RFID in Emerging Markets: Transforming Food, Logistics, and Circular Economy

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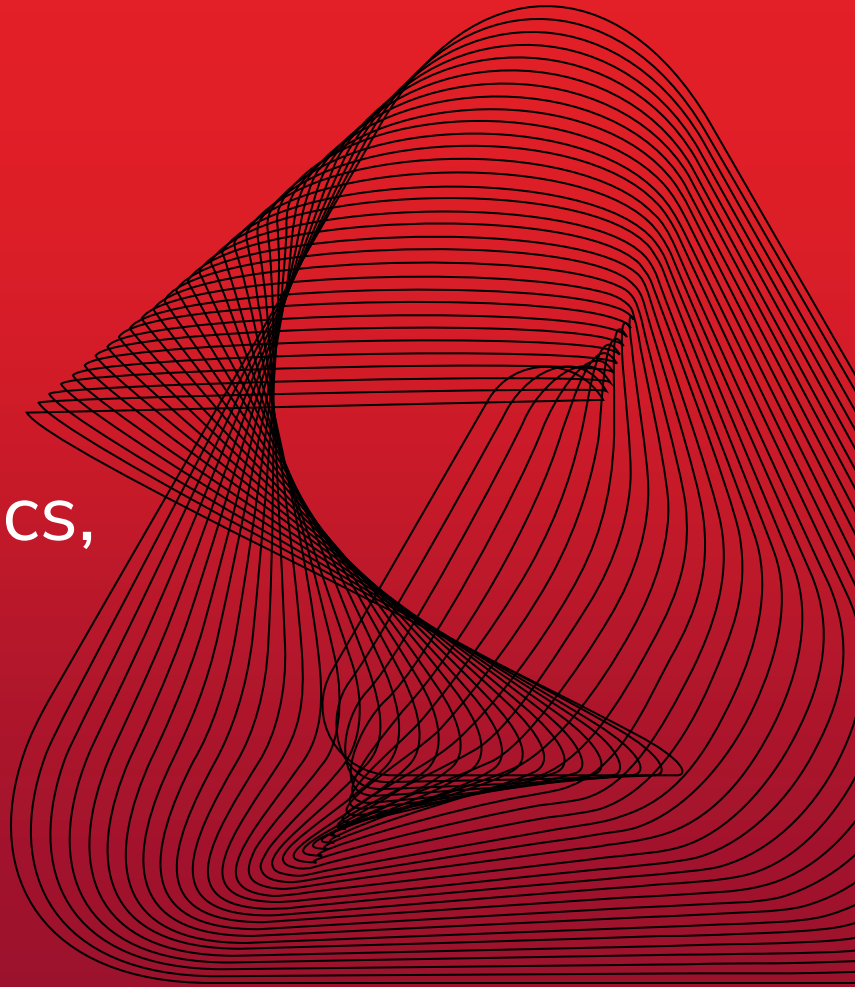
Presented by: Jonathan Aitken,
Ecosystems Market Development Director, Avery Dennison &
Chair, RAIN RFID Alliance



