engage again

A Virtual Conference presented by AIM & RAIN
9 - 10 December 2020

Sustainability with IoT Applications
A Panel Discussion

10 December | 10: 20 AM EST

Justin Patton

Sprague Ackley

Scott Austin

Meet the Subject Matter Experts

Justin Patton
Director of RFID Lab – Auburn University

Sprague Ackley
Principal R&D Engineer - DIGIMARC

Why IoT & Provenance are Important to Sustainability

To effectively manage an asset, product or material, optimizing its best placement into circular initiatives, it is important to know it's **PROVENANCE**

i.e. where it is, chain of custody & ownership, its chemistry and State of Health.

The best means of supporting **PROVENANCE** this is to first 'IoT-enable' an asset or give it a 'digital identity' anchoring the object through the Internet of Things enabling identification & traceability.

Item Level Claims

Sustainability Differentiation of Products

Types of data captured in platform per transaction:

Geographic Origin
Responsible mining (including ASM)
Responsible manufacturing
AML practices
KYC practices
Systems of warranties
Natural claims (for example, non-synthetic)
Recycled sources for object
Percent of profits going to charities
Energy & Water Metrics
GHG emissions

EV Battery Lifecycle Ecosystem
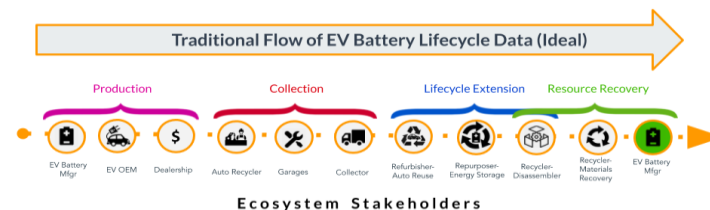
The Equation!

Low-Cost
Product Identification

+

Permissioned
Distributed Stakeholder
Data Access

Symphony of Technologies &
Partnerships

=

Improved Conservation
& Economic Inclusion

Accurate Claims

Efficient Reporting

Examples of IoT Deployment that Support Sustainability – EVBs

STAKEHOLDER VALUE

ECOSYSTEM STAKEHOLDERS

EV Battery Mfgr · EV OEM · Dealership · Auto Recycler · Garages · Collector · Refurbisher-Auto Re-use · Repurposer-Energy Storage · Recycler-Disassembler · Recycler-Materials Recovery · EV Battery Mfgr

"I now know what kind of battery I have and what my best options are for managing it. Before I was turning EVs away."

"It is important for us to secure a long-term supply of minerals for our products. Knowing that our batteries are being put to maximum use and being recovered after use helps ensure that."

"We wanted to repurpose before recycling but had liability concerns. Now we're more confident with transfer of EVB title on the blockchain."

"With falling battery prices it's essential that our process is efficient. We can now ensure we only buy batteries we can use and spend less time evaluating them."

"Sourcing EVBs in this emerging industry used to be a challenge. Now we rely on the Exchange to find what we need and where, saving lots in transportation costs."

Plastic Bottles and Fabrics Digital Watermarks

To keep plastics in circulation, we will need a combination of practices and methods. In addition to the elimination of problematic and unnecessary plastics, and switching from single-use to reuse models, recycling the plastic that we do need is crucial. The same is true with fabrics, particularly with uniforms and medical gowns

Plastic Bottles | Digital Watermarks

Digital watermarks are bar codes that are spread over an entire surface with little to no human visibility

The data (e.g., SGTIN) is encoded with a huge amount of error correction and then redundantly 16 times, spread out, and marked (e.g., laser) typically covering only about 5% of the substrate

Plastic Bottles | Sortation

Digital watermarks can also be molded into the plastic for zero additional cost

The molded data (e.g., GTIN) is decodable with typical imaged-based bar code scanners at high speed inspite of damage and distortions

Plastics in the recycle waste stream are sorted into pure material for sale and re-use

Textiles | Fabric printing

Digital watermarks can be printed imperceptably into the fabric design

Subtle localized color shifts can be detected by a bar code scanner, for example reddish-purple dots surrounded by a bluish-purple background

