RFID JOURNAL VIRTUALLY LIVE!

SEPTEMBER 30 - OCTOBER 1, 2020

CHIP (Chain Integration Project) Overview

Justin Patton, Auburn University

Jonathan Gregory, GS1 US

Antitrust Caution

AUBURN UNIVERSITY RFID LAB

GS1 US is committed to complying fully with antitrust laws.

We ask and expect everyone to refrain from discussing prices, margins, discounts, suppliers, the timing of price changes, marketing or product plans, or other competitively sensitive topics.

If anyone has concerns about the propriety of a discussion, please inform a GS1 US® representative as soon as possible.

Please remember to make your own business decisions and that all GS1 Standards are voluntary and not mandatory.

Please review the complete GS1 US antitrust policy at:
www.gs1us.org/gs1-us-antitrust-compliance-policy

Legal Disclosure

AUBURN UNIVERSITY RFID LAB

GS1 US, Inc. is providing this presentation, as is, as a service to interested parties. GS1 US MAKES NO REPRESENTATIONS IN THIS REGARD AND DISCLAIMS ALL WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY WARRANTY OF ACCURACY OR RELIABILITY OF ANY CONTENT, NONINFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.

GS1 US shall not be liable for any consequential, special, indirect, incidental, liquidated, exemplary, or punitive damages of any kind or nature whatsoever, or any lost income or profits, under any theory of liability, arising out of the use of this presentation or any content herein, even if advised of the possibility of such loss or damage or if such loss or damage could have been reasonably foreseen.

***GS1 US employees are not representatives or agents of the U.S. FDA, and the content of this presentation has not been reviewed, approved, or authorized by the U.S. FDA.**

*If applicable

EPC/RFID Retail Supply Chain Data Exchange Study (Project Zipper)

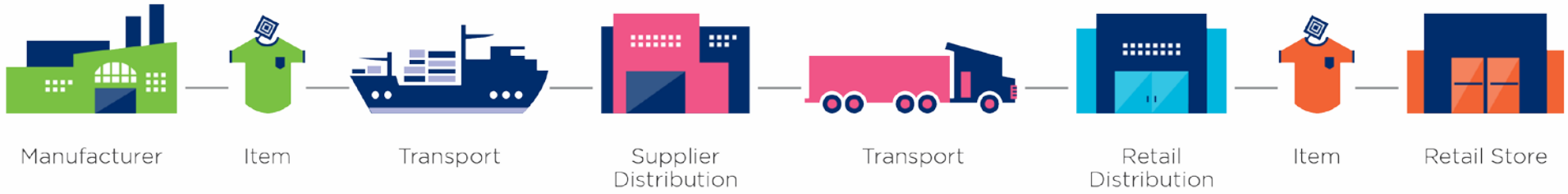
Auburn University's RFID Lab examined the benefits of item level product tagging, tracking, and sharing data from source to fulfillment

> "Data reconciliation issues, manual processes, mispicks—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*

