RETAIL IS READY TO EXPLODE

How IOT, Big Data and the Cloud Ignite the 4th Industrial Revolution in Retail

ThoughtWorks® Retail

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We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another.

– Klaus Schwab
*Founder and Executive Chairman,
World Economic Forum*

INTRODUCTION

A creative revolution is at our doorstep. Fundamental shifts in the way that individuals and organizations produce, deliver and experience goods and services are already here. Klaus Schwab of the World Economic Forum calls this the Fourth Industrial Revolution, saying "We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another". [i]

This sounds extreme, and it would be hard to fault anyone who saw this as just another case of academic hyperbole, but we believe that Mr. Schwab has named a disruptive transformation that is already happening. This is particularly true in retail, where there are unprecedented creative possibilities for radical change. The only question is whether existing retailers will be astute and agile enough to own the change in ways that create meaningful differentiation.

A great deal has happened in the retail industry over the last century, but a 1900's storeowner would still recognize the key elements of business today. Retailers continue to operate within the framework of buying and selling defined by the constraints of a "store". That store may be virtual or traditional brick and mortar, but it still largely reflects the basic model of commerce developed to serve twentieth century mass markets.

There is a real danger of being insufficiently awed by the scale and scope of the change ahead when a revolution arrives at our doorstep. Most of us spend our life working within stable frameworks with well-defined areas of opportunity, where the status quo evolves but seldom redefines itself. In this world, steady, incremental improvement is a perfectly acceptable strategy.

But revolutions do happen. When they do, the change is deep and transformational. Around 1780, the first industrial revolution applied machines to labor, and by 1870 a second revolution had marshaled these capabilities into factories that enabled mass production and created mass markets. This changed the world. Historically the United States had been dominated by agricultural employment, but by the end of the 20th century less than 2% of the US workforce was required to sustain a vastly increased level of agricultural production. The second industrial revolution triggered mass urban migrations. Educational levels skyrocketed and entire new industries emerged, including the foundations of today's retail business.

Today we live in the wash of the Third Industrial Revolution where electronics and information processing automate the forms of mass production developed in prior revolutions. We are masters of the mass market and the retail store concepts developed during the Second Industrial Revolution have reached full maturity.

Now the Fourth Industrial Revolution opens a door to far more revolutionary thinking and disruptive models of business. We believe Mr. Schwab accurately captures the reality of what's ahead when he says, "In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before."

Retail is poised to become a principal proving ground for these new possibilities, but today much of the innovation in this industry remains tied to the past. While retailers have rushed to update core business systems, leveraging new technologies such as new

point of sale (POS) solutions or using new omnichannel touchpoints to enhance the customer experience, this work is still largely done in support of the same basic business models that evolved over the last century. Even seemingly revolutionary new technologies are often innovation placebos. Many of the current generation of mobile retail apps simply revisit basic selling models. This may make executives feel they are making new ground-breaking investments, but in reality they end up simply building undifferentiated consumer tools that flounder among a million other applications available on mobile phone platforms.

Today is a genuinely different moment, where creative possibilities can redefine business models and alter the competitive environment. More and more examples are emerging of innovators who change the rules, making industry incumbents suddenly irrelevant. It only took three years for Uber's disruptive model - one that integrated new concepts of ownership, pricing, supply management and customer acquisition - to redefine the expectations of riders around the world, and for Uber drivers to outnumber the iconic yellow cabs on the streets of New York City.

Retail is ready for its own creative crisis. In the following five sections we highlight how today's incendiary innovations can be used to redefine the industry. The opportunities and challenges are presented in five sections:

• **Part 1:** *It's Time for a Crisis* – Why this is the time for disruptive change

• **Part 2:** *Follow the Customer Home* – Breaking free of the confines of store and engaging along the entire length of the value chain.

• **Part 3:** *Personalization for Real Life* – Creating unique value for customers at the moment of need in the actual context of their lives

• **Part 4:** *Hyper-responsive Supply Chains* – Serving needs in real time with new models for supply chain responsiveness and flexibility

• **Part 5:** *Creating Innovative Enterprises* – Creating organizations that can identify and pursue new market opportunities with the necessary agility

While each of these new capabilities is powerful in its own right, the real power comes when they are integrated in creative new ways.

There will be losers in this new creative world. As with prior revolutions, many who fall hardest will be those who were best adapted to and most successful in the status quo. Mr. Schwab observes, "An underlying theme in my conversations with global CEOs and senior business executives is that the acceleration of innovation and the velocity of disruption are hard to comprehend or anticipate and that these drivers constitute a source of constant surprise, even for the best connected and most well informed."

The world is changing in deep and fundamental ways, and retail will be one of the showcases for this transformational disruption. Winners will be the innovators that withstand the turmoil to break free of the box that has defined retail for a hundred years, and take advantage of the revolution's opportunities for radical creativity.

PART 1
Embrace the Crisis

EMBRACE THE CRISIS

Retail never stands still. When A&P invented the modern grocery store in the 1950's, its rapid rise to prominence was eclipsed thirty years later by discount empires such as Kmart and Walmart, who themselves are now threatened by online players like Amazon, who churlishly refuse to stay solely online.

Great Retail Revolutions

Sears creates the first mail order store with an extensive catalog that wows shoppers.

A&P redefines scale with the modern grocery store.

Kmart pioneers the discount store format.

Walmart builds the killer supply chain (crushing Kmart).

Borders pioneers the book palace (SKU's and coffee).

Amazon creates the second virtual store (disintermedtiating Borders).

Zara invents just in time mass market production.

There are places where the underlying thinking and business models are particularly vulnerable and subject to deep disruption. This is one. The key value proposition for stores - that there is big money to be made by acting as the middleman between production and consumption - is reaching the end of its life.

This doesn't mean that retail is dead, or that the only remaining opportunities are for commoditized "dog eat dog" battles that squeeze tiny margins out of exhausted markets. Even as grim battles are waged to scrape a little more meat off the retail industry's old bones, untapped opportunities remain to create value.

We Need A Good Crisis

We need to embrace a crisis. For the last century a store has been defined by four walls that enclose a selection of products. It's a crate within which we do commerce.

The digital revolution didn't do much to change this model. When we talk about online commerce, we use the language of stores. In a very real sense the retailer's job is just to put things inside our smartphones and then let us buy them. Things go into the crate and people take them out.

