



"How Close is Bar Code to RFID & What are the Implications for Hiring RFID Employees?"

by RFID Recruiters, LLC (www.rfidrecruiters.com), October 2006
(As of September 2009 this article is still as relevant as it was nearly 3 years ago)

Using a popular technology adoption model as a framework, RFID Recruiters discusses the adoption of RFID technology, compares and contrasts the adoption of Bar Code and RFID technologies, and then presents the implications for hiring RFID employees. This article is primarily written for vendors producing and distributing RFID offerings but it also has significant implications for companies purchasing and using RFID offerings.

How Close is Bar Code to RFID?

Answer: In terms of market adoption, Bar Code is way beyond RFID. In fact, not only is there a big distance between the two but there is gap separating the two technologies that is big enough to be referred to as a "Chasm."

Geoffrey Moore: Required Reading

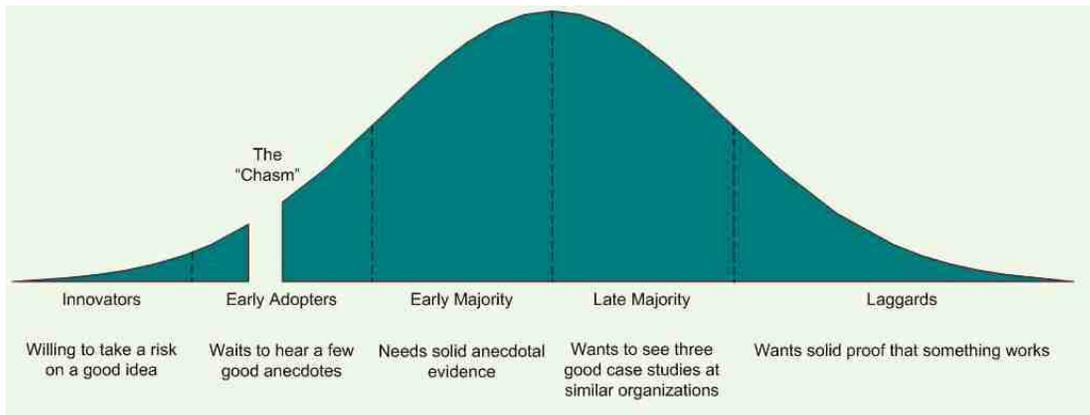
For those readers familiar with Geoffrey Moore (the author of several books including *Crossing the Chasm* and *Inside the Tornado*), the Chasm is understood as the space in time that separates an early adopter market from an early majority market.

Geoffrey Moore's explanation of the technology adoption curve has received widespread attention and as a result his work is subject to some interpretation (see two variations found on the Internet below). In general, RFID Recruiters adheres strongly to Geoffrey Moore's model although we often substitute the term "Full Solution" for Geoffrey Moore's terms of "Whole Product" and "100 Percent Solution."

Below are two of various interpretative representations of Geoffrey Moore's technology adoption curve model that can be found by browsing the Internet.



Graphics with text comments from <http://www.linuxjournal.com/article/6629>



Graphic with text comments from <http://www.ddj.com/dept/architect/187200223>

For those not familiar with Geoffrey Moore but whose company is in some way dependent upon on successfully selling RFID products or services, run – don't walk (or order online) a copy of *Inside the Tornado*; and while you are at it, make sure that every senior executive and every other manager regardless of their function and every marketing, sales, business development, and product development person regardless of their rank gets a copy (or at least borrows a copy) and reads the book. *Inside the Tornado*, which is the sequel to *Crossing the Chasm*, summarizes *Crossing the Chasm* and then extends the model introduced in *Crossing the Chasm*; therefore if you are only going to read one Geoffrey Moore book the book of choice is *Inside the Tornado*.

For those that haven't read *Inside the Tornado* or those who scanned the book but didn't really absorb it, the essence is as follows.

