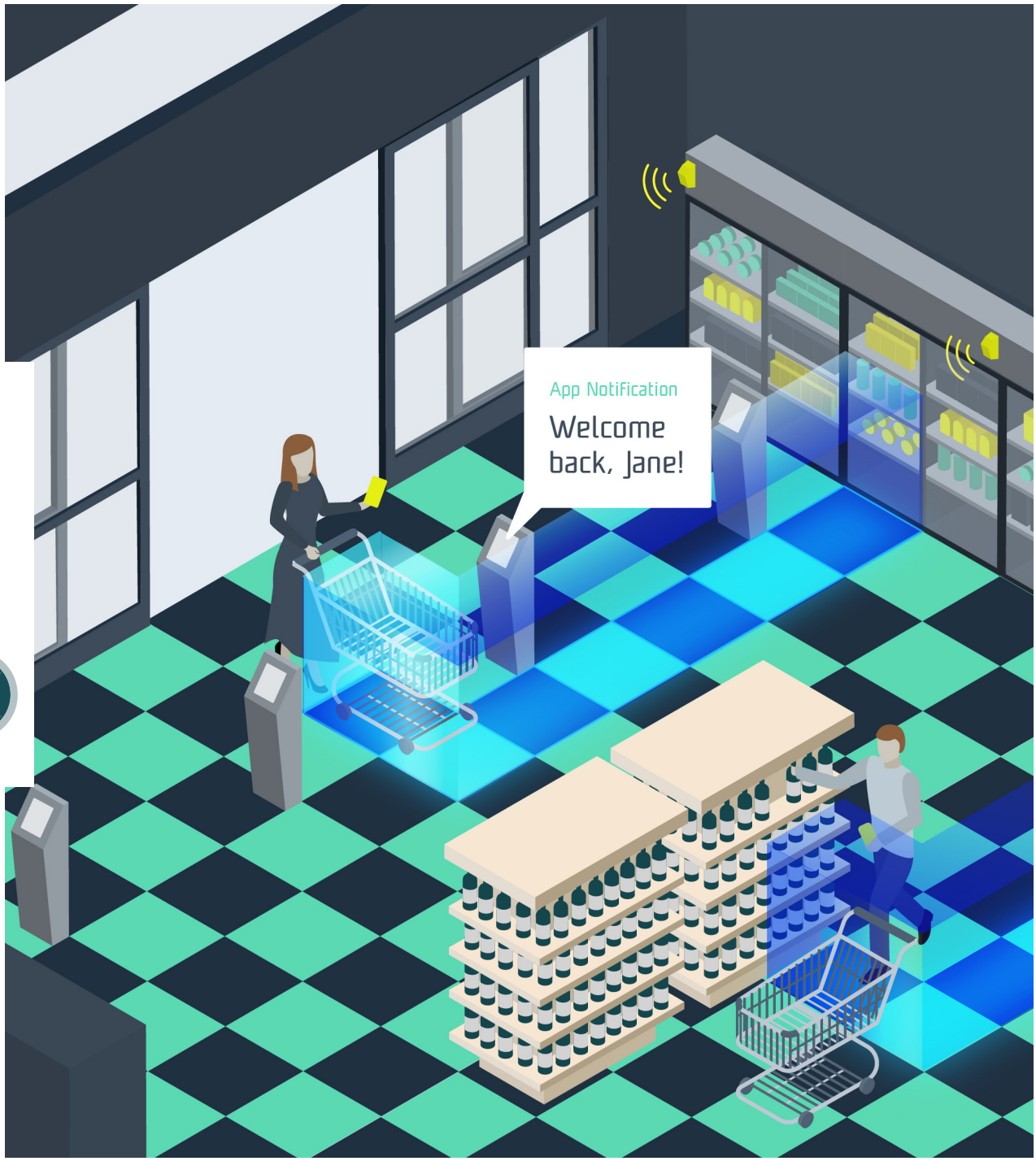
PLAN YOUR NEXT MOVE

BY C3

The Internet of Things: How Iot Is Reshaping Retail

The Deal Is in the Data



C3 Solutions

SOLVING FOR RETAIL

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From a term that came into use in 2009, the Internet of Things (IoT) has come a long way in 10 years. You've no doubt heard about it and likely use it on a daily basis if you own a fitness tracker or smart home gadget of any kind. It refers to the ecosystem of physical objects that are connected to the Internet and use it to communicate.