What has changed is that everyone is exceptionally good at this set of skills, so the opportunities to differentiate and build margins are vanishingly small. New technology that is used to do old things rarely produces breakout wins. Advances in mobile technology can and should be used to create an easy shopping experience in-store, mitigate the pain of
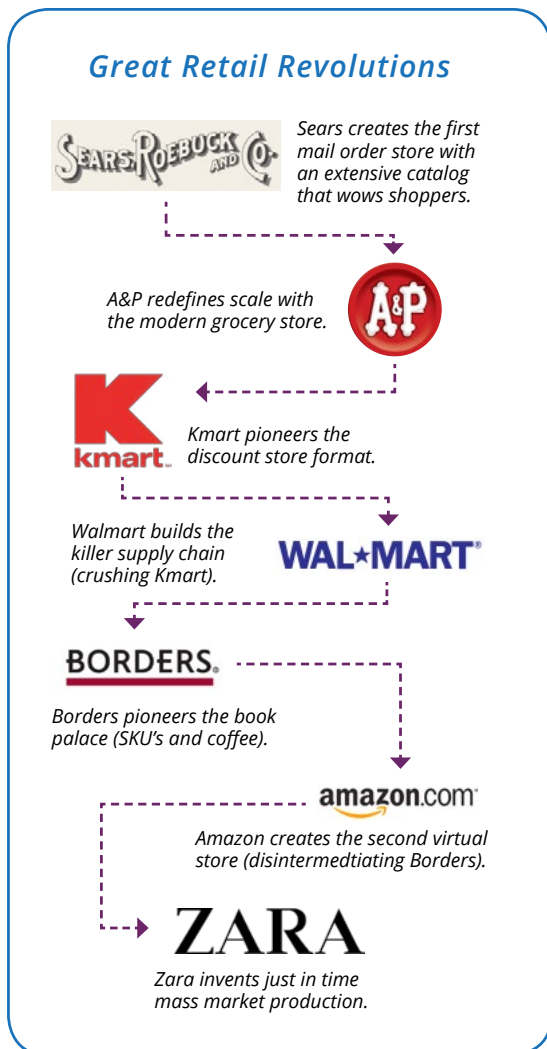
POS execution, or do a better job of providing margin-eating discounts to the very best customers. But none of those things will restore margins in a market where the underlying value of "putting things into a crate so that others can take them out" has become a commodity. Physical stores need to rethink their purpose.

Escaping The Crate!

The Retail Crate
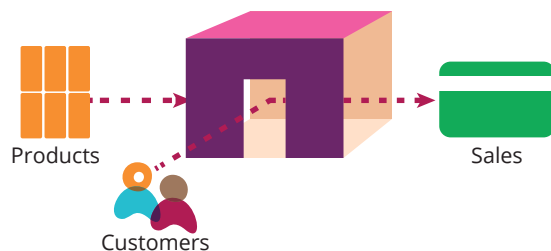
It's time to seek voices and ideas from outside retail's four walls. The same technologies that power better versions of a commoditized business model can be used to explore new territory and deliver value propositions that remain untapped in modern retail. In each of the settings below the physical store is a small part of a much larger set of opportunities that create value for customers and suppliers.

1. *Follow the Product Home* – The point of sale is just one step in the customer's acquisition and use of a product. Long chains of cost and value, largely untapped areas of opportunity and disruption, extend out on either side of the customer's sales interaction with retail stores.

2. *Deliver Solutions, Not Products* – The idea of selling a "thing" is based on the concept that customers will be responsible for using it to create value in their lives. What happens when retailers engage more directly in delivering that end value?

3. *Make Every Product Personally Perfect* – Stores exist because there are products to put inside them. When

it becomes possible to custom tailor products to the unique needs of each customer, the crate's purpose will become something quite different.

This Is Hard Work

When anyone makes the claim that there are riches to be had in some new idea, it is always worth asking, "Why hasn't this been done yet?" That should be particularly true of anyone pitching ideas that take a sharp turn off the well-worn path.

Part of the answer is that there has been a lot of money to be made within the traditional retail model. This is the classic trap Clayton Christensen identified for established industries: when things work well and at scale, it is hard to create the momentum for change. The more radically different an idea seems, the greater the barrier to strong creative pursuit. All three of these opportunity spaces will seem strange to those ingrained in the traditional retail mindset. Why break your business model, when you could simply build a mobile app for online ordering?
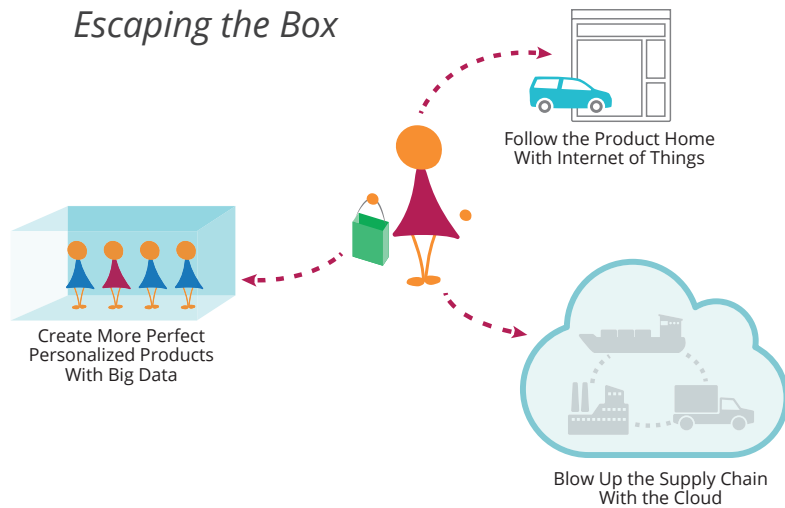
It's not just internal resistance to change. Each of the three "outside the crate" opportunities requires building complex business systems that mix many different skills. There are a lot of moving parts… and many of the parts are new and untested. Fortunately, new technologies are emerging that dramatically extend our capabilities and shift the economics of these strategies.

Each strategy is fueled by a powerful new technology trend. The internet of things (IOT), big data, and the cloud are more than buzz words in this context. They unlock new opportunities that have been off limits to retailers.

The Great Crate Escape Begins

Investing in being better at an exhausted business model is like squeezing a rock harder. The well understood world of operational optimization for

Escaping the Box

Follow the Product Home
With Internet of Things

Create More Perfect
Personalized Products
With Big Data

Blow Up the Supply Chain
With the Cloud

internal benefit has vanished. So, how might retailers find a way to matter more?

The first step is to let go of our fixation on a field of play that has become increasingly barren, to step out of a box that has become a trap. The great escape has already begun. When Amazon places a Dash button in your laundry room, the meaning of the store begins to shift. When young professionals stop buying cars, and simply Uber when they need to go somewhere, the

meaning of product changes. When a replacement knee is uniquely designed and constructed to fit a specific patient, it is more than just a medical advance. Mass market supply shudders.

None of these opportunities lie inside traditional retail. They call from a world that is rich in diversity and complexity. Shed the traditional view of what retailers do, where and how they do it, and all sorts of doors open up.

PART 2
Follow the Customer Home with IoT

Follow the Customer Home with IoT

There is a long chain of costs and value that a customer experiences for each product they buy. The vast majority of these consumer costs and benefits are ignored by retailers, which makes them an exciting area of opportunity.

What a Bag of Kitty Litter Really Costs

Let's use the example of kitty litter. A simple bag of kitty litter is full of a dozen little costs in a pet owner's life. There's a list to make, a trip to the store, the toting it home, and eventually the unpleasant job of scooping it up. A bag of kitty litter drags along with it a dozen points of need, yet how many of these opportunities does a traditional retailer capture from inside the crate? Just two ... product selection and purchase occur inside the traditional retail box. Everything else is left for customers to manage as best they can.

Every One of Those Points Represents an opportunity.

It's ironic that retailers continue to fight tooth and nail over a few small sources of value while ignoring so many other untapped opportunities. It's a market ripe for disruption with a land grab waiting to happen.

It's easy to miss the nature of this opportunity when traditional "inside the crate" retail thinking dominates. For example, the challenge from online sales is often framed in terms of the online retailer's price advantage. That is certainly an issue, but it views both the threat and opportunity in terms of the traditional retail role of enabling buying.