The tiny color swirls blend into a single visible pattern to the human eye that can be scanned for inventory control and proper waste steam management and recycling
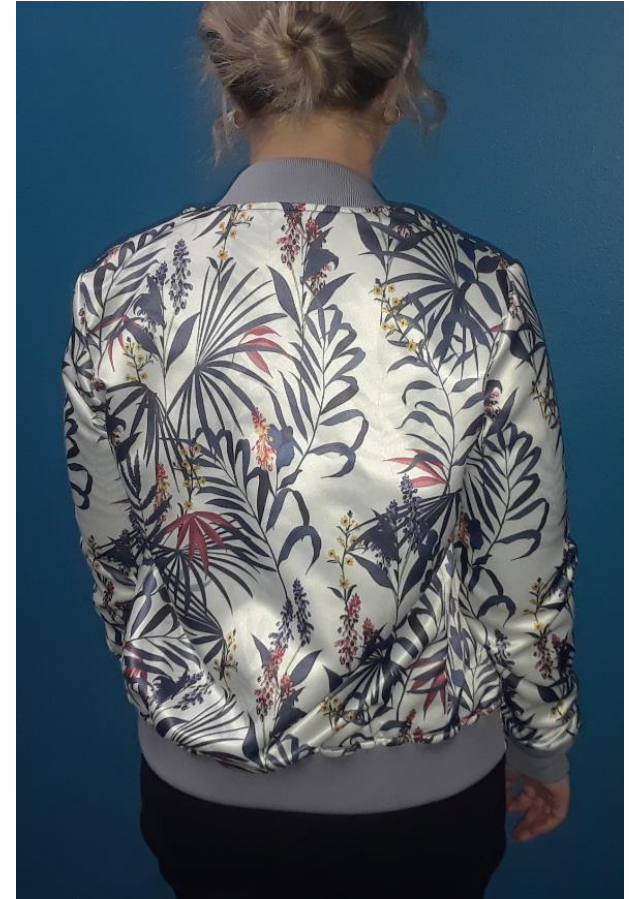
Textiles | Digital Looms

Digital watermarks can also become inherent in the production of fabric

Modern digital looms operate under computer control like printers allowing individual threads to be placed precisely

Different data can be encoded into each run allowing for waste stream identification as well as other applications such as authentication and brand protection

