



Retail 4.0: The Age Of

# METAMORPHOSIS

A briefing for retail industry executives on a future arriving sooner than expected.

by Gary Hawkins

**Retail 4.0: The Age of Metamorphosis**

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**“The future will be far more surprising than most people realize, because few observers have truly internalized the implications of the fact that the rate of change itself is accelerating....”**

**Ray Kurzweil, The Singularity Is Near**

## **Retail 4.0: The Age of Metamorphosis**

Automation and digitalization are poised to disrupt the massive, fast-moving consumer goods retail industry in surprising ways, ensuring a dramatic restructuring that many companies won't survive.

The realities of automation and digital transformation are pressuring the FMCG retail industry to adopt new capabilities in realtime even as the forces of change have intensified in the wake of the COVID-19 crisis. The good news is that Retail 4.0 opens the door to exponential value creation, giving traditional retailers the opportunity to level the playing field with digital-native competitors. But to realize the opportunity companies need to prepare their organizations for convulsive change, embracing new practices, processes, and business models.

Will the retail industry be ready for a future arriving sooner than expected?



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## INTRODUCTION

Ten years ago I released Retail 3.0, describing how the massive fast moving consumer goods (FMCG) retail industry had evolved from The Age of National Brands (1.0) to The Age of Big Retail (2.0), before shifting focus to The Age of the Shopper (3.0). The elements of Retail 3.0 — marketing personalization, contextual relevancy and customer data-fueled brand-retailer collaboration — have largely come to pass.

Each of the three ages represented a shift in power across the supply chain, evolutionary changes enabled by incremental changes in technology. Mass marketing of national brands gave way to retailers leveraging big data into logistical expertise, to advances in analytics and insights supporting the shift to a shopper focus.

Unlike the industry shifts that have come before, the development of Retail 4.0 will not be evolutionary. The digital transformation of retail will be breathtaking in its scale, scope, and speed. This digitalization of retail — the industry transmuting into a new, higher-order, ecosystem — will be accompanied by a radically different economic model, disrupting a nearly century old industry.

**The staid FMCG retail industry has a unique opportunity to participate in exponential value creation, which up to now has been the domain of digital purebreds,** companies like Facebook, Google, and others. Beyond significant cost reductions through the automation of physical and business processes, the digitalization of retail opens the door to explosive revenue growth far beyond online shopping and digital ad networks.

“

***Retail 4.0 promises to be a near-total transformation in how people shop, how retailers operate, how products are distributed, and how brands manufacture and market.***

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And this change will happen far faster than most believe, or are ready for. The duration of each retail age has been growing shorter, reflecting our climb along the exponential growth curve of technology-fueled innovation. Retail 4.0, projected to come about over the next five years, coincides with our hitting the inflection point on that curve: Massive, comprehensive change is coming at us — fast.

And, just as a gust of wind can fan and redirect a flame, the COVID-19 pandemic has accelerated industry development while sending it careening in new directions.

Like the simple caterpillar giving way to the complex butterfly, retail is undergoing a metamorphosis, the DNA of traditional retail is becoming digitized and mixed with accelerating and converging technologies. **Retail 4.0 promises to be a near-total transformation in how people shop, how retailers operate, how products are distributed, and how brands manufacture and market.**

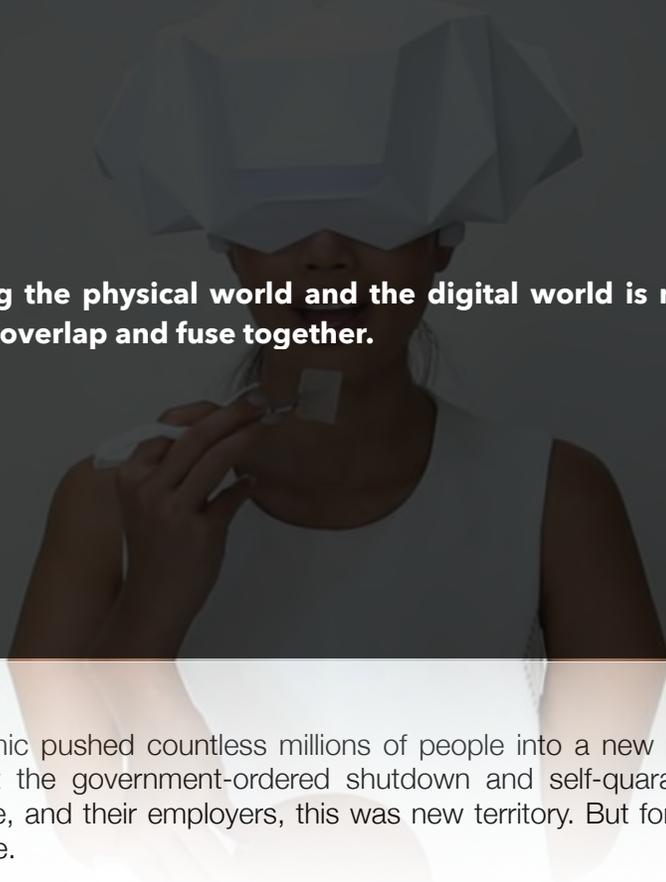
The question is this: Can traditional retailers reinvent themselves quickly enough to make the leap to 4.0 or will they be disrupted by an outsider — a new industry interloper able to move far faster, not held back by investment in legacy systems and an intractable company culture?

## A NEW DIGITAL REALITY

Project Nourished was an initiative launched several years ago that sought to transform the eating experience. Using virtual reality, aroma dispensers, and other sensory tools, the team successfully convinced diners that they were eating sushi, lobster, steak and other luxurious foods all while the diners were actually eating seaweed and agar-agar, a vegetarian gelatin substitute produced from a variety of seaweed vegetation. Many stories were written about the unique sensory experience.

The Project Nourished initiative is fascinating in that it shows just how much digital capabilities can impact and alter our view of the physical world. But it is also informative: No matter how sophisticated the manipulation of the digital environment becomes, it ultimately bumps up against the physical world. The adventuresome diners did ultimately consume real food.

It is this digital-physical nexus where we live, work and shop today. **The boundary delineating the physical world and the digital world is no longer clear as these two realities increasingly overlap and fuse together.**



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The COVID-19 pandemic pushed countless millions of people into a new reality, forced to work from home throughout the government-ordered shutdown and self-quarantining. For many of those millions of people, and their employers, this was new territory. But for others, it was simply another day at the office.

eXp Realty is a publicly-traded real estate brokerage that generated nearly \$1 billion in sales in 2019, up 96% from 2018. That pace of growth is unprecedented for a single brokerage company, almost unthinkable for a real estate company not structured as a collection of local franchises.<sup>1</sup>

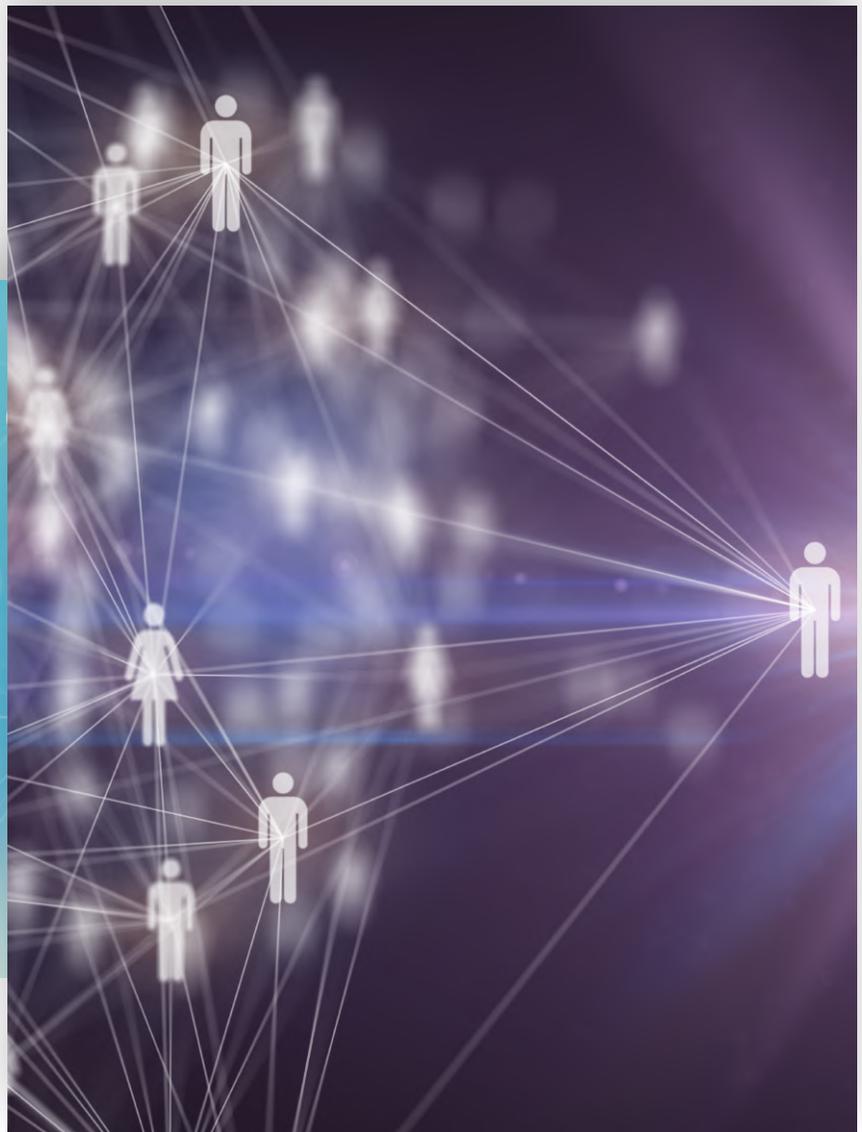
<sup>1</sup> Aaron Frank, "Inside a \$1 Billion Real Estate Company Operating Entirely in VR", SingularityHub, July 8, 2018, <https://singularityhub.com/2018/07/08/inside-a-1-billion-real-estate-company-operating-entirely-in-vr/>

eXp is a traditional real estate brokerage helping people buy and sell homes in the physical world, but the company uses a digital, virtual world as its corporate office. Some 25,000 agents work inside an online, virtual reality world, attending meetings, going to training sessions, and meeting friends. The only physical presence the company has is a small office in Bellingham, Washington, and a couple of other empty offices where mandated.