Claiming the Opportunity

Through a traditional lens, home delivery is simply a problem that online retailers need to solve in order to get back to the real business of selling. UPS and other delivery services were happy early beneficiaries of this willingness to outsource a new opportunity to others.
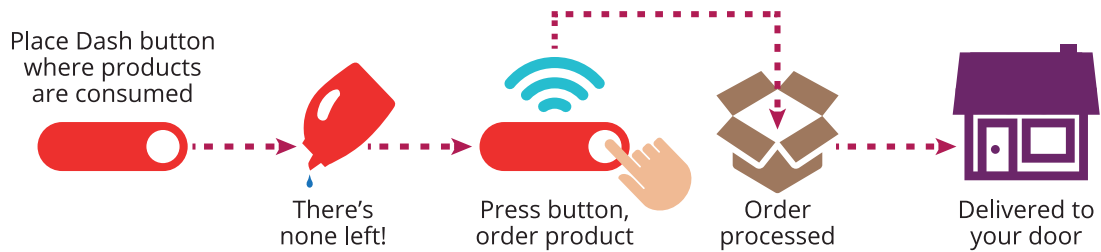
Yet, it's clear that home delivery is about more than just enabling a sale. Delivery is itself of value. Consider that bag of cat litter. With home delivery, the trip to the store and the unwieldy lugging of cat litter home are eliminated. Cutting out these steps creates new possibilities to reduce other costs. If there's no need to lug a heavy bag of litter on the subway train home, a bigger package can be purchased and erstwhile pet owners can make fewer runs through the litter buying cycle.

It's a good sign that retailers are increasingly unwilling to grant this chance to create customer value to others. Amazon's one-hour delivery service launched in New York City in 2014 and is now going global with the option available in London for 6.99 pounds per delivery. This provides a fairly explicit market valuation for what a trip to the store costs the customer.

IOT in Action - Amazon Dash

Just push the button. Amazon Dash enables consumers to get items from batteries to beverages replenished by literally hitting a button. It's a simple example of using the Internet of Things to capture previously ignored steps in the product value chain.

Amazon Dash

Place Dash button where products are consumed

There's none left!

Press button, order product

Order processed

Delivered to your door

The Dash button connects to the user's home wi-fi network and is synchronized with an Amazon smartphone app. It can be configured to allow consumers to order a pre-determined product using their Amazon.com one-click settings.

In the future, predictive analytics could allow Amazon replenishments services (ARS) to facilitate automatic ordering and delivery of consumables, based on the rate of appliance use. This will truly circumvent the product delivery chain.

Breaking Barriers - The Enabling Technology of IOT

To be fair, most corners of a customer's life have been inaccessible to retailers. Even if an ambitious innovator wanted to claim new opportunities along the customer's cost and value chain, there were few practical ways to do it.

Those barriers are falling, thanks to a rapidly developing set of new technologies collectively known as the Internet of Things (IOT). These small bits of smart connected technology are increasingly scattered across the path of people's lives. The Apple Watch literally connects people's bodies to the Internet while the pioneering Nest thermostat now conspires with dozens of other devices to manage the home environment. Distributed technologies have grown so important that one vehicle review pointed out that the Ford under consideration was a splendid car, but still downgraded the rating because of awkward in-car electronics.

In their early days, Internet of Things technologies seemed like bright and shiny toys looking for a problem to solve. Now a rush of technical development has created rich potential to disrupt the product value chain. In isolation a smart stove is a gadget. Integrate it with a home full of connected devices and some real life problems can be solved.

Retail is ideally positioned to bring the Internet of Things into its own rich problem space. Mobile technologies began to enable retailers to reach outside the store, but IOT dramatically extends those possibilities.

When customer's lives are filled with tiny devices, it allows creative retailers to:

• *Handle Requests* – It's no longer just a mobile phone or a tablet that reaches into a customer's life. Technology embedded throughout our world in products and other devices provides an ever-growing number of touch points through which requests can flow. The devices don't even have to be picked up and intentionally engaged. The opportunity to act is simply "there" where the moment of need arises.

• *Gain Insights* – These same technologies can provide a far richer measure of need in the daily corners of a customer's life. Why does a customer need to look at how many eggs are in the refrigerator when this is something the appliance can easily know? If we know they are running late at the office (via their wearable technology), why not delay that scheduled delivery to their home?

From Small Pains, Big Opportunities, and Bigger Threats

Kitty litter might seem unimportant as a business challenge, but it's wrong to discount the potential impact of this shift. These real life points of cost and value that stretch through a customer's engagement with a product have market value. There is an economic value to serving unmet needs; recall that in London one hour delivery was worth 7 pounds. This an exciting proposition in a market where conventional opportunities are so hard to sustain.

The opportunities can be substantial, but the threats may be of even greater concern. When competitors claim high value needs, they can bundle them in ways that remove the traditional role of the retailer altogether. Consider the case of men's razors. The Wall Street Journal reports that web subscription sales for men's razors doubled in the space of a year. Subscription services basically made getting a good razor painless. Buyers piled on, while Gillette,

the dominant player in the space with deep ties to traditional retail models, was left to play catch-up. (One of the authors is a beneficiary of this trend. A satisfied Harry's customer, he has effectively left the marketplace since his needs up and down the chain of value have been served).

Interestingly, playing in these open spaces doesn't just create standalone opportunities. The points of value are often naturally linked together. Take a holistic look at a restaurant's end to end approach to delivering a meal. It takes on the job of devising recipes, procuring ingredients, cooking, serving and cleaning up afterward. Once a customer walks through the door she no longer expects to be asked to make a short trip to the market for some ingredient. The grocer disappears as a player in that night's meal.

Doing Even More

IOT technologies and creative business strategies make it possible for retailers to extend their involvement in the customer's life. It becomes possible to do much more than offer a convenient place to buy stuff, a premise that has defined retail for years.

That's exciting, but it is just the beginning. Big Data and advanced analytics enable their own paradigm-busting strategies. That is the next part of this story of disruption.

PART 3
Individualized Value with Smarter Big Data

Individualized Value with Smarter Big Data

Customer delight is often conveniently defined as a great purchase experience. There's no debating that a great experience inside the retail store - finding exactly what you want, enjoying the ambiance, and receiving friendly service - is a genuine joy. Shopping inside the crate, whether it's a brick and mortar or online experience, can be a lot of fun. However, it is far from the only joy or challenge in life.

Retailers who see their customers as genuinely three-dimensional people and can act on this rich contextual insight – who customers are, what problems they are trying to solve in their lives, who they are solving these problems with and how they define value – have the opportunity to differentiate themselves in a compelling way. This is good news in a crowded marketplace, because as stores become ever more polished, a fine shopping experience will become an increasingly commoditized customer expectation.

Really engaging with individual lives requires another escape from the traditional retail crate.

