



Now That's Smart!

Pairing electronics with plastic and paper, also known as smart packaging, may one day revolutionize the beauty industry.

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A Kent cigarette carton lights up before the smoker strikes a match. Down the street, a neighbor opens a DVD boxed set for *The Apprentice* and hears the words, "You're fired!" At the same time, a patient reaches for her daily dose of medication and the package instantly reports back to her doctor that she's complied with directions.

Is this a far-fetched glimpse into packaging's future? Supermarket aisles and medicine cabinets full of talking, lighted, "smart" products are not as far away as some may think. In fact, all of the above examples demonstrate current electronic smart packaging applications. **Each is a case study from MeadWestvaco that employs electronics to create interactive packaging.**

"MeadWestvaco is currently producing interactive, electronic packaging for several other market segments that entertain, enlighten and educate consumers, and we believe the beauty packaging industry will soon embrace this technology," says Pat McGee, director of marketing for MeadWestvaco Health & Beauty Packaging, Glen Allen, VA.

Despite successful case studies from various market sectors, experts agree that smart packaging is still in its infancy. But its potential to revolutionize the packaging industry—and all of the industries that rely on packaging—is enormous.

"For the past 100 years, we have had labels and packages in static color," states Peter Harrop, chairman of research and event company IDTechEx, located in Cambridge, UK. "But we are at the beginning of a huge story. We are entering a situation where your children will look at the supermarkets of today and think you came from the Flintstone age."

Smart packaging has numerous benefits both aesthetically and functionally and can be utilized to meet a variety of business objectives. Below is a look at the current state of electronic smart packaging, the foreseeable future of packaging interactivity and an exciting glimpse into what may lie ahead.

Supply Chain Management

While smart packaging has enormous future potential, its current use is much more limited. "Right now, most of electronic packaging is supply chain driven," says Louis Bianchin, senior analyst and program manager RFID for VDC Corporation, Natick, MA.



A lot of today's commercially-used electronic packaging revolves around radio frequency identification (RFID) technology. Wal-Mart created a monumental stir in the packaging industry and brought this technology to the forefront when it mandated its top 100 suppliers to tag cases and pallets with RFID by January 2005.

The cost of compliance has been significant. Suppliers have had to invest in an entire RFID infrastructure, not to mention RFID tags. With current silicone chip technology, tags remain much more expensive than fraction-of-a-cent printed bar codes.

"Right now, we [as an industry] can't get past 8 cents for RFID labels at high volume," comments Harrop.

Despite the high cost to suppliers, RFID at the case and pallet level has many benefits. "It's proven itself in tracking and logistics," says Patrick Yanahan, president of market research and new product development agency USA Strategies in Chicago. "The number one benefit is preventing stock-outs," he adds.

Another unexpected benefit of Wal-Mart's tagging initiative is better display management. Beauty companies have tagged promotional displays, which enable them to track when the display is set up. The big discovery? "What happened in the past, more than 40 percent of the displays were not even making it to the floor for the first day of the promotion," says Bianchin.

In addition, "tagging has revealed that marketing initiatives may not coincide with stocked shelves," says Harrop. "However, it's not enough of a benefit. [Compliance] is still an expensive exercise for the suppliers."

The potential benefits—and return on investment—on item level tagging is more obvious for consumer product goods companies. Item level tagging refers to RFID tags placed on individual packages.

"Tagging individual items, when that is economical, will benefit us all," says Harrop. Item level tagging allows for improved shrinkage enforcement, better counterfeit protection and increased merchandizing and advertising opportunities, to name a few benefits.

If ever placed on every item in a supermarket, tagging can also significantly increase consumer convenience. Since many RFID tags can be read at a time, consumers would skip the laborious scanning process and enjoy an instantaneous checkout instead.

At RFID's current cost, however, item level tagging isn't for every product. "Right now, it's for high price ticket items. A \$5 lipstick does not justify [item level tagging]. It's all about the return on investment. It could be okay for one product, but it could be negative for another product," comments Bianchin.