www.gs1us.org/ProjectZipper

Auburn Blockchain Working Group:
Retail Pain Points

AUBURN UNIVERSITY RFID LAB



$98B
Counterfeiting

$35B
Claims

$49B
Shrink

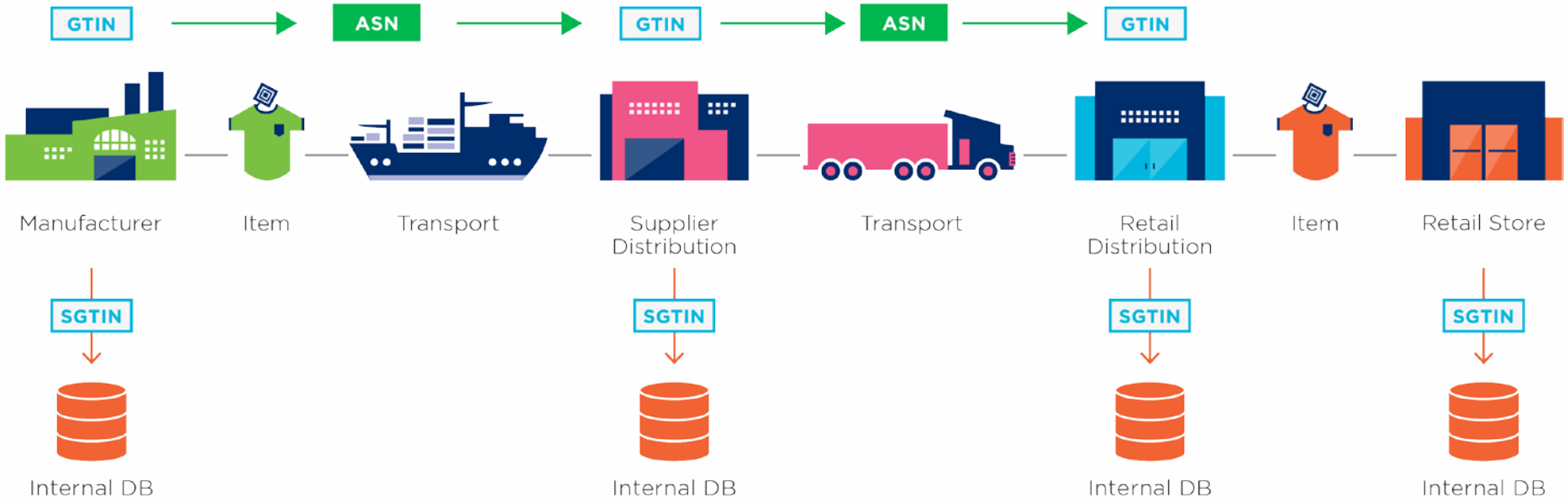
*data from FY 2017

Source: CHIP Whitepaper v7.0 - Working Group Review

Auburn Blockchain Working Group:
Data Flow Today

AUBURN UNIVERSITY RFID LAB

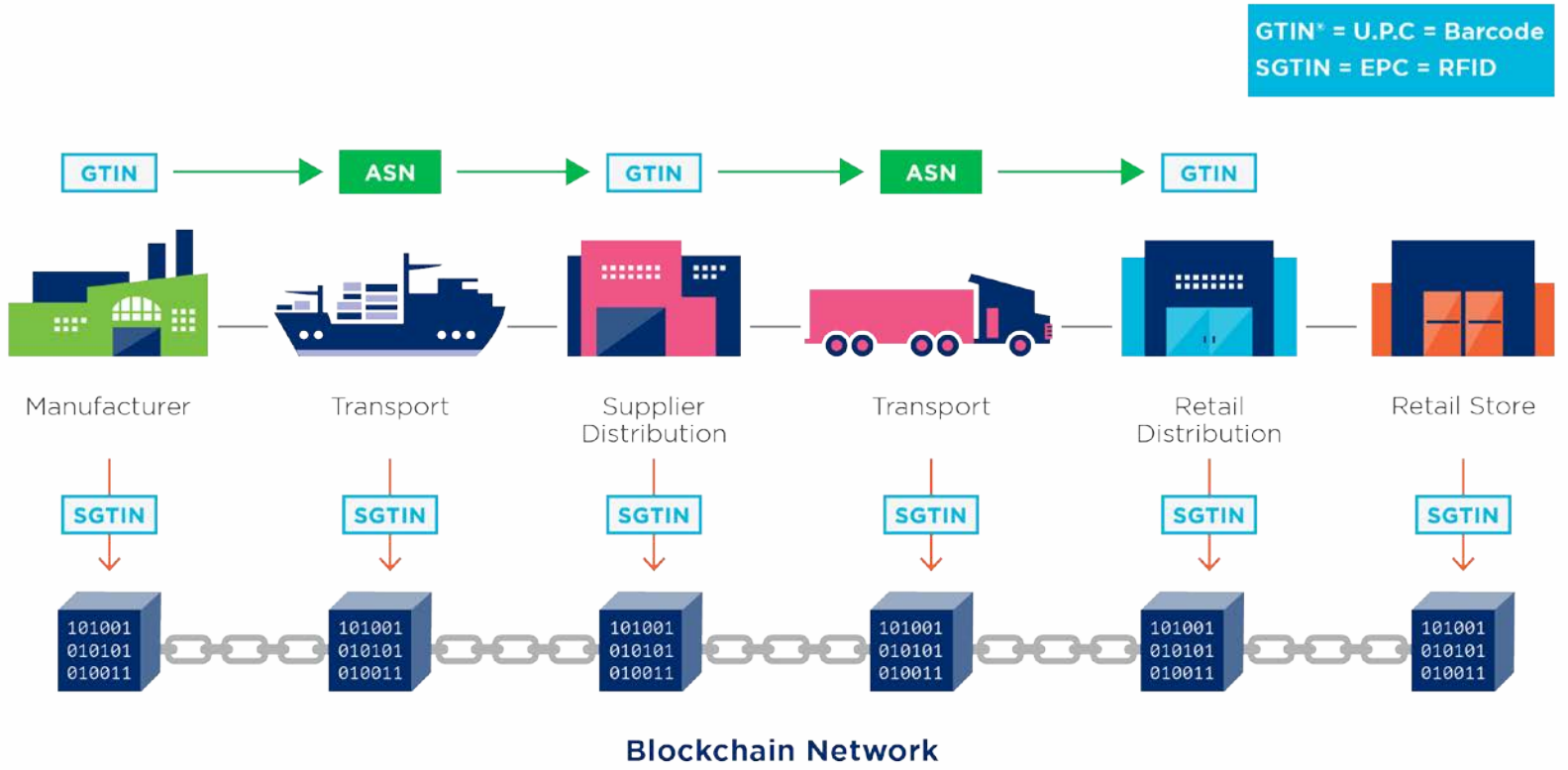
GTIN® = U.P.C = Barcode
SGTIN = EPC = RFID