As with many new technologies the IoT has been the subject of much hype, lots of grand ideas and, inevitably, somewhat less return than initially promised. For an in-depth look at IoT and the "endless opportunities", it was offering a few years ago, see our Whitepaper, **The Internet of Things and the Modern Supply Chain**. Right now, in the context of the retail Armageddon, we thought it was time to offer a reality check on IoT and how it may play out in the retail sector. **What we discovered is IoT does have numerous applications for retail operations, but not necessarily where we thought they might be a few years ago.**

What's interesting is how the use of IoT technologies to track inventory throughout the supply chain can dovetail with the kind of visibility you gain when you implement a **best-of-breed dock scheduling system**, like the one we've developed at C3 Solutions. IoT lets you know what's on an inbound trailer, for example, and our solution lets you make sure that the right trailer gets unloaded, at the right door, at the right time.

It's a beautiful, coordinated sequence that lets you keep all the pieces in play for better efficiency. **Read on to learn more about IoT, its scope and potential retail use cases. It's a fascinating technology, and it's here to stay.**

IoT explained

The Internet of Things refers to the network of connected items that use the Internet to communicate. They are connected electronically via sensors that collect data like location, motion, temperature, light levels and so on. The communication is two-way; meaning IoT-enabled devices monitor their environment, collect and send data and can receive instructions, and take action based on the information they collect and receive.[1]

IoT-enabled things are generally thought of as items that would not 'normally' communicate via the Internet, thus smartphones and computers are excluded from the IoT. Examples of IoT-enabled products include appliances, automobiles, trucks, numerous components and parts, as well as personal consumer items like clothing, mattresses, toys and smart home devices like locks and light bulbs.

In 2015 predictions for IoT adoption were extravagant. Top analyst firm Gartner estimated that there would be 26 billion connected items by 2020, while Frost & Sullivan suggested the number would be more like 50 billion.[2] Cooler heads have prevailed now, though, and Gartner's best guess was in 2019 there would be 14.2 billion connected items, growing to 25 billion by 2021.3 Other research is even more conservative, placing the 2018 estimate at seven billion (not including the computers and phones noted above) with growth to 11.6 billion by 2021.[4]

Whatever the correct number turns out to be, it's clear that there may have been some unrealistically high expectations for IoT four or five years ago.

IoT evolution

Regardless of the exact number, countless factors are currently influencing the direction and growth of IoT. You can't talk retail without mentioning the 800-pound gorilla, so here's where Amazon rears its head once more as a **retail disruptor**. The online retailer is moving into bricks-and-mortar stores with its Amazon Go self-checkout concept, and has plans to open 3,000 of the small footprint outlets by 2021. Equipped with cameras and sensors everywhere to capture what shoppers have in their baskets, this is seen as an important driver for the IoT market, as other retailers are likely to try to follow suit. The value of the IoT market in retail is predicted to jump from US$10 billion in 2017 to around $35 billion by 2024.[5]

Other factors supporting the growth and attractiveness of the IoT are significant cost reductions in the costs of the technologies that make it possible. The average price of sensors has fallen from US$1.30 in 2004 to $0.38 in 2019, for example. Likewise, the cost of data transfer dropped from $0.47 in 2014 to just 4 cents in 2019.[6]

The anticipated arrival of 5G communications technology is also expected to give IoT a boost by allowing for faster data transfer, bringing new use cases to light and bringing it into the mainstream. Here, it is anticipated that the consumer will be the main beneficiary; as they will have access to more data, faster, enabling more comprehensive comparison shopping.[7]

Inside and Out

A handy framework for understanding where IoT can be applied is to understand the external and internal benefits it can deliver to the business.

