



 **RETAIL WHITE PAPER SERIES**

The Future of RFID in Retail: Finding Value Beyond Efficiency



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Over the past decade the retail sector has achieved unprecedented efficiency through the introduction of radio frequency identification (RFID) systems. The falling cost of RFID made item level tracking possible, generating extraordinary visibility for supply chain managers.

Item level RFID not only cuts costs by streamlining logistical processes, it creates significant sales lift due to the elimination of out of stocks. As a result of implementing RFID, softline retailers for example, report sales uplift of from 5% to around 15% in SKU-intensive categories. One large retailer has reported average uplift of 13%, but said two of their major apparel categories, denim and women's intimates, rose by 18% and 30% respectively due to the high color/style/size complexity in the assortment.

A key source of benefit is in the ability to execute omni-channel fulfillment more effectively. Due to inventory inaccuracy, retailers are reluctant to commit online orders from store inventory without maintaining significant safety stock. This not only increases carrying costs, but also leads to excess inventory at the end of the season, leading to mark-downs and a reduction in gross margin.

More recently, RFID solution providers have been looking beyond sales lift and omni-channel fulfillment and finding additional value from the boundless technology. From product monitoring to loss prevention, or social media integration to advanced analytics, RFID has positioned itself at the center of a new era in retail.

The return from such services was difficult to gauge but recent research shows that they are fast becoming the new value propositions for RFID in the retail sector. This paper aims to explore the broad and increasing influence of this key technology and ask what RFID means for the retail business.



RFID Means Accuracy

Prior to introducing RFID, retailers generally took inventory just once or twice a year, providing stock accuracy of just 60%. By replacing barcodes with an RFID system they can increase inventory count rates from 200 to 12,000+ items per hour, meaning retailers can now take stock twice a month or more, leading to accuracies of 95% or higherⁱ.

According to extensive trialsⁱⁱ, the use of RFID tags improves:

- Inventory accuracy by 32%
- Out-of-stock situations by 50%

Accuracy means being in stock at all times, and the scale of the improvement highlights the true power of accuracy as well as the stark cost of being out-of-stock:

- 81% of consumers will shop at a competitor if a product is backordered or out-of-stockⁱⁱⁱ
- The probability of selling to a new prospect is 5-20%; the probability of selling to an existing customer is 60-70%^{iv}

So not only have you missed out on the opportunity to make a sale, up/cross sell and create customer loyalty, you have provided all these opportunities to your competitor. If a competitor has the item in stock and provides a good service, chances are you have lost this customer for life, or at least years. Regular out-of-stock situations will soon mean serious out-of-business problems.

RFID Means Omni-Channel

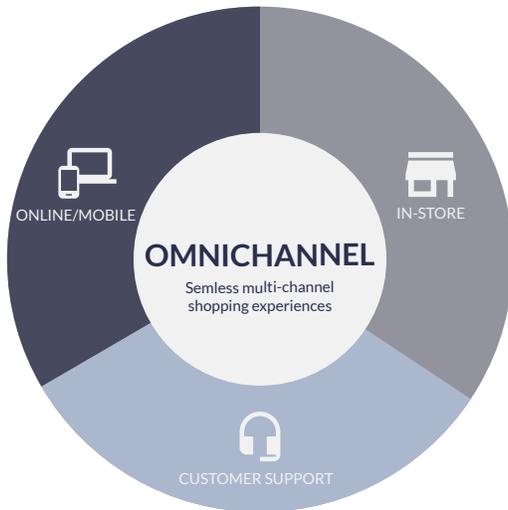
With the emergence of the Internet came online shopping that was supposed to spell the end of brick-and-mortar stores. The battle saw online retailers able to offer lower prices and the convenience of shopping from home. Brick-and-mortar retailers survived by moving online or because many shoppers still preferred to “touch and feel” products before purchase.

However, it soon became clear that retail had space for both forms of shopping, so omni-

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channel was born to bridge the divide between the two. The retail battleground now lies in omni-channel, the market leaders have already begun implementing it, the rest risk being left behind.

“The omni-channel train is leaving the station, and in a few short years, ‘omni-channel retail’ will be just ‘retail.’ And EPC-enabled item level RFID is the key component for making end-to-end supply chain visibility possible in this new retail world,” says Bill Hardgrave, PhD, Dean of the Harbert College of Business and Founder of the RFID Lab, Auburn University.

Through omni-channel retail, merchants aim to provide customers with a seamless experience whether shopping online, on a variety of devices, or at a traditional retail store. Omni-channel retail is no easy feat but has been made possible by the use of radio frequency identification (RFID) technology giving the level of supply chain visibility needed to put this complex system in place.

