THE GLOBAL LANGUAGE OF BUSINESS

GS1 US ITEM LEVEL RFID

TAGGED ITEM PERFORMANCE

TAGGED ITEM PERFORMANCE PROTOCOL (TIPP)

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INLAY PERFORMANCE ≠ ITEM PERFORMANCE

Problem for retailers: how can they get reliable tagged-item performance with accountability from suppliers

Same brand and same tag

Style 1
Power = 0.04 Watts

Style 2
Power = 0.16 Watts (4x more)

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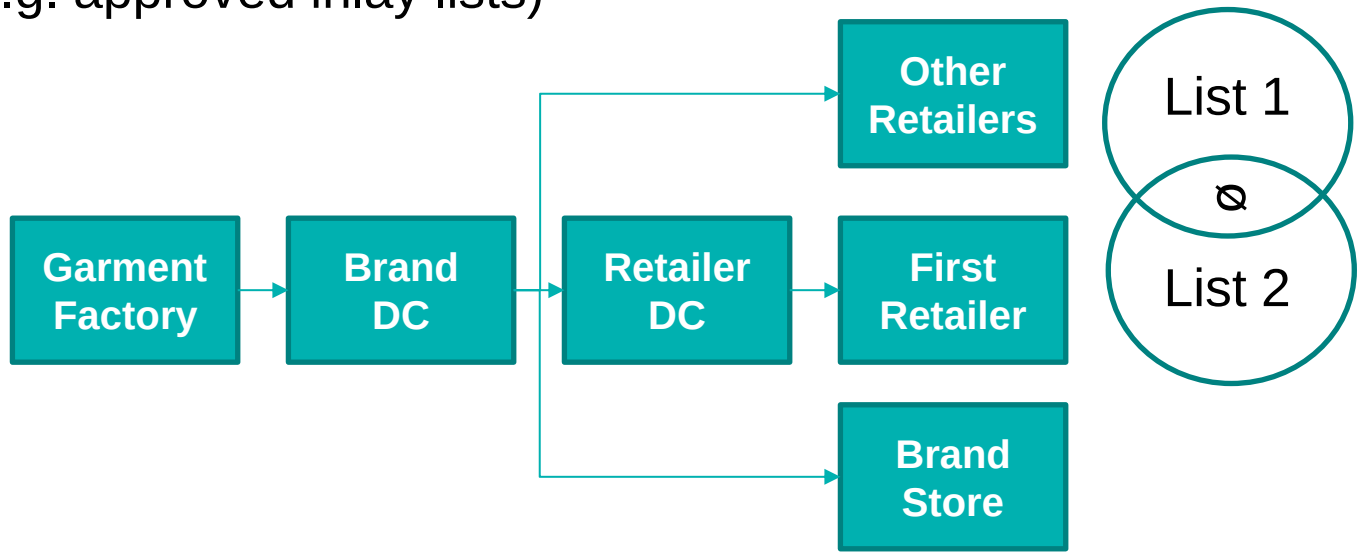
SOURCE TAGGING IS CONSTRAINED

Problem for brand owners: How can they move to source tagging and innovate if retailers have incompatible constraints (e.g. approved inlay lists)