In retail, that breaks down into how IoT can improve the customer experience to drive revenues – the external use case – and how IoT can be applied within the organization to create efficiencies.

Driving revenue

As noted above, providing more information to consumers is the primary method by which IoT will deliver external benefits. And it's in the **bricks-and-mortar outlets that most of the benefits may be realized.**

For example, this can include improving the in-store experience for shoppers by enabling location-based services such as an app that allows them to summon a clerk to their location, or request another size of an item from inside the changing room. Wearables offer retailers the ability to readily identify VIP clients, and in the case of Disney amusement parks, which hands out enabled wristbands to visitors, to monitor lineups and deploy staff to speed things up when necessary.[8]

Beacons are used to ping consumers in their immediate vicinity with special offers, and can also offer navigational aids within the store or mall environment.[9] Digital signage promises to inform customers with real-time price changes, specials or information like the number of parking spots available and on which level in a parkade.

The customer experience is also being enhanced through the use of heat maps to analyze traffic in stores and position products better where shoppers naturally seek it out.[10] Foot traffic analysis can also be applied across malls to optimize the shopping experience.

A perfect fit for fashion

Fashion retail, particularly, may stand to benefit from the use of these technologies, as clothing is mostly all tagged already. Adding the sensors and the ability to use the location data they provide is the remaining piece of the puzzle.

Men's shirt retailer Untuckit recently developed a pilot project in which RFID tags placed on “try-on” shirts in its retail outlets collect real-time data on merchandise movement from showroom to fitting room (and back). Using a combination of the chip data, overhead traffic counters and point of sale data, sales managers can identify which exact sizes and styles are being tried on and bought.

This data shows which SKUs are bestsellers so store managers can optimize inventory levels in real-time based on shopper behaviour. It also suggests which sizes or styles can be reduced in volume due to low demand, reducing inventory cost and allowing for Untuckit to redirect their investments toward more popular SKUs, or new offerings.

The pilot also included beacon-based traffic monitoring to count, observe and measure the traffic paths of shoppers and store associates. They can also gather data on when shopper-associate interactions occur, how often, in what duration, and how they impact shopper behaviour. With its high-touch approach, understanding how associate behaviour influences shoppers is a valuable training and service insight for Untuckit.

> **When people ask about examples of IoT in retail, I talk about this pilot. We have the ability to "upgrade" the physical store in a way that captures the same kind of data we get during online interactions,"**

said Keith Sherry, COO of SATO Global Solutions, which partnered with Untuckit.

> **"Retailers looking to compete in brick-and-mortar have more tools than ever to understand shopper behavior. The key is then applying these insights to align the customer experience with expectations across all channels." [11]**

For e-commerce, IoT payments are poised to gain a huge share. For drive-through applications or in-home shoppers, smart devices such as Amazon's Alexa can be enabled and authorized to transfer payment information via voice commands. Due to their speed and increased convenience, these transactions are expected to boom in the next four years; going from 56.5 million transactions made by payment-enabled smart speakers virtual assistants by the end of 2019 to 1,554.6 million in 2023.[12]

Driving efficiency

While most of the external benefits are seen in the retail space, the benefits that help keep costs under control are largely invisible to the customer. There are exceptions to that generalization, however, with IoT-enabled inventory counting increasingly being employed in retail outlets. From smart shelves that transmit inventory positions to stockers to robots that roam around taking counts, IoT is already being employed by numerous retailers trying to keep inventory numbers in real-time to prevent stockouts.

Inventory control inside the retail DC is not typically done with roving robots, although Walmart did try drone-based stock-taking in the warehouse a few years ago.[13] **More typical is sensor-based tracking using RFID on pallets or cartons to count and locate stock within the DC**. Active tags are also enabling the continuous tracking of loads in transit, from origin to destination, giving operations managers insight into where their goods are at all times and when they will arrive.

