

There's No Packaged Answer for RFID

Adding an RFID tag to a product's packaging requires careful designing, but there are things you can do to help ensure a favorable outcome.

Jan. 29, 2007—There are enormous challenges inherent in adding an RFID tag to a product's packaging. An RFID inlay is a foreign device. Unlike bar codes, which can be incorporated directly into the printed materials of the package and have no inherent volume, RFID inlays have mass, volume and other characteristics that must be considered before being incorporated into a product.

That's not a simple task. Packaging design deals with form, fit, function and aesthetics. These elements constitute the basis for nearly all product packaging, and must be taken into account to create a package that attracts attention, provides appropriate container features and conveniences, has integrity and, finally, meets environmental requirements. The addition of an RFID inlay, therefore, is not a trivial matter and requires careful planning.

There are five rules to successfully designing a product or product package that incorporates RFID:

1. Know the need (Level 1, 2 or 3—see below).
2. Don't rely on outsourcing for leadership.
3. Work in multidisciplinary groups, and have a clear leader.
4. Consider this the creation of a new product, rather than the modification of an existing product.
5. Think strategically.

Although a real-world implementation could be a mixture of all three levels, this article will focus on each level separately.

Level 1 Implementations: Keep it Simple

The most basic need for packaging RFID could be "forced compliance." Meeting the requirements of a mandate for which only a small portion of the total number of a company's SKUs need to be RFID-enabled is an example of Level 1. At this level, the problem should not become a packaging design issue, but rather a supply chain logistics project. Do not waste the money on reengineering any product packages.

Many companies colloquially refer to this level as "slap and ship." The common sense is that any money spent beyond the most elemental requirements has been wasted. There are new and emerging standards (EPC, ISO, DOD and ATA), as well as university and commercial white papers that describe and solve packaging needs at this level in more than adequate detail. If you decide to outsource any of this, be warned: Third-party suppliers will try to extract additional revenue by overspecifying your needs. I highly recommend an employee or employee team provide the specification against which competitive bids are engaged.

Level 2 Implementations: Assign a Leader

At the next level of need, there may or may not be a mandate to add RFID to the product or product packaging, but the number of affected SKUs is significant. Here is the first case where a cross-functional team needs to be formed with a clear leader. The selected leader *does not* need to come from a particular discipline.

Rather, the leader needs to lead. This may sound naïve, but the fact is that a good leader possesses enough intellectual curiosity to surface and address any key issues while exhibiting the essential ability to be action-oriented and not overly adverse to risk.

This cross-functional team can include third-party consultants or contractors, provided they play no role in the final decision process. A leader never delegates to a third-party solution provider in strategic matters. The worst thing a company can do is to assign a leader either because he is perceived to be astute (but lacks leadership skills), or to assign a contractor regardless of such skills as acuity and leadership.

This middle level is, perhaps, the most difficult to lead. That's because it lacks the strategic aspects of the next highest level but, conversely, is critical enough that an incorrect decision is the most costly in terms of product performance, warranty, reliability, aesthetics and even market share.

For example, take the case of a recent supply chain pilot where one of the products the company needed to be tagged required a spacer under the tag. This is often the case when tagging products made of metal, liquid or carbon-loaded plastic. Since only one of the many SKUs had such a need, the team elected to ignore the fact that merely placing a spacer under an existing tag created an ugly solution that put the tag at risk—it was likely to be knocked off at any time, and it interfered with stacking and warehousing.

In this middle level, the 80:20 rule applies, and the first process must be a triage. The team must decide which 80 percent are standard (similar to Level 1), to which 20 percent of the resources will be applied; the other 20 percent of the products will have the 80 percent of resources applied. The first group—80 percent of products and 20 percent of resources—mirrors the process outlined above. The second group mirrors the process used for Level 3 implementations, described below.

Level 3 Implementations: Project Management

The first and foremost requirement for success at this level is, once again, leadership—but with a degree of complexity greater than that necessary for Levels 1 or 2. At Level 3, the solution is a *system* and a *product*.

By "system," I mean that any given product is created by a team representing the cross section of many design-engineering disciplines. Examples include ergonomics, aesthetics, marketing, shipping and containerizing, safety and even, in some cases, warranty repair. At this level, the leader must be a system project manager almost to the level of general product manager, possessing excellent integrating skills. The myriad issues to be rationalized are endless. Once the correct person has been assigned, the project process can begin.

Goals and objectives must be crystal clear. Buy-in at key levels must be in place.

Create a New Product. It is important to view the development of an RFID-tagged product as the creation of an entirely new product, not the modification of an existing one. This is not to say the final RFID-enabled product will actually look or act any differently than the parent. What it *does* say is that while all historical aspects of the parent product will be taken into account, nothing is sacred. If you do not hold this attitude, the majority of people will fight this change. Remember that "just add RFID" as an attitude at Level 3 is a recipe for failure. The attitude must be "create an electronic product."

Think Strategically. Early in the process, the team will need to answer a series of strategic questions. For example: Can this electronic product be a market differentiator for your company? If the answer is no, you should consider creating an industry standard or working directly with competitors to assure best volumes and costs to supply common components. If the answer is yes or maybe, then it is imperative that intellectual property (IP) management be in place. Patent disclosures and applications need to be timely, while non-disclosure agreements (NDAs) and contracts clearly defining ownership of IP and potential trade secrets

must be managed from day one.

RELATED_ARTICLES Another question to consider: What phases of the entire product life cycle are intended to benefit from this new RFID-enabled product? If the new product benefits only the customer base, then specifications could be very different than those for a solution expected to affect the product from its birth to its final disposal.

Ultimately, success depends on making sure proper leadership is in place.

Why, you might ask, do I appear so negative regarding third-party solution providers? The answer, quite simply, is that I am one. In my heart of hearts, I can say that the majority of third-party solution providers (100 percent, in my view) never have adequate investment in or commitment to the process. That is not to say a team of 98 percent third-party solution providers could not be ideal—and even a perfect choice—provided the balance of leadership and strategic planning rests with the client company.

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