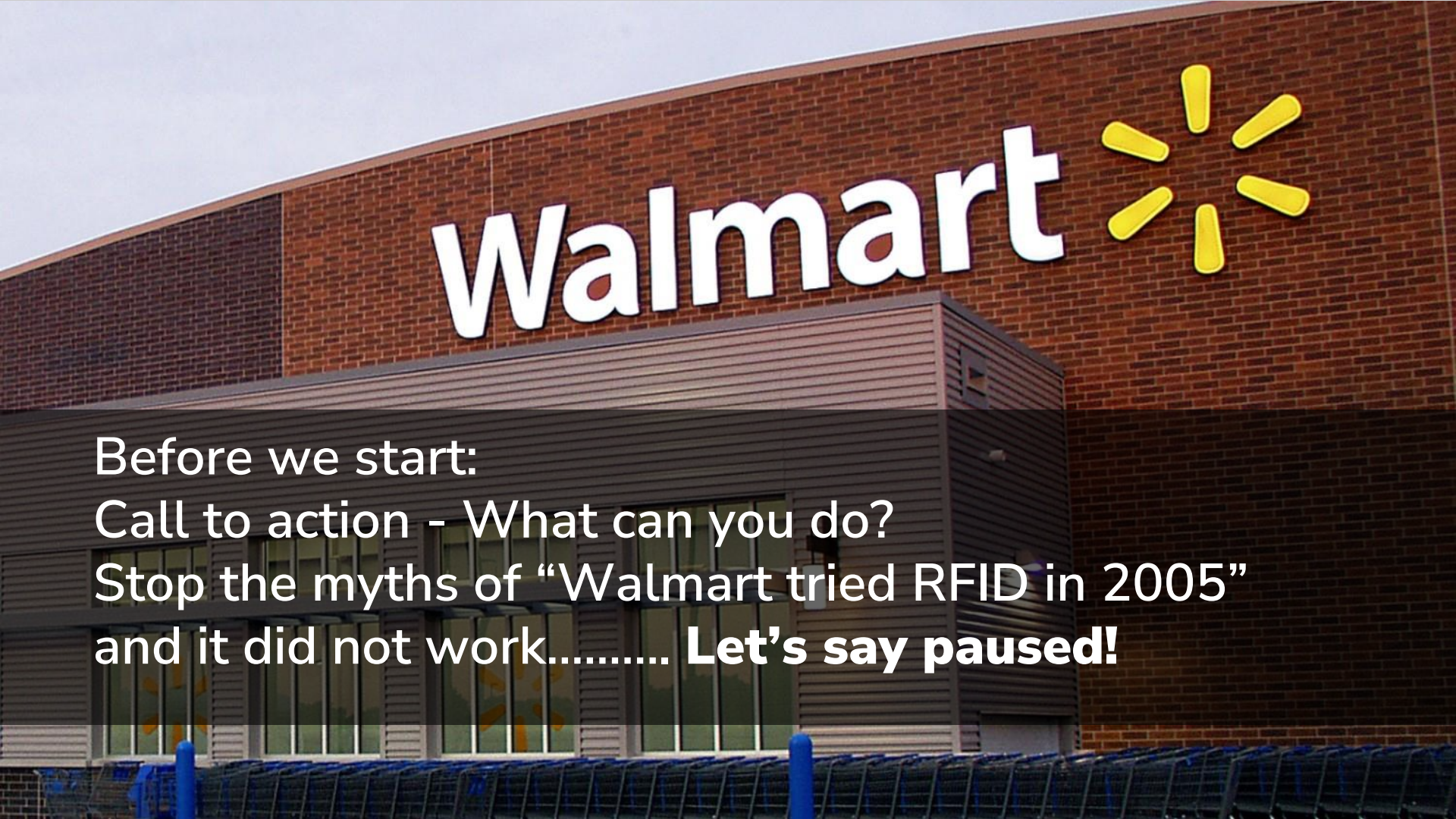
Speaker

Jonathan Aitken is the Chair of the RAIN RFID Alliance and an Ecosystem Market Development Director at Avery Dennison.

Prior to joining Avery Dennison, Jonathan was the Director of Retail IT for lululemon where he rolled out RAIN RFID.

Jonathan is committed to working with the RAIN board and community and is passionate about the future of RAIN and what the technology can do for sustainability.

In his current role with Avery Dennison, he has spent the last seven years developing relationships and partnerships with IC, RFID software, and RFID hardware companies in the RAIN RFID business and has worked on several projects related to sustainability and RAIN technology.