A Brief Review from Inside the Tornado

Early in the introduction of a new technology (Bar Code, RFID, other forms of AutoID or any other Information Technology) some (a relatively few) customers will buy the technology simply because they are "innovators" (also known as "technology enthusiasts") – they are technology experimenters if not scientists. As most companies have limited budgets for experiments the successful adoption of a new technology cannot survive on the relatively small demand generated in this first phase. So, any marketing and sales efforts driving the new technology must then look to a second wave of customers known as "early adopters". Unlike the initial wave of "innovators" the early adopters are not driven by a desire to experiment but rather they are driven by a desire to make money. Generally, the true early adopters (vs. purely "mandated" adopters) regard the new technology as a competitive advantage (not as a "tax" or a requirement for simply keeping up with their peer group). Driven by a desire to make money the early adopters are willing to take a risk on their own ingenuity which allows and enables the early adopters to purchase partial solutions from vendors and then turn those partial solutions (such as tags, readers, printer applicators, middleware, application software, etc.) into full solutions that will support some business objective.

Clearly, today in RFID, we are in the early adopter phase of the market as we see precious few "full solutions" delivered and implemented by vendors for customers. Almost all full solutions in place today have been delivered as partial solutions with the customer taking much if not all of the responsibility for the system integration of the parts into a system that comprises a full solution. While early adopters will accept partial solutions and do their own system integration "early majority" customers will wait for a full solution to be delivered by a vendor.

What are the hallmarks of a full solution for an early majority customer? Simply put, for an early majority customer a full solution must have 100 percent of the solution needed to solve the customer's problem. Beyond the "100 percent solution" perhaps the key hallmark is that a full solution must have not only a "value proposition" (a reason for the customer to buy) but it must have been demonstrated to have the most valuable of all value propositions: it must have a "business case" (a quantifiable cost justification based on reasonable assumptions) that shows how the purchase (of whatever the vendor is selling, i.e. the full solution) will not be just an expense for the customer but rather an investment that will produce a ROI (Return On Investment). In other words, a full solution must enable the customer to reduce enough costs and/or increase revenues sufficiently such that the "full solution" pays for itself within some reasonable period of time (probably measured in months or a very few years) thereby improving the profitability of the company. It is important to remember that the only way your company (or any other company) can increase profit is to reduce costs and/or increase revenue – there is no other way to increase profit. And therefore, your finance department (and your customer's finance department) will do everything in their power to avoid authorizing an expenditure for technology unless it meets one or both of these two criteria.

If your company has been struggling with selling its RFID product or service you can be sure that this means that your customers' Chief Financial Officers (CFOs) have yet to be convinced of the business case for your product or service.

Perhaps your sales force (or some members of your sales force) have been successful selling into "mandated" customers – i.e., customers who might be required to purchase tags (or other RFID components) by their customers (such as Wal-Mart or the Department of Defense). You might inquire as to what percentage of your company's sales have come from mandated vs. non-mandated customers. You might also ask if mandated purchases are anticipated to be sufficient to meet your company's revenue objectives or if your company's growth objectives will require customers to purchase based on the ability to achieve a ROI.

So, you say, what does this have to do with RFID and the "chasm" between RFID and Bar Code? (We'll address that next). And what, if anything does this have to do with who we hire as new employees? (We'll get to that later.)

Why Selling Bar Code is Much Easier Than Selling RFID (and why many companies successfully sell bar code offerings but struggle with selling RFID offerings)

First, let's go back to Geoffrey Moore's technology adoption model. In an early adopter market your sales force must seek customers who are willing to be their own system integrator. It is important to recognize that as system integration entails technical complexity and therefore schedule and ultimately financial risk many CFOs (especially CFOs in early majority companies) are reluctant to take such risk and will therefore defer purchases until they receive reports of other peer companies successfully overcoming the complexities and risks and achieving a compelling ROI. We are now in a period where many RFID vendors have sold some amount of their partial solutions but relatively few can point to a clearly understood and compelling ROI having been achieved by their customers. So the early majority customers (the customers that will buy in such large volumes that vendors will reach their desired revenue and profit objectives) remain on the sidelines waiting for reports of ROIs derived from full solutions that mitigate system integration risk. And they wait, and they wait, and they wait some more.