Through omni-channel the consumer now has the option to:

- Buy online, then collect in-store
- Buy in-store, then have the items delivered
- Select online, then try before buying in-store
- Buy in-store, then return online

However, for omni-channel to be successful, real-time inventory and location data needs to flow seamlessly through the supply chain to the consumer and back the other way. This is where RFID solutions comes in, by providing a means to accurately track inventory; the technology affords retailers the confidence to accept any order because items can be located and dispatched in an instant.

The modern consumer increasingly demands greater flexibility and reliability in their shopping experience. Research repeatedly shows that omni-channel is the clearest way to meet this demand and succeed in 21st century consumer retail.

- 95% of consumers prefer some form of omni-channel service when shopping^v
- 60% of consumers said they would purchase elsewhere if their preferred method of delivery wasn’t available, even if they have shopped with that retailer many times before^v
- Omni-channel shoppers spend between 50-300% more than single channel shoppers^{vi}
- The ICSC also state that 63% of shoppers use multiple channels when making orders over £100^{vi}
- “Consumers think of shopping as one experience, whether online, in-store or on a mobile device, and so must businesses”^{vii}



RFID Means Warehouse Functionality

The warehouse is the lynchpin of the retail business. It ties the supply chain together, receiving goods and dispatching stock to ensure everything is where it should be. Suppliers, nationwide and around the world, send masses of goods to your warehouse in a variety of formats, creating a chaotic bottle-neck that slows down the entire supply chain.

RFID systems are revolutionizing warehouse organization however. Tags placed on items and cartons are sensed by readers, ensuring warehouse managers know exactly where inventory is at all times. From there, orders can be dispatched accurately and on time, reducing delays and out-of-stock situations.

Pilot programs are already underway for the use of drones to collect orders from around the warehouse ready for dispatch. Without human intervention, when an order comes in, a drone would automatically locate the items RFID tag before loading the order on to a delivery vehicle. Such systems are redefining storage functionality and having an impact throughout the retail business.

An inefficient warehouse means an inefficient business, and a highly functional warehouse can be the difference between the market leader and its challengers.

RFID Means Monitoring

Logistics is already a tricky business but when you add perishable stock to the equation it gets a lot more complex. Recently however, RFID technology has been finding new ways to give unprecedented visibility to retailers of perishable goods.

Foodstuffs, pharmaceuticals, chemicals, livestock and other sensitive products must be kept at an exact temperature and away from contaminants throughout their journey, regardless of weather or other conditions. Meaning a misplaced container or box may soon result in lost goods. Products must be packaged fresh, then controlled throughout their journey in order to arrive on time and in perfect condition.

'Cold chain' RFID systems offer temperature, contaminant and other forms of monitoring. Active RFID tags can be designed to measure and endure a wide variety of conditions while wirelessly transmitting its sensory information in real-time. Alerts will sound when the conditions deviate, allowing logistics firms and retailers to react to any hazardous situation as it happens.

In addition, by removing the human element from specialized storage monitoring, RFID systems also save on time, minimize errors, and reduce the need to open the container at all - keeping products in the right place, at the right time, at the right temperature and without unnecessary exposure.

RFID Means Loss Prevention

Retail is a chaotic business and in that chaos things inevitably get lost. Even temporarily misplaced items, be they in the warehouse, truck or store, cause delays and incorrect stock-takes that directly impact retailers' bottom lines.

- **Retail inventory shrink accounted for 1.38% of sales, or \$45.2 billion, in 2015^{viii}**
- **US retailers are losing \$60 billion a year to shrinkage for the same year^{ix}**

Wherever the true figure lies, loss in retail is a big issue, and the main issue is theft^{viii}:

- **Shoplifting accounted for 39% of the reported shrink**
- **Employee theft amounted to 35.8% of inventory shrink**

"A common misperception about shoplifting is that retailers can 'afford' the loss of a candy bar or a pair of jeans, but the truth is that the industry loses billions of dollars





each year at the hands of callous criminals that could be put towards human capital, promotions and other necessary business operations,” says NRF Vice President of Loss Prevention Bob Moraca.

Retail may always be a chaotic business but with the use of the right technology, retailers can achieve the visibility they need to create efficiency and maximize profit. Item-level RFID tracks inventory throughout the supply chain and in-store, alarms can sound when an item leaves its designated area and any missing item can be tracked to its last position.

At American Apparel, who initially introduced RFID to improve inventory accuracy, shrink has been reduced by an average of 55% and theft by as much as 75% in some locations^x.