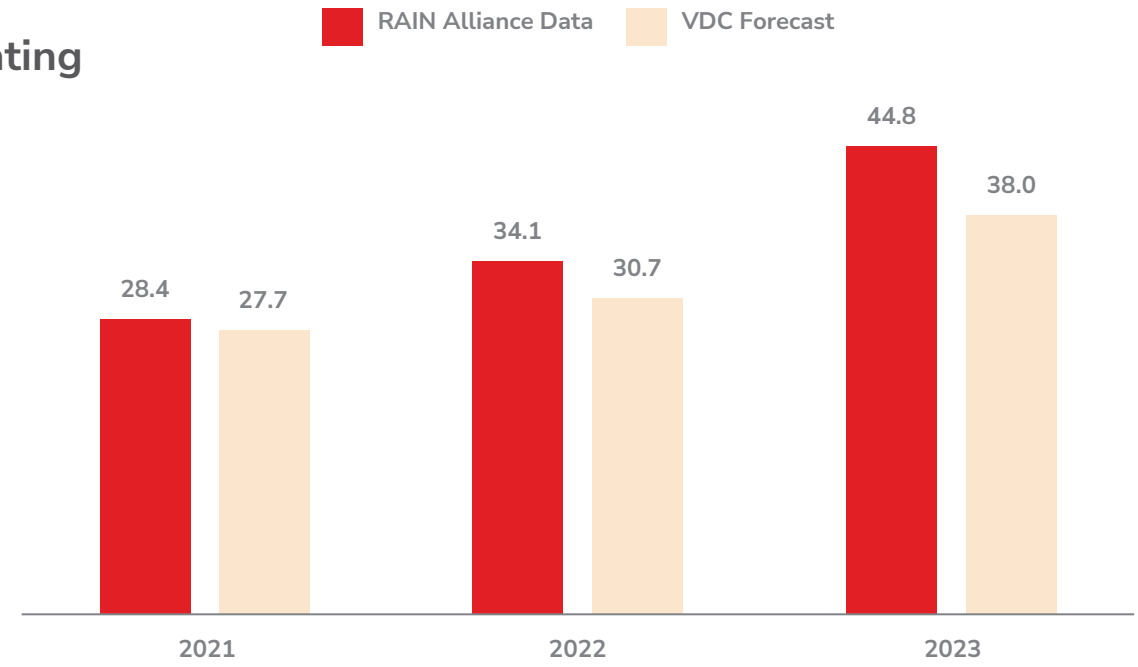
Before we start:
Call to action - What can you do?
Stop the myths of “Walmart tried RFID in 2005” and it did not work..... **Let’s say paused!**

Why RFID now vs 2005? (cost, performance)

	2005 (Walmart and U.S. DoD Issues RFID Mandate)	Now
Technology Reference	Nokia 1100 2g 	iPhone 15+ 5g 
Inlay Cost	$0.20 to $.50+ per inlay	$.05 to $.12 for inlay - volume and memory dependant Hard tags cost more, converted labels cost more
Read Performance	• Max Read Dist. = 20ft • Read Accuracy = 87% • Read/Write Speed = 10ms	• Max Read Dist. = 35ft depending on environments • Read Accuracy = 99.9% • Read/Write Speed = 1ms
Technology Adoption	• 600 Million IC's Sold Annually • Retail, Library, Military	• 44.8 Billion IC's Sold 2023 • Retail, Airline, Automotive, Healthcare, Beauty, Construction, Logistics, and Food

VDC Reports 44.8B IC's shipped in 2023

Growth is accelerating, beating VDC forecast by 32%.



