Innovation
Logistics (Food Safety – Traceability)

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Icon Global Link

Agenda

- IGL Background
- Food Supply Chain Overview
- Traceability Details
- Examples In Action
- Summary

Company Background

- An installed base for food safety applications of more than 200 clients - the largest market share in Australia.
- Company has eight years' experience in the development of food safety and risk management software applications, and logistics management software.
- Team has twenty-five+ years' combined experience in transportation and logistics management.
- 2004 Symbol Technology - Enterprise Mobility Solutions Award Winner
- Selected as industry expert on Bio-terrorism training courses developed by the FDA and US Defense Force

Current food safety application clients include:

- Murray Goulburn
- Cadbury Schweppes
- Heinz
- Simplot
- SPC Ltd
- Berri Ltd
- IXL (Smuckers)
- Hans Smallgoods
- Metcash (IGA)
- Wrigleys
- etc

Current logistics application clients include:

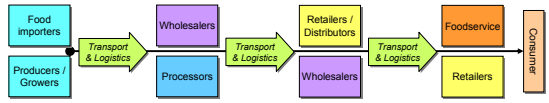
- Border Express
- K&S Corporation
- FCL Transport
- M3 Logistics
- etc

Food Supply Chain Overview

There is significant potential for e-enabled traceability to improve the efficiency of the agri-food industry supply chain

- The food industry:
  - is highly fragmented and involves numerous participants along the supply chain
  - has a high number of transactions
  - is dispersed across a wide geographic area
  - has a high proportion of perishable, time-critical goods.
- In many cases, transaction processing costs are very high relative to the value of the order
- The costs of poor quality assurance are high
- An increasing number of supply chain participants are Internet-connected

The food industry is highly fragmented and involves numerous participants along the supply chain



Category	Estimated Participants
Fruit & vegetable producers	13,981
Dairy farmers	13,177
Other primary producers	88,109
Food processors	4,254
Food transport (road)	23,565
Food wholesalers	6,631
Major supermarkets	4
Food retailers	22,326
Foodservice outlets	35,643
Total	**207,690***

Given each participant typically deals with several (if not hundreds of) others, the number of bi-lateral relationships is significantly higher again. Furthermore, each participant will tend to have their own unique procedures, systems, trading terms, etc. This introduces an even greater level of complexity and fragmentation. Inevitably, this has resulted in further inefficiencies in the supply chain.

* Source: Australian Bureau of Statistics, 1998

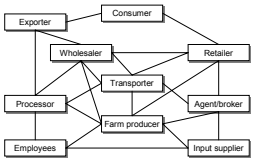
…. has a high number of transactions

Both in terms of sales transactions...

	Est. no. of domestic sales transactions [1]	Est. no. of export sales transactions [2]
Primary production *(dairy, fruit & vegetable, fishing)*	5m	N/A
Food processing	20m	338,000
Food wholesaling	15m	
Total	**40m**	**338,000**

[1] Icon Global estimate, May 2000
[2] Australian Customs Service, 1997

… and other information exchanges between parties



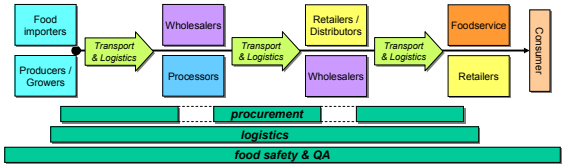
Information exchanges such as:

- *price inquiries and negotiations*
- *consignment information*
- *food safety & quality assurance records*
- *order & consignment tracking*
- *account inquiries*
- *product returns*
- *etc.*

Food safety & QA applications are an expedient basis for "e-enabling" an existing agri-food supply chain.

- There are three inter-related functions that form the basis of true end-to-end e-commerce across the agri-food value chain
- Of these, *food safety & quality assurance* offers the best opportunity to transform an existing supply chain because:
  - effective food safety regimes are a common need of all participants in the value chain, and in many food categories, are required by law
  - there is a high cost to food supply chain participants, both in terms of compliance and the implications of getting it wrong
  - there are also new demands for effective food tracking that are not safety-related *per se*
  - despite its importance, most food safety management is currently handled manually, and with minimal information-sharing
  - much of the data required for food safety incorporates that collected during procurement and logistics activities
  - Internet-enabled food safety systems will not cannibalise participants' existing investments in logistics or procurement systems
  - an Internet-enabled food safety capability can be implemented as a stand-alone system or integrated with other functions.

There are three inter-related functions that form the basis of true end-to-end traceability across the food value chain



Regardless of their position in the value chain, all participants necessarily engage in three common inter-company activities:

- procurement (eg. ordering, invoicing, payment)
- logistics (eg. transport, warehousing, processing / manufacturing, consignment tracking)
- food safety & QA (eg. safety planning, hazard analysis, tracking, QA)

Of these, *food safety* information flows extend the furthest (ie. from food production through to delivery to the end-consumer). It is also an ideal opportunity to transform an existing supply chain.

Traceability Details

Definition - Traceability

- The ability to trace the history, application or location of an entity by means of recorded information (ISO 8402:1994)

Functions - Traceability

- Tracking - can be defined as the ability to follow the path of an item as it moves through the continuum from point of production (Farm) to the point of consumption (Fork).
- Tracing - can be defined as the ability to identify the origin of an item or group of items, through records, upstream in the food continuum (Fork to Farm).

Evolution - Traceability

- Past - Identify food sources as personal property
- Present - Ensures better public health, safety and security
- Future - Provides trust up and down the supply chain, enabling cost and service efficiencies

Components - Traceability

- Product
  - Creates link between Material/Origin/Production/Distribution and Location after delivery
- Common Practices
  - Procedures are based on uniformly understood standards (Industry/Customer Based)
- Monitoring & Reporting
  - Relates the calculations and data generated through a quality loop to ensure all procedures and standards are met
- Auditing & Continuous Improvement
  - Provides a transparent platform to evaluate and improve Product/Common Practices/Monitoring & Reporting

Stages - Traceability

- Internal
  - Allows data about raw materials and processes within the business to be linked to the final product separately in each stage of Production/Processing/Distribution
  - Need to be able to link the unique identification of any product batch with information about when and where it was produced/moved/transformed
  - This provides the means for tracing the provenance of a food and its ingredients through the food chain
- External
  - Links each of the internally managed entities in one continuum across the supply chain
  - Provides information which accompanies the product flow from one link in the chain to the next (Paddock to Plate)

Methods - Traceability

- Manual
  - Slow
  - Cumbersome
  - Prone to human error
  - Difficult to keep current for all participants in the chain
- Electronically Integrated
  - Fast
  - Non-intrusive
  - Less opportunity for human error
  - Simpler to keep current for all participants in the chain
  - Builds with supply chain participants
  - Enables cost efficiencies and increase in service levels

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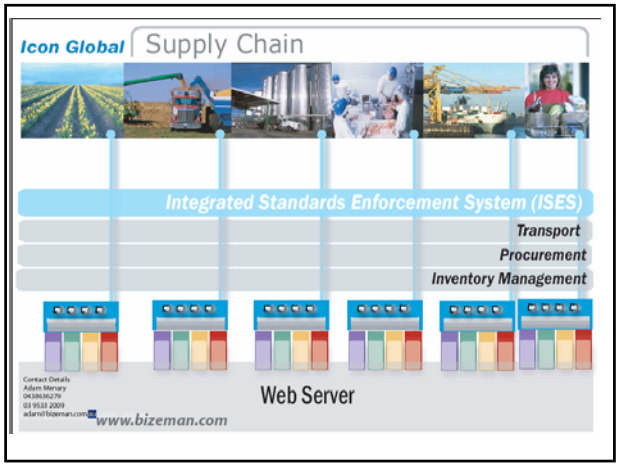
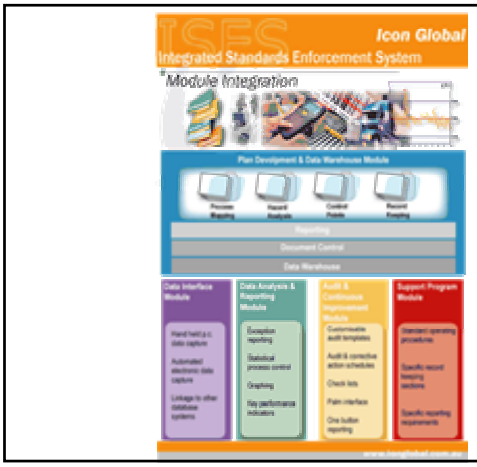
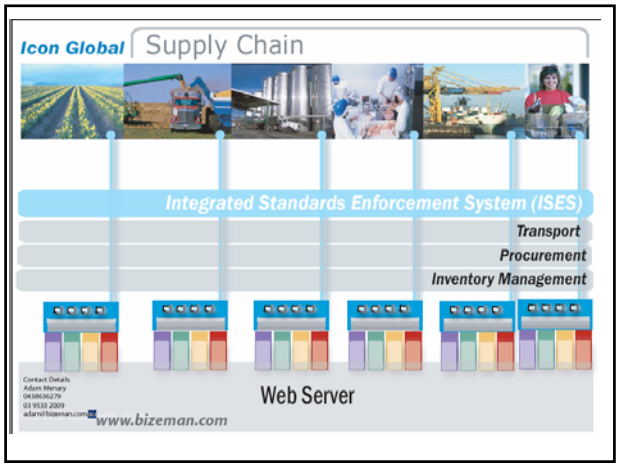






Examples In Action

Logistics and procurement data are inextricably linked with, and effectively form a sub-set of, the *food safety* function

- The agri-food logistics market is fragmented, with a large number of players using different information systems.
- Significant cost savings could be achieved through more effective information-sharing between logistics providers and other supply chain participants.
- In terms of data requirements, there are strong linkages between *logistics, procurement* and *food safety*. In fact, such data is embedded *within* food safety records.

Much of the data required for food safety incorporates that collected during procurement and logistics activities

There is a high degree of commonality in the types of data used in these functions.

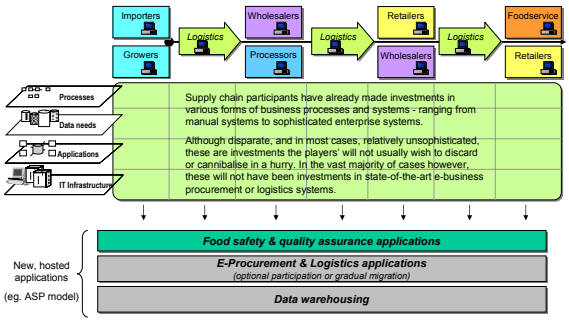
Data requirements

Information type	Food safety	Procurement	Logistics
Consignment number	✓	✓	✓
Buyer details	✓	✓	✓
Seller details	✓	✓	✓
Transporter details	✓	✓	✓
Product details (eg. code)	✓	✓	✓
Product quantities	✓	✓	✓
Date / time of movements	✓	✓	✓
Purchase order details	✓	✓	✓
etc			

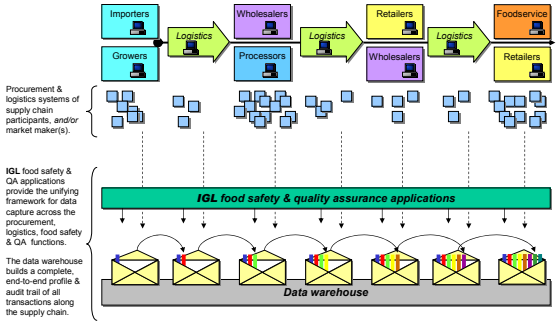
Functional requirements

Functionality type	Food safety	Procurement	Logistics
Consignment tracking	✓	✓	✓
Order approval / acknowl.	✓	✓	✓
Product catalogue access	✓	✓	✓
Buyer / seller authentication	✓	✓	✓
Permission management	✓	✓	✓
Audit trails	✓	✓	✓
etc	✓	✓	✓

Technology-enabled food safety systems will enhance logistics and procurement systems



Applications are now present to tie together otherwise fragmented agri-food industry supply chains



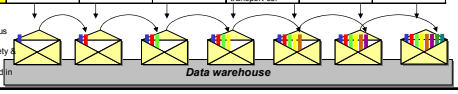
Applications are now present to tie together otherwise fragmented agri-food industry supply chains

Example

Take the simple example of milk (managing the Critical Control Point of 'temperature')

Function / Location	Farm	Transport	Manuf	Warehouse	Transport	Retail
e-Procurement	Order placed	Order placed	Order placed	Order placed	Order placed	Order placed
Logistics / transport	Transport co. notified to pick up	Transport co. picks up milk in a tanker and delivers to processing plant	Milk processed, packaged into cartons and placed in crates	Crates stored and later picked up for delivery	Picks up crates, delivers to retail stores	Cartons put on shelf, customers purchase and take home
Food safety / QA	Farmers ensures all 'inputs' into cows are safe. Milk from cows is collected in a temperature-controlled vat	Driver checks the temperature of the vat of milk. Once verified driver takes responsibility for the product and pumps milk into tanker. Checks temperature via on-board computer	Storeman checks temperature of milk in tanker. Once verified, pumps milk into processing plant. At each step of processing and packaging the temperature is checked	Storeman checks temperature prior to accepting. Once verified, cartons are stored. Storeman ensures that temperatures stays within tolerance until picked up by the transport co.	Driver checks temperature. Once verified, loads crates onto truck. Checks temperature continually while in his possession. Driver delivers to retail store.	Storeman checks temperature of the product off the truck. Accepts crates once verified. Places products on shelf. Checks temperature of shelves every few hours.

Transactional data is captured through various systems, and passed through IGL's food safety & QA applications, to be consolidated and stored in the data warehouse



Significant cost savings could be achieved through more effective information-sharing among supply chain participants

- Technology supports emerging supply chain management (SCM) practices such as vendor-managed inventory, collaborative logistics, e-logistics, and logistics exchanges.These initiatives are characterised by:
  - data capture (eg. order information) occurring closer to the customer
  - inexpensive, real-time inter-connection of remote operations, trading partners, etc
  - real-time synchronisation of supply chain activities
  - transparency of information assisting in optimising asset utilisation (eg. locating spare capacity on a truck scheduling to deliver on a particular route).

Existing saleable products:

Software

Icon Global Integrated Standards Enforcement System
Plan Development Module (ISES)

Icon Global Integrated Standards Enforcement System
Audit and Continuous Improvement Module

Icon Global Integrated Standards Enforcement System
Data Analysis & Reporting Module

Supply Chain

SeaLink

MilkLink

Northern Herd
Animal RFID Tagging

Summary

Summary

- Participants agree on processes and standards in manual form
  - Food quality and safety plans
  - Collecting and transmitting data
- Prepare for technology
  - Find people who understand specific industry supply chains in both logistics and food safety
  - Do Cost/Benefit analysis
  - Decide to build or integrate the old
  - Evaluate resources and options
  - Choose medium for information collection

Summary

- Integrate and implement technology
  - Decide what and how to integrate
  - Educate/Train people to properly use the systems
  - Migrate from the manual systems to the enabled systems
- Be Wary
  - If it does not work in a manual format it will work the same but faster when enabled
  - Companies selling "Hot Technologies" (ie RFID) probably do not know how it relates to assisting your business
- The supply chain is only as strong as the weakest link
  - One bad apple can spoil the bunch
  - All particpants viability and brand can be effected by one incident from one supply chain partner

For Further Information

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- Some of our latest food safety/supply chain developments:
  - www.sealinknet.com
  - www.iconglobal.com.au/milklink
- Saint Joseph's University Early Responders Distance Learning Center
  - www.erdlc.sju.edu