Think about the radically different financial model that eXp Realty operates with, compared to more traditional competitors. In New York City, office space per employee costs around \$15,000 per year. In eXp's virtual world, employees sign-in, and their avatar heads off to work, using nothing more than a notebook computer and an internet connection.

Project Nourished and eXp Realty are just two examples of how digitalization is transforming our physical world.

But we're just getting started; there is far more in store for the retail industry.



## A LEXICON FOR THE DIGITAL WORLD

Dale Carnegie, author of “How to Make Friends and Influence People,” said, “Ninety percent of all management problems are caused by miscommunication.” And so it is with the new world of retail. We need to define the derivations of ‘digital’ as best we can, giving us a lexicon for common understanding as we explore the world of Retail 4.0. After intensive study of how the technology industry and tech research companies like Gartner and Forester think about digital terms, we’ve landed on the following definitions:

### **Digitization**

dig·i·ti·za·tion

/ˌdɪjədəˈzāSH(ə)n/

This is the conversion of information to a digital form. Easy examples are scanning a paper document, or the conversion of music and photographs to digital formats.

### **Digitalization**

dig·i·tal·i·za·tion<sup>1</sup>

/ˌdɪjɪdəlˈzāSH(ə)n, dɪjɪdələˈzāSH(ə)n/

Digitization of information provides the foundation for the digitalization of business processes. Digitizing vendor invoices provides the basis for the electronic exchange of information (Electronic Data Interchange - EDI) that supports the digitalization of the receiving and payment process.

### **Automation**

au·to·ma·tion

/ˌôdəˈmāSH(ə)n/

Automation is commonly associated with robotics, which uses digital information and instruction. Robotic automation applies to physical tasks. An easy example is automating the manual picking of online orders through micro fulfillment center technology; robots that piece-pick orders. But there is another kind of automation that is becoming increasingly important — automation through software. Think of the traditional cashier job that has become automated through software like that used by the Amazon Go store.

### **Digital Transformation**

dig·i·tal trans·for·ma·tion

/ˌdɪjɪd/ /ˌtrɑn(t)sfərˈmāSH(ə)n/

This refers to the possibility of creating new business models as digitalization and automation grow and advance. Think of how the business model of music transformed from selling albums on vinyl records or CDs to selling individual songs and then to streaming as music became digitized.

## CONVERGING TECHNOLOGIES ACCELERATE DIGITAL EVERYTHING

The understanding of exponential growth moved from a nebulous concept to a harsh reality as we watched daily reports on the mounting toll amid the spread of the COVID-19 virus. Everyone became attuned to deaths doubling every six days, then four days, and then two days, as we watched the curve grow ever steeper. The pandemic showcased in realtime the frightening power of exponential change.

This concept explains what is happening with technology today as computer processing power grows exponentially. Faster, cheaper processing power in turn provides the foundation for the myriad of technologies changing our world. Some of these technologies have themselves reached exponential growth, including computer vision, IoT sensors, AI, materials science, and more. As these technologies accelerate, blowing past the inflection point on the growth curve, they are converging and powering even faster, more massive change.

Artificial intelligence is a foundational technology for Retail 4.0 and, like other terms, has become an oft-abused buzzword. Merriam-Webster defines artificial intelligence in two ways:

1. A branch of computer science dealing with the simulation of intelligent behavior in computers.
2. The capability of a machine to imitate intelligent human behavior.

Let's focus on the second definition, a machine that can imitate intelligent human behavior — in particular, decision-making. Gary Saarevirta, founder & CEO of Daisy Intelligence, an AI-powered platform, explains AI this way: "What differentiates AI from predictive analytics is the ability to simulate the future and to learn faster than the pace of time."

**“What differentiates AI from predictive analytics is the ability to simulate the future and to learn faster than the pace of time.”**

- Gary Saarevirta, founder & CEO of Daisy Intelligence

The power of AI resides in building models that are used to generate myriad scenarios. The outcome of each scenario is effectively scored against the goal of the initiative, with the AI system choosing the best outcome.

Machine learning is a branch of AI that effectively lets the machine learn by itself using the data available. For example, a machine learning system will understand over time that a given customer responds to a specific product offer only in the first week of each month — or responds to a certain discount level — and incorporates that learning into the next round of recommendations.

There's a key insight here that we'll come back around to later in the paper: The importance of models and the availability of data. The better and more refined the model, and the more data feeding into the model, the better the outcome. Thinking strategically, the sooner a company begins to build and refine its AI models and the more data a company can feed into the model, the sooner that company begins to realize improved results. And depending on the application, these benefits can drive ongoing, ever-increasing gains.

## DIGITAL DOPPELGÄNGERS

Zippedi is a provider of retail robots like those we see roaming the aisles in a growing number of stores. Zippedi's robots, though, are doing more than scanning for out-of-stocks and pricing errors; they are using computer vision, AI, and machine learning to create a digital doppelgänger of the physical store.

**Why is this important?  
Because technologies like 5G networks, big data, and AI are converging to power explosive growth of augmented and virtual reality, which enable us to navigate and shop inside the digital store.**

This idea of digital duplicates does not stop at the physical store. Birdzi, known for its AI-based customer engagement ecosystem, creates what can be thought of as a customer digital doppelgänger. This is a digital representation of each shopper, built from vast amounts of customer purchase data, attributes, preferences, and more. What this allows Birdzi to do for a growing number of retailers is model in the digital world — using AI and machine learning — how a given shopper may react to a given promotion, providing a foundation for advanced strategic hyper-personalization of marketing.

Customer digital doppelgängers also power up insights and understanding of shopper behavior. Birdzi's data science team can predict with uncanny accuracy which specific

shoppers, of all the new shoppers appearing in-store for the first time, will stick around to become valuable and loyal, helping the retailer to invest for the best ROI. In similar fashion, Birdzi is able to — again with high confidence — identify the valuable shoppers most at risk of defecting to a new competitor. And those are just simple examples of the power of this approach.

Having a digital customer doppelgänger to test and trial different marketing scenarios is immensely powerful, providing untold insights to customer behavior in the physical world. But having a digital replica of the physical store and the actual customer is only the beginning.

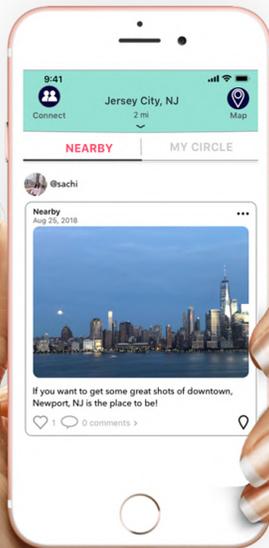
## SPATIAL WEB / WEB 3.0

Havanote is a fascinating app that ties digital information to a physical geolocation. For example, I can leave a Havanote - a virtual note - about a great restaurant I found in Denver that my son will see when he lands at the Denver airport. Or I can leave myself a note tied to Dead Horse Point, the midway stop for a Moab, Utah century bike ride, letting me know of my time and condition from the prior year. Havanote can act as a virtual time capsule, able to provide all the virtual notes dropped in a specific location across time.

It takes a while to get your head around the possibilities provided by this fusion of digital information tied to a physical location. Inside the store I can leave a recipe for salmon tied to the location of the seafood counter for other shoppers to find. Or I can create a special promotional price for Persian Cucumbers only available to the first ten shoppers that are near that item in the produce department.

But Havanote is just the beginning of a new world being created by the digital mapping of spaces and environments. You might think of Google Maps as an example of this digital mapping, and you'd be correct, especially as Google continues to add to the 10,000 indoor maps of buildings, transportation centers, etc. available today. But Google Maps is providing you information only in a two-dimensional format via the screen on your computer.

Think of the physical store and a digital representation of that store, accurate down to the smallest detail, like that provided by Zippedi's robot. Now merge them together creating a fusion of the two. New programming languages are being developed to address a three-dimensional location so as to anchor virtual information within a physical space. Think of it as geolocation in 3D.



This new environment is sometimes referred to as the Spatial Web or Web 3.0. For context, Web 1.0, the first iteration of the World Wide Web, was effectively a 'read-only' environment providing access to information but little to no interaction. Web 2.0 provides for interaction with, and creation of, content — think social media.

