



# Rising Expectations & Today's Supply Chain: A Challenge Worth Solving For

RAIN RFID and the Current Supply Chain Landscape





For years, supply chain operations have been growing in complexity, with each subsequent expansion adding new conveniences for customers. However, much like how a duck swimming looks effortless on the surface, behind these new conveniences exist complex operations in fulfillment, distribution, and shipping, to ensure orders are correct and timely.

Illuminated by a global pandemic, issues like the expanding costs of lost inventory and the shrinking labor pool for warehouses have been increasing and compounding. The most fragile links in the supply chain can be thrown into sharp relief, as shutdowns, re-directs, and delays across the world demonstrate both how interconnected our world is, and the fragility of those connections.

Luckily, while the challenges facing the supply chain are evolving, the technology to solve for these issues is as well. We'll focus on the warehouse and distribution center, and explore the impact of RFID technology on the processes of order fulfillment, shipping, and more in this ebook.

# 01

## The Supply Chain Landscape

“A global supply chain made so accessible via the internet has connected shoppers to the items they desire in ways we never imagined before. But this phenomenon also carries with it the unintended consequence of making the retail supply chain vulnerable.”

—Michelle Covey, Vice President GS1 US<sup>1</sup>

## Internet-fueled growth

Online sales continue to grow, and have accelerated with new modes of fulfillment emerging due to consumer demand, fierce competition, and a rapidly changing world.

In the US, online sales orders are expected to continue to climb from \$409 billion in 2017, and \$517 billion in 2018, to **\$638 billion by 2022**. Worldwide, the situation is similar, with e-commerce orders growing from \$2.3 trillion in 2017 to nearly \$5 trillion in 2021.<sup>2</sup>

Customer expectations are keeping pace and helping to fuel this inflation. They want convenience, safe, and faster deliveries—without having to pay a premium for rush delivery services.

According to Pitney Bowes,

**2,760**

**packages are shipped every second—that's 23 per person, per year!<sup>3</sup>**

## New world, new trends

E-commerce continues to grow with no sign of slowing. Warehouses, distribution centers, and 3rd-party logistics are grappling with the expectation of running their operations faster, cheaper, more transparently—and with 99.9% accuracy. Then in 2020, COVID-19 hit the fast forward button on these trends and added more layers of complication, with new demands for **stricter hygiene standards**, contactless service, and faster, accurate shipping as more consumers ordered everyday necessities online.

These changes will likely result in more long-term behavior habits affecting stores and the supply chain up the line: a Morning Consult study from April 2020 found that **24% of**

**consumers said they wouldn't feel comfortable shopping in a mall for longer than six months.<sup>4</sup> 20% said they wouldn't feel comfortable going to a restaurant in that same time frame**—which is why warehouses had to quickly divert bulk flour and other ingredients from restaurants to stores to avoid long shortages.<sup>5</sup>

These changing customer preferences are having a ripple effect upstream, with retailers trying to meet these new preferences quickly. Even before COVID-19, recent IDC data suggests **28% of retailers are piloting or doing a POC for automated cashierless checkout** which will protect employees and make customers more comfortable shopping in-store.<sup>6</sup>



## The last mile is the longest mile

The added demands for faster shipping and delivery pile on to the complications in the supply chain. In order to meet these increased demands, suppliers, distributors, and retailers alike will have to increase efficiency, optimize distribution networks and inventories, and streamline their operations. This increased effort and cost are not being met with an increase in customer loyalty—with so many options, customers will go elsewhere instead of waiting for stock to arrive or settle for something else.

**When customers are faced with a stock-out:**

**7–25%**

**will continue to shop but  
won't buy a substitute<sup>7</sup>**

**21–43%**

**will shop elsewhere to  
buy the desired item<sup>8</sup>**

## Expectations have no limit, but labor and resources do

One way to keep up and ensure customer demand is met and retain their loyalty is by adding warehouses closer to meet the rising need, which increased by 23.7% between 2015 and 2019 in the United States alone.<sup>9</sup> But warehouses don't run by themselves: unfortunately, **demand for skilled warehouse workers outpaces supply by a ratio 6:1.**<sup>10</sup> Clearly, this problem can't be simply solved with more aggressive hiring.