While the early adopters continue to make relatively modest purchases (often just enough to provide optimism to weary sellers in need of some good news), the vendors find themselves stuck on the wrong side of “The Chasm” between the early adopter market and the desirable steep growth slope of the early majority market.

How does a company get across The Chasm? While Geoffrey Moore devotes considerable attention to this objective and explains his recommendations in detail, here are three key suggestions to consider:

1. A company must package its offerings as a “Full Solution” and it should package the Full Solution for some particular type of customer requirement (for some specific application in some targeted vertical industry).
2. A company should focus on developing and executing a strategy that will lead to winning notable (dominant) market share in the targeted market segment (as defined by the application and vertical industry served). Geoffrey Moore makes an interesting comment that says effectively “pick on segments appropriate for your size” (i.e., if you can’t envision winning on the order of 40% or more segment share then perhaps the target segment might be too big for you to successfully attack.)
3. A company should work to get references and case studies that validate that the Full Solution really delivers a ROI.

So how is Bar Code different than RFID with these three considerations in mind?

Unlike RFID, Bar Code has made it past the Chasm. With Bar Code technology Full Solutions have been packaged and delivered to the market. The business case for Bar Code was debated and determined long ago. Bar Code (and related mature technologies) replaced the low hanging fruit of expensive and error prone human labor spent on handwriting orders and transcribing/keypunching orders, the time associated with mailing orders vs. electronically submitting orders, and as a result the overall time previously required to order/replenish, ship, and invoice. No one (except perhaps the “laggards” in the “late majority” phase of the technology’s adoption) struggles with a business case to cost-justify Bar Code vs. the manual alternative. The competitive battle for market share for Bar Code technology has largely been established.

Ok, so Bar Code is different than RFID, but isn’t that just a (market development) timing thing? Won’t Bar Code vendors be the natural vendors to provide RFID and win RFID market share?

These questions make a huge assumption – and one that is dangerous for vendors. In fact, RFID is not just an alternative to Bar Code, but rather, RFID offers alternatives for much of computing and information technology as we know it. Until somewhat recently (perhaps the last year or so), RFID has generally been the most visible as a technology that addresses problems and opportunities in Supply Chain Management (which has been a popular domain if not the popular domain of Bar Code). However, RFID is gaining traction and will continue to grow into applications well beyond the realm of passive (non-battery powered) RFID tags and Supply Chain Management. Active (battery powered) RFID tags are gaining momentum that rivals (and will eventually overlap with) the markets (and customers) for passive RFID.

Different markets, different technologies, different cost-structures. Just too different and too futuristic you say? No problem. Let’s focus on today.

Setting aside the adjacent developments in active vs. passive RFID (and the developments in sensors) and the larger role of RFID overall as a key building block

in the platform for “pervasive computing”, successfully taking passive RFID (including EPC Gen2, etc.) to market requires some fundamentally different approaches – even for vendors who are focused on Supply Chain Management, and even for (and perhaps especially for) vendors who have successfully achieved strong market share with Bar Code technologies.

Getting the Right Cultural Emphasis at the Right Time for RFID

While the Chasm separates RFID and Bar Code in terms of adoption it also drives a need for different company cultures in vendor companies; and this is where we begin to see the relevance of the technology adoption model to the hiring of new employees.

According to Geoffrey Moore, not only must a vendor develop full solutions (to avoid having customers experience hidden costs and other forms of risk and uncertainty that are red-flagged by CFOs), and not only should a vendor work to demonstrate real ROI benefits achieved by early customers, but the vendor must hire the right people and provide the right culture during the early adopter phase of market development.