- **Increasing volume**
- **Decreasing unit cost**

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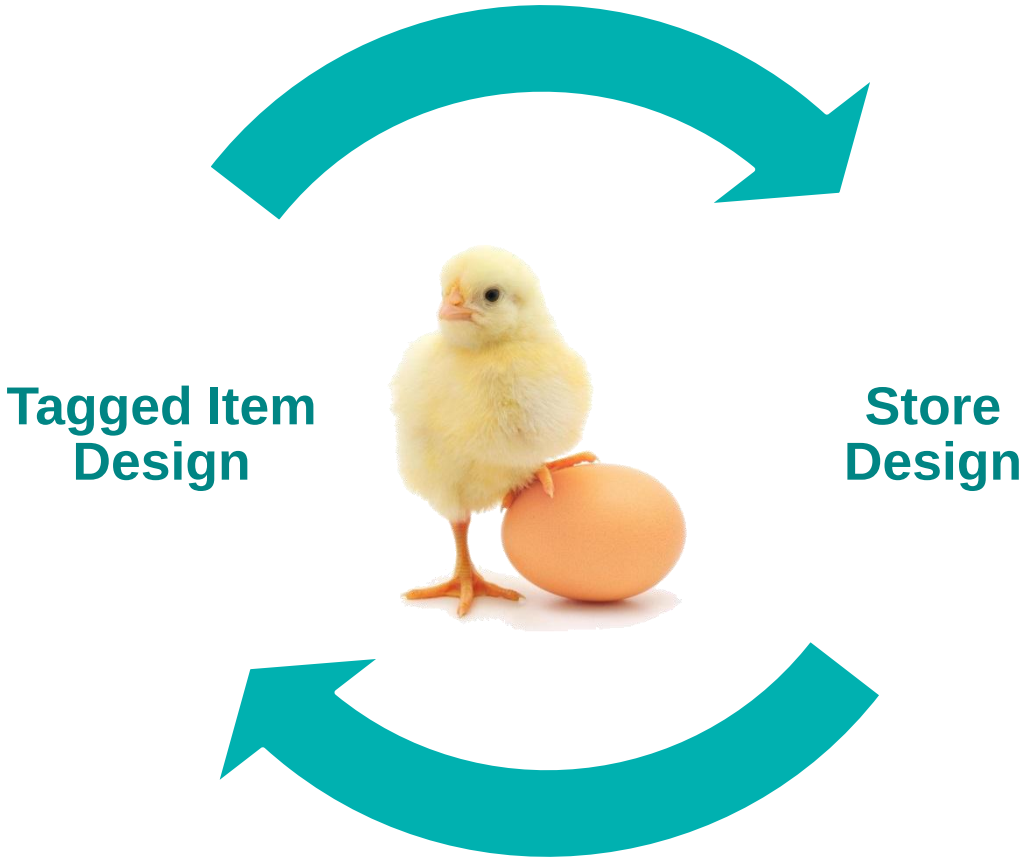
WHICH COMES FIRST, STORES OR ITEMS?



Problem for the industry: Circular dependencies limit scalability

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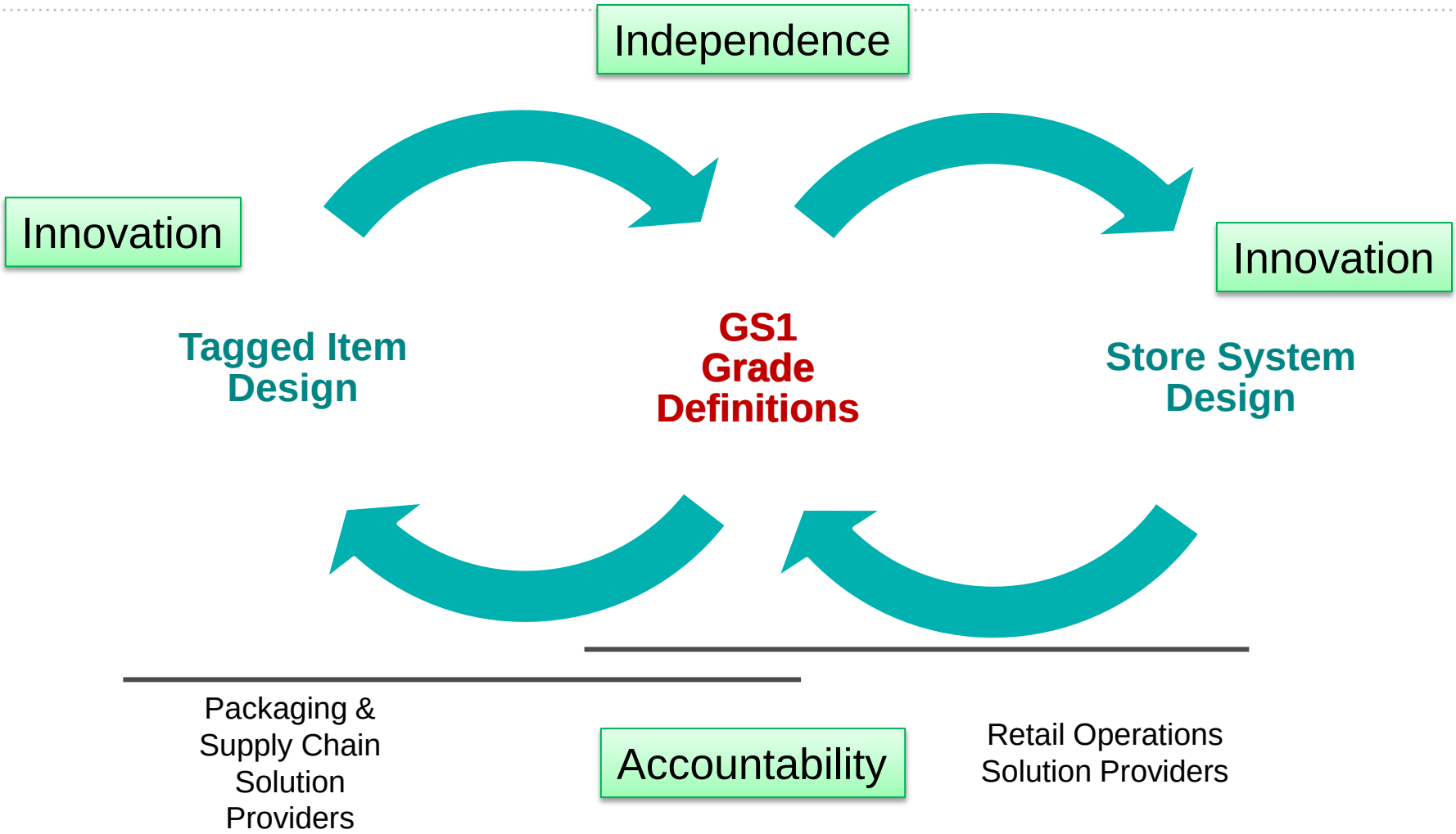
TAGGED-ITEM GRADES