Sustainability and the IoT
Digital Watermarks

Bar codes can be molded (even into chocolate) or laser etched to facilitate high speed sortation of plastic waste into marketable commodities
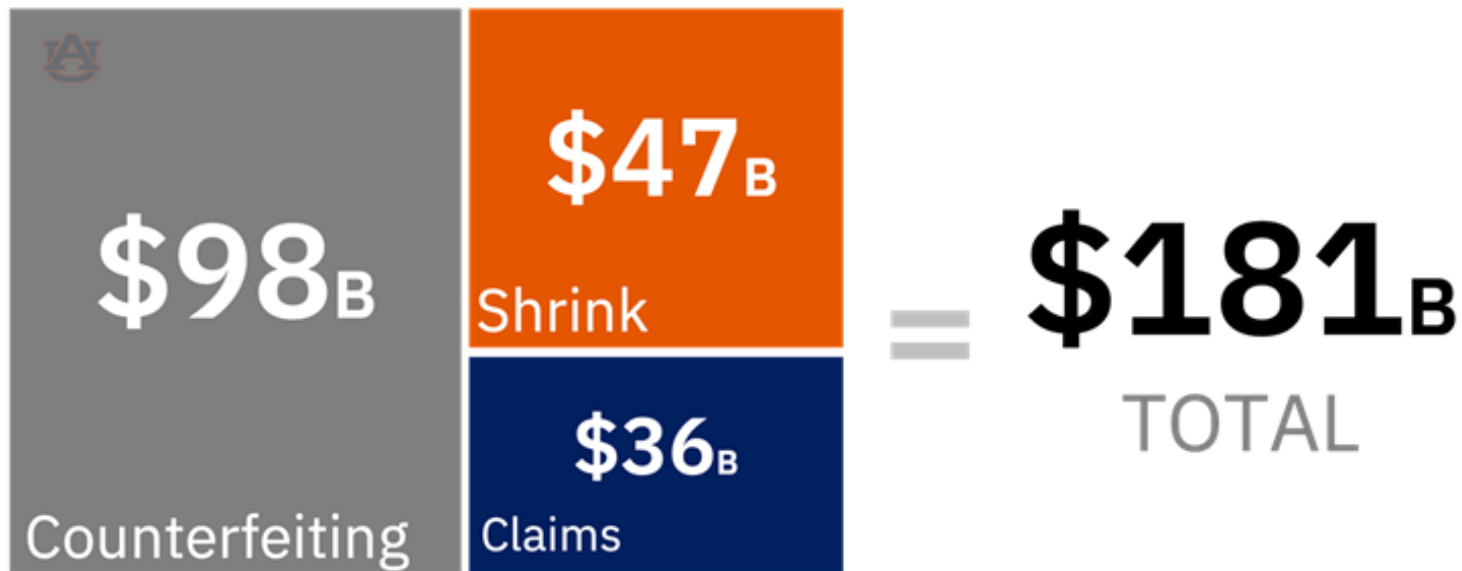