To explain the importance of having the right culture at the right times during the technology adoption cycle Geoffrey Moore critiques another book entitled “The Discipline of Market Leaders”. In *The Discipline of Market Leaders* the authors make a case for building successful companies by stressing the importance of three “value disciplines”: Product leadership, Customer Intimacy, and Operational Excellence. While Geoffrey Moore accepts all three values as being important he makes the case that at any one time during the technology adoption cycle that only two of the three are appropriate and that in fact at any time during the technology adoption cycle one of the three should be actively suppressed. Clearly, Geoffrey Moore and the authors of “*The Discipline of Market Leadership*” arrived at different conclusions, and RFID Recruiters sides clearly with Geoffrey Moore.

Geoffrey Moore points out that in an early adopter market vendors are (or should be) looking to determine what combination of product and service offerings will be viewed favorably (by the coveted and highly sought early majority customers) as a “full solution” that will produce a compelling ROI. In the meantime, while looking forward to the early majority market, the partial solutions and lack of a compelling ROI during the early adopter market keep vendors from crossing the chasm.

Geoffrey Moore asserts that in an early adopter market it is critical for vendors to press forward with “product leadership” but to do so with “customer intimacy” so that vendors can learn what constitutes a full solution that will produce a compelling ROI. This requires a vendor’s technical and business people to work closely with each customer to identify the business processes that can be eliminated, automated, or otherwise improved through the introduction of the newly proposed technology. This is all fine and good and understandable you say, but what’s wrong with “operational excellence”? The answer is that operational excellence tends to create conflict with customer intimacy. Operational excellence drives for doing the same things over and over - faster, cheaper, better for the vendor – which is good, but only when you are sure that you are doing the right things in the first place. In the interest of driving productivity through operational excellence, making more sales calls to sell more partial solutions (that often require more one-off product development) generally results in more revenue rather than more and better repeatable full solutions. Temporarily, the revenue growth might be attractive and exciting. A common problem with this approach however is that engineering reaches

a grid-lock state in which no more features can be added to the next release without delaying the release; at which point the features are prioritized with the result that the next release will have "something for everyone (all the important customers waiting for the next release), but not everything (i.e., no full solution) for anyone." Instead your company needs to be searching for a path across the chasm that provides validation from customers desiring to purchase more of what you have sold and for which you are well prepared to further sell. To cross the chasm, you need to sell more or less the same full solution (no doubt custom configured and personalized for each customer, but fundamentally the same platform) to similar customers in the same vertical industry for the same application, or an adjacent application to the same vertical customers, or similar applications to customers in adjacent verticals.

Geoffrey Moore refers to each of the adjacent vertical/application target market segments as bowling pins; when you hit the pins by achieving notable market share and the pins (the target segments) are truly adjacent to one another you begin to get enough pins clanging off one another that your market presence takes over a wider swath of market share (the bowling alley) and when things really resonate for your company's offerings with large volumes of influential customers somehow the bowling alley becomes the fabled tornado which carries you to the desired leadership position in the early majority market – at which time you can shift gears by jettisoning customer intimacy (since you clearly know what customers want) and engaging operational excellence (so you can sell faster and install faster). The terms (bowling pins, tornado, etc.) are a bit illustrative but the concepts have huge merit. The point is that you are searching for a path to the cumulative reuse of work, products, and services that is well received by customers who will validate that your offerings consistently produce a compelling ROI.

According to Geoffrey Moore, product leadership and customer intimacy are values in an early adopter market that will propel you in the right direction while operational excellence will impede rather than expedite your progress.

In a similar and simplified example, when teaching children a new skill we focus on getting a desirable result one time. Then we work on getting the same result twice in a row. Then we work for speed.