The benefits of having real-time visibility into on-hand and in-transit inventory is obvious. First, it saves the costs associated with counting things – time and labour. Second, the accuracy affords better planning and reduces the need for safety stock. Less stock means smaller warehouse footprints are possible, saving land and infrastructure costs. In the high-speed e-commerce and omnichannel retail, this also means there is less chance of losing customers to the competition because of out-of-stock situations.

The equipment and assets that operate the supply chain, from trucks and containers to forklifts and conveyors are yet another area that IoT is being applied. **The use case for asset tracking and predictive maintenance is a strong one, and it's been done for many years with solid results**.

It's almost routine now for forklift manufacturers, **AS/RS builders** and other material handling equipment suppliers to have IoT enabled maintenance communications built into their machines. Not only does it help keep their users' distribution centres running smoothly, with lower maintenance costs and less unplanned downtime, it also affords the manufacturer a potential new source of income from the diagnostic and maintenance service.

Specialized applications have also been tried, to ensure that material handling equipment is not inadvertently damaging product during the putaway and picking process. GE Appliances developed an IoT-enabled basiloid for appliance handling whose sensors will alert the user and back office to potential problems like excessive G-forces or pressure. **Ensuring the product you sell doesn't receive invisible damage on your own DC premises means more satisfied customers and fewer returns**.[14]

Bringing the outside in

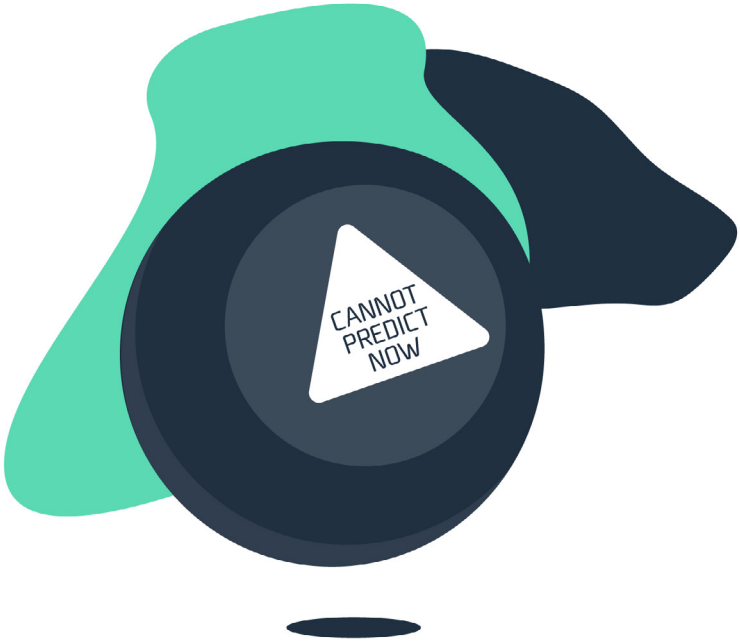
When you net the benefits that IoT can provide, both inside and outside the organization, you are essentially looking at the perfect, streamlined, transparent supply chain. Consumer data provider Nielsen refers to this **as "frictionless commerce", or giving shoppers "zero resistance from discovery to assessment to shopping to payment to fulfillment."**[15]

It encompasses the external blandishments being offered to consumers to entice them to buy – from the cashier-less Amazon Go shop, to the beacon that delivers personalized marketing messages, to the in-store experience that ensures no need goes unmet – and the back-end supply chain benefits like automated inventory control, shipment tracking, real-time inventory visibility and quality control. Meshing in-store data with full supply chain visibility gives the ability to use predictive analytics to optimize inventory flows.