It can be costly without a skilled workforce, where more than 50% are involved in picking, packing and shipping outbound orders:<sup>11</sup>

Mis-picks cost  
a warehouse

**\$389k**  
per year<sup>12</sup>

**2x**

Order pick time is double  
with every error<sup>13</sup>

Shipping cost  
can increase up to

**5x**

when re-shipping and  
expediting late items is  
necessary<sup>14</sup>

Labor costs  
constitute roughly

**65%**

of most warehouse facilities  
operating budgets<sup>15</sup>

# Expanding shrink and increasing loss

The consequences of limited visibility and deficient communication amounts to more than a \$181B pain point that ultimately inflates costs for suppliers, vendors, and consumers. The predominant sources of these costs are shrink, counterfeiting, and claims.

According to the National Retail Federation, total shrink, or unaccounted for inventory, amounts to over \$47B as a result of theft and vendor shortages, due in part to poor visibility and limited auditability throughout the supply chain.

Counterfeiting, a significant problem for brands and suppliers, exceeds over \$98B, and contributes to loss of revenue and brand reputation.

**\$36B**  
**Claims**

(retail, apparel, and grocery industries)



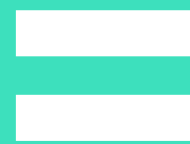
**\$47B**  
**Shrink**

(retail, apparel, and grocery industries)



**\$98B**  
**Counterfeiting**

(footwear, apparel and other high-end consumer goods)



**\$181B**  
**Loss<sup>16</sup>**

## Inventory (in)visibility

Legacy systems and outdated processes make inventory visibility a challenge. Without accurate, real-time visibility into available inventory throughout the enterprise, companies have limited options for inventory planning: either they risk losing a customer by over-promising and under-delivering, or tie up capital in overstock and extra inventory. But the alternative, lost sales, is even less appealing to the bottom line.

**\$984B**

lost revenue  
due to global  
out-of-stocks<sup>17</sup>

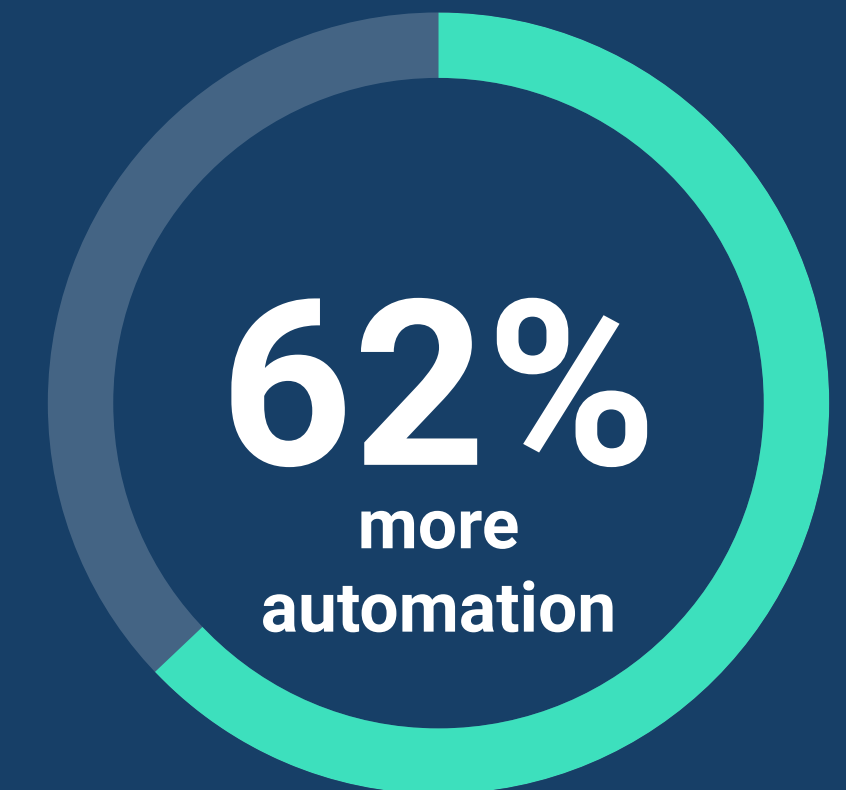
**63%**

avg. inventory  
accuracy rate<sup>18</sup>

Poor visibility can also make accurate forecasting difficult, which can lead to losses down the line. In a more agile buy-side environment, retailers have the ability to adjust to unexpected conditions throughout the supply chain, such as drawing from alternate sources if the primary source experiences an interruption. Insight into accurate inventory information is imperative to successful planning and agile management as demand fluctuates.