Beyond Stick Figure Customers

Since the advent of mass market retail, retailers have cast customers as groups of one–dimensional stick figures, with simple easy to understand needs, who fit into neatly drawn segments. The retail store replaced the custom creations of individual craftspeople with a pre-defined product to be sold to as many people as possible. It didn't matter who those people were as individuals. Even as organizations work to build 360-degree views of their customers, these perspectives are often constrained within the narrow boundaries of stocking and selling products. The retail crate was founded on the efficiencies of scale that came from serving a broad market in roughly the same way. The current focus on customer-centricity aims to change that.
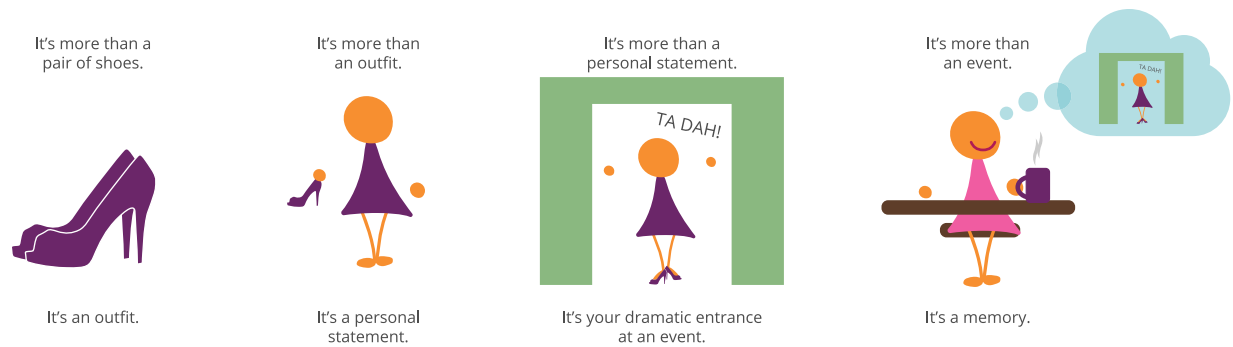
But even a decade's worth of purchase history and an up to date reading of a customer's family, home, and financial profile creates only a stick figure view of someone's life. This wealth of big data has little to say, for example, about what next Tuesday morning will look like for them or how their needs shift moment to moment.

Much of the investment in so-called personalization has been about getting a better fit between unique individuals and the preset choices available to them. Programs that delivered targeted offers were really more of an operational improvement to the mass market business model - good for the retailer and the coupon sponsor, but hardly transformational for the customer.

"Others who bought this also liked this" type recommendations are only marginally better. The mere fact that someone looks at a book on cooking for diabetics is just one data point. What a three dimensional customer genuinely desires will vary dramatically depending on whether she is doing a report for school ("Please help me pass my class"), looking for a gift ("I want to show that I care"), or buying it for my her own use ("I'm worried and really need some support").

Personalization Grows Up

Real lives encompass shifting, complex and messy definitions of value, which demand a deeper kind of understanding. Ultimately, purchases are not about

It's more than a pair of shoes.

It's more than an outfit.

It's more than a personal statement.

TA DAH!

It's more than an event.

TA DAH!

It's an outfit.

It's a personal statement.

It's your dramatic entrance at an event.

It's a memory.

the acquisition of a "thing", but about the role those things play in our lives.

If a retailer's only goal is to put a coupon in someone's hand, there is little value to understanding a customer more deeply. However, if retailers are willing to escape the crate and actively involve themselves in each customer's unique life, then there are almost immeasurable opportunities to create micro-markets of one, each with their own metrics for delight. Success will be driven by the ability to create unique brand experiences, products and services that customers perceive as valuable.

How might narrow retail services be extended? Think about what you might expect from a friend who knows you. That friend might enrich your life by:

• *Curating:* Almost everything works together with something else. If your friend has a sharp sense of style or in-depth knowledge, she would be the one you seek out to find the right combination for your personal style and life need. Fashion is an obvious area where this matters, but it is just as relevant to someone undertaking a new home improvement project, preparing for the birth of a child or even trying to figure out how to prepare for a new career.

• *Discovering:* As choice explodes in every aspect of life, individuals have a growing desire to discover new possibilities and stretch their world. Exploration is a highly personal act. A genuine friend would draw on more than your purchase history and a few mobile phone data points to help you discover

new possibilities. They would be aware of the kinds of personal questions and aspirations that underlie your interests: Who am I? Who do I want to be? What things have fallen by the wayside in my life? What's new and exciting?

• *Tailoring:* Remember the custom craftspeople and tailors of yore? Their products were customized to the needs and preferences of each customer. Consider the power and promise of custom crafting what you offer to the individual. Let's revisit the diabetic book example. Imagine you were a friend who wanted to help. You might propose radically different types of aid ("Can I help with your research this weekend?"; "Do you want me to gift-wrap that while you go pick up the kids?"; "Would you like me to hook you up with the support group my sister attends for people who are managing their diets?")

Note the common theme with all these strategies: they are all about creating unique improvements in individual lives. None focus on selling products inside the retail crate.

Today – StitchFix Personal Curators

StitchFix is an online personal styling subscription service for women. It curates a selection of clothing pieces and sends them to the customer's home at predefined intervals.

The service taps into a challenge many women face. They want clothes that work with other items in their wardrobe and that fit the range of wearing occasions

demanded by their lifestyle. It is often challenging to pull individual pieces together into the right collections, or to imagine the multiple ways that an item might work with what you already own, when shopping in the moment.

StitchFix uses analytics to combine information from a detailed questionnaire that includes questions about personal style, lifestyle activities, body type and other preferences, with customer ratings of prior recommendations, to propose even more tailored suggestions.

However, StitchFix doesn't stop there. They combine this digital insight with the judgment of 300+ human stylists who deliver customized selections, taking into account each client's unique circumstances.

Ideally, it is like having a friend with great taste on call. This is how one of the authors learned that her personal style is Boho chic.

Real Time Context: Life in Motion

When you enter a store, time stops. Whether it's opening an app or walking through big glass doors, the customer puts her life on pause while she shops. This of course can be a good thing, a welcome respite from the bustle of real life. But it also places the retailer in an isolated bubble separate from the real business of living.

Real life is in motion. The best opportunities to create unique, differentiated value are tied to changing moments of experience. Everyone knows that the shopper is more than a demographic data point who enters a store or types a URL. But what does this mean, and how many retailers truly embrace the concept of the shopper as a unique, three-dimensional individual?

Context as viewed from a customer's life is rich, diverse, and changing. We process a dizzying array of inputs all the time as we determine what really matters to us in any given moment. If you're running late, it matters if there is a meeting first thing in the morning. The importance of stopping for a coffee may be linked to how late you were up the night before. Your patience for the traffic backup on the road ahead is deeply influenced by whether the children are fighting in the back seat.

Context produces intense but fleeting needs. These needs dominate our daily lives and create opportunities impossible to fulfill within the fixed mindset and physical constraints of traditional retail. Choosing to serve these needs grants permission for wild thinking. How about a drone that dips into the traffic jam with your specific coffee order? Talk about context-dependent delivery!

The Near Future – Fernanda's Real Time Date

Data-driven insights combined with the Internet of Things create the possibility to provide personalized value in real time. Consider Fernanda's date.
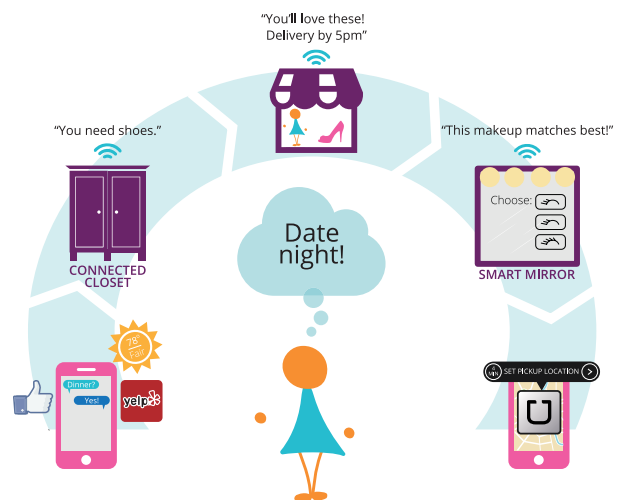
Alert the team. Particulars of her date arrive in a text and are quickly shared with friends via an army of smart devices.