We are at the dawn of the Spatial Web, which will quickly play a powerful role in the age of Retail 4.0. “The power inherent in the Spatial Web comes from its ability to enable information to be contextually anchored directly in the world itself, such that we can then interact with this information in the most natural and intuitive ways; by merely looking, speaking, gesturing or even just thinking. It adds intelligence and context to every place, object, and person that we encounter, and makes our interactions and transactions faster and more secure by decentralizing compute and storage of data in the most relevant and contextual way possible.”<sup>2</sup>

Augmented reality — a digital overlay to the physical world around us presented through AR glasses — will be the initial onramp to this new reality. AR provides a tool for stepping into this new dimension that is occurring at the

<sup>2</sup>Nguyen, “How the spatial web is changing the internet as we know it”, e27.co, Oct. 22, 2019, <https://e27.co/how-the-spatial-web-is-changing-the-internet-as-we-know-it-20191022/>

nexus of the physical and digital worlds and provides a new computing environment in three-dimensional space.

How close is this to reality? Gartner states that 100 million consumers will be shopping in AR online and in-store this year (2020), today through their AR capable smartphones and tomorrow through AR glasses. This will occur as consumer tech companies like Apple, Samsung, and others bring smart glasses to market in the coming months, fueled by apps and development tools.

But AR and VR are not the only ways to interact with the Spatial Web.

## **The convergence of 5G network technology, edge computing, IoT sensors, and computer vision means that we will increasingly be surrounded by the Spatial Web.**

That pervasive digital mesh will enable us to communicate with the environment around us by using our voice and gestures. Imagine being in a drug store in front of the cold medicines and asking which products will not make you drowsy. Or pointing at the dry aged strip steaks in the meat case to automatically trigger grilling directions and a suggested seasoning to use.

This new digital dimension to our current reality will force us to think differently about nearly everything.

## AI-POWERED METAMORPHOSIS

Think about the process of deciding whether or not to carry a new product, a decision made daily across retail organizations. Today, the category manager reviews the current assortment and looks at syndicated sales data to aid in making a decision. Once approved, the product must be placed in the category planogram, priced, an initial order placed, an optimal inventory level established, and more.

Now think about all these decisions — made by people today as part of a business process — instead made by a series of AI software bots. The product assortment bot makes the decision to carry a new product after automatically reviewing current category movement data but with a vastly expanded lens to ingredients and other product attributes. The decision is enriched further by the bot doing a deep dive into customer profile data.

Once a decision is made, the assortment bot hands it off to the pricing bot to establish a retail price. Once done, projected movement informs the inventory bot of how much to order. The order bot communicates to the vendor's bot to place the order, and so on. All this, and not a person in sight.

The technology company Ant Financial Services Group was founded in 2014, and in 2019, just five short years later, served over one billion consumers. The company was spun off from Alibaba several years ago and uses AI and data from Alipay, a mobile payments platform, to provide a wide variety of financial products. “The company serves more than 10 times as many customers as the largest U.S. banks — with less than one-tenth the number of employees. At its last round of funding, in 2018, it had a valuation of \$150 billion — almost half that of JPMorgan Chase, the world's most valuable financial-services company.”

“Unlike traditional banks, investment institutions, and insurance companies, Ant Financial is built on a digital core. There are no workers in its “critical path” of operating activities. AI runs the show. There is no manager approving loans, no employee providing financial advice, no representative authorizing consumer medical expenses. And without the operating constraints that limit traditional firms, Ant Financial can compete in unprecedented ways and achieve unbridled growth and impact across a variety of industries.”

Is making a financial loan decision any harder than making a decision to carry a new product? Or to price it? Or determine inventory requirements?

In all these examples, **AI systems view the decision-making process as data science, leveraging data into insights, analytics, choices, and predictions that then help automate operational processes and workflows.**

Certainly, executives and developers are needed to design the system, build the algorithms, and connect the data. But once that is done the system runs on its own, making decisions far faster, using more data, and, ultimately, more effectively than a person. It is AI that powers up Amazon's recommendations, sets prices, and more, for the retailing behemoth. It is AI that powers up recommendations made by Apple's Siri when you open up the music app, and it is AI that's behind Google's search recommendations.

Digital-based companies are rapidly transforming the business landscape across a growing number of verticals. AI-powered decision-making business processes can scale far more quickly and efficiently than people-based processes. And, leveraging the machine-learning component of AI, the decisions made become more and more accurate, efficient, and impactful.

**And AI-powered business process automation is coming for retail.**

## WHERE DID ALL THE PEOPLE GO?

Picture an empty office where previously there were dozens or even hundreds of people merchandising products — conducting activities ranging from buying decisions to category planning, pricing, planograms, and more. All that work automated through software. And all those costly people eliminated from the P&L statement. And if we don't have all those people, is there really a need for that beautiful headquarters office building and all those related costs?

Same thing when we head over to the marketing department; many of the people replaced by AI-powered, automated processes directing individualized promotions to each customer with a goal of optimizing share-of-wallet and lifetime value. Automated processes handling social media and other digital marketing, understanding in near realtime the impact of each action taken and modifying the next campaign based on that learning.

The Human Resources office? Again, largely empty, with the hiring, onboarding, payroll and other processes again automated. What about the dozens of people staffing the customer service call center? AI chat bots able to engage with shoppers via voice or text.



The massive distribution center? Staffed by only a handful of people, robots and automated systems slotting and picking cases and individual items to move to the stores. Micro fulfillment centers move the automated picking of online orders to the region or even neighborhood, automating the distribution of physical products even more.

How about the store itself? No cashiers — they've been replaced by computer vision and sensors. Food prep and production? Just a few people, most of the work being done by bread-baking robots, salad-making robots, and even robots making pizzas and grill items.

And yes, these things are all real today. Imagine where they'll be within the next few years.

The large scale automation of business processes creates a new paradigm for existing retailers that must wrestle with what to do with all those associates that are increasingly displaced. There is no simple answer; this goes to a much larger issue that must be addressed by business, society and government.

What this paper does want to clearly call out is the risk to traditional retailers that new, digitally native, competitors present by not having all those people in the first place. Like Ant Financial,

there is a risk of new entrants into retail built on a digital core, freeing them of people-oriented legacy issues. This scenario should keep traditional retailers awake at night. And remember, **this is not just about reducing costs by removing expensive people from the equation. AI-powered process automation removes the errors and lag time inherent in any people-dependent business process.**



## AI-POWERED SMART OBJECTS

What we think of as the modern consumer packaged goods retail industry has been around for the better part of a century. For one hundred years, fast moving consumer goods retail has been all about products, the entire retail enterprise organized and aligned to sell more products. But like everything else in the world of Retail 4.0, that product focus is being turned inside out.

Blockchain is a technology increasingly used to add confidence and transparency to transactions; it is commonly used in the world of crypto-currencies like Bitcoin. In the world of retail, Blockchain technology is used to provide confidence and transparency into supply chain transactions.

Now imagine Blockchain technology providing the foundation for digital assets, only in this case let's make the asset a digital ticket to a hit Broadway show. Blockchain provides the digital ticket with authenticity; it proves the ticket is 'real'.

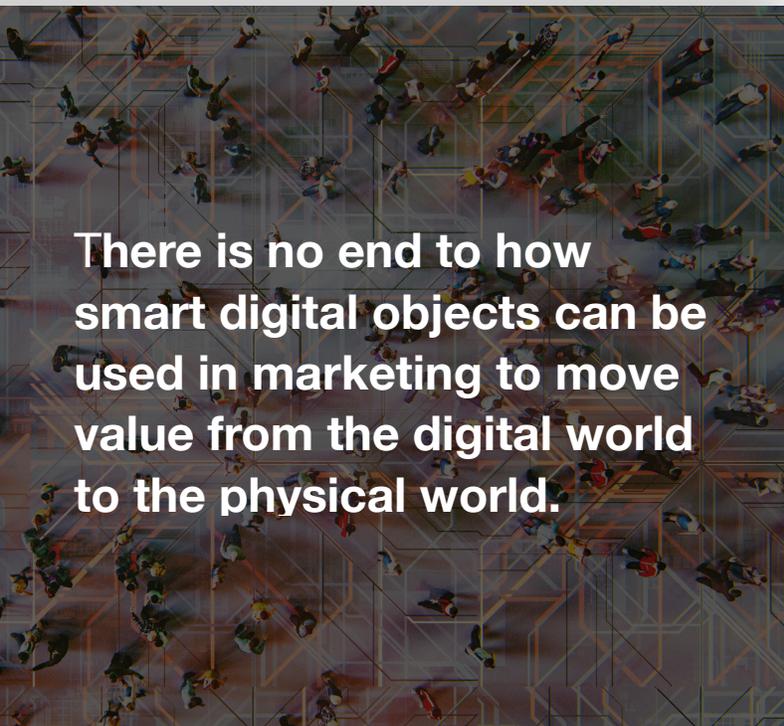


But we're just getting started. Imagine you're at the mall and see a digital sign promoting Coca-Cola, and there are six bottles of coke pictured on it. Pointing your phone at the digital sign you can click 'buy' and one of the bottles moves off the sign and onto your phone, where it is held in a digital wallet. There are now five bottles of Coke left on the sign.

You then go into a grocery store and swipe the digital Coke on your phone to the store's POS system, and walk out the door with a nice cold bottle of Coke. The smart object acts like a coupon; you've moved value from the digital world to the physical world.<sup>3</sup>

But smart objects can also be intelligent and can change and evolve using AI. Swiping the digital bottle of Coke to your friend's phone, it becomes two Cokes — one for your friend and one he can give away to someone else. As you are sensing, **there is no end to how smart digital objects can be used in marketing to move value from the digital world to the physical world.**

But value is not only resident in products.