Source: CHIP Whitepaper v7.0 - Working Group Review

Auburn Blockchain Working Group:
Data Flow in the Future

AUBURN UNIVERSITY RFID LAB



Source: CHIP Whitepaper v7.0 - Working Group Review

Step 1: Identify Serialized Systems & Stakeholders

AUBURN UNIVERSITY RFID LAB

For the first step of the PoC, each participant identified **serialized data touchpoints** throughout their supply chain as well as the **solution providers** that supported those serialized data systems.

Each partner pair was able to supply serialized data from multiple touchpoints ranging from **source to store**.

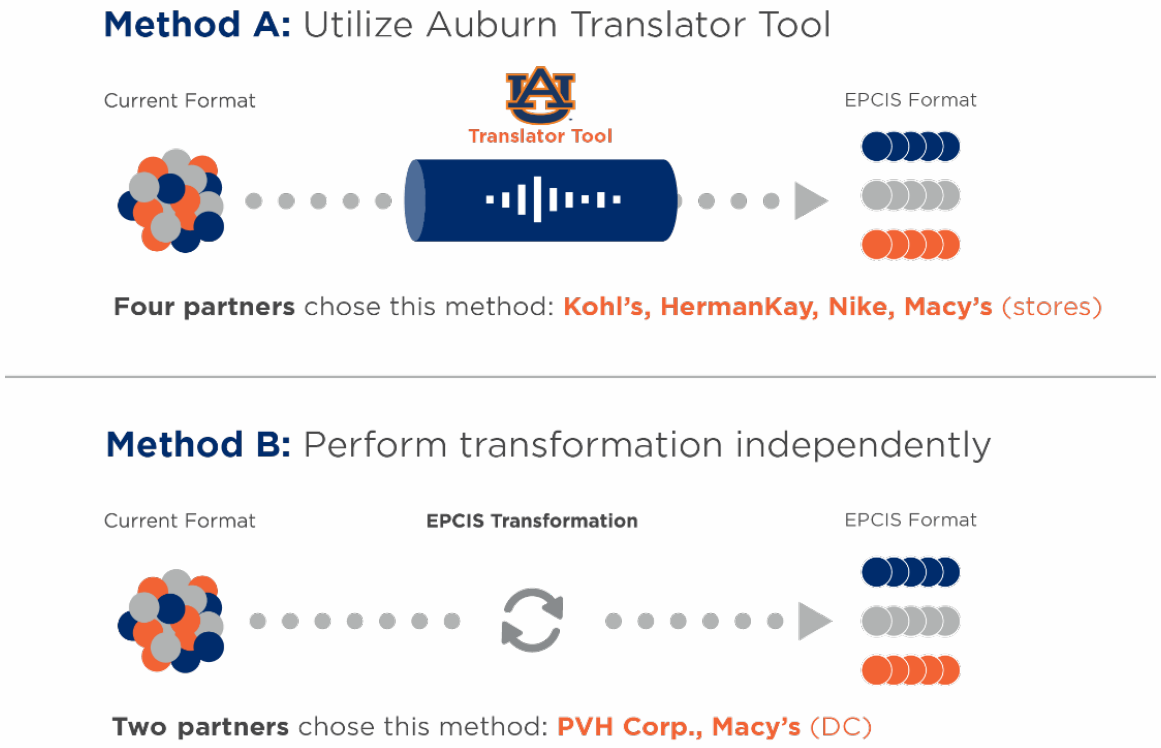
Source: CHIP Whitepaper v7.0 - Working Group Review