Getting smarter. More information is automatically marshaled from a suite of digital sources. It'll be raining

... the weather service. The table will have low lighting ... the restaurant's building management system. Her afternoon client meeting is across town and won't end until late ... the calendar app on her phone.

Her closet steps in. Remembering everything she's worn since college, her closet knows she will want to look sharp. It recommends an outfit, matching Fernanda's personal style with insights from on-trend fashion sites.

A problem. The only shoes that match the outfit are suede. The closet knows that's bad in the rain, so it sends a description for the planned outfit to a stylist who knows Fernanda. She curates shoe suggestions from a half dozen sources around town, and during a break at the office, Fernanda picks a favorite. They're automatically delivered to a locker near her crosstown parking spot.

Personalized look. Fernanda dashes home and sits in front of her smart mirror. It detects the tan she picked up over the weekend. Knowing the closet's recommendation and the restaurant's expected lighting conditions, the mirror sends instructions for a makeup formulation that's mixed by maker technology sitting on her dresser.

She's running late! Thankfully her home's information system knows where the closest Uber cars are and which driver will be willing to come out to meet her with an umbrella.

Adjusting in real time. At the restaurant, the date is going well! Her wearable tech notices her heart rate is up. So, when she makes a trip to the restroom, her interactive pocket mirror recommends a few makeup tweaks to deal with nervous perspiration.

Does this seem fanciful? Be careful, there are no miracles here, just data science and engineering. They create highly individualized business opportunities in apparel, delivery, cosmetics, transportation and a host of personal services. Where is the traditional retailer? Absent.

Bigger Big Data

For all the terabytes of information that have been gathered, this is still a technology in its infancy. Traditional retailers, with their focus on simple product recommendations and targeted offers, provide a small stage for Big Data's performance.

Personalization and real-time engagement change all that. When retailers can engage richly-drawn individuals when and where they act, there are enormous opportunities to apply sophisticated and nuanced insights. Big Data can finally strut its stuff.

• *Ecosystems of Data:* The network of data can grow well beyond the simple tracking of purchase history and personal demographics. Many of these diverse real-time sources will lie outside the retailers own systems.

• *Real Time Thinking:* Personalization focused on offers and recommendations has relied on offline processing for the heavy lifting. That works fine if your goal is to assign a coupon to a customer. However, real impact comes from assessing context and shaping a sophisticated individual response in real time. Expanded machine learning capabilities will further open the door to dynamic evaluation and recommended courses of action optimized for the specific circumstance and moment in time.

• *Deeper Brilliance:* Big Data is not just about the data. The real power lies in the ability to choose a course of action that is genuinely appropriate to the moment. More data and richer problems are creating a fertile environment for these more sophisticated and elaborate insights.

People have been talking about a 360-degree view of the customer for some time now. We believe that it is not the 360-degree view that matters but rather a context-dependent view. Improved analytics and integrated omnichannel capabilities will allow retailers

to map customers across their path to purchase. Sensor technology in-store coupled with the geo-location on customers' own mobile devices will allow retailers to deliver tailored communications and support based not only on where customers are on their path to purchase but on their physical location as well.

We've tackled the possibilities that open up if retailers think about the product journey in a new way. We've explored the opportunities to think about new approaches to personalized service individualized value creation. Next, we consider what happens if retailers escape the crate by fundamentally rethinking what being a retailer actually means in the 21st century and beyond.

PART 4
Hyper-responsive Supply Chains

Hyper-responsive Supply Chains

Much of retail's history has been written by those who whipped their supply chains to deliver ever higher levels of performance. Walmart became the world's largest retailer based on its legendary ability to source and place product inside its stadium sized boxes. Zara pioneered fast fashion with its blistering design to store cycle. And now Gap is also piloting the fast fashion model, proposing to run small "test" orders and increase the speed and responsiveness of its sourcing organization.

But what happens if we escape the traditional store, our retail box? If we pull apart the customer side of the business, the supply side will feel the shock. Following the customer home or delivering perfectly personalized value are opportunities that are not driven by the capability to deliver mass-produced goods to a mass market. They thrive instead when fed by a supply chain that enables responsive variety.

It will be more than better, smoother merchandising or just in time inventory management that allows retailers to escape the box. New hybrid retail models are already far less constrained by the necessity of keeping large inventory in their spaces. Look at Bonobos pioneering low inventory 'Guideshops'. These are primarily showrooms for the inventory available online. Customers use the stores to deliver the tactile experience that only physical stores deliver, but the breadth of choice resides outside the box. As these models continue to proliferate, they will give rise to a supply system that traditional retailers will scarcely recognize.

Begin by Redefining Efficiency

Efficient supply chains matter in a world where putting product on the shelf and managing inventory

are at the center of operational excellence. The mass market has trained us to prize the ability to replicate a fixed selection of products and services cheaply at scale. The more product that can be poured into the store, the better.

It is a cost-per-unit definition of efficiency where variety comes at a cost. Every incremental SKU, every unpredictable customer whim, adds another bit of overhead.

Retail Box Efficiency
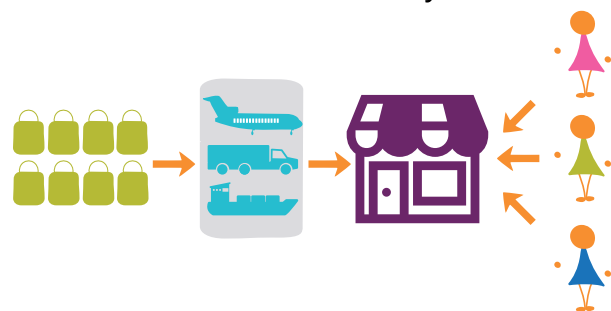
How good you are at getting a lot of a few things into the box

Outside the Box Efficiency

How good you are at creating unique personal value when and where it is needed

Escaping the traditional store model requires a new view of efficiency. Outside the traditional box, what matters most is a firm's ability to serve a wide variety of of unique, individual needs. This requires a definition of efficiency based on unit value, not unit cost. Efficiency still matters in a competitive marketplace, but it is the organization's ability to deliver original value cheaply and "efficiently" to individual customers that drives success.

Creating Pluggable Architectures – Supply Chain Lego

For all the talk about customer engagement, if you look under the hood of a big retailer, a substantial share of the technology is made up not of customer-facing technology but of big monolithic supply side systems. Many of these legacy elephants are at or beyond the end of their natural life. This offers the chance to ask a strategic question. Should big backend systems be updated or replaced? Or, is this moment of re-investment a chance to completely reimagine the way that the supply chain is executed?