<sup>3</sup> Peter Diamandis, *The Future is Faster Than You Think* (Simon & Schuster, 2020).

## AUTOMATING AI-POWERED REVENUE GROWTH

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**AI and machine learning capabilities are transforming retail competition, moving the battleground from the product to the individual customer, and keeping score by tracking customer share-of-wallet and lifetime value.**

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Retailers like Amazon, and increasingly retailers like Walmart and Kroger, understand that value is generated by the customer, not by the product. In the digital world, and increasingly in the digital-physical netherworld of the brick-and-mortar store, retailers are able to capture increasing amounts of data attributed to the individual customer.

Think for a moment about the marketing history of Amazon. Have you ever seen the company promote a specific product and price? No. Instead, Amazon has historically focused on driving shoppers to its platform and, once there, growing the value of those shoppers over time through personalized recommendations. During the first few months of the COVID-19 crisis, Amazon was reported to have gained an incremental \$3–\$4 billion a month in sales and was transitioning an estimated \$1 billion of that each month into recurring revenue through personalized recommendations and its Subscribe & Save replenishment programs.

Consider Kroger. For the past 15 years Kroger has provided personalized promotions to its regular shoppers, driven by the company's treasure trove of customer identified transaction data encompassing an estimated 60 million U.S. households.

For years Kroger has employed hundreds of data analysts to sift through the data, creating growing numbers of micro-segmentations to ultimately power personalized promotions. The company delivered over 3 billion personalized recommendations to its customers each year.<sup>4</sup> Imagine the savings as Kroger automates the process of creating and communicating those billions of personalized offers through AI software automation.

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<sup>4</sup> Kroger, "Customer Satisfaction & Digital Innovation", <http://sustainability.kroger.com/communities-customer-satisfaction-and-digital-innovation.html>

Birdzi, mentioned earlier, is using its customer digital doppelgänger to understand customer behavior in the virtual world, and using those insights to power hyper-personalized strategic marketing, and more, as it works with clients like Weis Markets, a regional supermarket chain.

The process begins with setting up all the disparate data feeds that ultimately come together in Birdzi's platform. Those data streams feed an automated process of loading billions of transactions and creating millions of customer profiles — the digital doppelgängers. Each profile consists of hundreds of attributes, scored and updated with every product purchase. And all this done in minutes.

For years, Weis has provided their most valuable shoppers extra savings on products through a cumbersome process. They would begin with creating a list of the most frequently purchased products by their best customer segment. That list would then go to merchandising to see what vendor funding would be available. Once finalized, the offer list would be fed into a targeting engine, outputting several 'personalized' offers for each best customer. Those offers were passed across to a direct mail house for printing of coupons and mailing; the promotions were also built in the retailer's POS system so they could be tracked.

Today, Birdzi is working to not only automate this entire process, but vastly improve the relevancy of the promoted products by beginning with the customer. The approved offer pool is fed through Birdzi's AI personalization engine — tweaked and directed to achieve strategic objectives — with the targeted promotions flowing automatically into emails to each shopper.

Not only is Weis reducing human intervention as it works to automate the marketing process, it is taking advantage of Birdzi's customer digital doppelgängers to substantially increase the effectiveness of the

initiative. Significantly lower execution costs paired with more effective strategic personalization provide improved ROI. And they're just getting started.

As retailers like Amazon, Kroger, and Weis Markets are finding, **AI and machine learning capabilities are transforming retail competition, moving the battleground from the product to the individual customer, and keeping score by tracking customer share-of-wallet and lifetime value.**

And while marketing personalization is itself incredibly powerful, there is something else at work here.

## THE GATEWAY TO EXPONENTIAL VALUE CREATION

Ask any traditional FMCG retailer about digital growth and they will immediately assume you are asking about online shopping. A lesser number will consider the ability to monetize their online shoppers via digital ad networks.

Consider what Amazon has done with its digital platform encompassing over 100 million U.S. customers that are part of its Prime program. Started in 2016, Amazon's ad revenues in 2019 were an estimated \$14 billion, up around 40% from the prior year. Not only does Amazon power tremendous growth through personalized recommendations — an estimated 35% of its sales are driven by its recommendation engine — it is now beginning to power exponential growth through its network by opening it up to digital advertising.

In addition to operating its own digital ad platform, Kroger is going further in monetizing its customer network. The company recently announced a partnership with Roku, the TV streaming service. Kroger brings detailed data from its 60 million households to Roku's digital platform, giving CPG marketers unparalleled ability to target ads through Roku's streaming service and tie ad performance to in-store and online sales.

But these digital ad networks are only the opening salvo in the age of Retail 4.0. Robert Metcalfe, co-inventor of Ethernet and co-founder of 3Com, a manufacturer of network cards for computers, was a keen observer of the power of networking.

**“Metcalfe’s Law” says that a network’s value is proportional to the square of the number of nodes in the network.** The end nodes can be computers, servers and simply users. For example, if a network has 10 nodes, its inherent value is 100 ( $10 \times 10 = 100$ ). Add one more node, and the value is 121. Add another and the value jumps to 144. Non-linear, exponential, growth.”<sup>5</sup>

“Network effects have become an essential component of a successful digital businesses. First, the Internet itself has become a facilitator for network effects. As it becomes less and less expensive to connect users on platforms, those able to attract them en masse become extremely valuable over time. Also, network effects facilitate scale. As digital businesses and platforms scale, they gain a competitive advantage, as they control more of a market. Third, network effects create a competitive advantage.”<sup>6</sup>

**Think of each digitally engaged customer as a digital node on a network.** Now apply Metcalfe's Law of network value to retail. If a retailer has 1 million digitally engaged shoppers — digital nodes — the retailer's network has an inherent value of 1 million squared, or 1 trillion (1,000,000,000,000). Retailers, with their large customer base, have an inherent potential to create massive value if they are able to successfully engage with their shoppers across digital channels.

To realize that massive potential value, retailers must expand their digital network, fostering connections with other shoppers, other services, IoT devices, and more — inside and outside the store.

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<sup>5</sup> Peter Fisk, “Metcalfe’s Law”, The Genius Works, February 17, 2020, <https://www.thegeniusworks.com/2020/02/metcalfes-law-explains-how-the-value-of-networks-grow-exponentially-there-are-5-types-of-network-effects/>

<sup>6</sup> Peter Fisk, “Metcalfe’s Law”, The Genius Works, February 17, 2020, <https://www.thegeniusworks.com/2020/02/metcalfes-law-explains-how-the-value-of-networks-grow-exponentially-there-are-5-types-of-network-effects/>

**This view creates a need for new metrics. To play in this new world of digital value creation, retailers need to measure both their network size and the quality of customer digital engagement.** Far too few C-level executives know how many customers their company's digitally touch each week — or what percentage of the retailer's business is impacted by some level of digital engagement.

Walmart, riding pandemic-powered brick-and-mortar store and online sales gains, recently entered into a partnership with Shopify, that opens the Walmart Marketplace to merchants on the Shopify eCommerce platform. The small sellers on Shopify can now list their items on [walmart.com](https://walmart.com), giving them access to surging Walmart online traffic — more than 120 million Americans visit [walmart.com](https://walmart.com) every month — while Walmart shoppers gain access to a wider array of merchandise. And, of course, Walmart creates another revenue stream. Walmart's battle with Amazon is getting more interesting.

This partnership shows why customer digital engagement is so important today, and essential for Retail 4.0 tomorrow. A network can create value in myriad directions as Amazon, Kroger, and Walmart show. In addition, the larger the network, the more data there is flowing into all the AI-powered business processes across the retailer's enterprise. And the more data, the better the decisions, and the more value that is created.

And if that's not enough, add smart objects to the mix. Smart objects that can move across a massive digital network, and morph depending on certain rules and data, all while ultimately providing value in the physical world. **Crossing into this digital world opens the door to exponential value creation for traditional retailers.**

It's enough to get your head spinning.

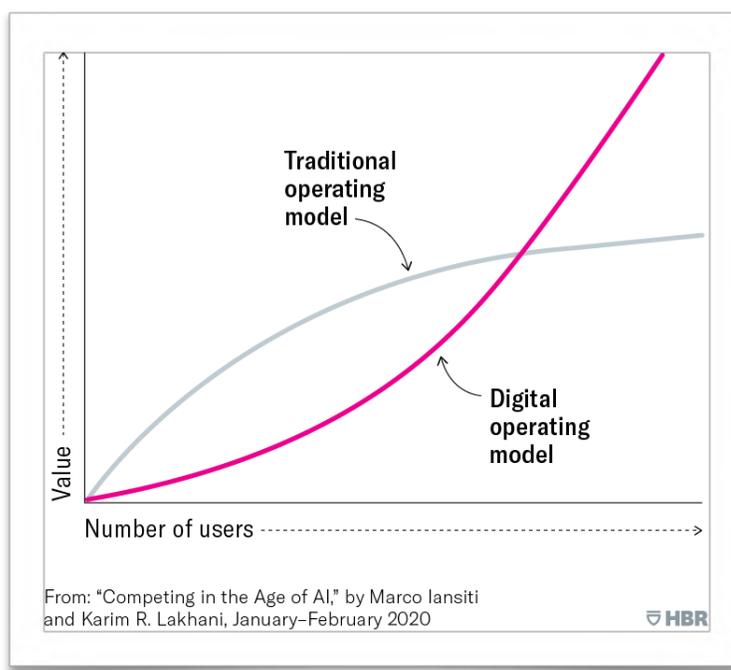
## RETAIL 4.0: A NEW BUSINESS MODEL FOR FMCG RETAIL

I can remember when Walmart entered the grocery business, with traditional retailers bemoaning Walmart's low prices and complaining that the company was selling products for less than the traditional retailer paid. What was really happening was that Walmart changed the game, directing all brand marketing funds into the cost of goods rather than the traditional practice of applying brand funds to advertising costs. Walmart simply changed the model and wreaked havoc on traditional retailers until they caught on.