If we introduce speed too early (or if we work on too many skills, i.e. applications and verticals) we actually slow down the process by impeding our focused approach to completing a full solution with a compelling ROI. If we introduce too many sales people before the first several sales people are successful we may be introducing sales people too fast. If none of the sales people or only a small percentage of the sales people are making their quota, maybe the problem isn't the sales process – but the offering. Can the President of your company, or the General Manager of the RFID business unit, or the RFID product line manager, or the marketing manager explain the value proposition as a ROI that will be achieved by a customer? If not, it's unlikely many of the sales people will be able to explain it to their customers. Do your customers consider your products and/or services to be a "full solution"? If not, your business development executives better have some partners who they can "sell with" or "sell through" or "sell to" who will augment your products and services with other products and services that will be viewed by the end customer as a full solution, and one that produces a compelling ROI. And by the way, not only should you have a full solution that produces a ROI by the time it gets to the customer, if you have any competitors with similar full solutions and who offer a similar ROI, then your sales people are also going to need a third item – some competitive differentiation. Coming in second in a procurement process only adds cost for your company, not revenue or profit.

The Technology Adoption Curve and the Implications for Employee Hiring

So, back to the question – what does this have to do with hiring employees? Everything.

Once you understand the technology adoption model you can see that we need to get certain functions (jobs) filled with the right people substantially completing their work before we staff up other functions. Your team that is responsible for figuring out the customer's business case better be reasonably far along in showing how the ROI will be achieved (at least in theory in a spreadsheet) before you spend a lot of time hiring hardware and software development engineers. If your company doesn't take Market Requirements Documents (MRDs) and Product Requirements Documents (PRDs) seriously, your engineers might be getting burned out and your sales people might be frustrated. Perhaps it would be good to have one or two "precursor" marketing people visit some existing or potential customers to see if the customers buy-in to the assumptions in the proforma business case reflected in the spreadsheet before you put a lot of engineers and sales people to work.

Beyond engineers and sales people it might be enlightening to see how many people in your company or your RFID business unit can explain:

- What is our full solution?
- Who is it a full solution for (what is the profile of a prospective customer)?
- How would/does our full solution produce a ROI for our customer?
- If we don't have a full solution (because we sell tags or readers or middleware, etc.) who are our partners that cause our products and services to be sold within their full solutions? And what is the business case for the customer at that point? (If you don't know the end user's business case and your channel partners don't know the end user's business case you might be waiting for a while to cross the chasm. As Yogi Berra once said, "if you don't know where you are going you could wind up somewhere else.")
- How is our full solution different and better than what our competitors offer?

Unless senior management, finance, marketing, sales, business development, customer service, product management, manufacturing, and engineering can answer these questions with similar answers then you might want to hold off on hiring more people in any of these functions until you get your team "linked and aligned" and in "ThinkSync". Your success as hiring managers and as a company depends on your team being in unison on the essence of your value proposition and competitive differentiation. This will require you to hire leaders who can help your company discover or establish and then document and articulate a compelling value proposition and compelling competitive differentiation by using their skills in the realms of product leadership and customer intimacy. Adding more people to key positions who do not have a track record of successfully utilizing their product leadership and/or their customer intimacy skills to cross a chasm (with other early adopter technology experience earlier in their career) is not likely to be a successful approach. Certainly, adding more people focused on operational excellence before you have a repeatable, differentiated, ROI-producing full solution will only cause you to go faster – mostly likely in terms of cash flow burn. You must discover and/or create before you can successfully accelerate.

RFID Recruiters Recommendations

So, what can you personally do about this?

1. Consider having your team read "Inside the Tornado" so that the team will have a benchmark technology adoption model and a shared vocabulary for discussing and refining your business model.
2. Consider reviewing whether your full team is able to articulate what you sell, to whom, why, and how – and most importantly, check to see if everyone on your team can talk about at least the conceptual value proposition if not the quantifiable customer business case (ROI).
3. Consider whether your culture is emphasizing operational excellence prematurely at the expense of product leadership and customer intimacy.
4. Consider whether you have the offerings and their value proposition sufficiently dialed-in before you begin allocating big quotas to sales people (if all of your sales people are struggling with quotas the problem might not be with the sales force).
5. This is a special/important consideration – if your company sells into early or late majority markets (like the bar code market) and also into early adopter markets (such as RFID) consider that you might have a common cultural conflict whereby the priorities (such as operational excellence) that worked (and may still be working) for a mature market don't work and may well be hampering the progress of your efforts in an early adopter market. This may require substantially separating some of the operations for your mature market and new market teams so each can work in an autonomous but synchronized manner (in telecommunications terms this is referred to as Plesiochronous Synchronization).
6. Consider working with a recruiting firm that specializes in RFID and understands not only RFID technology but how early adopter markets are successfully developed. Get the right people on board (both as external partners and internal employees) early and continuously throughout the growth of your business.
7. Do your best to surface discussions of these ideas throughout your company regardless of whether you are in a line position (sales, engineering, etc.) or a staff position (HR, finance, etc.).