Feeding the incessant need for faster and cheaper by building better monoliths, may buy short-term wins in the box's cycle of vicious competition, but it also traps the retail organization within the confines of the current narrow business model. Investing in a monolith is a liability for three other reasons:
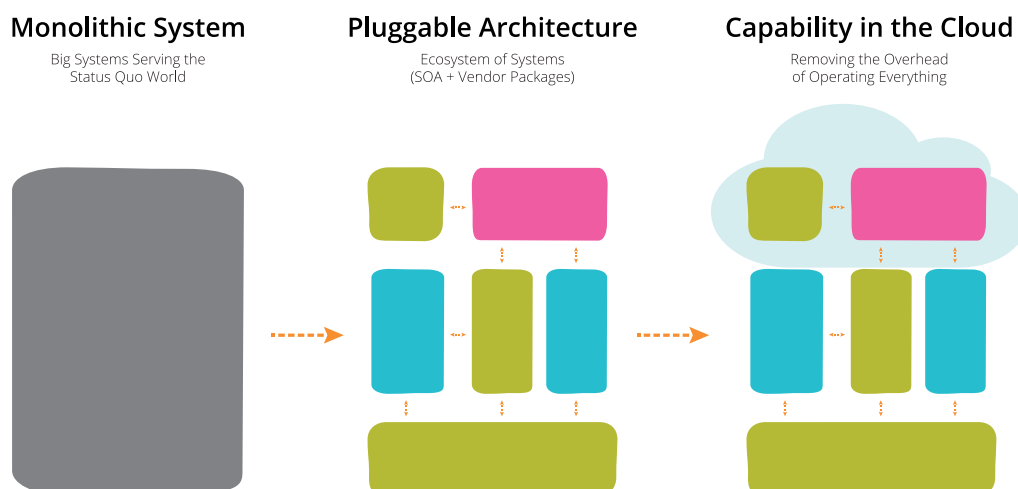
• *It's a One Way Street:* It's built for current needs and current views of the business (i.e. inside the retail box). The complexity of these big integrated systems makes them fabulously difficult to change later.

• *That's Hideously Costly:* Monoliths are famously time-consuming and costly to build and deploy. Often the cost and effort is so great that they never actually replace old legacy systems, and so the monoliths proliferate.

• *With Big Risks:* The track record for big all-encompassing technology projects is quite poor. The risk of project failure grows with the scope of the system.

Fortunately, a series of technologies are coming together to enable the demolition of the monolith and enable a far more flexible foundation for a responsive supply chain. The first of these is the evolution of Service Oriented Architectures (SOA). This is, in effect, the breaking up of monoliths into independent pieces, which in turn has enabled an explosion of technology vendors with more adaptable functionally-targeted solutions. These can be combined in an ecosystem of applications where individual parts can be swapped out and evolved along different paths.

Combine this with the cloud and you have the Platform As a Service (PaaS) model. Instead of having to set up

Monolithic System	Pluggable Architecture	Capability in the Cloud
Big Systems Serving the Status Quo World	Ecosystem of Systems (SOA + Vendor Packages)	Removing the Overhead of Operating Everything

and host on-premise systems (a huge task even for an out of the box software package), the cloud enables this operational overhead to be handled by others.

Inviting in Intriguing New Participants

With a new more flexible technical foundation, it becomes possible to invite new suppliers and collaborators. eBay and Amazon have fostered marketplace models where the barriers to becoming a supplier are vanishingly low. Interestingly, these open marketplaces also shift risks and responsibilities. Instead of taking ownership of forecasting and its associated inventory risk, these functions flow up the supply chain to the suppliers themselves.

It's the start of a change, but these open marketplaces are still rooted in the original Retail Box. While the source of products has been democratized, the business model is still about selling things within the traditional retail model. However, combine this openness with the context-aware customer engagement described in Part 3, and something genuinely different can occur.

For example, as the Internet of Things creates an ever smarter world around each consumer, previously dumb appliances can sense the ebb and flow of a family's life and understand preferences for things like organic fresh local produce. A smart refrigerator connected to the web, could become a new kind of shrewd retail buyer, with unfettered connections to a marketplace that increasingly operates in the Cloud.

While the average busy parent wouldn't casually break with their weekly grocery shopping routines, a smart fridge would be happy to patiently sift through a host of creative new buying options. In a Cloud enabled world, the refrigerator could locate a local farmer that only intermittently has fresh organic eggs for sale. Micro-suppliers like this wouldn't need a storefront, evocative brand or even a continuous presence in the market to sell to the fridge. Instead, the stainless

steel buyer sitting in a kitchen can conspire with them to shatter the long supply chains serving centralized retail locations.

What started with the "farm to table" movement is now being replicated across a broader range of consumer and industrial goods. As consumers demand more personalization and greater transparency to the provenance of the products they use, a wide range of innovative tools that marry the sharing economy with access to providers will continue to proliferate.

Supplying Infinite Variety on Demand

As markets become based on individual moments in individual lives, suppliers will increasingly need to think about short-run, micro-scale production. This can be supported with a wide range of emerging tools. Here are a few:

• *Maker Technology:* Digital printing and other "maker" technologies are still in their early days, but they are positioned to disrupt these nimble supply chains with personalized products. Custom-built knee implants, where "image to implant" techniques translate a body scan into a custom shaped body part, are already improving this common knee-implant surgery. When it becomes possible to routinely tailor perfectly personalized jeans as well as a replacement knee, the traditional store's role of selecting and stocking product will become largely irrelevant.

• *Supply Ecosystems:* The emergence of tools to communicate real time demand creates the opportunity for organic networks of supply. Uber and Air BnB are the first high profile players in this space, where customers can not only signal demand, but also have real-time visibility to all available sources of supply. But any market with distributed, untapped assets is ripe for this model.

• *Consumer Driven Investing:* Going even deeper into the supply chain, crowdsourcing sites like Kickstarter and GoFundMe make it possible for would-be consumers

to drive new products and services through direct investing. The customer jumps over the head of almost everyone in both the supply and investment chain to help create products that suit their particular fancy and desire.

Next... Pulling it All Together

What makes these models attractive to customers? They promise variety tailored to need. The businesses that are making waves with these strategies are the ones that have redefined efficiency around the fast, low cost, timely delivery of unique value.

Bring all these strategies together - following the customer home, delivering personalized value, and articulating a newly efficient supply chain of value - and the map of a new, deconstructed retail world emerges. Seeing this big picture is our next and final chapter.

PART 5

Pulling It All Together

Pulling it All Together

Leaving the conventional idea of a store behind, completely escaping the retail box, is an invigorating adventure. Yet, it's an adventure that most retail organizations are ill prepared to undertake. Dramatically reimagining strategic possibilities requires being able to consistently deliver innovations that disrupt the status quo. Retailers must retool their organizations to support this task and in this installment we explore the stages leaders see on the journey to create a responsive Lean Enterprise capable of market disruption. Completely changing the model of what it means to be a retailer is the fourth and final option for escaping the retail box.

How Much Disruption?

While there have always been periods of disruption in retail, day to day business has been dominated by efforts to adopt the latest best practices at scale. The stable backdrop of the retail crate provided leading retailers with a shared checklist of things to master. Suppliers of the latest merchandising, supply chain, and customer engagement solutions showcased them at large trade shows where mass audiences would all be exposed to the same "best practices".