I have heard similar complaints from traditional retailers about Amazon. The fact that Amazon is valued as a tech company rather than a retailer gives the company access to much lower cost of capital without even having to report profits. Another common complaint is that Amazon uses the profits from AWS (Amazon Web Services) to subsidize its other operations, giving it an unfair advantage. Traditional retailers feel they are having to compete on an un-level playing field.

Whether Amazon has unfair advantage is not for us to decide. Rather, Retail 4.0 gives traditional retailers the opportunity to level the playing field through an ability to exponentially grow value creation — just like the tech companies. And that happens by **significantly reducing costs in the physical world while powering new value creation in the digital world**

Retail 4.0 brings with it a radically different cost model for retail through the automation of physical jobs and business processes. Think it can't happen? Remember Ant Financial Services and its one billion customers, all effectively handled through a digital core.



But digital transformation is not just about cost reduction through automation.

Mark Bonchek is the Founder and CEO of Shift Thinking, and his work reinforces ideas core to the metamorphosis of retail — that **traditional (retail) businesses create value through hard assets, while digital businesses create value through networks.** “In the last century, industrial business models were defined by their use of machines to create increasing returns to scale. Digital business models use network effects to create what Ray Kurzweil describes as accelerating

returns to scale. The key difference is that industrial models are linear while digital models are exponential, as shown in this chart.

**“Digital business models are a bit of a misnomer. It’s not digital technology that defines them; it’s their ability to create exponential value.”<sup>7</sup>**

Traditional retailers have an opportunity to step onto the digital battlefield and access exponential value creation through the growth and expansion of their own digital networks.

Think of this value expansion as a series of ripples spreading out from the store.

The first opportunity for retailers lies in the massive application of AI and machine learning to provide the right set of promotions at the right prices to each individual customer. Day after day, week after week. Each promotion providing the AI system data for improving the next decision. That increasingly effective customer engagement helps grow the retailer’s digital network while powering significant sales and margin gains through strategic hyper-personalization.

The next ripple is enabling customers — digital nodes on your network — to connect with IoT devices throughout the store and in the Spatial Web. Imagine the immersive shopping experiences a creative retailer can provide in this kind of environment. Where simply looking at a bottle of wine launches a video tour of the vineyard and wine tasting notes from the wine maker.

Further ripples are created by extending the digital network back through the supply chain, creating untold new opportunities. Not to mention the ability to extend the network into business services and other data sources that all converge to power even faster, more massive change. Remember, one of the tenets of this time is the convergence of accelerating technologies.

**And convergence is not only happening with different technologies; tech innovation is driving convergence across different sectors and even industries.** Looks what’s happening in the world of food and healthcare.

ScriptSave, a leader in pharmacy programs and services, has brought together key partners to accelerate the fusion of food and healthcare. This activity leverages expansive product ingredient data, cutting edge nutrition science, and an enrolled shopper’s extensive profile that includes chronic health conditions, allergies, preferences, and more — to guide an individual to specific products across the store beneficial to the individual shopper.

Think of the linkages that can now be made between the customer, the food retailer, the healthcare provider, the pharmacy, and realtime health monitoring through wearable devices like the Apple Watch, just to name a few. The customer is able to realize savings on health insurance through improved eating, or lower costs on prescription drugs through improved compliance. The customer gets realtime guidance in the store on specific products based on realtime glucose readings. That customer can also connect with a dietitian for guidance via realtime video on a smartphone, watch, or AR glasses. The possibilities are endless.

But there’s more. Imagine Kashi, a division of Kellogg’s, creating a smart object of a cereal good for diabetics that is distributed to a retailer’s diabetic customers. Once in hand, the customer can share that smart ‘cereal’ object with friends and family members who may also have diabetes or

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<sup>7</sup> Mark Bonchek, “How to Create an Exponential Mindset”, Harvard Business Review, July 27, 2016, <https://hbr.org/2016/07/how-to-create-an-exponential-mindset>

are at risk of it. That smart object, in turn, creates its own network that ripples out from the initial shopper all while allowing Kashi and the retailer to create 'real world' value while expanding the network.

“The elimination of traditional constraints transforms the rules of competition. **As digital networks and algorithms are woven into the fabric of firms, industries begin to function differently and the lines between them blur.** The changes extend well beyond born-digital firms, as more traditional organizations, confronted by new rivals, move toward AI-based models too. Walmart, Fidelity, Honeywell, and Comcast are now tapping extensively into data, algorithms, and digital networks to compete convincingly in this new era.”<sup>8</sup>

Retail has traditionally been a linear business, slow-growth driven by incremental gains over time. But digital changes this pattern. “**Linear businesses gained a competitive advantage by buying assets, controlling supply chains, and driving transactions. Digital companies gain competitive advantages through building network effects, relationships and interactions.**”<sup>9</sup>

**“Linear businesses gained a competitive advantage by buying assets, controlling supply chains, and driving transactions. Digital companies gain competitive advantages through building network effects, relationships and interactions.”**

Let's focus on that idea: Digital companies gain advantage through building networks, relationships, and interactions. The key word here is relationships. Having a million shoppers is one thing, having a million shoppers digitally engaged with you as a retailer or brand adds considerable value to your network. And that comes back to **the imperative of driving meaningful digital engagement through a seamless user experience integrated with strategic personalization and relevancy.**

Like the caterpillar morphing into the butterfly, the digital transformation of retail brings with it fundamental change. **How retail has been valued in the past — hard assets like inventory, real estate, cashflow — dramatically changes as retail becomes digitized and transforms.**

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<sup>8</sup> Marco Iansiti and Karim Lakhani, “Competing in the Age of AI”, Harvard Business Review, January-February 2020, <https://hbr.org/2020/01/competing-in-the-age-of-ai>

<sup>9</sup> Peter Fisk, “Metcalfe's Law”, The Genius Works, February 17, 2020, <https://www.thegeniusworks.com/2020/02/metcafes-law-explains-how-the-value-of-networks-grow-exponentially-there-are-5-types-of-network-effects/>

## IN THE DIGITAL WORLD, SPEED RULES

Peter H. Diamandis is an engineer, physician, and entrepreneur best known for being founder and chairman of the X Prize Foundation, and cofounder and executive chairman of Singularity University. Diamandis has written about the growth cycle of digital technologies, which he encapsulates as the Six D's of Exponentials.<sup>10</sup>

While these D's are typically applied to specific technologies, I believe they provide a useful construct when applied more holistically to the retail industry. In particular, the first three D's are helpful in understanding where the digital transformation of the retail industry is today, and where it's going.

1. **Digitization** – Once something becomes digitized, it can be replicated and sold for close to zero cost.
2. **Deceptive Growth** – Doubling in growth seems small at first while the technology is in its infancy.
3. **Disruptive Growth** – Doubling in growth of a small technology results in massive, disruptive growth. As a result of 30 rounds of doubling, a technology will see about 1 billion-fold growth! This is disruptive (think about the massive growth rate of mega pixels in cameras or processor speed in computers.)

More and more of retail is becoming digitized — Diamandis' first D. This is certainly true of paperwork, vendor invoices, payroll systems, HR records, product data and far more. Even the store is becoming digitized through online shopping (a digital store), computer vision (Zippedi's robot), and shopper tracking.

Many of the technologies discussed here — and many more — are in the Deceptive Growth stage — unnoticeable gains but on an exponential path. **And many of these technologies that will power the industry's digital transformation are entering the Disruptive Growth stage, meaning massive disruption is fast approaching. Think computer vision (like Amazon Go), prescriptive analytics, business process automation, artificial intelligence, etc.**

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<sup>10</sup> "6 D's to Exponential Growth", Thinking Business Blog, <https://www.thinkingbusinessblog.com/2017/08/02/6-ds-to-exponential-growth/>

## Now let's look at the last three of Diamandis' Six D's:

4. **Dematerialization** – The process by which technologies and services move from costing money to becoming available for free. For example, think of all the apps on your phone that you used to have to pay a lot of money for: GPS, high resolution camera, high resolution video, video and voice teleconferencing, weather apps, news, books on line, podcasts, etc. A study was done recently that showed a typical smartphone today comes with free technology that would have cost more than \$1 million in the 1980s!
5. **Demonitization** – Once a technology has become digitized, the cost for that technology drops significantly. A great example is digital photography, which was expensive and of marginal quality 20 years ago. This is now “free” with super high resolution on your smartphone. Another example would be cloud-based server access and storage capacity. This was significant costs for startups – now it is hardly even a thought!
6. **Democratization** – As a result of digitizing and demonitizing, the resulting products becomes available to almost everyone on the planet. There are 3 billion people connected via the internet today and this will grow to 8 billion people by 2025. Free Wi-Fi is everywhere – we used to have to pay \$1 a minute.

We are already seeing the dematerialization, demonetization, and democratization of technologies impacting retail. Sophisticated personalization capabilities are available at a fraction of the cost of the previous generation of capabilities. Robotics as a service makes automation available to even the smallest retailer. Countless other capabilities are available via the cloud, removing the historical barriers of on-site hardware, software licensing, and dedicated resources.