A Post Script

RFID Recruiters believes that an accurate diagnosis is a critical pre-requisite to a successful treatment. The focus on developing full solutions that produce a compelling ROI is important to RFID's success in the near term, but the obsession with RFID's ROI will not go on forever. Once upon a time (in the late 1970s) enterprises required a business case to cost justify the purchase of standalone word processors; today companies of all sizes buy word processors (as application software on PCs) with near zero attention to the business case. RFID will follow a similar progression in which the early adopter market will give way to the early majority market.

RFID Recruiters is highly confident that despite RFID's current status in the early adopter phase of the market's development that RFID will not only enjoy great success in the early majority phase and beyond, but that RFID has - in our opinion - the potential to truly become the key building block for "Pervasive Computing". For a more detailed look at our perspective on RFID and the market for people with RFID expertise, please see: www.rfidrecruiters.com/Moving_into_RFID.htm

About RFID Recruiters

RFID Recruiters is 100% focused on recruiting for RFID. RFID Recruiters specializes in providing recruiting services for companies and individuals involved with RFID technologies, products, applications, and services.

Whether your company is looking for RFID expertise or whether you have RFID expertise and are looking for a strong RFID employer, RFID Recruiters offers the most focused approach to your objective.

RFID Recruiters provides service to leading RFID companies and experts in North America, Europe, the Middle East, Asia, and other regions of the world. For telephone and email contacts and additional information, please visit RFID Recruiters at www.rfidrecruiters.com

About the Author

Michael S. Shiff is the founder and General Manager of RFID Recruiters, LLC. Mr. Shiff's background includes over 25 years of experience with advanced information (computing and networking) technologies. Mr. Shiff began his business career at IBM and gained his first professional experience with Radio Frequency technologies at Satellite Business Systems (partially owned by IBM). SBS was the first private enterprise to contract for cargo space on the Space Shuttle. SBS launched 5 geosynchronous communications satellites from NASA's Kennedy Space Center. Mr. Shiff's work with 48 Mbps demand assigned TDMA digital baseband and RF technology at SBS and later work with systems operating wirelessly at speeds up to 120 Mbps laid the foundation for his knowledge of multiplexing, modulation, error detection and correction, and other fundamental analog and digital techniques that are the basis for many of today's applications of RF and related information technologies. Following Mr. Shiff's career in satellite communications which included management positions at M/A-COM DCC, M/A-COM Telecommunications, and Hughes Network Systems he went on to help build three early stage information technology companies - two of which achieved successful IPOs and one which was acquired by a Fortune 100 company. During this period, Mr. Shiff served for three years as the Chairman of the DICOM (Digital Imaging and COMMunications) Demonstration Committee; DICOM has become the most prominent worldwide standard for medical applications of digital imaging.

While Mr. Shiff considers RF and networking technologies to be essential elements of information technology he believes that networking is inherently lower on the stack than computing infrastructure and that applications software and the automation of business processes offer the opportunity to unleash relatively greater value and therefore belong higher on the stack. Mr. Shiff is passionate about the development and introduction of new technology that provides value for customers and their end users, vendor employees, and investors. Mr. Shiff believes that most successful investors bet on jockeys (people) more than horses (business plans).

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