Several cost barriers must be breached before widespread item level tagging is employed. “Roughly speaking, at five cents we see quite a lot of individual items tagged. For everything, it’s got to be a penny, but that will be reached with printed electronics in due course,” says Harrop.

A few printed RFID transistors (chip and antennae) are expected to launch into market this year, according to Harrop. Although they are “simple and crude” he states, “this year is very much a turning point.”

RFID continues to gain ground within the packaging industry and its potential uses in supply chain management and beyond grow daily. Simply put, “RFID is unstoppable,” says Yanahan.

Package as Product Aids

RFID is not the only electronic smart packaging technology available today. Some beauty companies have discovered an entirely different benefit of electronic smart packaging aside from supply chain management, exploring the use of battery-operated patches as cosmetic delivery systems.

Using electronics as part of the application process can make the process more controllable and in the case of skin care products, more effective, said Harrop.

Capitalizing on this benefit, Omnireliant Holdings, Inc, Tampa, FL formed an alliance with Power Paper Ltd of Israel to produce micro-electric patches for the Kathy Hilton skincare brand. The devices will be used to treat a variety of skin conditions, including wrinkles, hyper-pigmentation and photo damage.

Power Paper executives say the deal could bring about increased acceptance of this application system.

“Combining our unique delivery skincare systems with a Kathy Hilton branded line will facilitate global means for distribution and rapid consumer awareness of our products,” says Ran Gottfried, chairman and CEO of Power Paper.

Electronic package applications that aid in product dispensing continue to emerge. Matsushita Electric Works, best known for its Panasonic brand, filed a patent application in May for an “electrostatic spraying device,” essentially a hand-held, battery-powered container that can be used for liquid cosmetics.

The container electro-statically charges the liquid, delivering more even application. Procter & Gamble Corp., Cincinnati, OH, is also listed on the U.S. patent application.

Electronics do not only aid dispensing. For example, “We are probably only two years away from hair dye or hair curler liquid that will have packages with a timer,” says Harrop.



Marketing Potential

Although much of RFID's buzz has been around the supply chain, widespread item level tagging could also monumentally shift advertising dollars from traditional media outlets to the point of sale.

"Marketers will start realizing that they can tie [RFID] into in-store merchandising and promotions. That's what's going to be the driver [of RFID]," says Yanahan.

Imagine if an RFID reader senses that a consumer picked up a particular brand of foundation. A flat panel video display next to the consumer is sent this data and immediately sends a targeted advertisement promoting a matching concealer or face powder.

The scenario is not as far-fetched as it seems. Yanahan predicts POP displays will be replaced with video screens. "As the consumer travels through the store, advertising will be targeted to them," he adds.

On a similar vein, Bianchin states cell phones that double as RFID readers will be launched as early as late next year. This would give consumers the power, for example, to wave a phone over a display or package and hear application instructions or another message on-demand.

Interactive packaging also offers other marketing benefits aside from its in-store merchandising potential. It provides brand marketers with a powerful way to make an emotional connection.

"Interactive packaging expands the power of packaging by adding a new layer of communication through light, sound or motion. The end result is a package that communicates to the consumer on an entirely new level and deepens the consumer experience with the brand," says McGee of MeadWestvaco. This is "a feature many beauty companies will find very valuable as they strive to stand out in the marketplace."

Straight from the Jetsons

The applications being explored today are merely the tip of the iceberg. According to analysts, as printed electronics become more sophisticated and more cost effective, its uses will be endless.

Packages one day might lock to protect the consumer if the contents have expired. They could emit aromas. They could morph from one look into a completely different color or shape. Packages could even feature a disposable motion picture with sound.

The electronic smart packaging movement has the potential to dramatically change the look and functionality of beauty packaging in a way that's never been done before.



“The new world of printed electronics is amazing—foldable, biodegradable, tightly rollable,” says Harrop. In the future, “You will have a far more appealing cosmetic package.”