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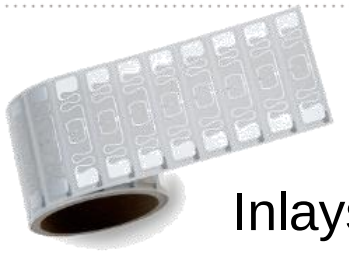
TAGGED ITEM GRADING CONCEPTS

- Tagged-Items are graded, not inlays.
  - Users care about the experience, not the potential
  - Inlay performance data is useful
- There are infinite possible performance specifications for tagged items, but we only need a few grades



Inlays

Tagged items

specifications

grades

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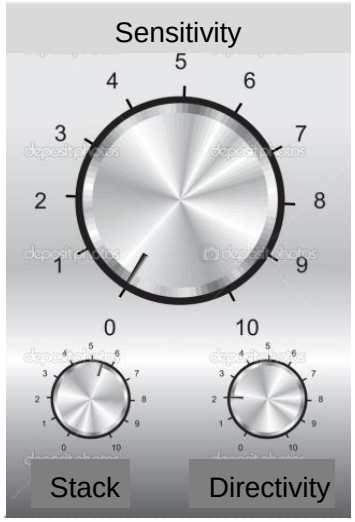
WHAT IS TIPP

- TIPP = **T**agged **I**tem **P**erformance **P**rotocol
- Performance grades for tagged-items (not tags or inlays)
  - Must meet sensitivity and backscatter requirements at multiple orientations
  - Grades can be global
- A standard test procedure to determine if a tagged-items meets a grade
  - Test procedures will have regional differences
- A tagged-item might be graded differently in different regions

S-M



5…10…20…30

B…D

1.1	Performance Grade SO5B
1.2	Performance Grade S15B .
1.3	Performance Grade S15D .
1.4	Performance Grade S20B .
1.5	Performance Grade M05B.
1.6	Performance Grade M10B.
1.7	Performance Grade M15B.
1.8	Performance Grade M20D
1.9	Performance Grade M25B.

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SCOPE OF TIPP

- What is specified by GS1
  - Grade definitions
  - Grading test procedures
  - How to communicate tagging requirements
- What isn't specified by GS1
  - Who, when, where to test
  - How to choose a grade for an application or use case
  - Additional or alternative tagging requirements
  - Acceptance criteria & validation/audit process
  - Alternative or derivative tests

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TIPP PROCESS: GOING GLOBAL

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HOW WE GOT HERE

- **Identified and validated the problem**
- **Solicited solution concepts**
- **Agreed on an approach**
- **Prototyped the approach**
  - 9 performance specs from 3 retailers
  - Grouped specs into grades
  - Tagged items from 5 suppliers using several inlays
  - Grading validation by 7 labs
  - On-shelf validation by retailers
- **Drafted and approved provisional guideline**
  - TIPP Overview
  - TIPP Test Methodology
  - TIPP Test Configuration Catalog
  - TIPP Grade Definition