This isn't a new issue: in a recent RSR research report focused on the supply chain and meeting demand, industry leaders replied to the areas in the supply chain that most need improvement. Respondents ranked **inventory visibility** at the top of the list, and automation also a priority.<sup>19</sup>

Areas in the supply chain that  
most need improvement





**So how can businesses navigate this  
challenging environment?**

# 02

## Using RAIN RFID to Drive Tangible Outcomes

“By implementing RFID, scanning can take place as each carton crosses the dock door, which could reduce the number of touches per carton by half. Because in apparel DCs, labor accounts for the largest portion of the facilities’ variable cost, RFID implementation could represent a significant reduction in DC labor cost.”<sup>20</sup>

—GS1 US, Source to Store Leveraging EPC®

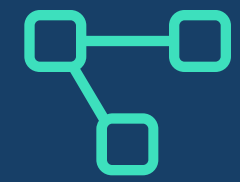
## Putting RAIN RFID data to work

RAIN RFID, when used with key business processes, reliably tracks almost anything, from items to cartons, pallets, and assets in manufacturing, warehousing and distribution, and retail operations. The technology provides real-time data identification information through more frequent data capture and greater item intelligence. With RAIN RFID, a dock door, conveyor, forklift, or work area can serve as an important data collection point, which can read and reconcile the location and status of items in a specific area of the warehouse, DC, and along the supply chain.



# HOW RAIN RFID drives value

*RAIN RFID delivers information to enable the following:*



**Efficiency** – Reduce workflow issues and streamline the completion of tracking and management tasks while reducing handling speed.



**Automation** – Eliminate manual, error-prone data capture to improve productivity, and reallocate resources to higher value activities.



**Accuracy** – Improve the integrity and value of real-time supply chain information.



**Visibility** – Empower decision makers with real-time information necessary to make faster, better and more informed decisions aligned to customer need.



**Capability** – Improve supply chain transactions and enhance the customer experience with ongoing RAIN RFID-driven improvements.

# ***WHERE*** the ROI of RAIN RFID is achieved

Once applied, the benefits of RAIN RFID can be seen and realized throughout the organization immediately, from improving workforce productivity, to automation and efficiency in operations, to data accuracy and enabling visibility to items in motion. This is where RAIN RFID really proves its worth.

- Warehouse and distribution center operations
- Inventory management
- Item availability
- Asset management
- Accounting
- Loss prevention
- Customer experience

## Warehouse and distribution center operations

Companies can reallocate labor from manual tasks by using RAIN RFID sensors to automatically track items, cartons, and pallets as they enter and exit the facility. Through the use of this newly-enabled automation and conveyance, labor costs can be reduced, productivity increased, and labor reassigned to more strategic and customer-focused tasks. In addition, operational processes will become streamlined and more “touchless” supporting a safer working environment for warehouse teams.

As items in warehouses and distribution centers are picked, packed, and shipped for outbound orders, RAIN RFID can help validate items and correct packing contents as the order is built and prepared for shipment. This process prevents costly mis-shipments, keeping customers satisfied with their orders. While replacing manual processes with RFID-enabled automation, data entry mistakes, inventory tracking errors, and expensive labor costs are dramatically reduced.