Units in Billions of IC's shipped
Source: RAIN and VDC

Industry challenges we all face that RFID can and will address

Optimizing labor and supply chain efficiency

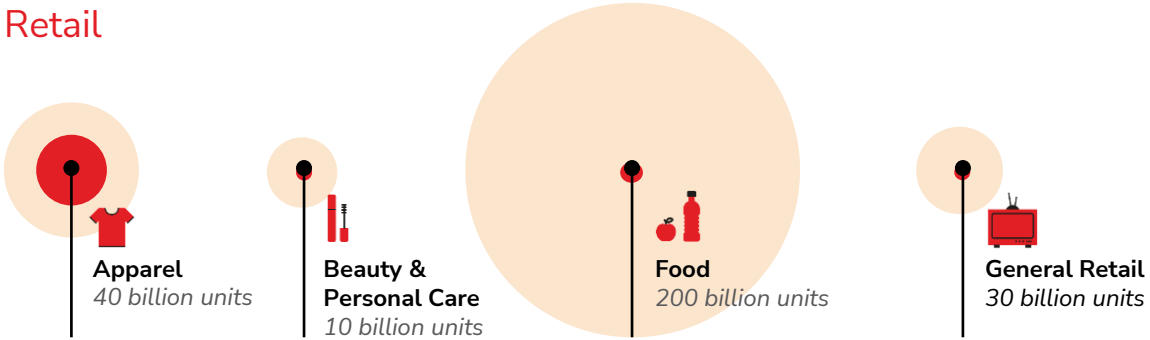
Reducing waste

Advancing sustainability, circularity and transparency

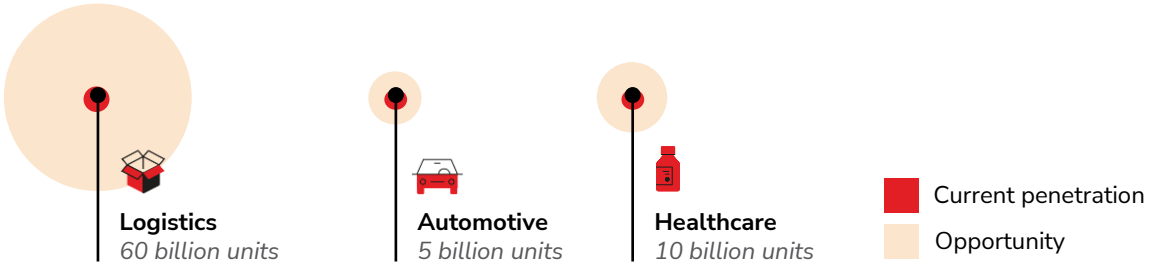
Helping brands and consumers better connect

Large, untapped addressable opportunities

Retail



Industrial



- Historically fragmented segments
- Opportunity to for all of us in this room to expand the use of RFID into Food, and Logistics.

- Challenges also exist:
  - tagging variable sizes
  - developing standards and processes
  - automating production lines

The Food Waste (Food Shrink) Problem

33%

Of all food produced is wasted, with some of the biggest losses coming from **fresh fruit and vegetables, and seafood.**

Sealed Air, 2018

1 in 7

"Up to **one in seven** truckloads of fresh food delivered to supermarkets gets thrown away. Freshness and shrink, managed together, can add as much as **$60MM a year to a $10BN chain's earnings."**

Source: A Retailer's Recipe Fresh Food and Far Less Shrink-Oliver Wyman*

80%

"While perishables make up about **30% of total store sales, they can be responsible for up to 80% of total store shrink"**

Source: A Retailer's Recipe Fresh Food and Far Less Shrink-Oliver Wyman*

Food: High Impact Categories

Expiring items

Avery Dennison has identified these areas in Grocery.
TDS 2.0 will help. DSGTIN+

Bagged Salads

- Labor savings
- Sales uplift from reduced Out Of Stock (OOS)
- Food waste reduction savings
- Better recall management - traceability

Fresh Cut Produce / Deli items

- Labor savings
- Sales uplift from reduced Out Of Stock (OOS)
- Food waste reduction savings
- Better recall management

Bakery

- Labor savings
- Sales uplift from reduced Out Of Stock (OOS)
- Food waste reduction savings

Packaged Proteins

- Labor Savings
- Reduced shrink
- Expiration management

Innovation Tag and Read 100% of all Items

On-Metal

- Reliable RF performance for tagging on metal and liquid
- Meat, fish, and packaged foods (chilled or frozen)
- Applied to polystyrene, plastic, metallic and paper packaging

RAIN RFID

- UHF Gen2 compliant
- Standard RFID printer/encoder
- ETSI and FCC versions

WaveSafe™

- Resist excessive heating and arcing
- Safe for accidental microwave use cases
- Home and commercial microwave ovens

Food supply chain FSMA 204 compliance

The proposed FSMA requirements would help the FDA rapidly and effectively identify recipients of those foods to prevent or mitigate foodborne illness outbreaks and address credible threats of serious adverse health consequences.

It requires food suppliers, growers and retailers to establish and maintain records containing **Key Data Elements (KDEs)** associated with different **Critical Tracking Events (CTEs).**

FSMA requires stakeholders to establish and maintain traceable records at each CTE in an electronic format that can be made available within 24 hours to the FDA.

By enabling RFID in their operations, grocers can record and access data across the supply chain driving compliance to FSMA 204

Source: FSMA Guidance

Sep 21, 2020
Published to Federal Register

Jan 21, 2021
Comments Due

Mar 7, 2022
Publish to White House

Nov 7, 2022
Finalized Rule

Jan 7, 2023
Effective Date

Jan 20, 2026
Compliance Date

RAIN RFID: The keys to a smarter supply chain

Focus on these 3 areas to create an intelligent Supply Chain:

Accuracy

Ensure Item-level inventory accuracy every step

Visibility

Achieve Item-level inventory visibility at every step

Efficiency

More volume at faster rate at a lower cost

A product's journey through the supply chain

Trillions of consumables distributed globally each year

Very **few items are actually 'connected'** today

A highly **manual and physical ID** based system

Supply Chain disruptions cost organisations an average of **$184 million** per year

Source: Statista

Connected Logistics results

Clear benefits being achieved today with RFID

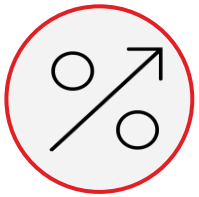
20% **Percent Increase in Productivity**
Reductions in dwell create a more productive workforce

75-92% Faster counts

99% Outbound Mis-Shipments
Inbound Manifest Errors

Accuracy

Visibility



Efficiency

10x More inventory visibility

99+% Inventory accuracy

90% Reduction in receiving time

10% Gain in truck volume

Source: Based on Avery Dennison customer pilots

New legislation on the doorstep: paving the way for Digital Product Passports

The Digital Product Passport (DPP) is key to the EU's transition to a circular economy.

- This initiative is part of the Ecodesign for Sustainable Products Regulation (ESPR) and one of the key actions under the EU's Circular Economy Action Plan (CEAP).
- It aims to improve traceability and transparency along the entire value chain of a product and to improve the management and sharing of product-related data which are critical to ensuring their sustainable use, prolonged life, and circularity.
- Avery Dennison is paving the way for large-scale adoption of digital product passports, working with the European Commission and enabling global businesses in textiles, EV batteries, general retail merchandize, and more to prepare for the upcoming regulation.
- DPP for the first product groups (e.g. apparel) is expected to come into effect in 2026.
- Our atma.io connected product cloud team has joined the CIRPASS consortium. Its aim is to prepare the ground for the gradual piloting and deployment of the DPPs from 2023 onwards, with an initial focus on the electronics, batteries, and textile sectors.

The EU Digital Production Passport (DPP) is coming. Start preparing for it now.

The urgent case for transparency, circularity and DPP

$163 billion worth of inventory is discarded each year due to overproduction or expiry.

According to "The Missing billions" report, overproduction and waste are exacerbating the supply chain crisis and hitting businesses to the tune of 3.6% of their annual profits as nearly 8% of stock perishes or is discarded. (AD Global Supply Chain Research, 2022).

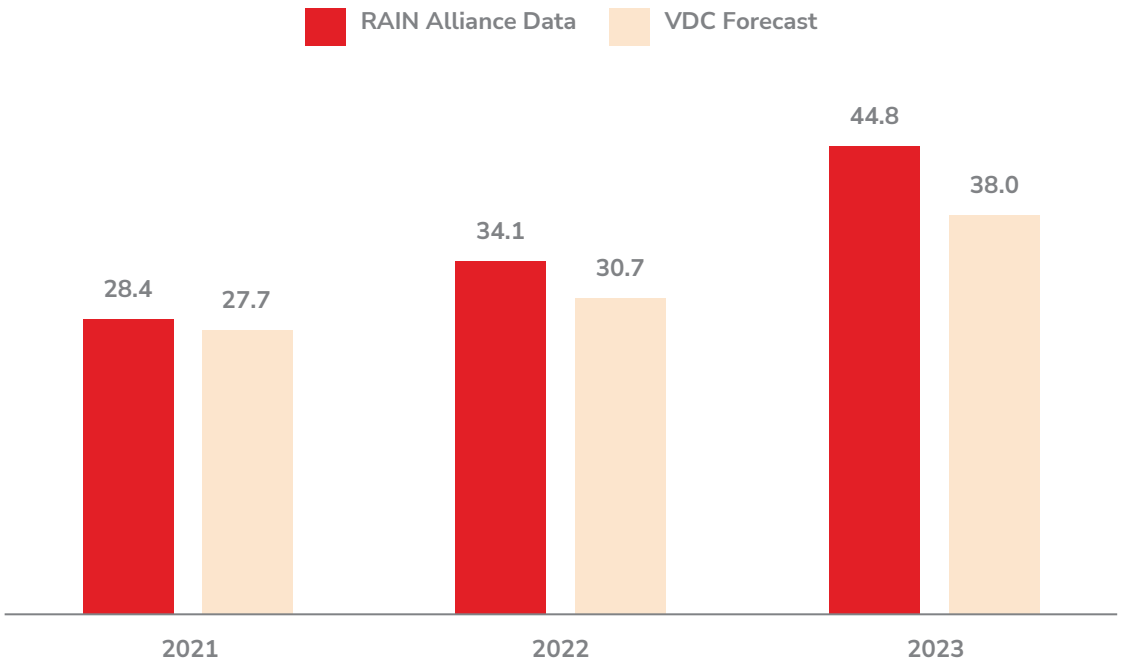
43% of consumers say transparency about a product's origins and journey is important to them.