Fabrics can be printed or woven with bar codes that can be sewn on (e.g., patches) or used to make garmets, which can be scanned from cradle to grave
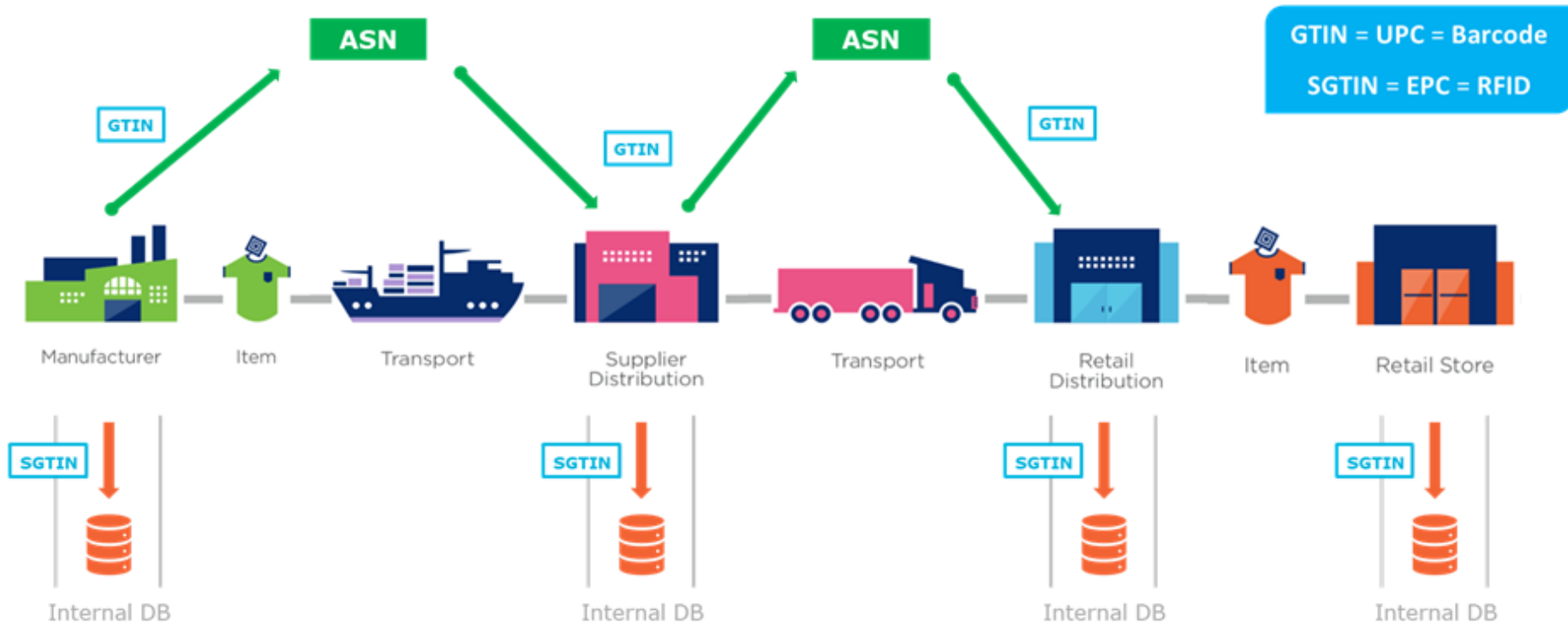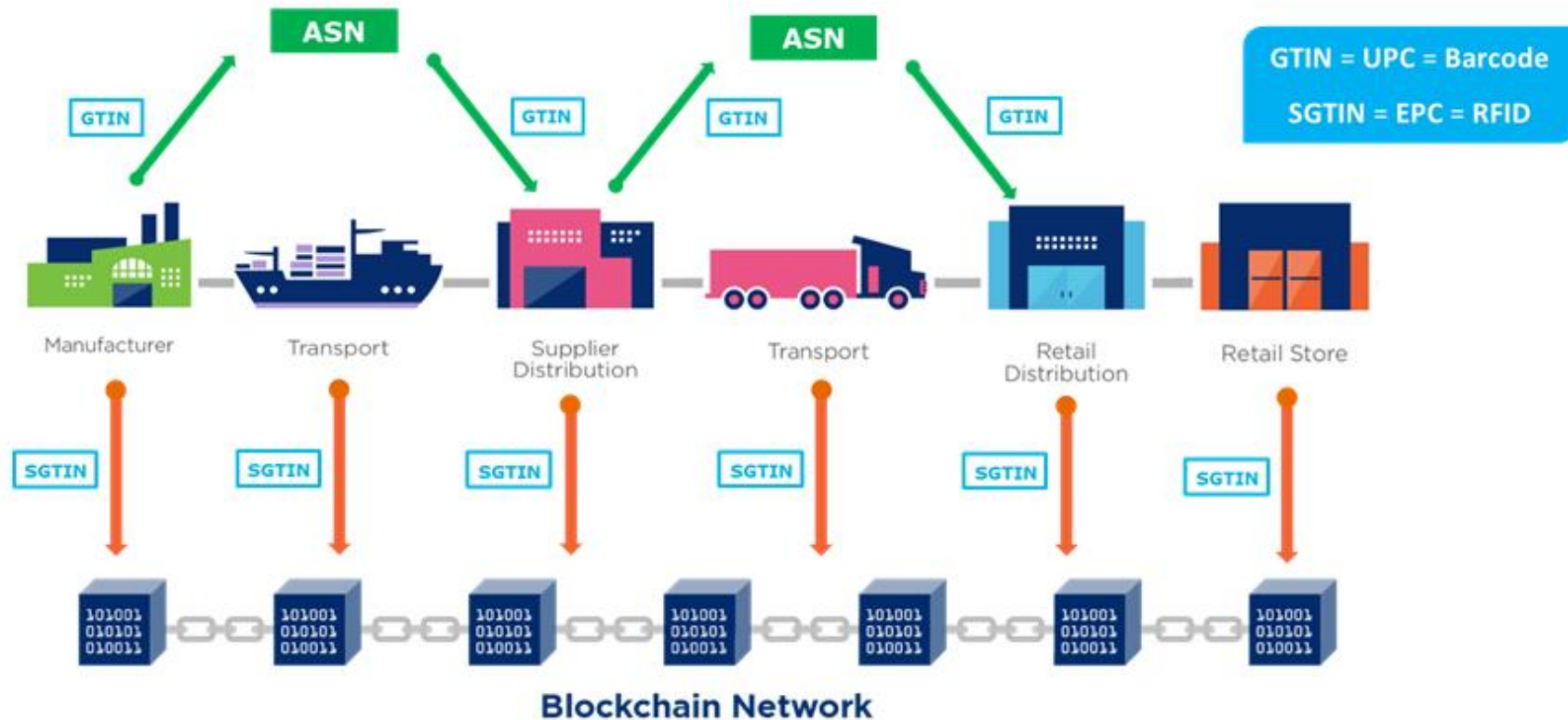
CHIP Project