Across the industry item level RFID solutions are providing intelligent data on every missing item, allowing retailers and supply chain managers to identify and tackle sources of loss.

RFID Means Better Customer Experience

“RFID technology helps retailers much more significantly on the sales floor than in their supply chains,” says Bill Hardgrave, dean of Auburn University’s College of Business. This is especially true with apparel, which thanks to multiple size and color combinations can be troublesome to keep properly stocked.

“Stores are chaotic. The processes are not repetitive; customers don’t behave the same way every day; the weather isn’t the same every day and that impacts buying patterns. So this is where RFID has the most value,” Hardgrave explains.

Advanced systems such as Wide-Area RFID by Mojix can be deployed in the retail store to provide complete visibility. Requested items, which may have been misplaced or yet

to be shelved, can be located instantly to maximize sales. Customers can even enter a store with an online shopping basket and locate items themselves using a smartphone.

In fitting rooms we have begun to see smart mirrors being installed. These mirrors can identify items brought into the fitting room, suggest complementary items and allow customers to request a different size or color at the touch of a button. With smart mirrors it is possible for customers to send a photo or video of their outfit to a friend for feedback, and they also show people their own reflection.

In the future stores may not even need to checkout at the cashier, they can just walk out with their purchases. Item-level tracking technologies like RFID hold the key to a truly accurate and seamless checkout-less shopping experience. Using low-cost passive RFID tags, items and customers can be tracked within the store. A customer can fill their basket and then any items held by the customer when leaving the store will be charged to their account.

An RFID enabled store is more automated allowing more time and energy for sales assistants to help customers. Through loyalty cards or smartphone integration RFID can also track customers as they move around the store, allowing sales assistants to position themselves in strategic areas.

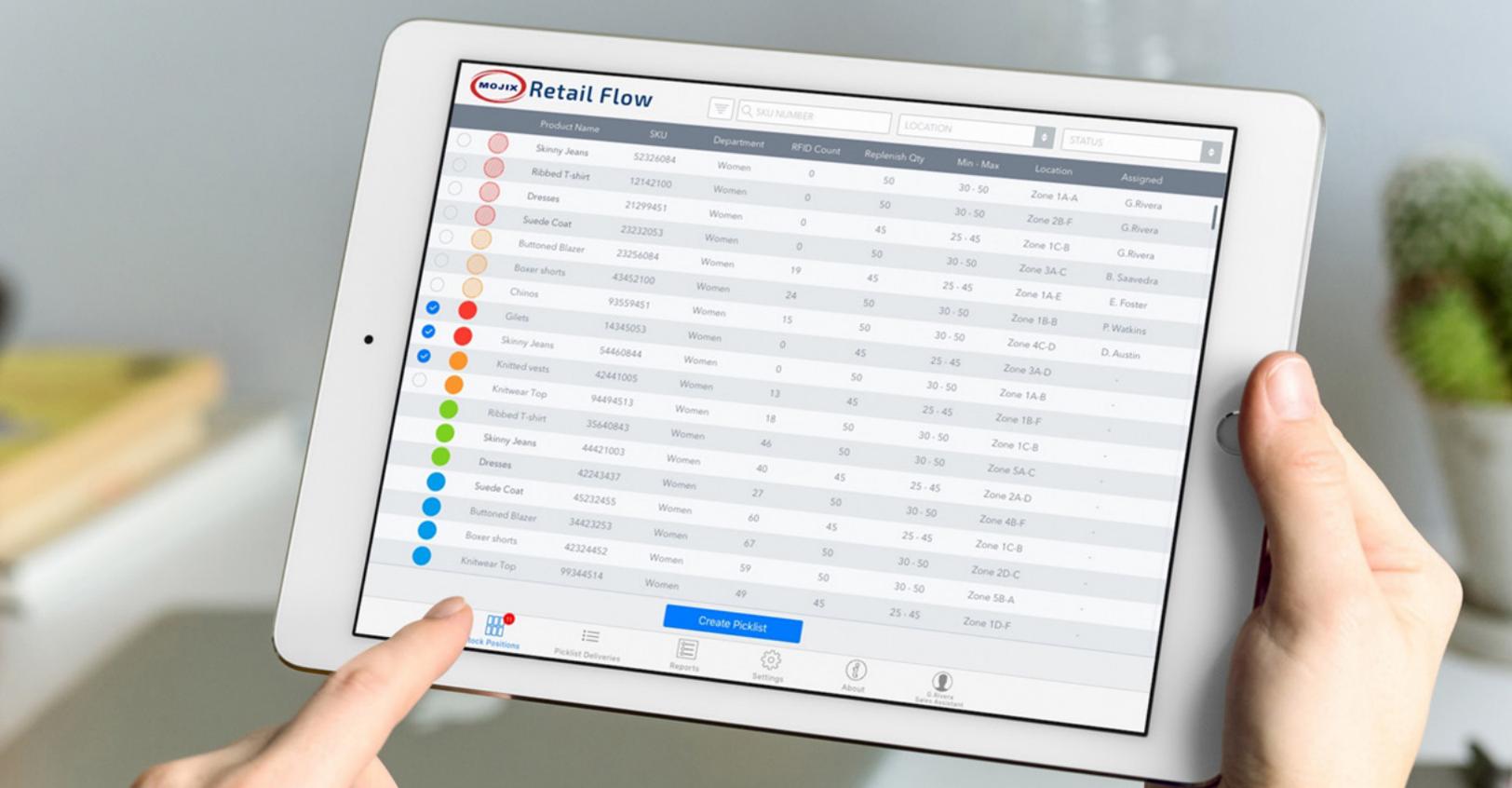
- **62% of consumers purchase more items more often when provided with a personalized service^{xi}**