Step 2: Standardize Data Streams

AUBURN UNIVERSITY RFID LAB

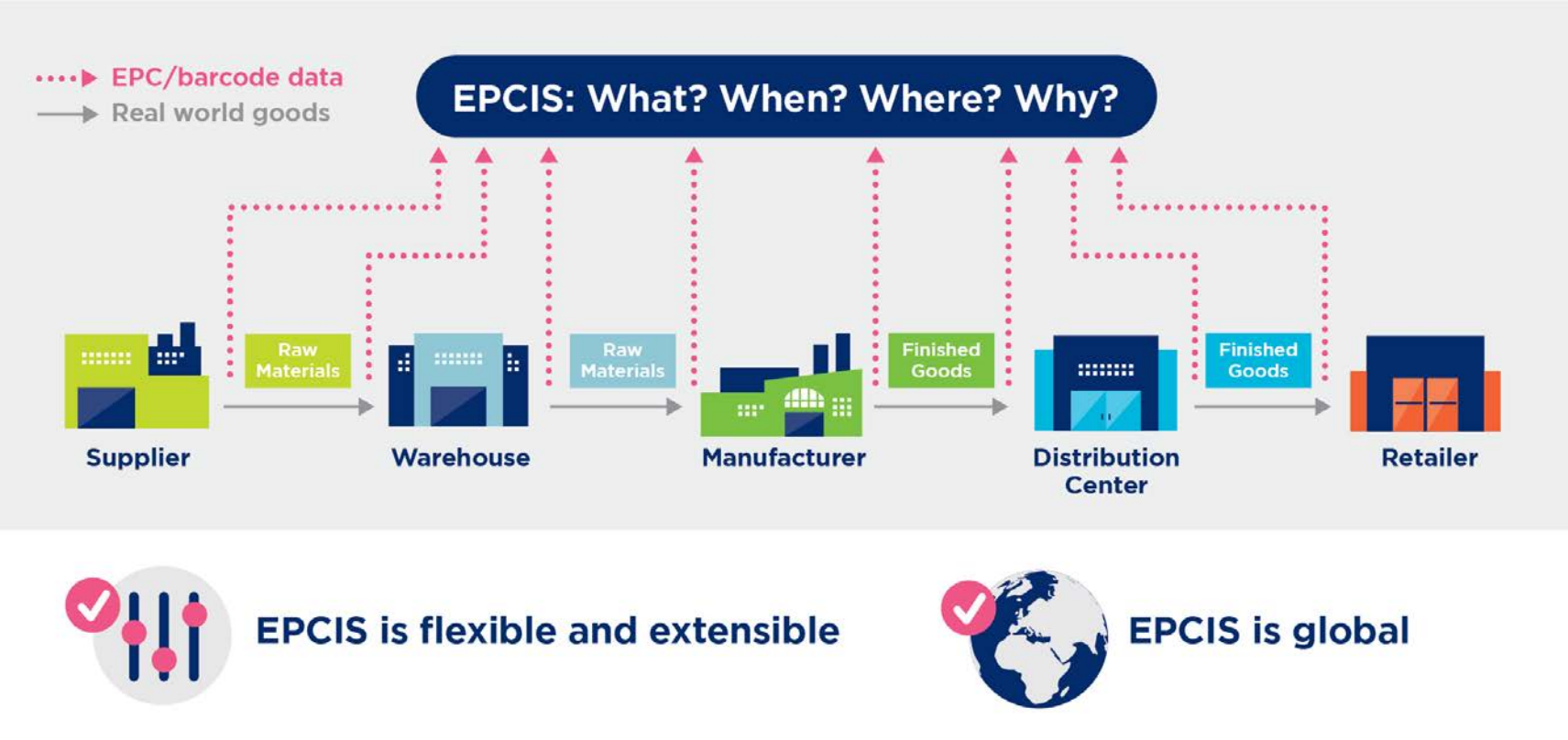
Once pertinent serialized data systems were identified, they were **standardized** so that there would be a common language within the network.

