Packaging: Smart is the new Green

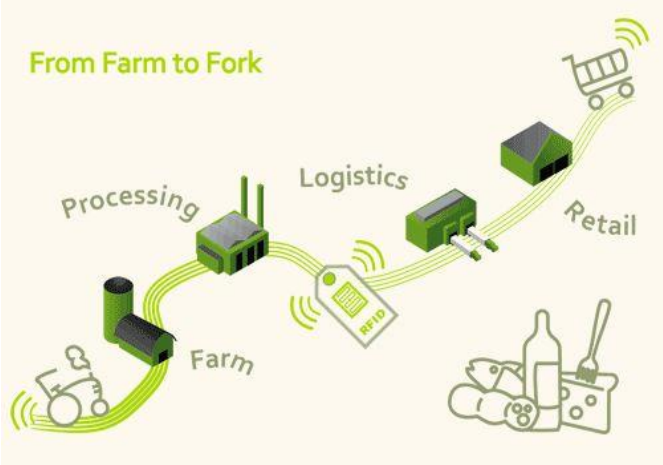
The idea of food and beverage packaging that embeds additional information ("smart packaging") has been around for decades. Until recently, you mostly heard about it (surprise!) from technology companies. This is changing. Smart packaging in the past was often about electronics, but now the term encompasses a spectrum of technology embedding information from "farm to fork".

This May the consulting firm McKinsey released a report that projected the direct economic impact of the so-called "internet of things" – which encompasses smart packaging – would be between $2.7 and $6.2 trillion per year worldwide in 2025; they also project some 30-80% of retailers adopting smart logistics in that period.[1]

But the McKinsey report didn't specifically address the growth of "smart" packaging in the food and beverage space as a part of that trend. IAP believes, however, that four key drivers will dramatically accelerate the growth of these technologies in our sector in the next ten years. In fact, we think that the same way that the packaging industry has embraced the sustainability movement in the last decade, these four drivers will make "Smart the new Green" for packaging firms servicing food and beverage companies.

Driver One: New Government Regulation

In 2011, the FDA's Food Safety Modernization Act (FSMA) hit. This was the first major reform of US food safety laws since 1938.



The FSMA aims to ensure that US food is safe by shifting the focus of federal regulators from responding to food contamination to preventing it. In so doing, the law is redefining how food must be tracked, traced and monitored through the entire supply chain. Major food companies are implementing traceability programs for their

[1] See the McKinsey Global Institute's report: "Disruptive Technologies: Advances that will transform life, business and the global economy", page 56.

products from their origin to the retail shelf. That means they're adopting various forms of smart packaging.

On top of the FSMA, other food-related Federal regulations are starting to bite and adding to the case for smart-packaging adoption. One example is the Bioterrorism Act of 2002. Chicago-based Blommer's Chocolate has no branded food products, but they've started using RFID to trace shipments because thanks to the traceability requirements of the Bioterrorism Act, it's the only way Blommer's can continue to do business with Nabisco. Granted, Blommer's is the largest cocoa processor and ingredient chocolate supplier in North America, but the same traceability requirements are now filtering down to smaller firms.

In this, the US is part of an international trend: the European Union is going the same direction, with the European Food Safety Authority stressing food traceability from "Farm to fork".

Driver Two; Insurance Premiums - Paper and barcode-based traceability systems don't strip out much cost, as they rely too much on human interaction. In the past, that's what the business case for smart packaging was built on. That same human interaction, however, also makes dumb packaging far less desirable from an insurance standpoint, so insurance companies are now helping drive the business case for traceability via smart packaging. In the future, you'll see even more insurance premium reductions for smart packaging that take humans out of the loop in the food and beverage sector. The insurance industry is also embracing smart packages (RFID, holograms, and smart inks), as a means to enhance food shipment security. As a result of these dynamics, embedding RFID or similar "smart" components in their products will be a "Table Stake" for food and beverage packaging firms over the next ten years.

Table Stakes are changing in this industry

Driver Three: Growing Ubiquity among Consumers - Insofar as packaging interfaces with the food and beverage buying public, "smart" is the future.

Consider Coors' recent success with a smart label that simply told customers that the product was cold. Indeed, Coors' built their entire TV ad campaign around the *package*, not the beer. The Coors' label was made by Inland Label & Marketing Services using thermochromic ink from LCR/Hallcrest, LLC. Relatively simple, packaging

but very smart and effective promotion. You'll see more such smart package-driven promotion in the future.