Competing in an age of artificial intelligence changes the rules. Historically, many retailers have been ‘fast followers,’ letting someone else experience the pain of introducing some new innovation. In a slow-moving industry working with razor thin margins, that makes sense. But in today's world speed rules. **The continual improvement offered by AI and machine learning in driving cost savings, along with growing revenue and margin, can be a source of ongoing competitive advantage.**

Thomas Davenport is a noted professor and author focused on big data and AI. In an article in Harvard Business Review he called out the danger of not leading in the application of AI technology. “By the time a late adopter has done all the necessary preparation, earlier adopters will have taken considerable market share — they'll be able to operate at substantially lower costs with better performance. In short, **the winners may take all and late adopters may never catch up.**”<sup>11</sup>

The retail industry is already moving onto a new battleground where the rules of competition and business strategy have changed. We must now overlay the exponential growth of tech-driven capabilities onto the strategy board and think differently than we have in the past.

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<sup>11</sup> Vikram Mahidhar and Thomas Davenport, *Why Companies that Wait to Adopt AI May Never Catch Up*; Harvard Business Review. December 6, 2018, <https://hbr.org/2018/12/why-companies-that-wait-to-adopt-ai-may-never-catch-up>.

Retailers who begin to leverage new AI driven capabilities — automation of physical labor, automation of business processes, and expansion of digital networks — gain on their slower competitors every day. And every day that performance gap grows. That is why **Retail 4.0 is bringing with it a radical restructuring of the FMCG retail industry.**

## ARE YOU A CATERPILLAR OR A BUTTERFLY

That retail is becoming digitized and beginning a radical digital transformation is beyond doubt. There are really only two questions retailers have to ask themselves:

1) How much time do we have to digitally transform? 2) Can we?

Understanding that the changes wrought by retail ages 1.0, 2.0, and 3.0, are occurring at a quickening pace suggests that retailers do not have long. Retail 1.0 lasted about 40 years, Retail 2.0 about 20 years, and Retail 3.0 about 10 years. Extrapolating from that implies that the Age of Retail 4.0 will be about five years.

Looking at Gartner's "hype-cycles" — which explain how a technology or application will evolve over time — confirms this five year timeline. Technologies like computer vision, insight engines, machine learning and many others are poised to explode onto the plateau of productivity within the next two to five years. Interestingly, robotic process automation

software is expected to reach this plateau within the next two years.<sup>12</sup> UiPath, a leading upstart in the process automation space, has kicked off a \$200 million -plus fundraising round at a \$10 billion valuation, a sign of how fast this tech category is growing.

That means that the vast majority of traditional retailers have a lot to do in the next sixty months.

Which leads us to question number two: Can retailers change?

Supermarket retail has been very resistant to change over the years, but whether that was due to retailers' response to change or the fact that FMCG retail economics are incredibly challenging for new interlopers is open to debate. What is beyond question is that the supermarket industry has historically been slow moving, and retailers have typically adopted a 'follower' strategy. But we now live



in a world where tomorrow may no longer resemble today and following may no longer be the best option.

Retailers believed that being a ‘fast follower’ helped lower the risk of adopting new innovation. But in today’s world of exponential change, this risk mitigation is an illusion. As Davenport called out earlier, in an age of AI-powered capabilities, being a slow adopter becomes increasingly dangerous as the leaders open up growing performance gaps.

And if the change from being a follower to a leader is not challenging enough, **many retailers are compounding their headaches by failing to realize the promised benefits of deploying new technologies and solutions.**

I spoke with one regional retailer not long ago who had deployed a leading business intelligence solution that promised to provide myriad product and customer insights that would help the retailer grow sales and margins. The only problem was that the retailer later realized it didn’t have any associates with the needed skill sets able to use the new capability.

But things can go from bad to worse when you have associates who simply do not want to use new technologies.

Daisy Intelligence provides powerful AI promotion optimization that plans the timing and pricing of advertised items. Retailers using the solution and following the recommendations produced by the system realize significant sales improvement and margin gains.

Talking with Gary Saarevirta, Daisy’s CEO, the largest challenge they face in deploying at retailers is not technology, but overcoming the resistance of the category managers who don’t want to give up their old ways. As Daisy has found, **a retailer’s culture can be the largest impediment to making the needed transformations demanded by the future.**

All these issues suggest that different thinking is required as we enter Retail 4.0. Successfully navigating a digital transformation requires far more than just digitizing existing processes and practices. Companies seeking to create exponential value require different leadership skills and a different organizational culture.

## IT'S ALL ABOUT POSSIBILITIES

I have had countless discussions with retail executives, including C-level execs at prominent companies, who speak very knowledgeably about innovation and seem to have a good grasp of industry transformation. But then, when discussion shifts to disrupting their own businesses through new technologies and practices, they quickly rationalize why those changes are not applicable to their company — ‘well, that can’t happen here’.

Just as the Olympic sprinter must believe that winning the gold medal is possible before stepping onto the track, **retail industry executives must believe that radical transformation is possible before embarking on the metamorphosis of Retail 4.0.** And this isn’t a half-hearted ‘sure, it’s possible’ but a total commitment to transforming traditional retail and pursuing exponential value creation through digitalization.

In the HBR article “How to Create an Exponential Mindset,” author Mark Bonchek states it this way: “To create exponential value, it’s imperative to first create an exponential mindset. The incremental mindset focuses on making something better, while the exponential mindset is making something different. Incremental is satisfied with 10%. Exponential is out for 10X.”

To create exponential *value*, it’s imperative to first create an exponential *mindset*. The incremental mindset focuses on making something *better*, while the exponential mindset is makes something *different*. Incremental is satisfied with 10%. Exponential is out for 10X.

But changing the mindset of company leaders is not enough — remember the retailer whose associates didn’t want to use the new capabilities?



**Companies of any size across the massive retail industry must change their culture to embrace new possibilities, and ongoing, ever-faster change.** This challenge goes beyond business: People everywhere must prepare for a world of exponential change. And that’s not easy to do.

My son Sterling has become a student of this need to prepare for a world of constantly increasing innovation and change. He has studied countless philosophies and a multitude of training programs in search of the best approach for helping people adjust to this new environment. As you would guess, there is no simple, easy answer. But there are tools he has assimilated that teach individuals and organizations to become more comfortable with change and to open them to new possibilities.

At the heart of this issue, though, lies the core challenge:

Breaking out of our comfort zones to accept, if not embrace, change and new ways of doing things; becoming open to what's possible. In my experience, people are capable of far more than they believe. And it is usually some experience that turns on the switch; something Sterling calls the 'adventure mindset'.

Some people are forced through circumstances to persevere — cancer patients having to battle through treatments, soldiers caught in life or death battles. Others knowingly seek to push themselves outside of their comfort zones by going skydiving or signing up for a marathon. But all these challenges begin with a core belief that surviving the experience is possible.

Outward Bound is an organization started in 1941 after Kurt Hahn, the founder, noticed that many sailors' lives were being lost at sea during World War II. The reason, he believed, was that these sailors lacked the mental fortitude to persevere in challenging circumstances. Thus was born Outward Bound as a school dedicated to physical fitness, enterprise and tenacity.

Each Outward Bound course is designed to provide a mental and physical challenge; be it with hiking, canoeing, cycling or even sailing. The last day is the culmination of the trip, a marathon type event designed to prove to participants that they can indeed do more than they thought.

I signed up for a week-long cycling course in New England years ago, knowing the final day would be a century (100 mile) bike ride. The first days were educational but uneventful as I learned to rappel down cliffs, do ropes courses, and, of course, cycle up and down mountain passes carrying all my gear. All was going according to plan until three days before the end of the trip I took a bad fall off my bike, knocking myself out. After an emergency room visit I was stitched up, bruised and aching. Sitting out the next-to-last day — the program leaders were worried I might have a concussion — I thought about the final day, wondering if I could still try to ride. Having trained for months preparing for the trip, I decided I had to at least try. I embraced the idea that completing the ride was possible.



Honestly not knowing if I could ride even one mile, let alone one hundred, I started out that morning with our group. Somehow I finished, riding the 100 miles in about 8 hours — with, it turns out, a couple of cracked ribs and a broken shoulder that were not picked up in the emergency room visit. Like I said earlier, we are all capable of far more than we give ourselves credit for when we commit to new possibilities.

