The path to interoperability

CASE STUDIES AND APPROACH
GOING FORWARD
Tuesday 23 May 2023, 10.30am to 12.00pm AEST

Levine Naidoo
Executive Director
LXN Digital

Michael Dossor
Managing Director
Result Group

Luke Wood
CEO & Founder
Escavox

Greg Calvert
Co-founder & Director
FreshChain Systems
## Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Item</th>
<th>Who</th>
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</thead>
</table>
| 10.30am | Welcome and Introduction                                            | Peter Davenport  
Manager – Alliances  
GS1 Australia |
| 10.35am | Opening Remarks and official welcome                                | David McNeil  
Manager - Customer Experience  
InfraBuild Steel |
| 10.45am | Framework of Interoperability                                       | Levine Naidoo  
Executive Director  
LXN Digital |
| 11.00am | A case study of how interoperability standards in the IoT sector have accelerated market uptake of these systems and their associated relationship to with traceability. | Luke Wood  
CEO and Founder  
Escavox |
| 11.15am | Cherry Plus case study                                               | Greg Calvert  
Co-founder and Director  
FreshChain Systems |
| 11.30am | Case Study 3                                                         | Michael Dossor  
Managing Director  
Result Group |
| 11.45am | Panel Session with Q&A                                               | Moderator: Peter Carter  
| 11.55am | General Business & Close                                             | Peter Carter  
Director of Innovation  
GS1 Australia |
Acknowledgement of Country

We acknowledge the Traditional Custodians of the various lands on which we meet and work today and any First Nations’ people that may be participating in this meeting.

Specifically, we acknowledge the people of the Kulin and Eora nations, where GS1 offices are located, and pay our respects to elders past, present and emerging.

We recognise and celebrate the diversity of First Nations’ people, and their ongoing cultures and connections to the lands and waters across Australia.
Participants on GS1 Boards, committees, task forces, work groups, or other similar bodies, must always remember the purpose of the Board, committee, task force, or work group is to enhance the ability of all industry members to compete more efficiently and effectively to provide better value to the consumer or end user.

GS1 activity almost always involves the cooperation of competitors; therefore, great care must be taken to assure compliance with competition laws in Australia and in other jurisdictions (including the Australian Consumer Law (ACL), the Competition and Consumer Act (CCA) and state based Fair Trading Legislation.

This means:

• Participation must be voluntary, and failure to participate shall not be used to penalise any company.
• There shall be no discussion of prices, allocation of customers or products, boycotts, refusals to deal, or market share. (For the avoidance of doubt, this does not preclude discussion of GS1 Australia's prices, customers or products.)
• If any participant believes the group is drifting toward impermissible discussion, the topic shall be tabled until the opinion of lawyer(s) with experience in competition law can be obtained.
• Where appropriate, meetings shall be governed by an agenda prepared in advance and recorded by minutes prepared promptly after the meeting.
• Where appropriate, tests or data collection shall be governed by protocols developed by GS1 in consultation with, and/or monitored, by legal counsel.
• The recommendations coming out of a GS1 Board, committee, task force, work group, are just that. Individual companies remain free to make independent, competitive decisions.
• Any standards developed must be voluntary standards.
Official Welcome by Co-Chair of the NGTAG

David McNeil
Manager - Customer Experience
InfraBuild
# National Accord Statements

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>1</strong></td>
<td><strong>For the greater good</strong></td>
</tr>
<tr>
<td></td>
<td>Traceability systems can deliver competitive advantages to individual companies. It is its aggregate value across the economy that will deliver greater safety for all Australians and lift Australia’s brand in key export markets.</td>
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<tr>
<td><strong>2</strong></td>
<td><strong>Interoperability and global data standards</strong></td>
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<td></td>
<td>Interoperability of traceability systems is critical to ensure transparent and cost-effective implementation of solutions. Interoperability is needed within and across sectors, domestically and internationally.</td>
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<td><strong>3</strong></td>
<td><strong>Traceability insights, collaboration and sharing</strong></td>
</tr>
<tr>
<td></td>
<td>The business value of full product traceability can be harnessed through collaboration and sharing of traceability insights along with necessary data on both critical incident as well as on a regular basis.</td>
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<tr>
<td><strong>4</strong></td>
<td><strong>Transparency with privacy</strong></td>
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<tr>
<td></td>
<td>Transparency is a key principle for responsible sharing of traceability data to establish full end-to-end product traceability. The signatories recognise that the sharing of traceability data with supply chain partners must be done with data sharing agreements and privacy protections in place.</td>
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<tr>
<td><strong>5</strong></td>
<td><strong>Resolution of incident and data disposal</strong></td>
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<tr>
<td></td>
<td>Resolution of product safety incidents, including food safety, in a timely manner is one of the key criteria for successful implementation of traceability solutions.</td>
</tr>
<tr>
<td><strong>6</strong></td>
<td><strong>Traceability with purpose</strong></td>
</tr>
<tr>
<td></td>
<td>Traceability must deliver benefits that are tangible, measurable and meaningful to consumers, industry and governments. In this respect traceability is a means to an end, rather than an objective on its own.</td>
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</table>
Signatories to the Accord

Signatories of the National Traceability Accord agree to:

• Openly collaborate on end-to-end traceability in a non-competitive way, for the benefit of all.
• Utilise global data standards, update or develop new standards when necessary and strive to support interoperability to the greatest extent practical.
• Commit to share traceability insights to enhance product safety and recall, biosecurity and authenticity in both domestic and global markets.
• Recognise the need to share traceability data with supply chain partners based on data sharing agreements, whilst protecting privacy and intellectual property.
• Agree to share relevant product data amongst themselves along with external entities for timely resolution. Signatories will commit to the timely disposal of data shared along with the supporting artefacts.
• Share a common goal to enhance traceability to achieve safer and more responsible production and consumption, to gain market access, more effectively meet regulations, to increase efficiencies and capitalise on circular economy opportunities.
Strategy 2022-2024

Revised Priorities

1. Progress Traceability through sharing and awareness.

   Info Sharing, Awareness & Education

2. Connect, empower and support industry to lead

   Industry Partnerships & Collaboration

3. Support and promote an ecosystem for interoperability

   Interoperable Technology Ecosystem

4. Support state, territory and federal activities and cross agency collaboration

   National Traceability Strategy
Levine Naidoo - LXNDigital

Levine Naidoo
Executive Director

LXNDigital

The Global Language of Business

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A PRACTICAL PATHWAY TO TRACEABILITY INTEROPERABILITY

May 2023
Levine@LXNDigital.com
Contents

• Introduction

• What does traceability interoperability mean?

• Why is it important?

• What is the complication?

• Taking a layered approach

• Summary
What is supply chain traceability information?

Refers to the information collected and recorded at various points in a supply chain, which enables businesses to track and trace the movement, origin, and history of a product or raw material.

Can include data pertaining to:

- Identification
- Product
- Origin
- Processing and Handling
- Transport and Logistics
- Transactions
- Chain of Custody
What is traceability interoperability?

Refers to the seamless exchange of traceability information across different systems, organizations, and supply chain stages (end-to-end).

- Different stakeholders can capture, exchange and process data seamlessly regardless of specific systems and platforms
- Information is exchanged in both directions

- End to end traceability interoperability means capturing and sharing data seamlessly across the value chain
Why is traceability interoperability important

• Visibility
  - Transparency
  - Risk and compliance
  - Trust

• Resilience
  - Friction
  - Agility and response times

• Sustainability
  - Waste
  - Circularity
  - Scope 3
What’s the complication

• Technology
  - Market fragmentation
  - Legacy systems
  - Integration challenges
  - Connectivity challenges

• Data
  - Data islands
  - Security

• Organisational
  - Resistance to change
  - Resource constraints
  - Costs
  - Collaboration mindset

Applies to every industry sector
Interoperability layers

- **Organisational**
  - Business identifiers and business process

- **Semantic**
  - Definitions, meaning, structure and rules for validating

- **Technical**
  - Securely packaging, exchanging and preserving entitlement

- **Policy & Legislation**
  - Formal statements for e.g.
    - govern sharing of data
    - Guide the design and adoption
    - Guiding Principles

Solution providers can influence but ultimately needs an endorsement leadership role.

Australian Traceability guidelines

Solution providers can influence but ultimately needs a governance leadership role.

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Summary

• Why traceability interoperability is important
• A cross sector challenge
• A barrier to traceability adoption
• Layers can be domain specific
• Layers can be common across sectors
• Cross-sector collaboration is essential
Luke Wood - Escavox

Luke Wood
CEO and Founder

Escavox
The Path to Interoperability
- a case study of how interoperability standards in the IoT sector have accelerated market uptake of these systems and their associated relationship to traceability.

Presented by Luke Wood
The IoT Landscape requires 3 layers of interoperability

**Technical** – the physical
- How do I actually connect or plug into something else
- Eg: 3G/4G/LTE, WiFi, BTE

**Syntactic** – the language
- How do I communicate with whatever it is I have plugged in to
- ISO/IEC 18000-63, SMS,

**Semantic** – the meaning
- The context and meaning of what I am communicating
- EPCIS, KDE, PoS

**Key Take away**
The greater the number of different nodes in the network the more valuable interoperability becomes.
A single example – GSMA TS.34 IoT Specification

1.1 Problem Statement
The predicted large scale growth of IoT Devices and their associated IoT Device Applications will create major challenges for Mobile Network Operators. One major challenge that Mobile Network Operators must overcome is the risk caused by the mass deployment of inefficient, insecure or defective IoT Devices on the Mobile Network Operators' networks. When deployed on a mass scale such devices can cause network signalling traffic to increase to a level which impacts network services for all users of the mobile network. In the worst cases the mass deployment of such IoT Devices can disable a mobile network completely.

1.3 Intended Audience
The target audiences for this document are Mobile Network Operators, IoT Service Providers, IoT Device makers, IoT Device Application developers, Communication Module Vendors and Radio Baseband Chipset Vendors.

7.3. Network Connection Efficiency
7.3.3. References
See Section 7 – Connection Efficient Requirements from GSMA IoT Device Connection Efficiency Guidelines v7.1:
GSMA | TS.34 IoT Device Connection Efficiency Guidelines - Newsroom

Key Take away
All players in the ecosystem must play a role in defining the standard for it to be effective
How has this changed traceability:

< From This
To This >

< From This
To This >

Key Take away

Interoperability allows solutions to be deployed which enables change
Greg Calvert - FreshChain

Greg Calvert
Co-founder and Director
FreshChain Systems
CHERRYPLUS

A standards-based traceability system to support horticultural industries

Project partners:
Woolworths Macro Organic Cherries & 2kg Brushed Potatoes
Overview

Objectives
1. To use ISO/IEC-compliant data standards to immediately identify a product's origin or properties in the horticulture supply chain
2. Show that data standards enable efficient emergency responses and supply chain logistics, including all required data for interstate market access
3. Identify areas in the supply chain where the product sits for too long or is exposed to unsuitable conditions to reduce waste.

Methods
To test the suitability of an ISO/IEC-compliant data standard for an integrated traceability system
GS1 data standards and the GS1 National Location Registry were used.
Pilot trials using potato and cherry were conducted to test the efficacy of a data standard traceability system. Potato and cherry were used as pilot commodities as potato is a well-established industry and a staple market commodity and the Australian cherry industry has an interest in using traceability to gain access into markets. Both commodities were supplied to Woolworths as the retailer brands of 'Macro Organics' and 'Woolworths' own label. Serialised unique QR codes with a GS1 Digital Link label were applied to all consignments in the potato and cherry trials. For potatoes, 4,500 labels were printed and for cherries, unique serialised labels embedded with data were applied to 1,152 punnets that were linked to 144 serialised crate labels and linked to 4 serialised shipping container codes (Figure 1). These labels were printed on-demand and applied.
What did we want to prove?

<table>
<thead>
<tr>
<th>Project Objectives</th>
<th>Status</th>
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<tbody>
<tr>
<td>➔ Instant Property identification using GS1 Global Location Numbers (GLN’s) to support Government quickly deploy support in the event of a biosecurity threat or natural disaster (floods, bushfires, fruit fly incursion)</td>
<td>Successful</td>
</tr>
<tr>
<td>➔ Multiple mock recalls using the FreshChain platform for rapid identification, containment and sharing of data using GS1 standards in the event of a critical food incident. (back to farm, forward through to DC and stores, real time updated messaging via the QR code for product already sold and potential food fraud. The goal was to identify, capture and share that data using multiple search metrics like GLN, Batch/Lot/Code/Pack date/GTIN/DC/Product description. How long did it take?</td>
<td>Successful in under 60 seconds</td>
</tr>
<tr>
<td>➔ Linking on-demand printed and serialised punnets to serialised crates to serialised pallets using serialised QR codes with a GS1 Digital Link URI to identify, capture and share data for upstream and downstream traceability.</td>
<td>Successful</td>
</tr>
<tr>
<td>➔ 4 Digital certificates uploaded on platform for product journey for digital approvals for market access using GS1 GDTI standards (Global Document Type Identifier)</td>
<td>Successful</td>
</tr>
<tr>
<td>➔ Consumer insights and analytics gained through provenance engagement of the GS1 Digital Link 2D QR codes on every pack</td>
<td>Successful</td>
</tr>
<tr>
<td>➔ Environmental and location FreshChain sensors travelling with consignments to assess chain of custody and impacts (Temperature, Humidity, Light, Movement, Shock)</td>
<td>Successful</td>
</tr>
</tbody>
</table>
Figure 1. In the cherry trial, every level of packaging was uniquely identified. Source: Wishart (2022).
Benefit 1

Track and trace

For each of the scenarios, track and trace demonstrations could instantly identify the product’s location in the supply chain. Product origin was accurately identified and the FreshChain system was able to send instant recall alerts to display on the QR code when scanned. All batches could be managed from the FreshChain dashboard. Figure 5 shows the interface that a Food Authority officer or retailer will see when initiating a track and trace or food recall. Product can be traced by entering the batch number or packed date and all data associated with that number will be identified and displayed as shown in batches. There is a ‘lock down all’ button that, when activated, will send a recall message to the identified affected batches.
What about further protecting your customer in the event of a critical food incident or biosecurity threat?

Examples of search metrics:

- Product name
- GLN
- Serial Number (GTIN)
- Batch/Lot/Code
- Date
- Stores
- DC
- 3PL
Benefit 3

Environmental and Location FreshChain sensors

Sensors

The FreshChain sensors used in this pilot trial detected temperature changes in the supply chain, highlighting a potential area for improvement, especially where the cherries were exposed to higher than optimal temperatures during transport (Figure 11). More research into the transport component of the supply chain could identify areas where waste due to inefficiencies can be reduced.
Benefit 4

You have purchased a Mitolo verified 2kg Brushed Potato from Woolworths

Harvest Information

Grower: Frank and John Mitolo
Hillston, New South Wales, Australia

Map

Packed: 10 Nov 2021 10:00 am
Weather: Showers 29C
Crop 13
Serial number 410315

Sustainability and Certifications

The bag is recyclable, return to store for soft plastic recycling

Nutrition & Health

Veg a day: 1/2 medium potato (75g) = 1 serve of veg
Contains Vitamin C, which helps support your immune system, healthy brain function and can reduce tiredness.
A good source of Potassium - one potato has more than twice the potassium of a banana.

Socials and Shop

This is a demo only

Nurturing & Certifications

Modern Slavery Statement (view document)

Nutrition Information

Savings Per Package: 26
Serving Size: 75g

Feedback Form

When did you scan the QR code for the first time?
- At home (before consuming)
- At home (after consuming)

Why did you decide to scan the QR code?
- General curiosity
- To learn more about the farmer
- To obtain information on nutrition and health
- Expecting promotional activity
- To find recipes
- Other

Please rate your Cherries

Figure 7. Example of information provided to the consumer on the user experience webpage.

Figure 8. Feedback form for consumers.
Temperature and weather
11 degrees
Overcast

Destination & PO
Minchinbury DC
PO 78929736
Batch 123

Chain of custody (A)
Major temp breach (3 hrs at 25 degrees in transit)

Growing and picking method
Greenhouse
Open field
Hand Picked
Machine Picked

Packing process
Shed
Field
Combination

Carrier(s)
Nolans - 1st leg

Origin - what level (A)
Coffs Harbour
Region/Post Code
+Farm X
++Paddock 1
+++Row 23
++++ Picker ABC

Harvest and/or pack date and time (A)
23/06/2022
0600 hrs

Freshness Index (A)
6 days from packing

Day and Time of despatch
24.06.22
16.45 hrs

Upstream inputs
Fertiliser Use
Pesticide Use
Herbicide Use
Growth Regulator Use
Fungicide Use
Baiting Use
Sunscreen Use
Other treatment Use
Water Use

Scanned location (A)
Wollongong 2500
3.23pm, 29/06/2022

Temperature and weather (A)
11 degrees
Overcast
Benefits to industry

This pilot trial identified the following key benefits for industry in adopting an ISO-compliant data standard traceability system:

1. Successfully demonstrated an integrated digital traceability system for horticulture.
2. Successfully traced products forward and backwards in the supply chain.
3. Identified the benefits of traceability for growers, exporters, retailers, governments and consumers.
4. Quick identification of property and assets, minimising loss to the grower.
5. Assuring consumers of the food safety, provenance and authenticity of Australian products to improve consumer confidence.
6. Reducing economic damage to the growers and industries through efficient recalls.
7. Creating new export opportunities by:
   - enhancing clearer supply chain visibility
   - quickly and accurately identifying the origin of the product
   - providing the framework for electronic certification for increased market access
8. Connecting growers with consumers and encouraging communications that could influence buying decisions.
Conclusion

Using a global data standard as a foundation for a traceability system means information can be integrated to make managing products in the supply chain much more efficient. Global data standards will also reduce the time spent identifying products in the supply chain, making food safety incidences and product recalls easier to manage. Although there are many traceability systems available, there are increasing challenges with their interoperability. Data standards agreements can pose challenges for growers, retailers, and government's ability to work together during food recalls, emergency management situations and biosecurity incursions.

For this pilot trial, GS1 global data standards and the National Location Registry were tested in a traceability system, enabling accurate identification of property and products at pre-determined points in the supply chain. This type of traceability system will reduce downtime, allow quicker, more accurate deployment of government resources, and increase consumer confidence. The system also encouraged consumers and growers to communicate with each other, enabling feedback and product information to be shared. All supply chain participants including the retailers, freight services, growers and government.
Transformational activity

*Seamless data flow in maintaining traceability from whole to cut watermelon in store.*

Seamless transfer of live data from whole to cut seedless watermelons in-store using serialised and unique GS1 Digital Link QR codes using an on-demand print solution in the store cutting area. Thu 16 Dec 2021 Fri 20th May 2022

Michael Dossor – Result Group

Michael Dossor
Managing Director

Result Group
ATGA Traceability Export Grapes

Code Generation – GS1 Digital Link

Picking Software - Farm Data

ERP & WMS Connection

Aggregation & De-Aggregation

Supply chain & Transportation

B2C Microsite

B2B Microsite

Label – Pre Print

Label – Variable Print

IOT – Location & Temperature tracking

Enhancing Consumer Engagement
Challenges & Learnings

**Production & Packing Operational Change**

**Scalable Solutions for an Industry**

**Deep Collaboration with Current Tech Vendors**

**Different Markets – Different Outcomes**
Promotion dates
02/05/2023 – 12/06/2023
Hungry Jack’s UNO Promo

YEAR 1
$87 MILLION

YEAR 2
$120 MILLION

YEAR 3
$140 MILLION

FUTURE
Hungry Jack’s UNO Promotion

Connection to Digital Printing Press

POS Food Prize Actions

Prize distribution engine – major prizes

HJ’s app – existing user

Prize distribution – minor prizes

HJ’s app – new user

Prize distribution – collect to win

Stash or Hold - food prizes

Prize distribution – second chance

Consumer Web traffic monitoring

Enhancing Consumer Engagement
Challenges & Learnings

- Data Security
- Packaging Development
- Deep Collaboration with ALL Tech Vendors
- Marketing & Operational Outcomes
WHERE TO FROM HERE?

Follow Us

michael.dossor@resultgroup.com.au

Michael Dossor
Group General Manager

Co-Chair
Panel Session

Moderator

Peter Carter

Director – Business Development & Innovation

+61 418 231 997

Email peter.carter@gs1au.org

Panelists

Greg Calvert
Michael Dossor
Luke Wood

David McNeil
Levine Naidoo
General Business

• Traceability terms made simple

• Future presentations of case studies for Pathway to Interoperability

• How to join the Traceability Solution Provider Special Interest Group
The Traceability Solution Provider Special Interest Group are in the process of gathering terms related to traceability to share amongst the community. The aim is to have an easy to read library of terms for everyone to access.

**CALL TO ACTION AND OPEN TO ALL TO CONTRIBUTE BY WAY OF SHORT VIDEO PRESENTATION**

<table>
<thead>
<tr>
<th>Term Identifier</th>
<th>Expanded</th>
<th>Description</th>
<th>Link to Video</th>
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<tbody>
<tr>
<td>GTIN</td>
<td>Global Trade Item Number</td>
<td>Global Trade Item Number (GTIN) can be used by a company to uniquely identify all of its trade items. GS1 defines trade items as products or services that are priced, ordered or invoiced at any point in the supply chain.</td>
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<tr>
<td>SSCC</td>
<td>Serial Shipping Container Code</td>
<td>Serial Shipping Container Code can be used by companies to identify a logistic unit, which can be any combination of trade items packaged together for storage and/ or transport purposes; for example, a case, pallet or parcel</td>
<td></td>
</tr>
<tr>
<td>EPCIS</td>
<td>Electronic Product Code Information Service</td>
<td>GS1 Standard for creating and sharing visibility event data, both within and across enterprises, to enable users to gain a shared view of physical or digital objects within a relevant business context.</td>
<td></td>
</tr>
<tr>
<td>Interoperability</td>
<td>GS1 and other definitions</td>
<td></td>
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<tr>
<td>Data Ownership</td>
<td>Data ownership refers to both the possession of and responsibility for information</td>
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</table>
CALL TO ACTION FOR ALL SOLUTION PROVIDERS

If you would like to have the opportunity to present your case studies, please reach out to the TSP-SIG team to discuss.

Send letters of interest to alliances@gs1au.org
How can you join the TSP-SIG?

- Traceability Solution Provider - Special Interest Group

Open to all industries and solution providers interested in supporting enhanced product traceability for Australian industry and governments. Traceability requirements are continually evolving. No single solution is likely to meet all industry needs, now or into the future.

You are welcome to play an active or passive role in the group with the intention of networking, sharing insights and hearing from industry and government representatives to discuss projects, issues, trends and, where possible, align needs.

There is no cost to participate in this group other than the contribution of your time.