RFID Means Information

“If you can’t measure it, you can’t improve it,” said Scots-Irish mathematical physicist and engineer, William Thomson – The Right Honorable Lord Kelvin – more than 100 years ago. Thomson’s words have never been more poignant, not least for the retail sector where RFID is generating unprecedented levels of valuable data.

Today, information is king. Sensors are being applied to almost every element of our lives, creating data that can provide insight and intelligence to better support decision-making. Data alone, however, is not enough and the volume of data being produced creates its own challenges. It is only with the use of advanced analytical software that RFID’s big data can become actionable intelligence.

- **Real-time delivery management by analyzing weather, traffic, and truck location feeds to determine the exact time of delivery**
- **Faster order picking process by incorporating data like orders, product inventory, warehouse layout, and historical picking times**
- **Better vendor management through well-defined key performance indicators**
- **Accurate demand forecasts by analyzing purchase history, marketing, lead times, and other factors such as promotions and weather**
- **Enhanced personalization of marketing and merchandising by analyzing post-sale data from social media and customer feedback channels**



Armed with market-leading IoT platform solutions like ViZix, the retail sector is fast becoming a trailblazer in big data analytics, seemingly finding benefits wherever it places sensors and gathers information. Data derived from suppliers through to the shop floor and beyond, is directly impacting businesses bottom lines and creating a competitive advantage for early adopters.

As more and more information streams in big data analytics is proving its value for retailers:

- 64% of supply chain executives consider big data analytics a disruptive and important technology, setting the foundation for long-term change to management in their organizations^{xii}
- Embedding big data analytics in operations leads to a 2.6x improvement in supply chain efficiency of 10% or greater^{xiii}

RFID Means The Future of Retail

The tide is turning in the modern retail landscape. RFID is fast becoming commonplace and it's not just for the major players. Retailers of all sizes are increasingly excited by this revolutionary technology that promises to create value and develop efficiency across almost every segment of their business.

RFID adoption boosts total retail profit margins from 8.9% to 14.3%, on average, due to lower operating costs, fewer errors, fewer markdowns and general streamlining. It also achieves 12% ROI from the reduced time and labor costs associated with implementing RFID^{xiv}.



RFID is directly attributed with sales increases of 18%ⁱⁱ. Importantly, increases disappear when RFID is removed. River Island reported a 10% sales increase in pilot stores. When RFID was removed, sales in those stores dropped by the same percentage.

While the efficiency benefits of RFID have been clear and calculable for sometime, recent years have demonstrated value beyond efficiency. Unsurprisingly, awareness of the benefits of item-level RFID tracking and big data analytics are at an all time high:

- 73% of retailers and brands are either currently implementing or piloting RFID technology^{xiv}
- 97% of supply chain executives report having an understanding of how big data analytics can benefit their supply chain^{xiv}

RFID adoption is no longer a question for the retail sector to answer. Efficiency is enough to justify investment and keep RFID adopters in the competition. However, the difference between the best and the rest will be decided by who can harness the far-reaching benefits of RFID.

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Corporate Headquarters:

🏠 Mojix® Inc.
11075 Santa Monica Blvd, Suite 350,
Los Angeles, CA
90025

📞 Phone:
+1.877.886.6549

🌐 Web:
mojix.com

✉ For more info:
info@mojix.com

📘 Facebook:
Mojix Inc

🐦 Twitter:
@MojixInc

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