> **Speed and convenience will drive behavior – and every millisecond reduced is a battle won,"**
>
> Nielsen says.[16]

Miles to Go

In spite of Nielsen's optimism, IoT still has a long way to go before it becomes mainstream technology and that perfect supply chain is realized. It's not the retailers aren't interested; **in fact, they strongly believe that IoT will have a dramatic effect on business in the next three years**, and 72 percent in a recent North American study said they were interested in IoT based automation, sensors and analytics.[17] It's just that half of them don't know how they'll use it in their own business.[18]



> **The biggest barrier to the IoT is that most enterprises do not know what to do with the technology,"[19] says Gartner Research Vice President Mark Hung. Even now, IoT seems to be a solution searching for a problem to solve. While the tech is "clearly past the early innovator phase...now we need to find out how to get it more mainstream," said Bill Hoffman, president of Object Management Group, a not-for-profit technology standards consortium, speaking at an IoT conference in October 2019.[20]**

"3PLs need to come to us with proposals on the kind of automation and IoT solutions that are going to noticeably counter rising costs while increasing visibility. We hear of solutions in R&D labs but we do not see the case studies of success stories implemented at scale. Nobody wants to be the guinea pig," Intel's global logistics procurement director Greg Christensen told the authors of the *2019 State of Logistics Report*.[21]

Where's the ROI?

It's understandable that companies don't want to take the risk on technology that has yet to demonstrate solid ROI numbers. Retail has the lowest margins of any sector, at .5 to 3.5 percent, making the investment hard to justify, especially when the use case is primarily in brick-and-mortar stores, which have been suffering under the e-commerce onslaught.

The few scaled-up implementations are being undertaken by retail giants – Amazon, Walmart and supermarket giants, primarily in dense markets like the United States and Europe. But for most retailers, IoT may not be that compelling.

Gartner suggests that the strongest business cases for IoT focus on finding **cost savings in fuel, energy consumption and labour – delivering shorter ROI times and higher paybacks.** The best candidates in their estimation are asset-intensive industries – so-called heavy industry like energy production and mining.

Gartner said in its “Leading the IoT” report.[22]

> **Here, industrial mechanical devices with high cost and complexity, critical asset value and remote geographic location realize IoT benefits such as remote asset monitoring and predictive maintenance that maximize asset utilization and minimize critical failure unplanned downtime,"**

It's about the data

Going back to the internal versus external framework for analyzing IoT applications, it appears that retailers need to keep their eyes on the real prize: the data. In a recent report, RSR Research claims that IoT for retailers is not at its heart about saving costs, although that is a side benefit of the inventory accuracy and information IoT delivers.

> **Its ability to bring about accuracy and efficiency to both inventory and inventory-related tasks absolutely has a cost-benefit component. After all, a needless task wastes human capital, and retailers have long been clamoring for smarter ways to reduce time wasting efforts – and the dollars associated with them,"**
>
> the research firm suggests.[23]

What retailers really stand to gain is the data, the information that is generated by the billions of smart devices in stores, and in the products they sell. With better quality information – not to mention more of it – retailers are able to take more informed action on their inventory positions. They'll be better equipped to decide where to allocate a product in the store to help it sell, when to put it on sale when its time is nearly up, where to position it in the distribution network to speed up fulfillment and lessen the pain of returns. When the information is that good, retailers can also share it with their customers to improve communication and further strengthen the relationship.[24] It creates a positive feedback loop where the retailer and customer join together in an IoT ecosystem that ideally finds a perfect balance.

Keep it Simple

We've talked a lot here about bricks-and-mortar stores. Usually the focus is on retail distribution and how to make the background operations as seamless as possible to ensure perfect order fulfillment. And ultimately, that's what we are still talking about.

Understanding where and whether to use IoT in your retail operation is a strenuous exercise, requiring a thorough understanding of your own operation and the potential business benefits you might gain. We can't tell you if IoT is right for your business, but we can explain how what we do will support you; regardless of the IoT decision you make. Successful retail distribution depends on having the right inventory in **the right place at the right time**, and it needs to be moving fast to keep up with today's pressures for same day delivery. That's the bottom line, regardless of how you get the inventory data you need to fulfill orders.