Then there is the spread of "readers" and "apps" among food consumers. A very small fraction of US shoppers currently use shopping applications like Fooducate, packaging interactions from Blippar , or specialty food allergy or diet management apps like Allergy Free Entertaining or dLife Diabetes Companion. But nearly one-third of Americans own a smart phone, and that fraction is rising each year. Moreover, with major retailers of all types rolling out apps (from the Walmart shopping app to the Whole Foods App), their use will grow fast. Smart packaging will interact with these apps for couponing and other relatively prosaic purposes.

But remember - smart packaging in the retail environments isn't simply about interaction with the consumer: as soon as intelligence can be embedded in food packaging, retailers will want to make use of that capabilities. Walmart, for example, knows that on-shelf availability is vital to their profitability, and they will be driving food packaging firms to adopt packaging intelligent enough to *both* attract the consumer *and* to assist with stock management issues.

Earlier this month one of our partners visited the Googleplex, Google's headquarters outside San Francisco. The numbers confirmed there are startling: while only 10% of US retail sales are online, an additional 40% of sales are "internet assisted". This portion will only grow as firms like Walmart push "internet-assisted retail" as the new normal. Over the next decade consumers will actually be "trained" to *want* interaction from all products. Packaging will be a key medium through which food and beverage companies will deliver that interaction, and these firms will expect their packaging providers to keep up.

Driver Four: Declining Cost and Increasing Capability The capability of today's smart packaging systems and interactions are finally catching up to the hype.

Now RFID tags, for example, can not only provide tracking and traceability information, they can add temperature and freshness monitoring via oxygen and CO2 sensors. RFID now also works in fairly extreme environmental conditions, so can monitor cold chains and address freshness concerns. And again, the current legal climate is helping, as insurance companies underwriting food shipments are starting to offer incentives for businesses to use RFID temperature monitoring to document and improve quality and to reduce risk and loss.

A related driver is the growth of "active packaging" such as shelf-life extension and anti-microbial films: to be fully effective, this "active" packaging must also be "smart" to report to consumers, retailers and manufacturers that it's working. Again, insurances rates will be part of the business case.

And RFID isn't the only smart packaging technology with increasing capability and falling costs: ThinFilm Electronics ASA, a Norwegian printed electronics company, is working on low-cost sensors containing rewritable memory to wirelessly monitor perishable food and to deter counterfeiting of high-value products like wine and expensive vinegars. Big market? A recent New York Times story quoted the US Grocery Manufacturer's Association saying the counterfeit foods costs the industry between $10 billion and $15 billion a year.

Another firm, LITMUS, LLC is working on tags that change color to indicate the freshness of seafood. Across the board, smart packaging capabilities are expanding and costs are falling.

An early smart packaging prototype can that popped up when the fish was "ready" (testing limited to Sweden)

The Economic Implications

The economic implications of the paradigm shift to smart packaging are widespread, but we believe that it is worth highlighting two:

1) Packaging companies may want to initially focus their smart efforts on food manufacturers who suffer from the "Lemon Problem". That's not a fruit issue – it's the term that economists use to describe the fact that companies that produce fresh products can't capture the full value of their superior goods because consumers fear buying "a lemon" (the first market economists looked at when describing this issue was used cars; people selling good used cars received less when the buyers had no way to verify quality, and feared getting stuck with "a lemon" of a car). Seafood, dairy and produce companies, for example, will increasingly fight their lemon problem through smart

packaging assuring consumers of their products' freshness.

2) Packaging companies who already "get" the trend towards embedding information may want to look upstream or downstream for partners or acquisitions, as those packing firms who are able to deliver integrated solutions stand a better chance of turning commodity products into value-added solutions to the issues described above.

Conclusion

"If you don't like change, you're going to like irrelevance even less." - General Eric Shinseki

"Smart packaging" can come in many forms, but packaging firms that service US food and beverage companies need to consider now how they will stay in the game in the next decade. Packing firms need to be changing at least as fast as the consumer that the food industry services. For us, a recent image that captured the spread of that change well was the juxtaposition of pictures from the 2005 announcement of Pope Benedict XVI with the 2013 announcement of Pope Francis. As you can see in the images to the right, in the past eight years smartphones and tablets have become pervasive parts of peoples' lives everywhere around the globe.

Thanks to this and the other drivers outlined above, the information expectations of packaging customers for the food business will be rising faster than you can say "Smart is the new Green".

Insight Advisory Partners would welcome a chance to discuss what the rise of smart packaging might mean for your firm.

Insight Advisory Partners advises companies in the food industry across all aspects of corporate and financial strategy including strategic growth initiatives, capital raising strategies, acquisitions and divestitures, retained search, due diligence, pre-and post-merger integration, turnarounds and financial restructurings. For more information please visit us at www.insightadvisorypartners.com or call 312-399-3627.