**25%** gain in productivity<sup>21</sup>

**75%-92%** cut in inventory cycle time<sup>22</sup>

**90%** reduction in receiving time for inventory shipments<sup>23</sup>

**99.9%** supply chain shipment accuracy with RFID<sup>24</sup>

**80%** improvement in shipping and picking accuracy<sup>25</sup>

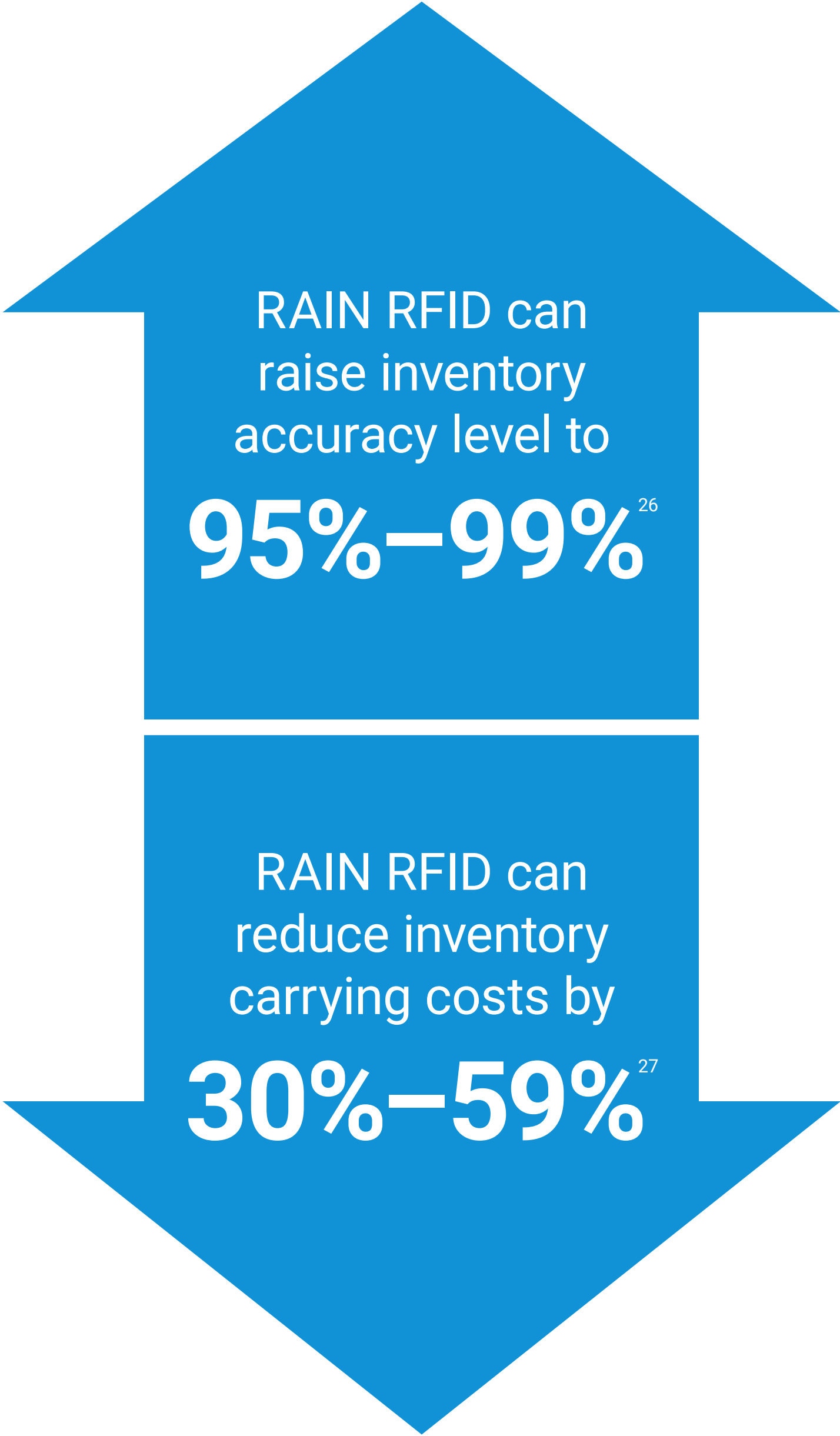
## Inventory management

RAIN RFID takes some of the mystery out of monitoring and managing inventory. Applying RAIN RFID in warehouses and in distribution centers increases visibility, improves accuracy, drives labor savings, and helps reduce shrink. But that's not all. By attaching or embedding tags into products and using RAIN RFID readers, locating and moving inventory becomes faster and easier, and helps to maintain near 100% accuracy. RAIN RFID can enable process automation and help workers identify and count up to 1,000 individual items per second.