So, when you think about that higher function, also take a moment to consider how the moving parts of your distribution centre might be made more efficient. Take the dock doors, for example. In this fast-paced environment are you still using a spreadsheet to keep track of what's coming and going? Do you have a frustrated, harried co-worker whose job it is to track down truck drivers and find out why they didn't show up when they said they would? Maybe that person is you!

It doesn't have to be that way. The technology is at your fingertips to manage and control those dock doors, so you don't have to. **Dock scheduling from C3 Solutions** frees up the time of that scheduler and lets them do more productive work. It allows truck drivers to set their own appointments at the dock door, using a mobile app. It integrates with your system software – ERP or WMS – so you have visibility into the inventory inbound on those trucks.

Smoothing out the operation of your loading docks could just be the simplest, most effective change you make. Imagine how much more efficient the DC could be with inbound loads arriving on time, as expected, with staff at the ready to unload quickly and efficiently. **Carriers will love you** because you make and ***keep*** **appointments, and they don't get stuck waiting, wasting precious driver time.** You'll save money on **detention charges** too.

It sounds simple, doesn't it? We make it that way so that you have time to ponder the really big questions, like whether IoT is right for your business. But, just as a fully IoT-enabled retail operation succeeds on the successful analysis of reams of data, a C3 scheduling solution puts the complicated calculations and algorithms behind the scenes.

All you and your carriers see is the effective interface that keeps traffic at the docks flowing.

Ready to Plan Your Next Move?

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Globally recognized as the masters of Dock Scheduling and Yard Management Software technologies; we've perfected the art of helping industry leaders move strategically through quickly changing landscapes so that operations continue to move smoothly.

At C3, we've dedicated ourselves to helping you plan your next move!

Learn How to Improve your Retail Operations

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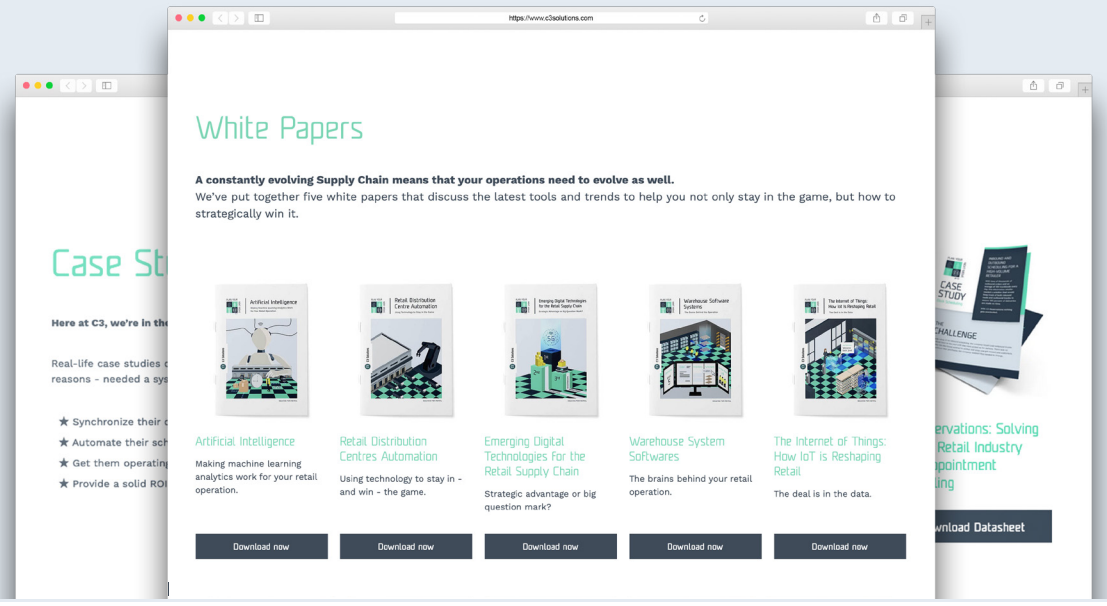

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