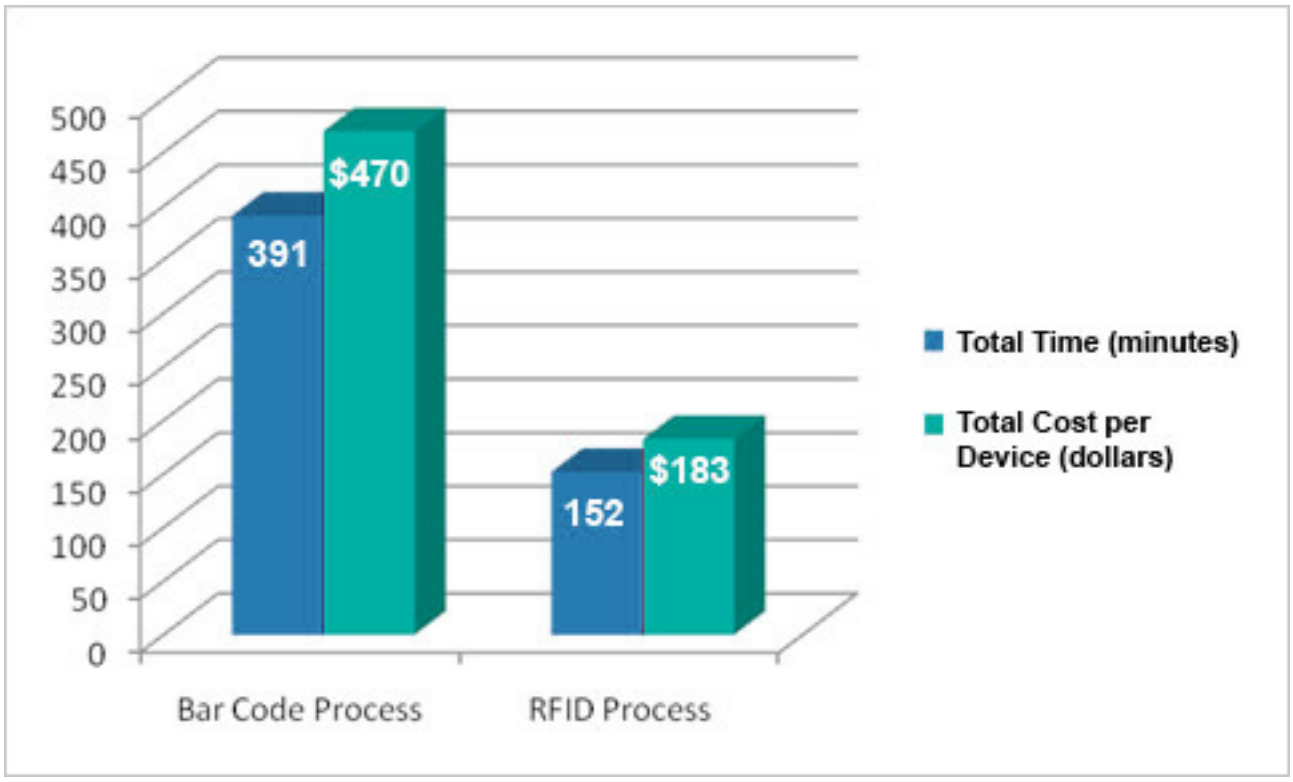

This is a 61% savings in effort to provision and do a one-time audit and location verification. Now let's look at the impact to the bottom line:

Assumptions:
Data Center receives 1,800 new devices annually
Fully loaded cost of system administrator including benefits $110,000
$110,000 = $52.88/hour

Annual Provisioning cost (manual method):
1,800 devices x 391 minutes/device/60 minutes/hour x $52.88/hour = $620,337

Annual Provisioning Cost (using RFID):
1,800 devices x 152 minutes/device/60 minutes/hour x $52.88/hour = $242,719

Annual savings on provisioning alone: $377,618 (this does not include increased productivity through provisioning the server in a much faster manner)

If the same data center costs $250,000 to deploy and integrate an RFID network the ROI is less than seven (7) months. Assuming a 3% weighted average cost of capital (WACC) the net present value (NPV) over three years is an astounding $794,305 or nearly eight million dollars of value created across an enterprise of ten data centers

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If you look at inventory and audit requirements for Sarbanes Oxley, tracking requirements for hard drives containing sensitive customer information and loss due to manual data entry errors, the savings for a data center described above tops out well over $500,000 per year. Many CIOs would first think about laying-off almost five full time staff members as a way to get that savings. Wouldn't you rather save the money on counting equipment and use it to keep staff for more value-add processes or billable services?

Under this scenario, if your organization had ten data centers, RFID could drive $5,000,000 savings annually through process improvement while improving your IT asset security posture at the same time. Remember with RFID it is not about the technology. It's all about the process improvement and ROI.

Technology, Standards and Price Drive RFID's ROI

The return on investment from automating data centers through RFID has only been possible for just over a year. Eighteen months ago Quake Global's RFID lab produced a metal-mount tag benchmark, specifically evaluating tags that were in production and could work on metal surfaces such as servers, laptops, and other metal objects. At the time there were a couple dozen tags that were in production, less than half of those actually worked well. As of November of 2009, Quake Global labs has identified over 50 RFID tags with multiple new chip and antenna technology that showed performance increases five to six times those tags of just a year ago. Form factor can be as small as the fingernail on your pinky, making even the toughest to tag servers a possibility. The readers and solutions are also better performing and easier to set-up and maintain.