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POST PROTOTYPE ACTIONS

- **Closure**
  - Create/update test document
  - Form two new grades from our test data and knowledge
- **Immediate Guidelines**
  - Publish GS1 US guidelines
    - Updated Test Procedure
    - Updated Provisional Grade Set
    - Item Orientation Catalog
- **Continue to Global Standardization**
  - Give our output to global office
  - ARC prototype data set
  - Fine tuning of grade data

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INNOVATION WITH TIPP

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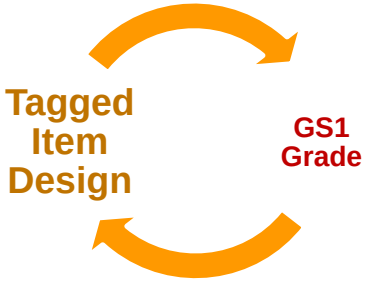
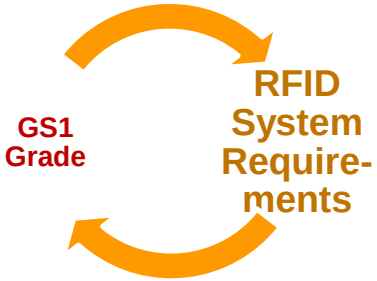
SMARTRAC connect things!

TIPP is the right tool because

- It takes into account the RFID performance requirements of the store environment
- Therefore tagged items are graded, not tags or inlays
- Which will eliminate discussions about good/bad inlays/tags/etc.
- There are only a handful of grades which are easy to manage and adopt
- GS1 is the right standard body to set tag item grades





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Tag performance has impact on data accuracy

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		% of Total Items
Total Items	**32,981**	
Total Correct Items		**94.63%**
No Inlay		**3.10%**
Supplier		1.47%
Returns		1.38%
Lost		0.25%
Encoding		**0.38%**
EPC Encoding not Matching UPC		0.32%
No EPC encoding		0.06%
Stray Inlay		**0.07%**
Double Inlay		**0.39%**
Dead Inlays		**0.35%**
Physically Damaged		0.08%
No Apparent Damage		0.27%
Poor Performers (No Cycle Read)		**1.07%**
Total Issues		**5.37%**

Root Cause
Inlay?
Tag?
Brand?
RFID System?

Source: RFID Lab at Auburn University

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A successful adoption of tag item grading a qualified implementation concept

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Gather requirements of use case

Translate requirements into Grades

DEFINE

Grade & Test on product level

Measure tagged item performance against grade

VALIDATE

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Manufacture tag item grade compliant tag

VERIFY

Check if the items that meet the Grade performs as expected in the use case

CONTROL

SMARTRAC – The leading RFID company

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Overview

- Founded in 2000 and headquartered in Amsterdam, SMARTRAC is the world's largest supplier of RFID transponders
- SMARTRAC is well positioned in the double-digit growing RFID market
- The strategic partnership with One Equity Partners ensures SMARTRAC's independence and fosters it's long-term growth strategy

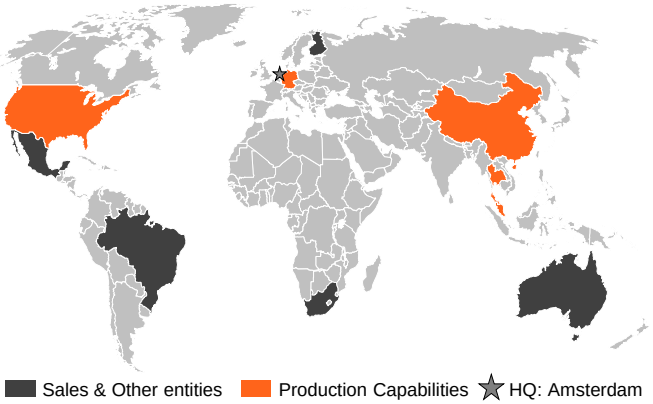
Leadership

- Largest production capacity in the RFID industry with manufacturing locations in 5 countries
- Over 1.5 billion RFID transponders produced and supplied in 2013
- Frost & Sullivan European RFID Market Competitive Strategy Leadership Award in 2012
- Financially strongest pure RFID company (>270m EUR sales, profitable above industry average)

Product and technology portfolio

- With more than 1.000 patents and patent applications, SMARTRAC has the most comprehensive technology portfolio in the RFID industry
- Superior R&D capabilities
- Biggest product range in the RFID industry covering the needs of:
  - Security printing companies
  - Card manufacturers
  - System integrators
  - The automotive industry

Global Footprint



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