Global firms are planning to introduce technologies to identify unique item-level tracking and traceability to increase transparency in supply chains.

VDC Reports 44.8B IC's shipped in 2023

So, back to the 32% growth. What will that also accelerate?

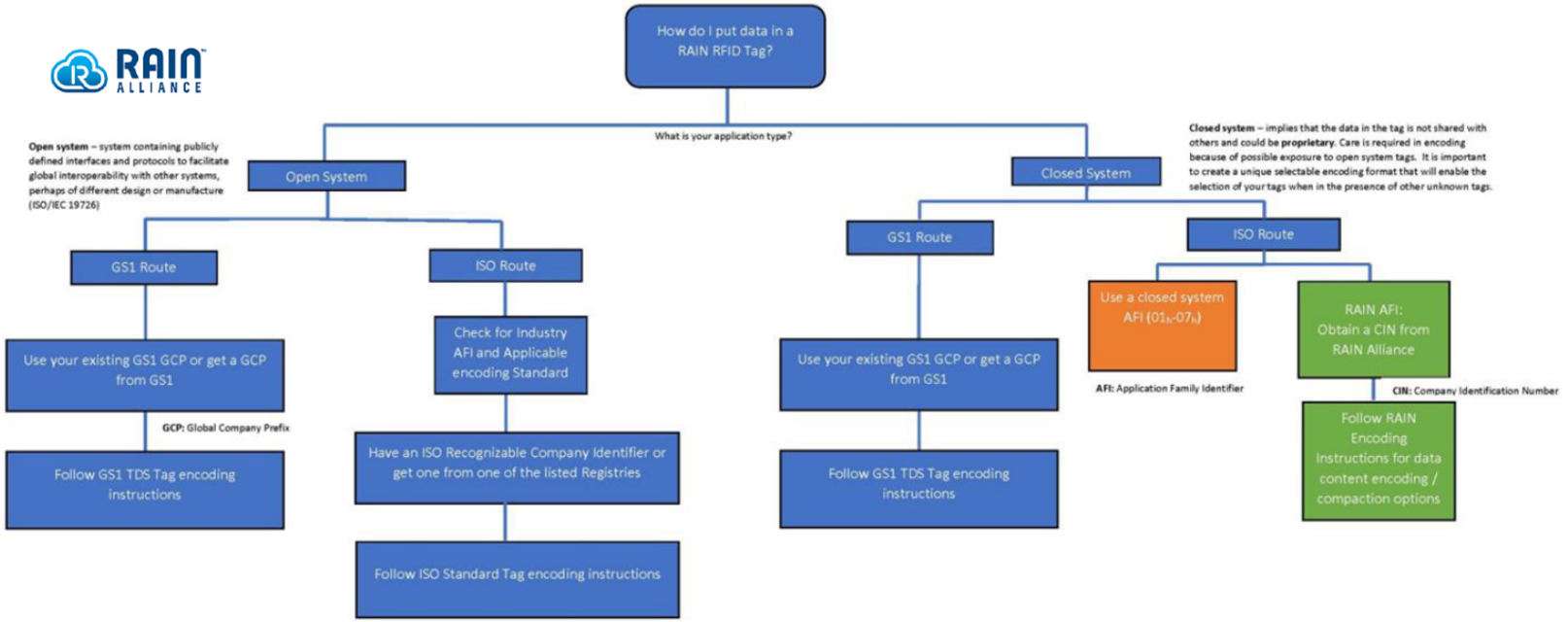
Tag Clutter!



Units in Billions of IC's shipped
Source: RAIN and VDC

Tag Clutter - caused by tags in circulation

As use of RAIN RFID tags continues to increase and embedded tags begin to be more commonplace, avoiding tag clutter in systems is important. GS1, or ISO don't go down your own path.



Q & A