In the long term, with accurate visibility into items along the supply chain, it will help to

eliminate the need for excess inventory as safety stock, which removes specific costs completely from the supply chain instead of shifting it from one stakeholder to another.

The use of RAIN RFID to tag items, cartons and pallets will help to track items and assets in real time, automate processes, optimize inventory, and reduce costs. This improved management will drive inventory accuracy which is the foundation for effective inventory visibility. Accurate insight added anywhere along the supply chain will help to track delivered goods and better manage and match demand.




RAIN RFID can  
raise inventory  
accuracy level to  
**95%–99%**<sup>26</sup>

RAIN RFID can  
reduce inventory  
carrying costs by  
**30%–59%**<sup>27</sup>

## Item availability

Effective inventory management with RAIN RFID, will lead to improved item availability. The accurate inventory visibility and item tracking will help improve planning and forecasting, and eliminate out-of-stock conditions. With real-time insight into items and locations, the right amount of inventory will be where it is needed to fill orders and meet customer demand. When conditions or trends change causing an unusual spike in demand, RAIN RFID enables the supply chain to adjust and react quickly and effectively to locate stock and keep products flowing and available where they are needed.



**RAIN RFID**  
can reduce  
out-of-stocks by  
**50%**<sup>28</sup>

## Asset management

Businesses need to know the location, inventory levels, and maintenance records of assets in real time so they can operate efficiently. Critical equipment like forklifts, pallet jacks, and bin carts transporting materials must be in good service and available or inefficiencies can occur. Real-time asset tracking using RAIN RFID can reduce the costs by improving equipment utilization, streamlining preventative maintenance, minimizing asset loss, and reducing labor costs related to searching for assets. With timely item-level visibility into every asset in the facilities, ensure that assets don't get lost, misplaced, or stolen.

**5.5%**  
cost reduction in  
asset investment<sup>29</sup>

**14.1%**  
reduction in  
RTI stock<sup>30</sup>

## Accounting

Claims and chargebacks generally occur between supply chain trading partners when shipments are lost, incorrect or damaged. Shipping and receiving with RAIN RFID helps to reduce claims and returns by increasing shipping accuracy and enabling electronic proof of delivery for traceability, and visibility into accurate inventory information. RAIN RFID technology can enable the generation of Advance Ship Notices (ASNs). This automated data with improved shipping and receiving accuracy reduces invoicing disputes and accelerates payments.

**54.3%**  
reduction in  
chargebacks<sup>31</sup>

## Loss prevention

By tracking items with RAIN RFID, exact points of error and loss can be identified and prevented for the future. Whether the cause of loss is attributed to theft, administrative or human error, or fraud, RAIN RFID can help eliminate the source of shrink from source to supplier, and into the retail store. Using RAIN RFID technology to track items, an audit trail is created with the points of transition and ownership identified, providing insight and electronic proof of delivery along the supply chain.

The foundation of any good anti-counterfeit plan is inventory visibility, and the use of RAIN RFID is a critical enabler in preventing loss due

to fraud. The technology can help reinforce authenticity and maintain brand protection by isolating the introduction of counterfeit products into the supply chain. Using RAIN RFID to ensure authentication will protect consumers from loss, and protect retailers and supplier brands from lost sales and negative image when poor quality imitation products get into the hands of customers.

With expectations for broader product assortments and faster shipping on the rise, it's now more important than ever for supplier brands to protect product authenticity with proactive anti-counterfeit strategies.

“RFID, gives each individual product its own unique serial number identity. So if you think about shoes for example, every single pair of shoes, even in each shoe, can have its own serial number that's unique from all the other shoes like it. With that RFID tag, it carries that data and it's very hard for somebody to copy it and create the same identity that it has on there.”