The global community worked for many years to create a standard that was acceptable to countries around the globe. No company wanted to rely on proprietary standards that would not allow for marketplace competition or interoperability with partners. The result started out as the Electronic Product Code (EPC) and has evolved to the International Standards Organization (ISO) standard 18800-6c for UHF passive RFID. The same tag can work from Hong Kong to London to New York.

With technology advances, an open competitive standard and multiple manufacturers, the prices dropped very quickly. Now metal mount tags can be purchased for under a dollar in high volumes, two to three dollars for small quantities. What this means is entire data centers can be deployed very economically. There are RFID readers built for specific business activities, from tables with built in RFID readers to carts to be wheeled down rows in the data center which automatically read the rack contents.

The improvements in technology will keep getting better. The standard is well adopted by many industries, and the price will follow Moore's law and decline with the rising performance. These three drivers are why in just a couple of years data centers that are not using RFID will have a much higher cost structure than the rest of the industry.

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What are some of the mistakes early adopters made?

You are a smart CIO and you don't want to reinvent the wheel, right? Then you need to do your homework and find out some of the mistakes that the early adopters made. There are three primary mistakes the early adopters of data center RFID solutions were guilty of:

1. They didn't understand the physics
2. They chose a software company to lead the project
3. They did not participate in the Finical Service Technology Consortium RFID group

Physics is the Key to RFID

RFID systems are like cars. Each one is intended for a slightly different purpose or with a different design philosophy. Some are meant to be mounted on forklift trucks, others were meant to mount on one of Wal-Mart's dock doors. However, RFID hardware manufacturers have sales teams that tell you they have the silver bullet. The one reader out there that works for everything. Don't believe it. Different geographies use different frequency bands, certain environmental factors influence how a reader should be set up and cost is always a factor. Like cars, readers have different performance metrics, costs and construction.

There is no silver bullet. Understanding the different readers can only come from diligent scientific experimentation and testing, and then deploying them in the real world. This ties into the software of choice as well, since many companies have written their software to work with only one or two readers. That too is a recipe for failure, since multiple readers are normally required for an optimal solution and trying to use one reader is not the foundation for a scalable global solution.

Software Companies Don't Get RFID

One leading U.S. bank went to Microsoft looking for an RFID solution. In less than six months they had deployed five data centers with a Microsoft partner in what looked like a winning program. A year later, however, they were ripping out the software and throwing away the investment in their "RFID BizTalk" solution because it failed miserably. Hundreds of thousands of dollars wasted. They chose a software company that has a section on its website stating that RFID and physics are not important and testing or benchmarking the parts is irrelevant. The bank was getting terrible read rates, the readers were deployed incorrectly because the software company didn't understand physics, and they even warned customers on their web site about their ignorance and disregard for the foundation of an RFID network..

Another big software mistake is buying RFID software that attempts to be a complete enterprise asset management solution. This ties back to the car analogy with the readers, you can't be good at everything. SAP, Maximo and Oracle all have spent millions of dollars and many years developing their solutions. A start-up company a few years old is not going to be better at asset management than your existing SAP or Maximo solution. In addition, you've probably spent millions of dollars on your enterprise ERP deployments, you need to maximize that investment.

RFID software should be only for RFID - simple, elegant, and meant to manage the specific processes around a data center via RFID. Quake Global's founder ran one of the most secure data centers in the world in the late 1990s, and was

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running the East Coast practice for a company that built more than six million square feet of data center space before that. Through real world experience Quake Global has distilled the data center operations down to a handful of basic workflows that need to be integrated into RFID software. Software should have just enough to manage the RFID network and numbering scheme, follow basic workflow functionality and then easily and inexpensively integrated into systems like Maximo, Remedy, SAP, and the like. RFID software should not replicate SAP it should make your investment in SAP more valuable.

Let the FSTC be Your Sandbox

In 2008 the Financial Services Technology Consortium (www.fstc.org) put together a working group for RFID. This group is led by a visionary by the name of John Fricke. Fricke wanted to make sure that banks were all on the same page with technology. He spent a career in the FS industry and saw firsthand what could happen if emerging technologies were not sheparded into the industry. The FSTC RFID working group created a set of standards on performance specifications, and created a numbering scheme by working with the GS1 organization. The working group is also a great place for FS companies to learn from the deployments of others. Many banks like Wells Fargo, Bank of America, and others bring their real world lessons to these meetings. There are many vendors that participate, from RFID companies like Quake Global to hardware players like Dell and HP.

Transformational Technology, Automation, and Tangible Value - a Recipe for Success

The economy and political situation is uncertain enough without worrying about getting fired. Most of the CIO's in the survey (referenced in the opening paragraph) were fired for not being proactive and aggressive enough in transforming their organizations. If you want to make sure you create job security – change the company. One of the most visible ways is to do what industry leaders have already done – automate the data center with RFID.

CIO magazine annually recognizes the "CIO of the Year" for innovation and transformation.. If you've got your sights set on getting up on the stage of finalists and winning that award; if you want to do something exciting your whole team can get jazzed about; if you want to be put in the CEO's spotlight not in the dark RFID may be the answer. The technology is ready for prime time, and is being publicized as leading edge, so adoption will generate notoriety. If you do it right, it will be a great legacy to leave your company with and a competitive advantage in running your data center. Your boss, your shareholders and most importantly your employees will appreciate the initiative.

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