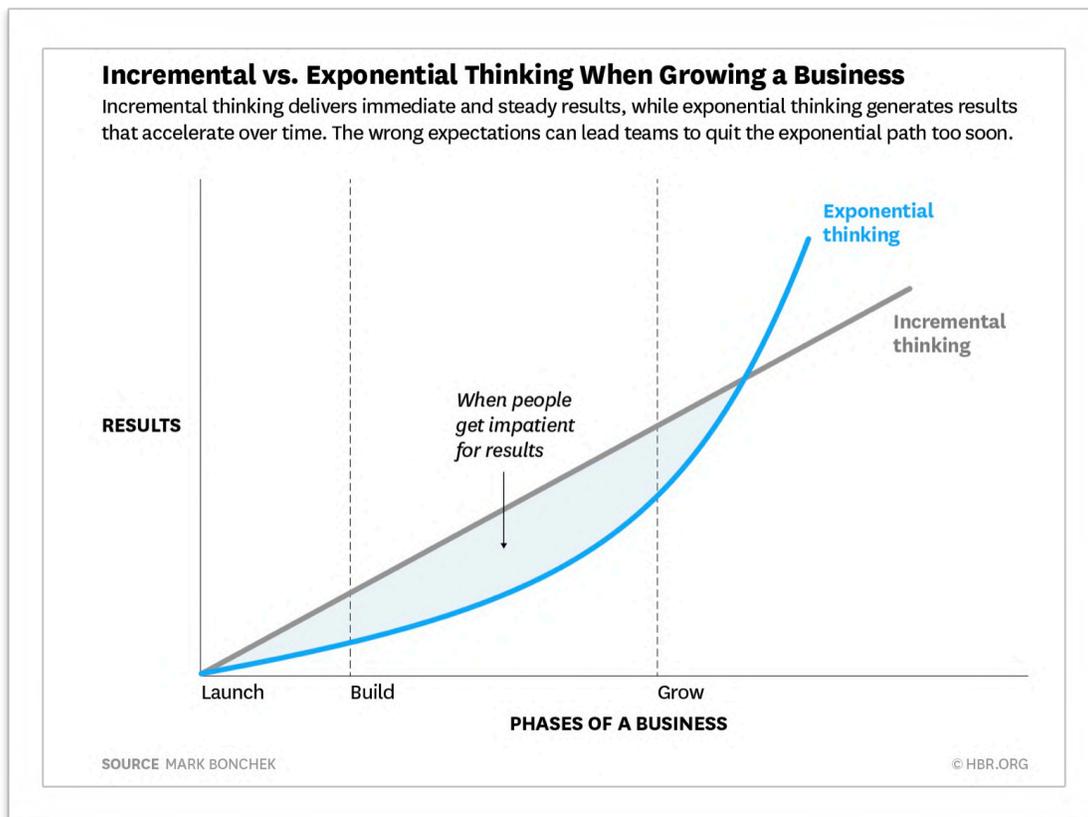
This isn't meant to be a motivational story. Rather, **without truly embracing the idea that business transformation is possible, companies will be unable to make the transition to Retail 4.0.**

## MIND THE (EXPECTATION) GAP

When setting out on a path to exponential value creation, the early stages of the journey can seem slow, almost as if nothing is happening. It's natural to think that if 25% of the projected time is gone, we should be about 25% of the way to accomplishing the goal. But that's not how exponential growth works. Early on the growth is tiny and unnoticeable, but then hits the point of inflection and growth seems to explode.

Bonchek refers to this early period as the 'expectation gap,' and it is the time of greatest risk to a new course. This is where many business executives give up and settle back into a more comfortable, incremental path forward.

**Adopting a new mindset and creating an organizational culture that embraces change and new possibilities is fundamental to surviving the future.** In many ways, this is the largest and most significant challenge retailers face in the age of Retail 4.0. I gave a presentation on the future of retail to the senior management team of one of the country's premier supermarket retailers a while back. The comment from one of the C-level execs afterward was telling: "We know where we have to go and what we have to do. The question is can we change our processes and practices to do it?"



## PLANNING IN A TIME OF EXPONENTIAL CHANGE

The Human Genome Project was launched in 1990 to decode the entire human genetic code, laying the foundation for massive leaps forward in understanding and treating disease. The project was budgeted to cost \$3 billion and projected to take 15 years to accomplish.<sup>13</sup> “Seven and a half years into the Human Genome Project, scientists announced they had decoded only 1% of our genetic code. Skeptics said it wouldn’t work; it would take a century to complete. Ray Kurzweil — inventor, philosopher, futurist — had a different reaction. He said the genome was practically solved.”<sup>14</sup>

“The amount of data sequenced each year practically doubled, leading to the completion of the project nearly two years sooner than expected. The cost of DNA sequencing came down from about \$10 per base pair in 1990 to a couple of cents in 2004 and has continued to fall since.”<sup>15</sup>

The Human Genome Project is a classic example of planning in a time of exponential change. Scientists were jumping off into the unknown in pursuit of a worthy goal but unsure of just how they were going to accomplish it.

Retail industry executives are in the unenviable position of having to commit themselves and their organizations to an unknown future. Many realize that transformation and disruption are increasing and that they must change. Others may even have some sense of where they want to go — deploying automation and committing to exponential value creation through digital transformation — but are unsure of how to get there.

**In the past — the confidence-inspiring days of linear, incremental, growth — business people could create three- and five-year plans, having a pretty good view of how they would get from here to there** using available technologies and systems.

Today, we’re unable to see that far ahead. As we look out, the road we’re on quickly takes a turn out of sight and we’re no longer confident the road is even still there beyond the curve — maybe it’s a cliff or a dead end. How then do businesses plan and make decisions on significant investments in technology, not knowing if it’s the right path or a dead end?

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<sup>13</sup> “Human Genome Project FAQ”, <https://www.genome.gov/human-genome-project/Completion-FAQ>

<sup>14</sup> “Ray Kurzweil and Exponential Growth”, <http://www.russellsteinberg.com/blog/2014/11/27/ray-kurzweil-and-exponential-growth>

<sup>15</sup> “Ray Kurzweil and Exponential Growth”, <http://www.russellsteinberg.com/blog/2014/11/27/ray-kurzweil-and-exponential-growth>

## GUARDRAILS FOR AN UNCERTAIN PATH

Let's revisit my Outward Bound trip on that last day. I knew where the finish was but had no knowledge of the journey along the way, how many mountain passes, how steep the climbs would be, and so on. The best I could do was scope out the map ahead of time and locate some milestones along the way to help know how I was doing.

Given my unsteady condition during that last day's ride, I was thankful for the guardrails that had been put in place to keep wayward drivers - and cyclists - from going off the road. In similar fashion, retailers can put in place some guardrails to help navigate their uncertain path, a handful of key trends that can guide retail's journey into Retail 4.0.

- *Seamless / cohesive digital experience:* Without question, digital customer engagement is massively important to FMCG retailers. Without it, retailers will be unable to access the value creation resident in creating digital networks across their shoppers. **Fundamental to digital engagement is providing a seamless, cohesive digital experience across channels, devices, and touch-points.**
- *Data is only becoming more important:* Product and customer data are core to providing that seamless experience. Product attribute data, traceability, sustainability, and more, is increasingly important to shoppers. Customer data is needed to provide meaningful engagement. **Digital interaction implies relevancy.**
- *Personalization and relevancy:* All that data, and more, comes together to power up sophisticated customer profiles (Birdzi's customer digital doppelgänger) that in turn enable hyper-personalization. **With a majority of consumers accessing the web via apps on their smartphones, contextual relevancy is all important.**
- *eCommerce will continue to grow:* The COVID-19 pandemic accelerated years of eCommerce growth into a matter of weeks. While that growth may moderate as we continue through and come out of the crisis, eCommerce will continue to advance, bringing an increased focus on profitability, which in turn means accelerating automation.
- *Everything in realtime:* Data is increasingly moving in realtime, making batch processing of data seem archaic. One of the maxims for retail going forward is realtime.
- *Automation everywhere:* If work or a business process can be automated, it will be automated; the only question is how soon. **Retailers must continuously be looking to automate any and all processes for increased efficiency, improved results, and growing digital networks.**
- *Privacy rules:* Europe's GDPR and California's CCPA regulations are only the beginning of a growing focus on privacy in the digital world. As retailers venture deeper into the digital world, customer privacy must be top of mind.

Those key trends can help guide decisions going forward over the next several years and can act as the guardrails to help keep technology decisions on the right path.

## THREE STEPS TO PREPARE FOR THE FUTURE

Beyond those guides, our years of experience working with companies across the supply chain in markets around the world, point towards three key areas that strongly correlate with success.

### 1. Understand where you are today and where you're going

There are actually several pieces to this.

- The first is doing an assessment of all the primary solutions used across your organization, comparing each to best-in-class capabilities today, and then aligning to what will be needed looking out over the next few years.
- Beyond doing an assessment of technology capabilities is doing a similar assessment of key processes and practices across your company. For example, what is the process for creating the weekly ad? What is the process for hiring and onboarding new associates? What are key processes at store level. These are the things that will eventually become automated through AI.
- Building on the assessment, evaluate key trends and start developing an understanding of where you're going along with a roadmap for how to get there. **Think in terms of milestones; if the goal is to deploy sophisticated personalization capabilities, break it down into building blocks:** Customer identified transaction data, accurate product data (with attributes), a customer intelligence platform to bring it all together, capabilities at checkout to deliver customer-specific promotions, and so on.

CART recently worked with a mid-size regional retailer in doing an assessment of key capabilities and technologies, identifying gaps between what the retailer has in place today with what's needed tomorrow. The final report triggered a powerful discussion among the executive team and resulted in defining a business strategy to position the company for future growth, which is being brought to life through a playbook and roadmap.

### 2. Have a process for discovering and evaluating new capabilities and measuring your progress

The assessment and playbook help drive focus around discovering new solutions and capabilities in the needed areas. Here are some steps.

- Develop a regular cadence (2x, 3x or even 4x a year) to reviewing your roadmap.
- Bring the management team together to review and discuss new innovative capabilities in the needed areas.
- Inevitably there will be what we refer to as 'black swans,' some new capability that was unexpected but that can create significant change. Be sure to include such solutions even if not directly tied to your roadmap.

Let's look at all this more deeply. As mentioned, there should be a regular cadence to this review of new technologies that, ideally, includes the entire senior management team. In innovation program events we've run, **it is amazing the discussions that generate from having executives from across the organization together at the same time, focused on new capabilities.** One of the outcomes is much greater speed to pilot and deployment.