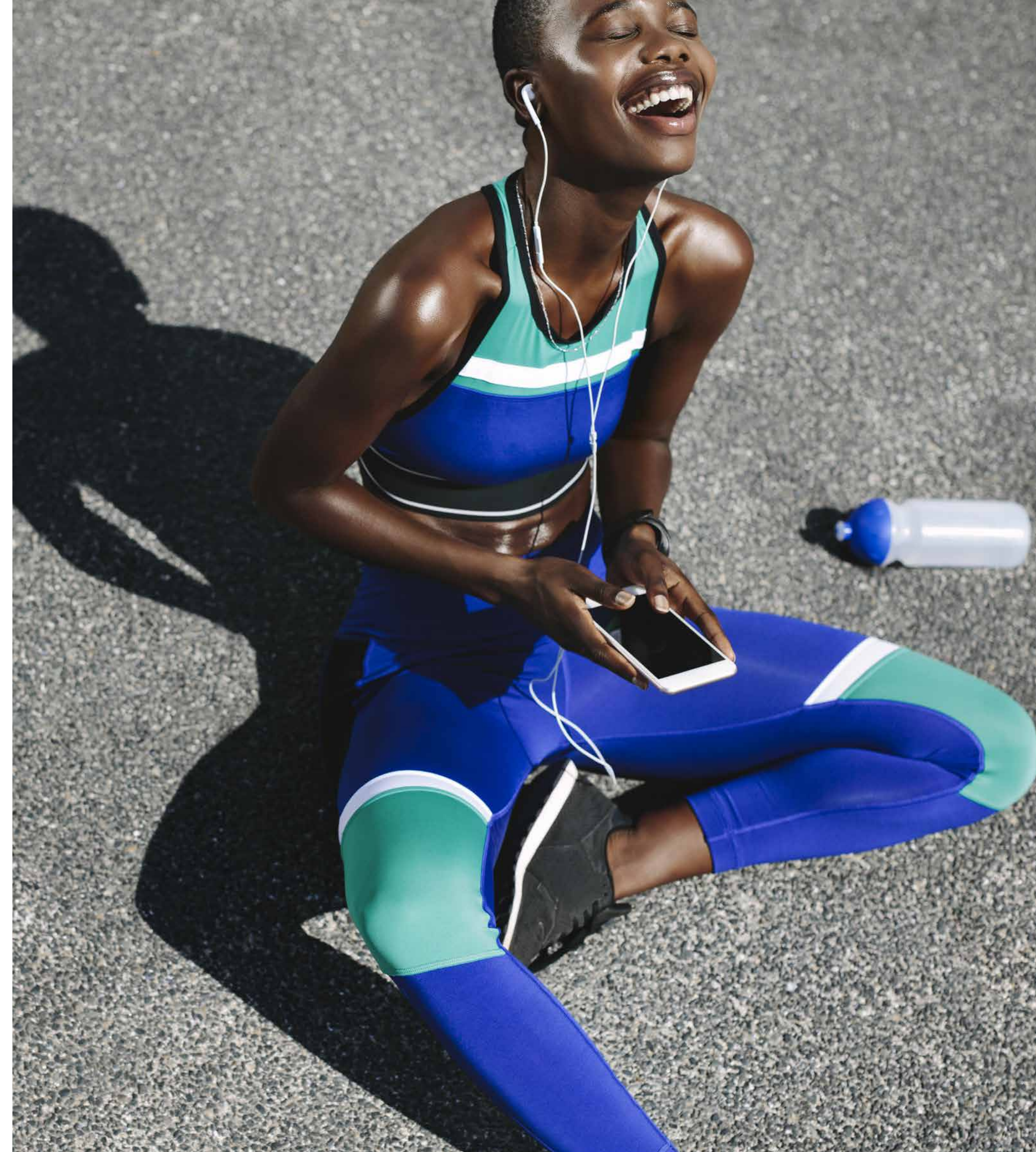
—Justin Patton, Director, the Auburn University RFID Lab<sup>32</sup>

## Customer experience

Businesses are focused on getting the right products to the right people at the right time, resulting in delighting customers with what they want and when they want it. Through accurate visibility, RAIN RFID enables better inventory management, reduces supply chain issues, and improves inventory availability—all of which will help to enhance the customer experience.