Optimizing Traditional Retail Inside the Box

Known and Understood

Disruptive and New

Today   Future

figure 1
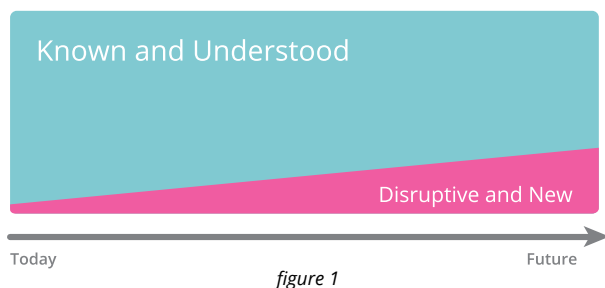
Adopting these best practices is neither easy nor innovative. They are focused on making existing systems incrementally more efficient or effective. Even though the concepts have been well chewed over and codified, the systems are expensive and time-consuming to implement. This hard work of optimizing the status quo often leaves little room for the creative and new (figure 1). Disruptive thinking and investment is done on the margins, if it is done at all.

Competing Outside the Retail Box

Known and Understood

Disruptive and New

Today   Future
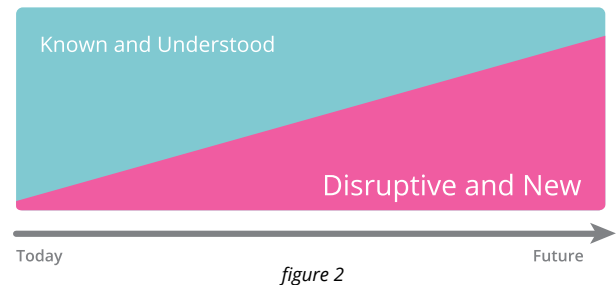
figure 2

In contrast, when retailers choose to compete outside the traditional retail model (figure 2) they are not focused on looking inward to modify current processes and systems. Rather, they look outside their own walls to disrupt the lives of their customers in creative ways. Their best opportunities are likely to be untested, requiring imaginative exploration. Optimization of known and well understood capabilities necessarily takes a back seat as creative disruption becomes the retailer's key skill.

Creative Maturity Level 1: Good at Doing the Predictable Better

Most retailers operate inside stable, long-established business models and are very good at doing predictable things better. They leverage the fact that they have a stable set of business rules, to make plans that can be followed.

Well-defined functional siloes focus on improving elements of their own processes, often without the holistic view that might lead to exponentially better solutions. Merchandising, supply chain, marketing and store operations teams make incremental changes without a full understanding of the up and downstream effects, or without clarity on what customers want or need.

They revisit strategies annually and (usually) support investments with very specific business cases. This means that investments are usually tied to solutions that enhance existing processes or optimize embedded technology. Project performance is measured in terms of compliance to specifications with the "Iron Triangle" of scope, time, and budget. Often individual departments' performance is viewed in isolation regardless of how its impact may enhance or degrade performance in other areas.

Command and Control
Doing the Predictable Well

Staying within budget, rather than creating new market value is the measure of success within the organization. This is not a model that promotes ongoing learning or transformative change.

Stable markets, where all players are making only small, incremental moves, make it possible to exchange creative opportunism for the comfort of predictability. But today's market dynamics are anything but stable.

Creative Maturity Level 2: Team Based Learning Loops

In contrast, when retailers operate outside well-understood business models, they uncover opportunities in previously lightly-explored areas of innovation. They begin to think about commerce, supply and merchandising in completely new ways. They challenge assumptions about the role they play in their customers' lives.

This demands a big change in thinking, a fundamental shift in the way that leaders view and manage business risk. Retailers need a management model that can:

• *Actively Respond to Change:* Leverage imperfect knowledge. Constantly look for new insights and pivot efforts to follow emergent opportunities and deflect newly discovered risks.

• *Pursue Unique Opportunity:* Prioritize efforts to differentiate in a sea of creative competitors. Focus management efforts around identifying and pursuing opportunities, not just completing work.

• *Create Quickly:* Quickly take action on complex new opportunities. Internalize the need for urgency. Do hard creative things quickly.

Alternative Models for Managing Risk
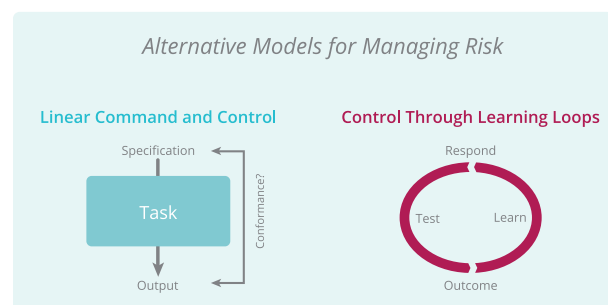
Traditionally siloed and hierarchical structures cannot explore and respond to opportunities in this way.

Fortunately there is a proven alternative that lets retailers respond in completely new ways. Over the last 15 years, "agile" technology and design teams have been mastering the use Learning Loops to enable nimbleness.

Agile methodologies have been widely deployed within IT organizations and within their partner delivery organizations, such as user experience design teams. They are on the ground, learning consistently throughout development.

Traditional Command and Control
Surrounding an Agile Team
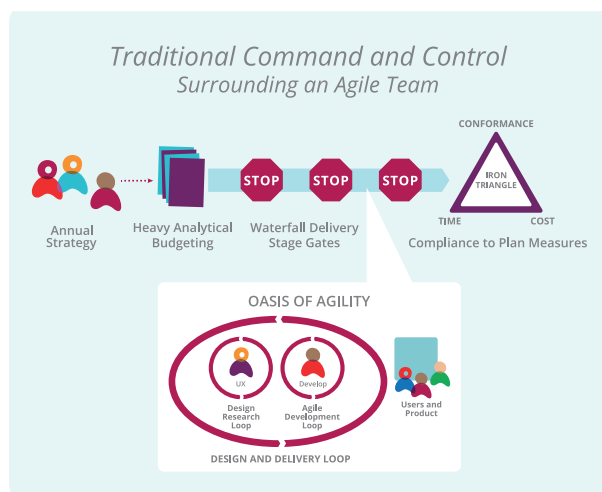
This allows them to see and fix errors that are within their span of control. However, it is common for these learning based teams to sit like an oasis of learning in an organization that is frozen into functional siloes.

Creative Maturity Level 3: End to End Innovation Labs

Creative oases are easily disempowered. An organization's resistance to change is often strongest among the middle managers charged with overseeing the traditional operating models. This frozen middle of the business hierarchy holds power over strategy, budget and the final declaration of success or failure. In traditional organizational hierarchies it is easy to attack change agents because the projected benefits of new ideas are hard to quantify, delivery plans are