EPCIS, an event-based data standard defined by GS1, was chosen as the universal language for the network. Partners could either standardize their data with a translator tool built by Auburn or transform the data independently.



Source: CHIP Whitepaper v7.0 - Working Group Review

EPCIS: Visibility Syntax



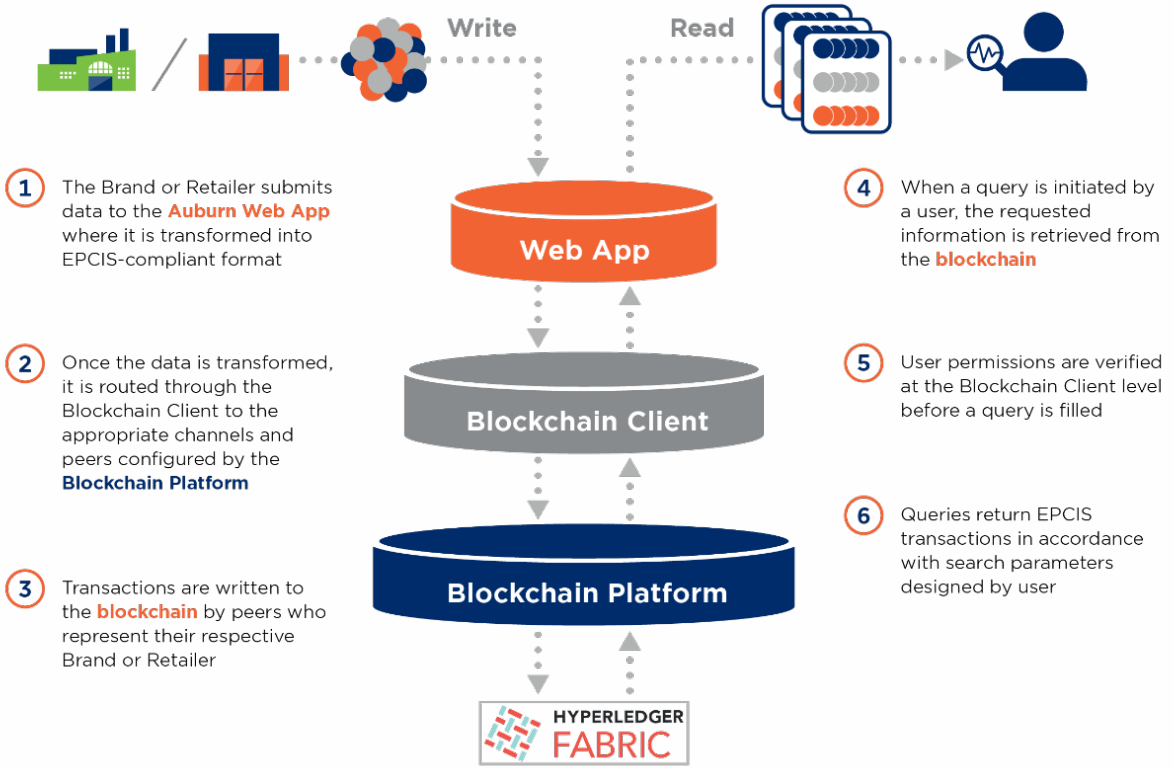
Source: CHIP Whitepaper v7.0 - Working Group Review

Step 3: Integrate Data Streams Into the Blockchain

AUBURN UNIVERSITY RFID LAB

After serialized data streams were standardized, they were integrated into a **blockchain-based solution** that the Auburn team constructed and administered.

The solution was built on Hyperledger Fabric with the help of IBM's Blockchain Platform.



Source: CHIP Whitepaper v7.0 - Working Group Review

Proof-of-Concept Conclusion

AUBURN UNIVERSITY RFID LAB

Key Takeaways

- The PoC was able to successfully prove that blockchain is an effective method for exchanging serialized data
- EPCIS is key—a common platform requires a common language
- Data quality is paramount—"garbage in, garbage out"

What's Next

- Optimize performance and ensure scalability within the blockchain network
- Investigate vendor-neutral blockchain networks and multi-cloud deployments
- Launch the **CHIP Pilot** (phase 2)

Source: CHIP Whitepaper v7.0 - Working Group Review

CHIP Phase 2 | Transitioning to Pilot

AUBURN UNIVERSITY RFID LAB

Goals of Next Phase

- The Step 1: Identify Serialized Systems & Stakeholders
- Step 2: Standardize Data Streams
- Step 3: Integrate Data Streams Into the Blockchain
- Step 4: Analyze
  - Financial Implications
  - Impact on Claims

ROI Opportunities

- Improve claims identification
- Claims reduction
- Faster time to reconciliation
- Lower reconciliation costs
- Automated data collection

Source: CHIP Whitepaper v7.0 - Working Group Review

CHIP Phase 2 | Transitioning to Pilot

AUBURN UNIVERSITY RFID LAB

Goals of Next Phase

- The Step 1: Identify Serialized Systems & Stakeholders
- Step 2: Standardize Data Streams
- Step 3: Integrate Data Streams Into the Blockchain
- Step 4: Analyze
  - **Financial Implications**
  - **Impact on Claims**

ROI Opportunities

- Improve claims identification
- Claims reduction
- Faster time to reconciliation
- Lower reconciliation costs
- Automated data collection

Source: CHIP Whitepaper v7.0 - Working Group Review

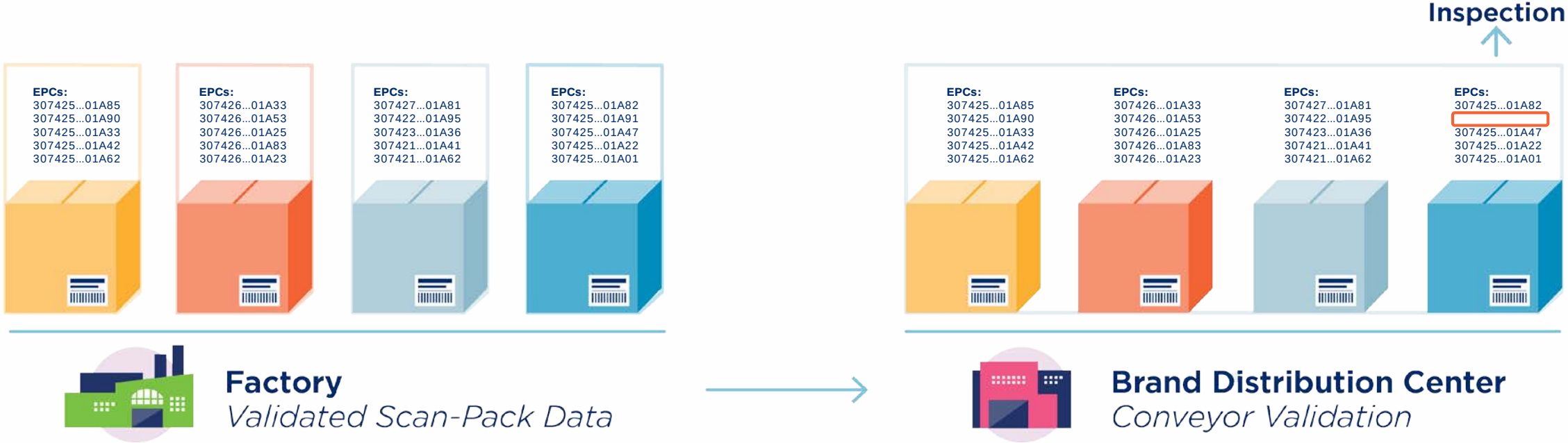
Data Collection Challenge

AUBURN UNIVERSITY RFID LAB

- Challenge: Capture RFID tag values
  - Items in a carton on a conveyor
  - Traveling at 5’ per second, or faster, or variable speed
  - For footwear, for basics, for intimates, for other categories…
  - With near 100% accuracy
  - Properly associating all of the contents to the right carton
  - With the prior/next carton in close proximity

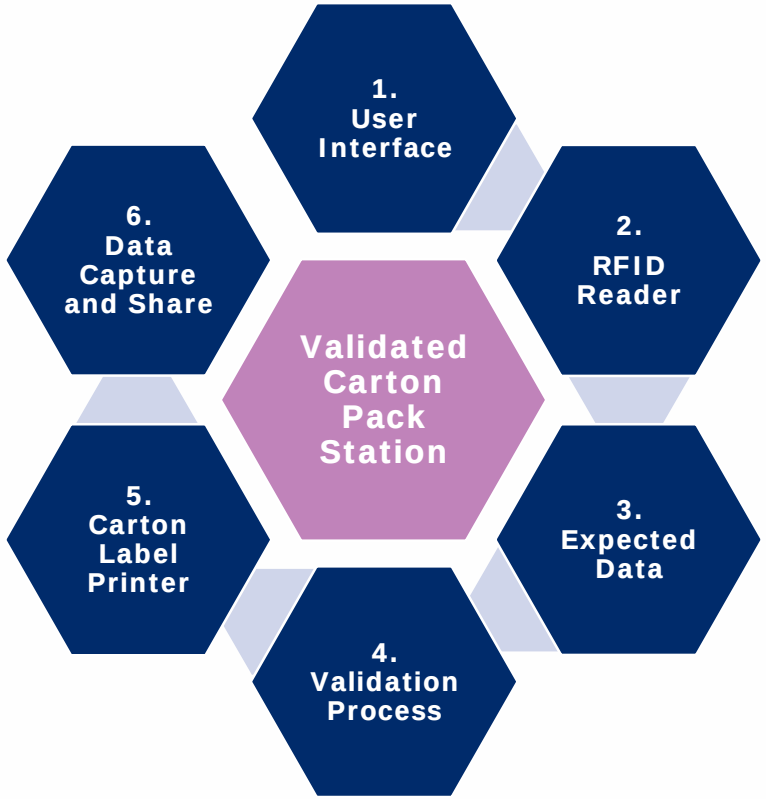
Solution Approach

AUBURN UNIVERSITY
RFID LAB



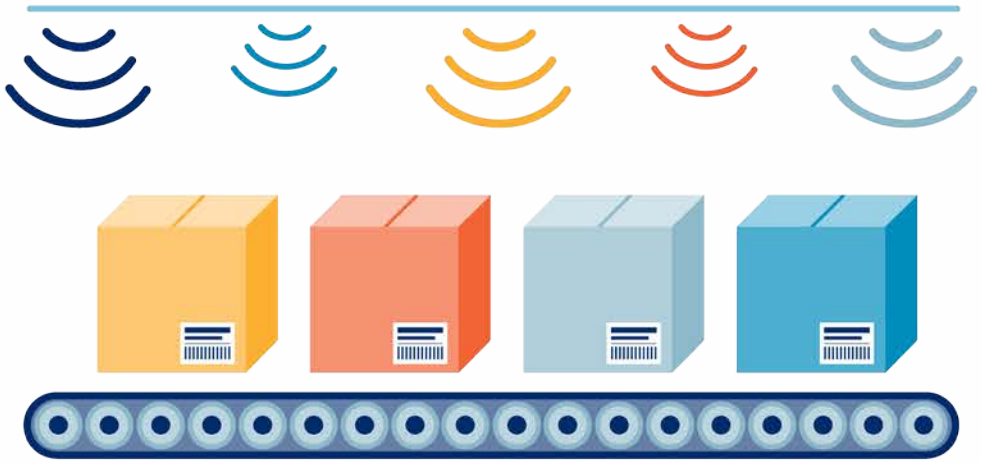
Validated Carton Scan Pack Station Components

AUBURN UNIVERSITY RFID LAB



Conveyor Validation

AUBURN UNIVERSITY
RFID LAB



Brand Distribution Center
Conveyor

Expected and Read EPCs

307425...01A85	307426...01A33	307427...01A81	307425...01A82
307425...01A90	307426...01A53	307422...01A95	307425...01A91
307425...01A33	307426...01A25	307423...01A36	307425...01A47
307425...01A42	307426...01A83	307421...01A41	307425...01A22
307425...01A62	307426...01A23	307421...01A62	307425...01A01

EPC Data Repository
with **Factory**
Validated Scan-Pack Data

Wrap Up

AUBURN UNIVERSITY RFID LAB

- Upcoming events/milestones
  - RFID 101 Webinar: October 15th https://site.gs1us.org/webinar-rfid-101-visibility.html
  - RFID 201 Webinar: November 17th https://site.gs1us.org/webinar-rfid-201.html
- Make contact if interested in further discussions or potential workgroup participation!

Contact Information

Justin Patton

Director, RFID Lab
Auburn University

Jonathan Gregory

Director, Community Engagement
GS1 US

JGregory@gs1us.org

THANK YOU

RFID JOURNAL VIRTUALLY LIVE!