“RFID gives us the most complete view of our inventory that we have ever had. It’s quickly becoming the most precise tool in our arsenal to meet an individual consumer’s specific need at the exact right moment”

—Mark Parker, CEO, Nike<sup>33</sup>



# 03

## An Item-Level Solution

“Data reconciliation issues, manual processes, mis-picks—all of these challenges slow down the supply chain and can be improved, even eliminated, with the use of item level RFID. Our customers are demanding excellence and RFID will help us truly evolve to meet the needs of the omni-consumer.”

—Chris Clark CIO, Levi’s<sup>34</sup>

# The continuous value of RAIN RFID

If nothing else, 2020 has shown the need for agility and reliability in business operations. A healthy amount of flexibility is integral to building resilience.

Warehouse and distribution leaders require new insight to drive competitive advantage. They need to manage supplier networks and more complex customer relationships, which require a new level of visibility, automation, and accuracy.

In short, problem solvers in the supply chain have their work cut out for them. Flexibility and innovation will be necessary skills for companies to navigate unforeseen challenges and to survive and thrive in the long-run.

RAIN RFID is a proven solution that can add new **capabilities** and **automation** to drive **efficiency** throughout the supply chain. With **accuracy** and item-level intelligence, and granular **visibility** into the inner workings throughout the supply chain, businesses can proactively combat growing pains and evolving expectations to streamline processes, improve operations, reduce errors and loss, and increase productivity—all critical to solving for growing expectations in today's supply chain.

**Want to learn more?**

<https://www.impinj.com/solutions/supply-chain-logistics>

# Sources:

1. RIS News,"Taking Anti-Counterfeiting Action with Item-Level RFID", 2017

2. Select USA, "The Logistics and Transportation Industry in the United States", 2019

3. 3PL Central, "2020 State of the Third-Party Logistics Industry Report", 2020

4. Morning Consult, "When Consumers Say They'll Feel OK About Dining Out and Other Activities", 2020

5. Miami Herald, "Can't find flour during the pandemic? Here's why — and it's not 'pantry-loading'", 2020

6. WSJ, "Cashierless Stores Make Inroads in the U.S.", 2020

7. Conveyco, "Top Order Fulfillment Key Performance Indicators", 2019

8. Conveyco, "Top Order Fulfillment Key Performance Indicators", 2019

9. Statista, "Total number of warehouses in the U.S. 2007-2019",2020

10. 3PL Central, "2020 State of the Third-Party Logistics Industry Report", 2020

11. Conveyco, "Top Order Fulfillment Key Performance Indicators". 2019

12. SupplyChain 24/7, "The 3PL Warehouse Peak-Season Playbook", 2020

13. Fulfillment Companies, "The True Cost of a Mis-Shipment"

14. Fulfillment Companies, "The True Cost of a Mis-Shipment"

15. Conveyco, "Top Order Fulfillment Key Performance Indicators", 2019

16. Auburn University RFID Lab, "Why Retail is Ready for Blockchain", 2019

17. IHL Group, "Out-of-Stocks, Out of Luck", 2018

18. Auburn University, RFID Lab Studies

19. RSR, "Benchmark, 2020 RSR Supply Chain Management", 2020

20. GS1 US, "Source to Store Leveraging EPC®-enabled RFID Throughout the Supply Chain"

21. SupplyChain 24/7, "The 3PL Warehouse Peak-Season Playbook", 2020

22. Auburn University, RFID Lab Studies

23. Auburn University, RFID Lab Studies

24. GS1 US, "Project Zipper – EPC/RFID Retail Supply Chain Data Exchange Study", 2018

25. Auburn University, RFID Lab Studies

26. Auburn University, RFID Lab Studies

27. Auburn University, RFID Lab Studies

28. Auburn University, RFID Lab Studies

29. The SMS Group, "6 Ways RFID Technology Can Increase Operational Efficiency and ROI"

30. The SMS Group, "6 Ways RFID Technology Can Increase Operational Efficiency and ROI"

31. The SMS Group, "6 Ways RFID Technology Can Increase Operational Efficiency and ROI"

32. Opelika-Auburn News, "RFID use combats retail counterfeiting", 2019

33. NIKE Q419 Earnings Release, June 2019

34. GS1 US, "Project Zipper – EPC/RFID Retail Supply Chain Data Exchange Study", 2018