The **CH**ain **I**ntegration **P**ilot has a goal of integrating item-level data streams from various stakeholders in the retail supply chain, creating a common record of information jointly shared by trade partners that will enable end-to-end visibility.

$98_B Counterfeiting + $47_B Shrink + $36_B Claims = $181_B TOTAL

Auburn Blockchain Working Group: **Data Flow** *Today*

ASN · ASN

GTIN = UPC = Barcode
SGTIN = EPC = RFID

GTIN · GTIN · GTIN

Manufacturer · Item · Transport · Supplier Distribution · Transport · Retail Distribution · Item · Retail Store

SGTIN · SGTIN · SGTIN · SGTIN

Internal DB · Internal DB · Internal DB · Internal DB

Auburn Blockchain Working Group: **Data Flow** in the *Future*

GTIN = UPC = Barcode
SGTIN = EPC = RFID

ASN

GTIN

ASN

GTIN

GTIN

GTIN

Manufacturer · Transport · Supplier Distribution · Transport · Retail Distribution · Retail Store

SGTIN · SGTIN · SGTIN · SGTIN · SGTIN · SGTIN

101001 010101 010011

**Blockchain Network**

Future of Sustainability with IoT

For more Information

AIM Whitepaper | Sustainability and the IoT
This paper investigates how the Internet of Things (IoT), a network of sensors connecting our objects to the cloud and supporting real time data capture and cloud interaction without human intervention, can have and are having a positive effect on sustainable work practices and thus supporting a Businesses ROI.

Download here: https://bit.ly/2JajxP4

SUSTAINABILITY AND THE
INTERNET OF THINGS

White Paper

IoT Work Group
11/10/2020
AIM, Inc. WP / 021020
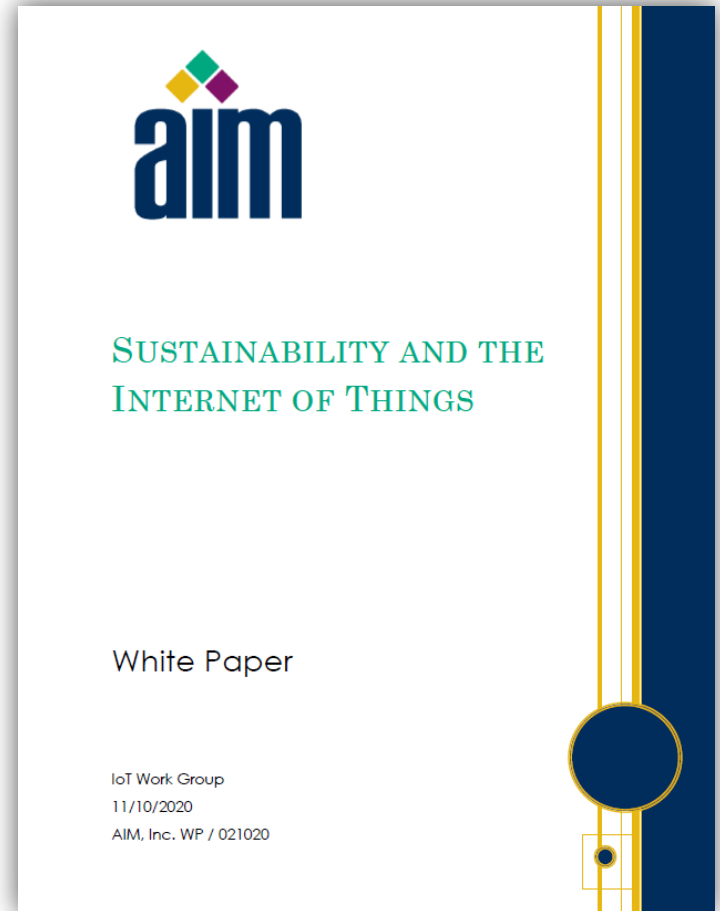
Questions or Comments

Thank you for Attending

Presentations will be available on-line soon. You will receive an email with a link when they are available.