There are already a massive number of new solution providers coming into the FMCG industry, and the influx of new innovation continues to grow. To provide some perspective, CART alone has a database of over 8,000 different solutions, and our team reviews an estimated 1,000 new solutions each year. We have spoken to many retail executives across the industry that no longer answer their phone or reply to emails, as they are inundated by solution providers pitching the latest capabilities.

While the massive inflow of new innovation presents a very real challenge, we have seen many retailers make mistakes in the opposite direction — becoming enamored with some new capability and securing it without due research of other solutions in the marketplace.

What this all leads to is the importance of having a process for understanding innovation trends, discovering new capabilities, and measuring progress towards milestones and goals. A number of significant regional retailers, distributors, and even national CPG brands have worked with CART to formalize the discovery process and bring new, relevant, innovative solutions into their organizations through CART's Innovation Program.

### **3. Establish a culture comfortable with change**

Years ago we launched one of the first loyalty programs in the U.S. supermarket industry and quickly understood the vast differences in customer behavior and financial value. That understanding led to running the first free turkey program at Thanksgiving time, rewarding customers for their shopping with us over the weeks leading up to the holiday. For any non-qualifying customer, turkeys were full, regular price.

I'll always remember explaining the program and rationale to my father (we were a family grocery business). He patiently listened, asked a couple of questions, understood the rationale for investing thousands of dollars in our most valued customers rather than losing money selling turkeys below cost to any shopper that walked in the door. Satisfied, I started to leave his office. On my way out, he stopped me and said, "But we're still going to sell turkeys cheap on the front page of the ad for Thanksgiving, right? Can't take a chance on losing that business!". Guess he didn't get it after all.

**Far and away, the single largest hurdle for retailers to overcome is getting themselves and their organizations comfortable with embracing change.** This is not a one-time thing; as we move up the exponential growth curve of technology, change happens ever-faster and is ever-more noticeable.

Here are some guidelines for establishing a culture comfortable with change:

- Developing a culture that embraces change is not about bringing in a motivational speaker; that lasts for about five minutes after the meeting ends. Rather, building your organizational culture

requires systems, processes, education, and training. It requires an executive focus on creating and maintaining cultural change.

- With that design in mind, think about the structure needed. A clear example is provided by how retailers are organized today, all around products; category buyers, pricing specialists, etc. What's needed tomorrow are customer savants; people who understand customer data analytics and can pair that with the psychology of shopping and buying to drive new insights.
- Think about Sterling's tools: the active mindset, accepting new possibilities, and understanding limits and how to use them to power breakthroughs. Much of this involves developing new habits, new ways of speaking, and new ways of thinking. Easy? No. But absolutely necessary for the future.

Creating a culture comfortable with change though is only half the work to be done. While we now live in a world today of ever-faster transformation, our organizations - and more importantly our processes - were built for the world of yesterday. It is vital to change how we work, not just speeding up what we do today, but changing how we do what we do to make decisions faster and more effectively.

John Patterson, Co-founder and CEO of Influence Ecology, works with companies to improve what he calls 'transactional competence'. Influence Ecology's training seeks to "pace human transaction with the speed of evolving new technologies" by providing a system and framework for making team interactions more efficient and effective.

In talking with John and learning more about the training his organization provides I was struck by the link between human interaction and new tech innovation. Historically, business leaders have not had to consider the implications of how and how fast decisions have been made; we simply worked like we've worked for many years. But today that approach brings with it growing risk as companies must be far more nimble than ever before. And that requires new systems and structures built for today and tomorrow.

## CALL TO ACTION

**5 years.**

**60 months.**

**260 weeks.**

**1,825 days.**

That's how long this retail industry metamorphosis is going to take. The digital transformation of retail has already started. And as Davenport so clearly calls out, time is of the essence.

### **The clock has started.**

Retail 4.0 is the radical reinvention of retail, driven by the digitalization of nearly everything across the organization and across the supply chain. The automation of physical work and business processes over the next several years will drive dramatic change. The development of digital networks encompassing digitally engaged customers opens the door — for the first time — to exponential value creation for traditional retailers.

Parts of retail are already becoming digitized: shopping has gone online, marketing is shifting from the old printed ad circular to digital channels, customer service calls are being handled by AI chatbots, even the physical store itself is becoming digitized through the growing use of computer vision systems used to monitor out-of-stocks and shopper traffic. But the digitization and automation of business processes is just getting started.

We don't have to look far to see how digitalization is transforming and disrupting other industries: Just look at eXp Realty and Ant Financial. This type of massive change is coming to the FMCG retail industry.

But between today and Retail 4.0 lie legacy systems, processes, practices, and organizational structures built for another time. It is frightening to speak with multi-billion-dollar retailers who continue to rely on green-screen systems built decades ago for ordering, inventory, pricing, and other critical functions. Some of these retailers will find it within themselves to adapt, to undertake the needed transformation, while others will not.

And what many fail to appreciate is just how fast this is going to happen. Understand where we are on the exponential growth curve of technology processing power and look at the new technologies and capabilities that have come into the market just in the past few years. **As we climb the growth curve, the floodgates of new innovation will increasingly open, powering the metamorphosis discussed here.**

Retailers have no time to lose. The time is now to re-envision the future. Begin the process of assessing where you are today and understanding where you are going. Put in place a process to understand, discover, and deploy new innovation. And embrace the possibility of an exciting future.

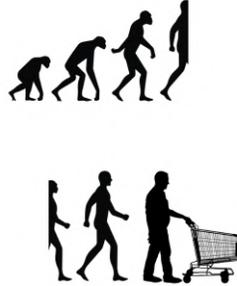
**There's no time to waste.**

## ADDITIONAL RESOURCES

Following are recent papers, books and articles by Gary Hawkins that shed light on many of the concepts addressed in this paper. All of these works, and more, can be found at <https://www.retailmindsteps.com/>



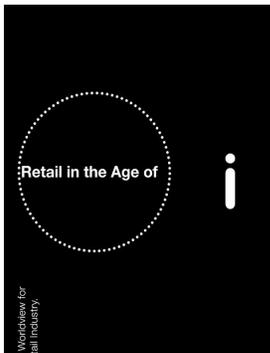
[It's Time For a COVID-19 Technology Checkup: A Prescription for Food](#)



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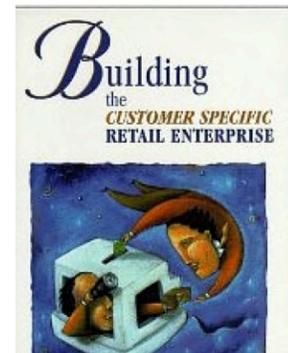
[A Retail Mindstep Like None Before: The COVID-19 Crisis](#)



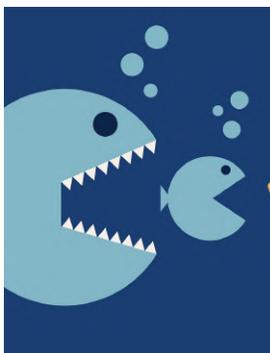
[Retail in the Age of "AI"](#)



[Customer Intelligence](#)



[Building the Customer Specific Retail Enterprise](#)



[Maybe Bigger is Not Always Better](#)



[Digital Customer Engagement in Supermarket Retail](#)



[Personalized Retail: Where Retail and Healthcare Converge](#)

## ABOUT GARY HAWKINS

**Gary Hawkins** has lived his career ahead of the curve, putting him in the right place at the right time to help guide the fast moving consumer goods retail industry into the future in a time of exponential technology growth using never-before-available capabilities to innovate the future of shopping.

Hawkins is the Founder and CEO of CART (Center for Advancing Retail & Technology). CART's mission is to connect retail to new innovative capabilities through programs, events, and education. Knowing that awareness and discovery of new technologies are only one part of future success, the CART team is at the forefront of helping retailers, wholesalers, brand manufacturers, and solution providers cultivate a culture of innovation and agility through a proven process and approach. On the other side of innovation lies strategy development, technology roadmaps, and systems assessments. Hawkins and his team are uniquely positioned to assist retailers in preparing for the future.



Hawkins' work is built on a legacy of driving retail industry innovation. Early in his career, understanding the transformative power of technology, Hawkins launched one of the first loyalty programs in the US supermarket sector, quickly leading industry learning around shopper insights and analytics. That work soon expanded to assisting premier retailers in markets around the world in gaining customer intelligence. Next up was helping global CPG brand manufacturers develop a shopper focus and leverage customer insights and analytics into collaborative marketing initiatives with key retailers, laying the foundation for today's shopper marketing movement. Realizing the ineffectiveness of mass marketing across the supply chain, Hawkins leveraged early insight to new innovative technologies to develop and deploy the first personalized marketing system for mass retail, driving industry focus on the power of marketing personalization.

Hawkins leverages his unique perspective into his role as board member and strategic adviser at select companies bringing exciting and game-changing capabilities to the market. Retail Mindsteps ([retailmindsteps.com](http://retailmindsteps.com)) serves as Hawkins' personal blog and repository of the myriad articles and papers written for industry publications where he distills the complexity of tech-fueled retail innovation into digestible and actionable insights. Hawkins is the author of three books including the latest, Retail in the Age of 'i', that explores the future of retail propelled by the exponential growth of technology. In addition, Hawkins is a regular guest lecturer at Georgetown University's McDonough School of Business in addition to keynoting retail conferences in the US and abroad.



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