tentative and incomplete, and there will inevitably be failures along the way.
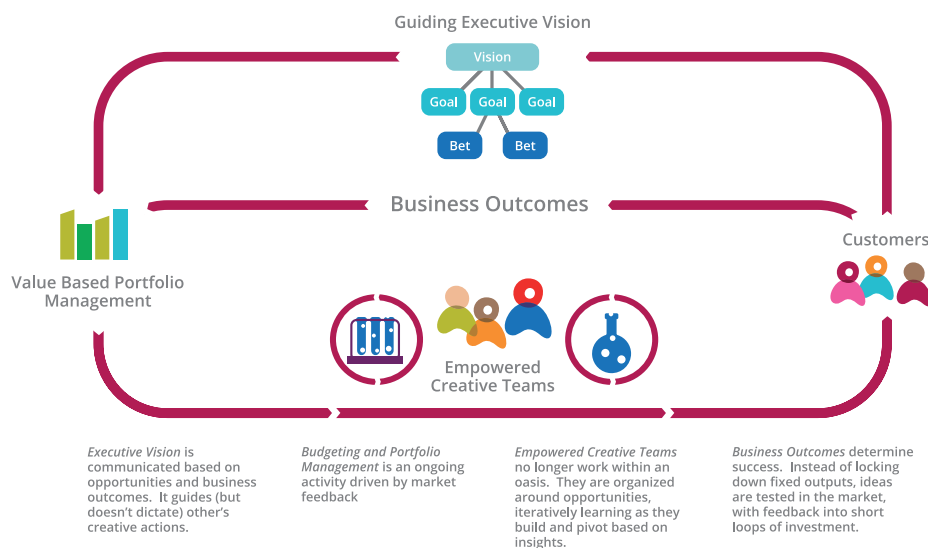
Recognizing this challenge from within their own organization, executive leaders intent on disrupting their business model often launch separate Innovation Labs. These mini organizations within the organization have control over the end-to-end innovation lifecycle, from budgeting through actual hands on testing with customers. They allow everyone who is safe inside the confines of the lab's walls to live the mantras of "fail fast" and "learn quickly".

Command and Control
Doing the Predictable Well
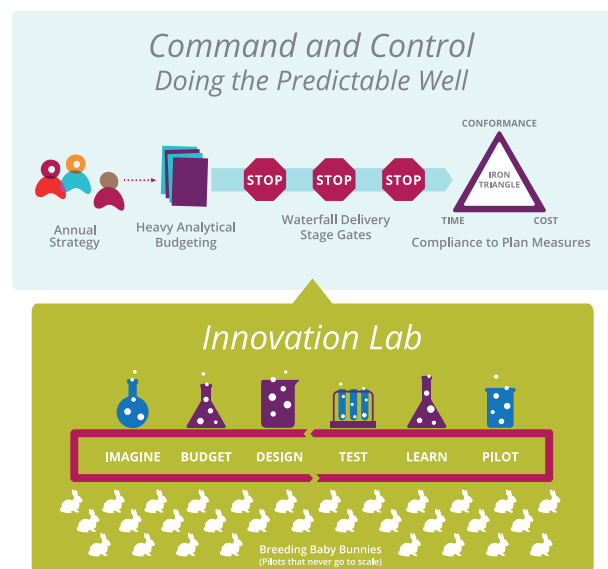
Retail Innovation Labs have been powerful tools for building brands associated with creative retailing. Nordstrom's videos of innovation teams working right in the store with customers to improve their shopping experience are genuinely inspiring and have spawned many imitators. Labs have proven to be great sources for articles in Wired and the Wall Street Journal.

Unfortunately, innovation labs' independence often creates an insular separation from the rest of the organization. Pilot programs proliferate like baby bunnies, and some may have great potential. However, teams pushing new ideas developed within the labs, even those that show great promise, face

Guiding Executive Vision

Vision

Goal Goal Goal

Bet Bet

Business Outcomes

Customers

Value Based Portfolio
Management

Empowered
Creative Teams

Executive Vision is
communicated based on
opportunities and business
outcomes. It guides (but
doesn't dictate) other's
creative actions.

*Budgeting and Portfolio
Management* is an ongoing
activity driven by market
feedback

Empowered Creative Teams
no longer work within an
oasis. They are organized
around opportunities,
iteratively learning as they
build and pivot based on
insights.

Business Outcomes determine
success. Instead of locking
down fixed outputs, ideas
are tested in the market,
with feedback into short
loops of investment.

major challenges when they try to take their disruptive ideas to scale.

Creative Maturity Level 4: Responsive Lean Enterprise

Ultimately, creative disruption can't sit in isolation. The organization as a whole must create a capacity to explore, shape and deploy untested disruptive ideas. The entire organization must be capable of responding to a dynamic, hyper-creative marketplace.

This is a big demand, but there is hope in the same models that have empowered teams on a smaller scale. Learning loops can be leveraged by executive teams, teams on the shop floor, the program management office and even management's frozen middle. For the retail enterprise to break through the safe confines of best practices, they all must be drawn into a dynamic partnership with the creatively empowered teams.

The application of learning loops to the entire enterprise is a relatively recent development. This shift isn't easy, but it opens the door to bold disruptive action outside the retail box. Consider a combination of disruptive ideas from earlier parts of this series. Imagine an enterprise building customized personal supply chains for their customers, extending the farm to table concept into people's daily lives. They would need to leverage big data insights, dramatically expand supplier relationships, establish new flexible store independent distribution models, and engage customer in the context of their daily life.

Old divisions that built silos between business and technology should be blurred or lost altogether. The fundamental culture shifts too, from doing a good job at the same thing that the organization has always done, to one of shaping complex new forms of value.

Such a model has allowed retail startups like Story and B8ta to completely rethink the traditional rules of retail. Their approaches to merchandising, procurement and commerce are unconstrained by conventional retail thinking and supported by organizational and technological platforms designed for innovation. As more retailers begin to focus more on an outside-in approach to service delivery, starting with a deeper understanding of how and why customers behave and building retail solutions around them, they will need to position themselves

for continuous innovation with learning loops.

Executive Vision is communicated based on opportunities and business outcomes. It guides (but doesn't dictate) others' creative actions.

Budgeting and Portfolio Management is an ongoing activity driven by market feedback

Empowered Creative Teams no longer work within an oasis. They are organized around opportunities, iteratively learning as they build and pivot based on insights.

Business Outcomes determine success. Instead of locking down fixed outputs, ideas are tested in the market, with feedback into short loops of investment.

A Final Wrap Up – Expanding the Field of Opportunity

The opportunities within the retail crate, that box that retailers put products in and where customers come to buy, are increasingly commoditized and subject to ever more tenacious forms of competition. It's a hard place to survive, and many who cling to that model will struggle to retain customers and profits.

The Retail Box is not a safe space. Not only is there blistering competition from others inside the box, there is also an explosion of disruptive new strategies from those who escaped, treating the old retail store model as irrelevant.

Getting better at a losing game is not a smart strategy. Escaping the boundaries of the store changes the story. The field of opportunity becomes the customer's entire life. Powerful new technologies like IoT, Big Data, and the Cloud, multiply the possibilities for creativity.

Disruption is not just a threat, it is an opportunity. There is nothing easy about being the retailer that thinks and acts differently from retailers of the past, but that path leads to a future filled with promise. There's a big new world outside the box. We should all be playing in it.

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Dan McClure supports executive teams and program leaders of creative organizations working to extend the impact of their innovation investments. He draws on over 30 years of hands on experience leading and enabling enterprise innovation, working with a wide range of retail and commercial firms in diverse business sectors, as well as government agencies, humanitarian and not for profit organizations. He has collaborated with some of the world's largest retailers, enabling organizational change agents to respond to disruptive change in their marketplace. He leads ThoughtWorks' efforts to stretch and extend innovation practices, focusing on the emerging challenge of doing "big innovation" with complex enterprise scale ideas that have the potential to disrupt and transform markets.

Dianne is a member of the ThoughtWorks North America Retail team. She partners with clientsto design meaningful customer experiences and deliver digitally-enabled solutions that create shared value for retailers and their customers. By helping clients to craft solutions that integrate front and back end-technologies, and embed the necessary process and organizational design changes, she positions them to generate customer delight, drive sustainable growth and increase profitability.

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[i] https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond