From Barcode to Electronic Code

About ECR Australasia

ECR Australasia – working together for total customer satisfaction. Efficient Consumer Response (ECR) is a business concept aimed at better satisfying consumer needs, through businesses and trading partners working together.

In doing so, ECR best practice will deliver superior business results by reducing costs at all stages throughout the supply chain, achieving efficiency and streamlined processes. ECR best practices can deliver improved range, consumer value, sales, service and convenience offerings. This in turn will lead to greater satisfaction of consumer needs.

ECR Australasia reflects a commitment to take costs out of the grocery supply chain and better satisfy consumer demands through the adoption of world's best practice. In an increasingly global food and grocery industry and a retail environment subject to rapid change, the future for Australian and New Zealand suppliers, retailers and wholesalers depends on increased efficiencies, reduced costs and added value for consumers. Influences such as global sourcing, new retail formats and channels, international retailers, competing products and services and technological innovation have all contributed to the pressure for change.

ECR Australasia is an initiative of manufacturers, retailers and wholesalers in the Australian and New Zealand food and grocery industry and is supported by the respective industry associations.

Launched in November 1999 and directed by a board of nine senior industry executives, ECR Australasia seeks to build on earlier collaborative work in the industry in Australia and New Zealand and to access the outcomes of global ECR related activities and the Global Commerce Initiative. Experience and leading practices from around the world are combined with local learnings and developments to generate a roadmap to take the Australasian food and grocery industry forward. This work is directed through the challenging program set by the ECR Australasian Board and made possible by project teams with members from manufacturers, retailers, and service providers and by consultants committed to the development of the industry.

The "From Barcode to Electronic Code" report assesses the Australasian market's readiness for Radio Frequency Identification (RFID) and Electronic Product Code (EPC) at a company level, and compares it with the global state-of-play detailed in the Global Commerce Initiative (GCI) EPC Roadmap, published in November 2003. The Australasian report identifies the key industry level issues which need to be addressed to pave the way for the successful adoption of RFID/EPC in the region.

For more information about ECR Australasia, visit **www.ecraustralasia.org.au**

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Acknowledgements

Executive Summary

The connection of Radio Frequency Identification (RFID) technology to the newly developed Electronic Product Code (EPC) network through uniform global standards promises to deliver significant benefits to the supply chain management of many companies, beyond that offered by today's barcode system.

RFID/EPC has key advantages over existing barcode technology, such as the ease and speed of identification, which enable a more seamless integration of objects and information into the supply chain.

With major global retailers such as Wal*Mart, Metro and Tesco, and the US Department of Defence all mandating their top suppliers to move to RFID tagging at the pallet and case level, RFID/EPC is already gaining significant momentum in the Northern Hemisphere.

Wal*Mart, for example, has mandated its Top 100 suppliers to begin tagging pallets and cases by January 2005 to supply the Dallas/Fort Worth metroplex area.

In Australasia, retailers represented on the ECRA Board are maintaining a watching brief on overseas developments. They are looking to leverage key learnings, understand business cases and waiting for harmonisation of standards. Early indications on adoption windows of RFID/EPC systems ranged from two to five years.

Consumer product companies have an opportunity to use this window to continue to increase their knowledge.

Benefits will only flow, however, if companies embrace EPC collaboration and standards, and if they look beyond a "slap and ship" approach of simply affixing a tag to an object, largely for compliance sake.

RFID/EPC will deliver its maximum benefit to users who use it as an enabler to drive business process change.

This report – sponsored by ECR Australasia, Accenture and leading food and grocery organisations in Australia and New Zealand – aims to have a role in promoting education and collaboration on EPC issues in the region.

Using the results of a detailed survey sent to leading retailers and suppliers in Australasia in February 2004, the report gives a benchmark of the region's current state of preparations for RFID/EPC against which future progress can be measured.

Of the 103 organisations which received the questionnaire, 53 responded – one of the highest-yet response rate for an ECR Australasia survey.

The response, while it indicates a very strong level of interest in RFID/EPC, also reveals a "wait and see" approach from many Australasian companies, in both the retailers and suppliers.

Given that adoption in the US and Europe is still only in its infancy, this can be a positive if Australasia can also "watch and learn" so that it can optimise its preparations.

Already, some companies are leading the way in the region. Packaging companies Amcor and Visy have piloted RFID in their internal supply chains, and have reaped early benefits.

In June 2004, Coles Myer announced a two month trial to track RFID-equipped roll cages between a distribution centre in Melbourne's Hampton Park, and a supermarket in nearby Glenferrie.

As this report shows, a majority of companies already have RFID 'champions' within their organisations, and are already talking to their customers and suppliers about the implications of the technology.

Australasian units of global consumer product companies are also in touch with RFID/EPC developments in their overseas operations, and are drawing on that as part of their preparations.

A process is underway to develop a Privacy Code with input from organisations such as the Australian Retailers Association, ECRA the Australian Consumers Association, and EAN Australia.

The Australasian RFID/EPC landscape could change very rapidly. Momentum could come from a major retailer announcing a Wal*Mart style mandate, or Governments could make policy decisions with RFID/EPC implications.

Australasian producers supplying overseas markets could also move to comply with their own customer mandates.

ECR Australasia, Accenture, EAN Australia and EAN New Zealand have produced this report with the aim of playing a constructive role in the early development of RFID/EPC in our region.

It is a key future technology which can best deliver its benefits through industry collaboration, education and preparation, in a journey which has only just begun.

contents

From Barcode to Electronic Code

Glossary

Auto-ID Centre: The Auto-ID Centre was an industry funded programme founded in October 1999 by the Uniform Council Code (UCC), Massachusetts Institute of Technology, Procter & Gamble and Gillette. It was superseded in the autumn of 2003 by the Auto-ID Labs and the EPCglobal organisations.

Electronic Article Surveillance (EAS): An in-store anti-theft system, based on a technology that is not part of the RFID/EPC network.

Electronic Product Code (EPC): A coding system, developed by the Auto-ID Center at the Massachusetts Institute of Technology in 1999, which uniquely identifies an individual object from a RFID tag.

EPCglobal: A joint venture between the Uniform Code Council and EAN International, formed in September 2003, to serve as a registry for EPC, to administer EPC codes, and to direct the implementation and commercialisation of the EPC vision.

Global Commerce Initiative (GCI): A voluntary body of over 45 multi-national retailers and manufacturers, working collaboratively to improve the performance of the international supply chain for consumer goods.

Middleware: Also known as a savant, this is the software layer between the reader and the application systems which filters data and passes it to an appropriate application system.

Radio Frequency Identification (RFID): A method of uniquely identifying items using radio waves contained in either active or passive tags fixed to objects.

Reader: A transmitter/receiver sends out radio frequency signals into an environment where tags are expected and acquires radio frequency signals from the tags.

Tag: A radio frequency device attached to the object to be identified, capable of receiving reader signal and returning data to the reader. Tags can be passive or active. Passive tags have no battery and relies on the reader's signal to communicate with the reader. Active tag that contains its own battery, or derives its power exclusively from a source other than a readers signal.

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About the Report

Background

RFID (Radio Frequency Identification) is not a new technology. Its origins go back as far as 1945, when it was used to identify aircraft. Cashless toll collection on motorways and remote opening and closing of doors are now everyday RFID applications touching consumers around the world. RFID has lain relatively under-utilised for many decades, but the 1990's sparked an interest in new applications.

In its new incarnation, RFID presents a significant opportunity within commercial supply chains when used in conjunction with readers to give items Electronic Product Code (EPC) numbers. Identification of pallets or cartons can streamline and speed up inventories and ultimately deliver process efficiencies and financial savings. The EPC vision is of warehouses of perishables which do not perish, of automatically triggered shelf replenishment, of a perfect demand-driven and networked economy synchronising activities across the supply chain from point of purchase back to raw material procurement. For companies, the EPC vision is a world

where they move closer to the ideal of selling one, then making one. For consumers, the advantage is enhanced on-shelf availability and product freshness. For society as a whole, EPC can be an enabler for greater environmental sustainability through the facilitation of product re-cycling.

For the RFID/EPC vision to deliver, suppliers and retailers need to embrace new levels of collaboration and integration, and the world needs to endorse uniform standards for processing RFID information. Enormous progress has been made in these areas, but we are still at an early point in the journey.

In 1999, the Auto ID Center at the Massachusetts Institute of Technology (MIT) was sponsored by end users – from retailing, manufacturing and the technology industries – to create a technology with open standards which could be utilised anywhere in the world to identify objects in the supply chain. *(Figure 1.1)*

RFID/EPC In Action

MANUFACTURING SITE

MIDDLEWARE

DISTRIBUTION CENTRE

RETAIL STORE

1. Each object (case, pallet, etc.) has a tag attached to it during the manufacturing/distribution process. Each object can now be automatically identified, collected and tracked.

2. As the object leaves the manufacturing site, a RFID/EPC reader positioned at the loading door, beams radio waves that activate the tag.

3. The tag sends data contained in the tag back to the reader, and the reader transmit the data over the internet to indentify the object.

4. At the DC, the RFID reader positioned at the unloading dock beams a radio wave that activates the tag. The pallets/cartons does not need to be broken down, as the middleware will provide a full inventory listing.

5. As the pallets/cartons are despatched from the DC, the inventory systems are automatically updated to reflect the reduction in stock.

6. The pallets/cartons are receipted into the retailers systems, updating inventory records, as soon as the good enter the store-back-room.

As the network matures, additional functionality can be incorporated into the system:
* Temperature Checks
* Store Replenishments
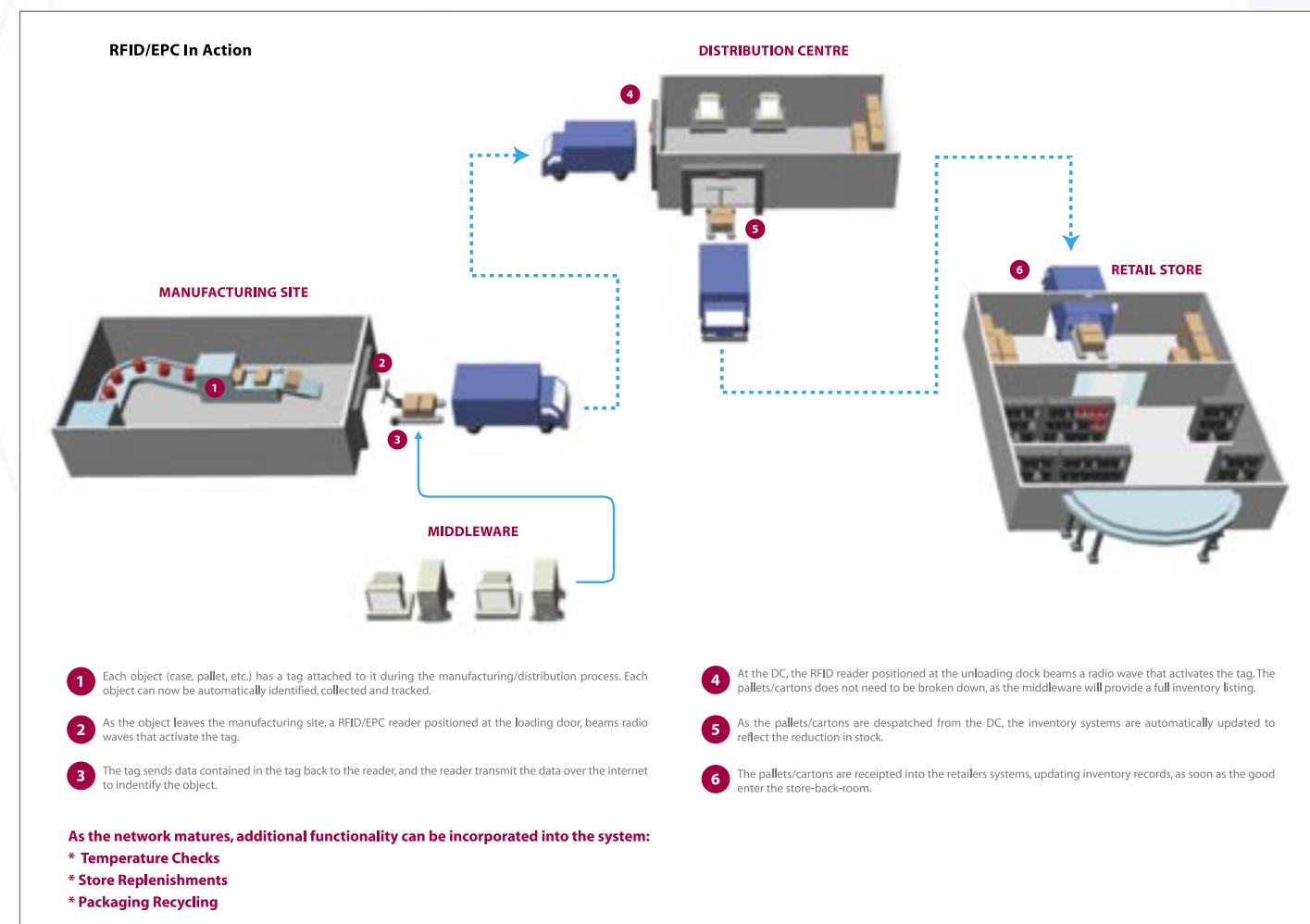* Packaging Recycling

Figure 1.1

The Auto ID Center announced in late 2002 that it had succeeded in its objective and the technology was ready for commercialisation.

At that time, the Auto-ID Center was superseded by two new organisations – a global network of six Auto-ID Labs and EPCglobal, a collaboration between EAN International and the Uniform Code Council (UCC). One of these labs is at the University of Adelaide in South Australia. While the Auto-ID Labs continue with developing the technology and its applications, EPCglobal is charged with spearheading the drive towards a worldwide, multi-industry adoption of the key identification aspect of RFID, the Electronic Product Code or EPC.

EPC is a coding scheme, to be managed by EAN, developed by the Auto-ID Center which identifies an individual object – such as a case or pallet. The information on the tag – typically a "passive" tag with no power source of its own – is deciphered by a "reader" made up of an antenna and a controller. The reader, which can either be stationary or mobile (and wireless) – then sends the information back to a software layer of middleware which can then interact with applications and a company's enterprise and supply chain systems and effectively use the EPC information. *(Figure 1.2)*
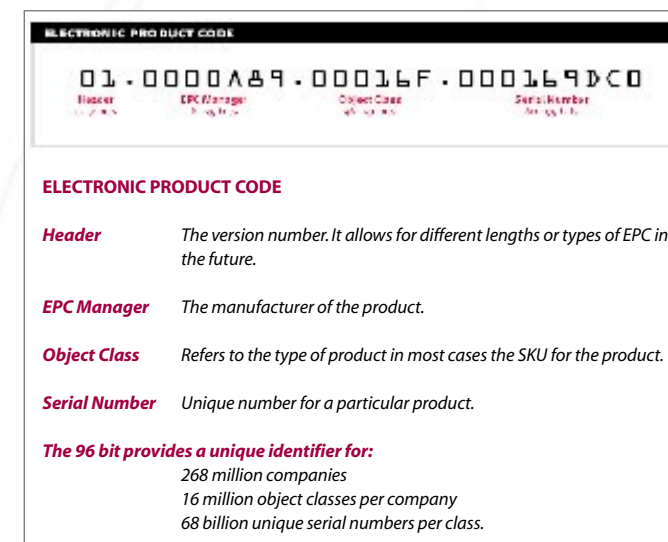

ELECTRONIC PRODUCT CODE

Header	The version number. It allows for different lengths or types of EPC in the future.
EPC Manager	The manufacturer of the product.
Object Class	Refers to the type of product in most cases the SKU for the product.
Serial Number	Unique number for a particular product.

The 96 bit provides a unique identifier for:
268 million companies
16 million object classes per company
68 billion unique serial numbers per class.

Figure 1.2

Instead of being printed on a paper label like a barcode, the EPC number is encoded into an electronic tag attached to the object. (EPC is not to be confused with EAS – or Electronic Article Surveillance – an instore technology designed to detect theft). Combining the EPC with RFID creates an EPC network of information that can be used in tracking objects passing through supply chain triggers. The EPC concept is that, with its widespread adoption, economies of scale will deliver cost-effective tags which communicate with reading devices using RFID to uniquely identify objects and deliver secure and controlled visibility through the supply chain.

EPC is seen as having a number of advantages over the barcode system we use today. With barcodes lasers must see a barcode to be able to read it, while radio waves do not require a line of sight and can pass through materials such as cardboard or plastic. EPC uniquely identifies an individual object while a barcode only generally identifies to SKU (stock keeping unit) level. EPC also

requires less human intervention to be read, and can be read from objects moving at a faster speed than barcoded objects. RFID tags are less susceptible to damage, and have the potential for a read/write capability, making them re-usable.

Since the creation of EPCglobal in 2003, the technology has been embraced by several global retailers – such as Wal*Mart, Metro and Tesco – who have announced mandates for their leading suppliers to become EPC compliant. In October 2003, the US Department of Defence mandated the use of RFID tags as part of its procurement strategy. Key consumer product suppliers, such as Gillette have responded to these initiatives with enthusiasm, creating significant momentum for the global uptake of EPC in the next few years.

Objectives

This report is a trans-Tasman initiative to raise the awareness and understanding of RFID and EPC issues in Australia and New Zealand. With participation from ECR Australasia, Accenture, and executives from leading organisations in the two countries, the report team developed a detailed questionnaire in early 2004 to survey industry knowledge and attitudes towards RFID/EPC.

The survey aimed to benchmark the Australasian market's readiness for RFID and EPC at a company level, and compare that with the global state-of-play detailed in the Global Commerce Initiative (GCI) EPC Roadmap published in November 2003. The Australasian survey enabled the identification of the key industry level issues which need to be addressed to pave the way for the successful adoption of RFID and EPC in the region. From there, the project team has developed an industry action plan to facilitate EPC implementation (section 4).

"EPC is an innovation that will help accelerate future business growth," says John Bower, Gillette's Regional General Manager for Australia, New Zealand, and the South Pacific, and the ECR Australasia board sponsor for the project.

"It will significantly assist in improving product availability which in turn will benefit manufacturers, retailers and consumers."

"But to be successful, there must be a harmonious approach from both retailers and suppliers."

"One company or group of companies cannot go in one direction and others in a different – that is now well recognised by our peers overseas through the Global Commerce Initiative."

Global Commerce Initiative (GCI)
Electronic Product Code (EPC) Roadmap

The GCI EPC Roadmap of November 2003 delivered a global company and industry roadmap to facilitate the adoption of RFID/EPC. It outlined the technology and process initiatives which have the power to revolutionise supply chain practice, and detailed the status of a global standard and the results of early EPC trials. The aim of the GCI/EPC Roadmap was to help companies understand the benefits of EPC, and encourage them to consider the adoption of standards-compliant EPC in their own supply chains.

Pharma Case Study

For EPC to be a success, it requires unprecedented levels of collaboration and integration between suppliers and customers, and within industry groups.

Collaboration is at the heart of a new alliance between a group of leading US pharmaceutical manufacturers, distributors and retailers who have joined together with Accenture to explore RFID and EPC.

In February 2004 the group, which includes Abbott Laboratories, Barr Pharmaceuticals, Cardinal Health, CVC Pharmacy, Johnson & Johnson, McKesson, Procter & Gamble, will explore the application of EPC and RFID technologies. They will be supported by key industry groups the Healthcare Distribution Management Association (HDMA) and the National Association of Chain Drug Stores (NACDS).

Accenture will act as the program manager for the project, which will look at three areas: enhancing the safety and security of the pharmaceutical supply chain, improving the process of pharmaceutical returns management, and increasing the efficiency of distribution operations.

The project group is also encouraging the use of the EPC digital identification standard throughout the pharmaceutical industry, and has already worked with the Food and Drug Administration's Anti-Counterfeiting Task Force on how the new technology can limit the distribution of counterfeit drugs.

Several areas have already been pinpointed as having potential for RFID and EPC application. They include expiration date management, lot and batch tracking, shipping and receiving accuracy, operational integrity, and product security and consumer safety.

"The program's goal is to explore the benefits that full adoption of this emerging technology could bring to consumers as well as companies through the pharmaceutical supply chain," said Lyle Ginsburg, a partner in Accenture's Products Operating Group.

"We also plan to help participating companies accelerate the technology learning curve and to share our findings with the industry."

The roadmap was developed to answer five key questions:
1. What is the EPC, and what is the vision behind it?
2. What current progress is being made with EPC Development, and what are the issues we need to act upon to make the EPC vision a reality?
3. What are the key application scenarios, and what are the compelling reasons to act now?
4. What does a company implementation roadmap look like?
5. What can the industry jointly do to remove the barriers for broad industry adoption?

The GCI roadmap is a valuable source for the Australasian experience, and its conclusions can be summarised as:
- A critical mass of manufacturers and retailers have conducted EPC trials and are preparing for wider adoption.
- Companies should strongly consider adopting the EPC vision. The success of global trials has created a growing degree of enthusiasm for EPC, and early adopters have been convinced on the value of continuing with their EPC journeys.
- Competitor activity and requests from key trading partners are expected to accelerate EPC implementation across the globe. Companies should understand the implications of wide adoption on their business, and should consider the development of EPC network plans at a pilot level with trading partners.
- The main benefits to a company and to industry are through process change. The technology is simply an enabler. While there are benefits from implementing EPC solely within an organisation, there are significantly higher benefits from end-to-end supply chain collaboration with trading partners across an industry.
- Today enough of the critical enablers – including voluntary global standards - are in place to test the EPC network.
- EPC implementation should be considered as a step-by-step process, and not as a big-bang. (source GCI EPC Roadmap).

The GCI roadmap also identified four phases to help structure thinking about industry readiness – learn, experiment, evaluate and adopt. In the first phase, companies learn about RFID and appoint a RFID "champion" to co-ordinate the education process. Initially, only a few people within the organisation, possibly from different functional backgrounds, possess awareness and understanding of RFID but as knowledge grows, the "champion" is appointed to co-ordinate the sharing of knowledge across the organisation.

As the education process spreads, it becomes clear that the organisation will need to conduct a trial or a pilot to supplement its knowledge with some practical experience. In this experiment or pilot phase, hands-on practical knowledge is built and a supporting case for change is developed and confirmed. After developing a high level business case, the experiment aims to prove the technology and validate the accuracy of the business case.

The lessons from this exercise are shared across the organisation. Additional experiments may also be conducted in other areas of the business, with a view to understanding the impact of EPC on different business processes and to confirming the benefits.

In the next phase of evaluation, an operational pilot is conducted with a third party organisation as a precursor to an organisation-wide roll-out. In this phase, a company EPC vision is developed and documented, and a business case for the pilot is developed and funding secured. Priority business applications are identified. The organisation then conducts the pilot and tests the integrated technology and the resulting process changes. The pilot is then assessed and a wider EPC deployment is planned.

The organisation then enters the final phase, the adopt phase, with an assumption that EPC will become its standard business practice. With this confidence, the business case is further updated and additional funding is secured for roll-out across the organisation.

Methodology of the Australasian Report

In February 2004, questionnaires were sent to 103 leading organisations in Australia and New Zealand. The target group was retailers and manufacturers in the consumer products sector, although questionnaires were also sent to automotive, pharmaceutical, packaging and third party logistics suppliers, and technology services providers in related areas.

The objective was to give a snapshot of EPC and RFID awareness and readiness in Australasia. Another objective was to focus on the food, grocery and retailing industries and compare them with progress in the pharmaceutical and automotive industries, but due to the small number of responses from those two industries this objective was not achieved. The survey was in two parts, the first of which sought information on companies and their current technologies and processes, and the second, which concentrated on respondents' attitudes to RFID and EPC, and any steps they had taken towards implementation or pilots.

From the 103 questionnaires distributed, completed responses were received from 53 companies, a response rate of 51%.
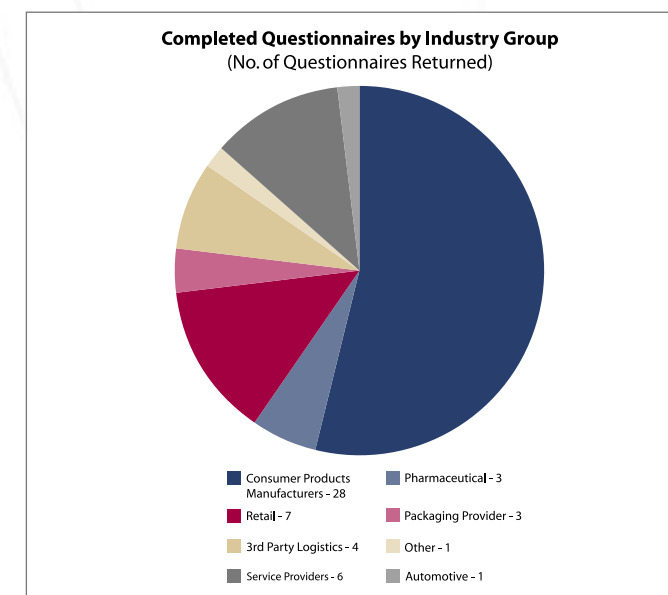
"The response rate confirms the strong interest there is within companies in the technology and its potential impacts on the supply chain, and that is what encouraged such a healthy response rate," said Harris Boulton, manager of ECR Australasia. Of the 53 completed questionnaires returned, 28 were from manufacturers, 7 were from retailers, 6 were from service providers (hardware, software, integrators, consultancies etc.), 4 were from third party logistics organisations, 3 were from packaging providers, 3 from the pharmaceutical industry, one from the automotive sector and one other. *(Figure 1.3)*

In terms of the size of the companies which responded, 24 had annual sales revenue of less than A$1 billion, 16 had revenues between A$1-5 billion, and 12 had revenues of over A$5 billion. Fifteen of the companies employed less than 500 people, 17 employed between 500 and 2000, and 21 employed over 2000. *(Figure 1.4).* 42 of the respondents were from Australia and 9 were from New Zealand. The vast majority of the people who completed the questionnaire – around 65%– were from the supply chain areas of their companies.
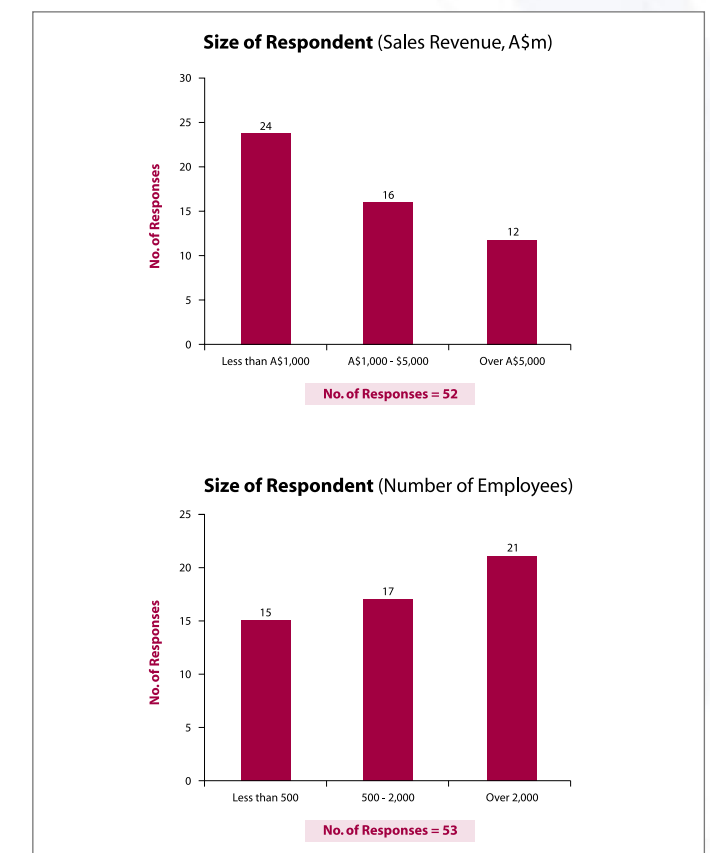
Size of Respondent (Sales Revenue, A$m)

No. of Responses = 52

Size of Respondent (Number of Employees)

No. of Responses = 53

Figure 1.4

Completed Questionnaires by Industry Group
(No. of Questionnaires Returned)

- Consumer Products Manufacturers - 28
- Retail - 7
- 3rd Party Logistics - 4
- Service Providers - 6
- Pharmaceutical - 3
- Packaging Provider - 3
- Other - 1
- Automotive - 1

Figure 1.3

The RFID/EPC Environment

The Australasian environment for RFID and EPC implementation is very different from the environment in the northern hemisphere. While major retailers in both geographies are leading the charge with mandates to their core supply base, no Australasian retailer has yet published an RFID mandate and it was only in June 2004 – after the questionnaire had been completed – that Coles Myer announced it had begun an RFID pilot, the first by a major Australasian retailer.

Coles Myer's pilot, which began in late May 2004, is an internal-only pilot which involves tracking RFID-equipped roll-cages between a distribution centre in Melbourne's Hampton Park, and a supermarket in nearby Glenferrie. Tags have been attached to 2000 metal roll-cages. Readers at the Hampton Park distribution centre read the tags on each cage as they leave the centre on a delivery truck, while another set of readers identifies the cage on arrival at the supermarket.

While Coles Myer is at the beginning of its first pilot, improving supply chain performance has become a major focus for the retailing and manufacturing industries in Australasia.

Retailers and suppliers are working jointly on programs to improve supply chain efficiency. By necessity these programs are having a major flow on impact back through the supply chain, as suppliers work with their customers on such initiatives as shelf ready packaging, perpetual inventory and redesign of the customer distribution centre network.

While clearly RFID/EPC will have a role to play in these initiatives, it is unlikely to be the priority in the short to medium term. Retailers represented on the ECRA Board have indicated that they are maintaining a watching brief on overseas developments. They are looking to leverage key learnings, understand business cases and waiting for the harmonisation of standards. With the current focus of retailers and suppliers on supply chain initiatives and cost improvements, indications from retailers on the adoption window of RFID/EPC systems ranged from two to five years.

In the US, Wal*Mart began an external RFID/EPC trial with eight suppliers covering 21 products, one regional distribution centre and several super-centres in April 2004. Wal*Mart has mandated that it expects its top 100 suppliers to supply RFID tags at the case and pallet level for delivery to Wal*Mart stores and SAM'S CLUB locations in the Dallas/Fort Worth metroplex area by January 2005. Another 37 companies have volunteered to join the initiative. (Figure 2.1)

In the UK, Marks & Spencer has attached RFID tags to 3.5 million returnable produce delivery trays and is now rolling out the tagging of individual garments. The tagging will enable the retailers to manage its stock more effectively throughout its distribution chain.

The UK's largest retailer, Tesco, began putting RFID tags on cases of non-food items at its distribution centres in April this year to track

them through to stores. Some of its suppliers will put tags on cases delivered to Tesco distribution centres from September. The company has said it aims to have RFID implemented throughout its supply chain by 2007. Tesco has also teamed up with France's Carrefour and Germany's Metro group to explore RFID/EPC collaboration.

Metro Group, the world's fifth largest retailer, begins its own RFID/EPC trial in November 2004. Approximately 100 suppliers will tag pallets for delivery to ten central warehouses and around 250 stores across four Metro divisions: Metro Cash and Carry, Real hypermarkets, Extra supermarkets and Galeria Kaufhof department stores.

These mandates will have a major impact on suppliers to these retailers as they move to comply with the RFID and EPC requirements. Consumer product manufacturers in the USA and Europe will have to learn about the new technology under severe time pressure. There are both negative and positive aspects to this: it will undoubtedly accelerate the adoption of RFID/EPC in these geographies, but many of the companies complying with the mandates have adopted a path of least resistance.

While some are effecting process changes and using RFID/EPC adoption to drive efficiencies within their own businesses, others will use a 'slap and ship' approach to satisfy the mandates in the short term.
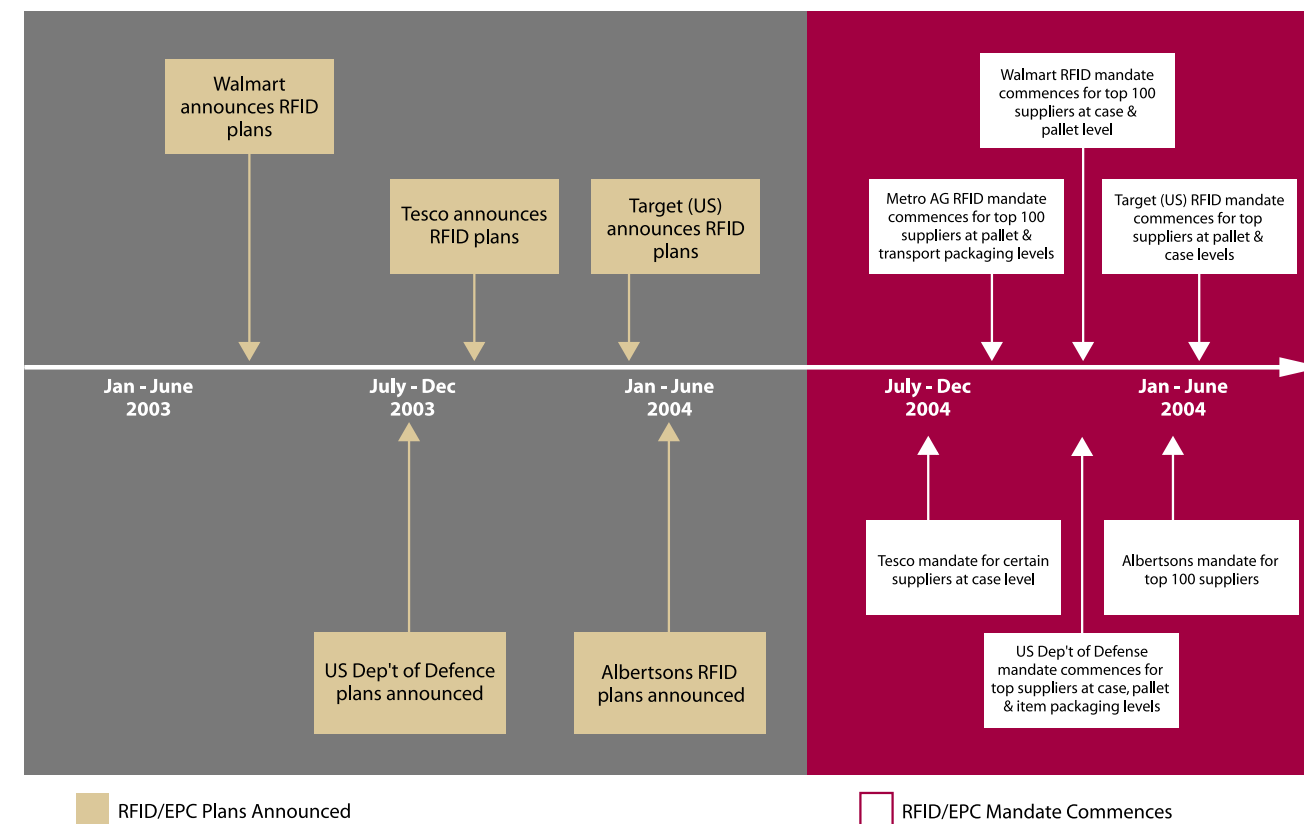

Figure 2.1

Gillette Case Study

Among manufacturers, Gillette has been a leader in piloting RFID/EPC. After conducting a large scale pilot in the US during 2003. Gillette is currently focussing on developing scalable RFID/EPC solutions that can be deployed in multiple facilities and tested with retail partners. In 2004 /5, the company will begin shipping tagged cases and pallets to retailers as part of further pilots and to meet retailer mandates.

Gillette's approach has been that while RFID/EPC is potentially disruptive in it's implementation, it offers tremendous business benefits to the supply chain, delivering lower costs and greater sales, and increasing consumer satisfaction through improved on-shelf availability.

Gillette began preparations for RFID/EPC in 2002, when it completed its internal business case.

Within Gillette's "four walls," the company sees that the technology could reduce its in-house losses through greater product transparency. It could also improve labour efficiency at plants and distribution centres, and reduce inventory costs.

The first US pilot, in 2003, tracked 7 different SKUs of Venus cartridges at a case and pallet level through nine stations within a Gillette pack centre and its 3PL managed distribution centre.

The pilot included reading tagged cases as they came off the pack line, aggregating cases to pallets, the transfer of product from Gillette to the 3PL, creating mixed pallets for despatch, and despatching whole pallets of 1 SKU and packing to order.

Because the distribution centre is managed by a 3PL this added a degree of complexity to the trial and also revealed many unexpected benefits, such as improving the link between product transfer and both parties financial processes to streamline Gillette's payments to the 3PL .

110,000 cases were tagged, with the result that 100% were correctly tagged, written and read, successfully aggregated to pallets and then verified in their movement from packing to distribution centre.

As a result Gillette has already identified benefits both in productivity and quality and is ready to move to the next level of connecting to a customer and taking RFID/EPC outside of Gillette's four walls.

From its experience so far, Gillette anticipates many benefits for their trading partners through Gillette adopting RFID/EPC. Benefits include a reduction in inward goods handling times and improved accuracy, and consumers should benefit from a more cost effective supply chain with goods less likely to be out of stock

03
Report Findings

Australasian companies have been watching global developments with great interest – they have been proactive in learning and some are already experimenting with RFID/EPC pilots. In general, Australasian corporates are in the "learn" phase of the GCI EPC roadmap, while a few – most notably in the packaging and transport industries – have progressed beyond that to the "experiment" and "evaluate" phases. Two companies, Amcor and Visy, report they have completed initial trials. One company, Visy, is already at the point of advancing to the "adopt" phase.

In most cases, Australasian companies have appointed a local "champion" to be the hub of their RFID/EPC knowledge, but this knowledge has not yet been widely spread through the organisation. The knowledge has been built largely through self-education, discussions with partners and from watching overseas counterparts. In some cases, local branches of multi-nationals have received their information from the activities of global parents, some of whom – such as Gillette for example – are impacted by the Wal*Mart mandate. Nevertheless, Australasian knowledge still tends to be limited to a handful of employees, even though the quality of that knowledge is comprehensive and up to date.

Levels of Awareness
In the retail industry, the majority of companies report they have "many" individuals with a "basic" knowledge of RFID/EPC. As could be expected, Australasian retailers are closely tracking developments among RFID/EPC leaders in the US, UK and Europe, and are already thinking about how the technology can be applied to their own operations. (Figure 3.1)
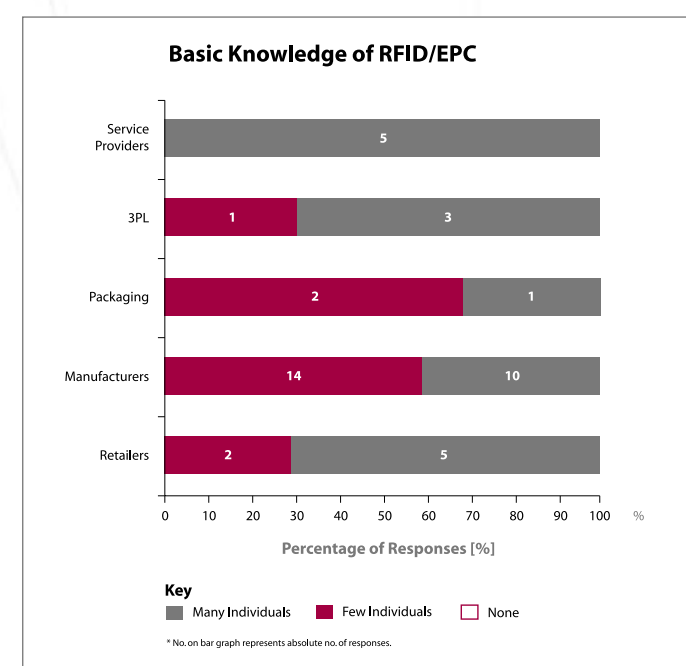
Most companies report they have "few" individuals with an "intermediate" knowledge of RFID/EPC concepts, and the key benefits it can deliver to their own organisation. This is certainly the case with the majority of manufacturers, where some of the leading companies have been learning from the RFID experience of their sister companies overseas. Australasian companies have a time advantage over their counterparts in the US and Europe, as the lack of a local mandate gives them a window of opportunity to study developments overseas, and learn more about the technology. (Figure 3.2)

Intermediate Knowledge of RFID/EPC

Figure 3.2

When it comes to "comprehensive" knowledge, more than half of the respondents said they had "few" individuals with this level of awareness on the key benefit areas, the potential challenges and key decisions they will face. (Figure 3.3)

Information Sources
Industry and trade journals were nominated as the most useful source for information on RFID/EPC, followed by the internet and specific RFID/EPC seminars.

Company experience from overseas was found to be a useful information source, as were organisations such as EAN, EPCglobal, ECRA and the AFGC.

The Auto-ID Centre and the GCI Roadmap were also seen as useful centres of information about the technology and its applications.
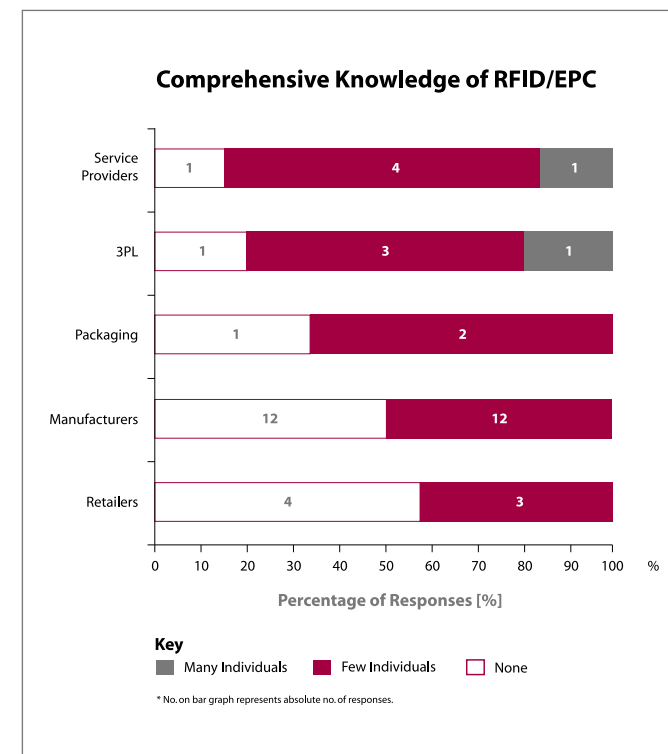

Basic Knowledge of RFID/EPC

Figure 3.1

Comprehensive Knowledge of RFID/EPC

Figure 3.3

Discussions with Trading Partners
Most of the respondents said they had proactively discussed RFID/EPC with customers and suppliers, but fewer have extended those discussions to technology providers (of both hardware and software) or to third party logistics providers. While more than 75% said they had discussed the issue with customers, only 45% had done so with third party logistics suppliers. (Figure 3.4)
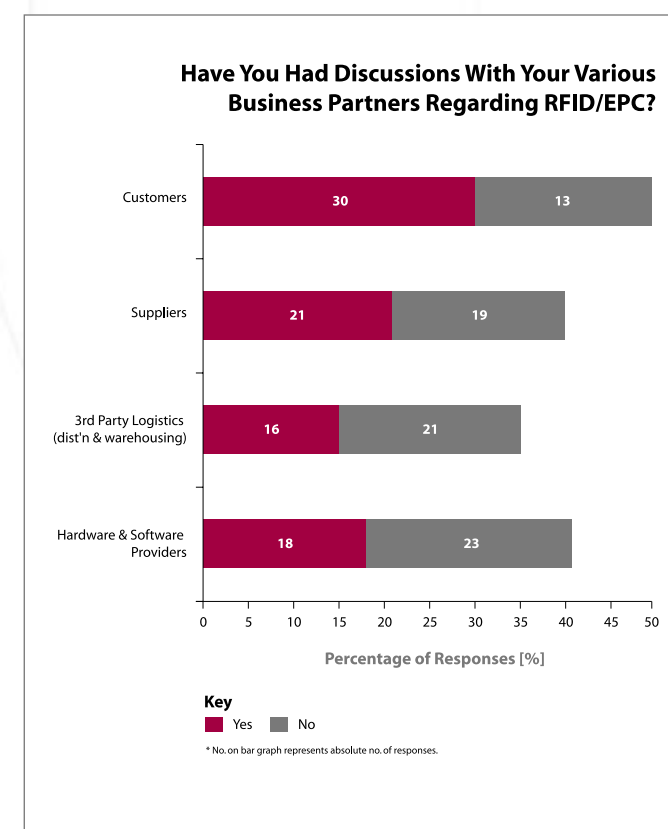

Have You Had Discussions With Your Various Business Partners Regarding RFID/EPC?

Figure 3.4

It is a positive sign that discussions have taken place with multiple parties in the absence of an Australasian retailer mandate, rather than remaining in-house. We have already seen that supply chain improvements are high on many company's agendas, and they are taking a holistic and collaborative approach to the RFID/EPC issue.

Half of the respondents from the retail industry have held discussions with hardware and software providers, compared with less than 40% of respondents from the consumer products industry. Manufacturing respondents have been active in talking with their customers, more than two-thirds of respondents from this sector said they had done so.

With developments moving rapidly overseas, half of the survey respondents have reported contact with overseas counterparts. Most of the manufacturing respondents have had these discussions. Of the group companies which had not yet been in contact with global RFID/EPC teams the most common reason given was that no mechanism – either formal or informal – had been established for communication.

Internal preparations
Australasian companies are beginning to establish their own internal RFID/EPC organisations by appointing a local 'champion' and creating cross-functional and multi-disciplinary teams. Of the survey respondents, nearly half have appointed a RFID/EPC champion. The retailers have been the most active here, with more than 80% taking this step. In comparison, only a third of manufacturers have done so.

Just over 50% of the appointed company 'champions' are senior supply chain executives, with the retail sector appointing more senior people as their champions than companies in the manufacturing sector. In terms of seniority, the RFID champion from one of the retail respondents was the chief executive, the only instance of someone at that level taking responsibility for this area. (Figure 3.5)
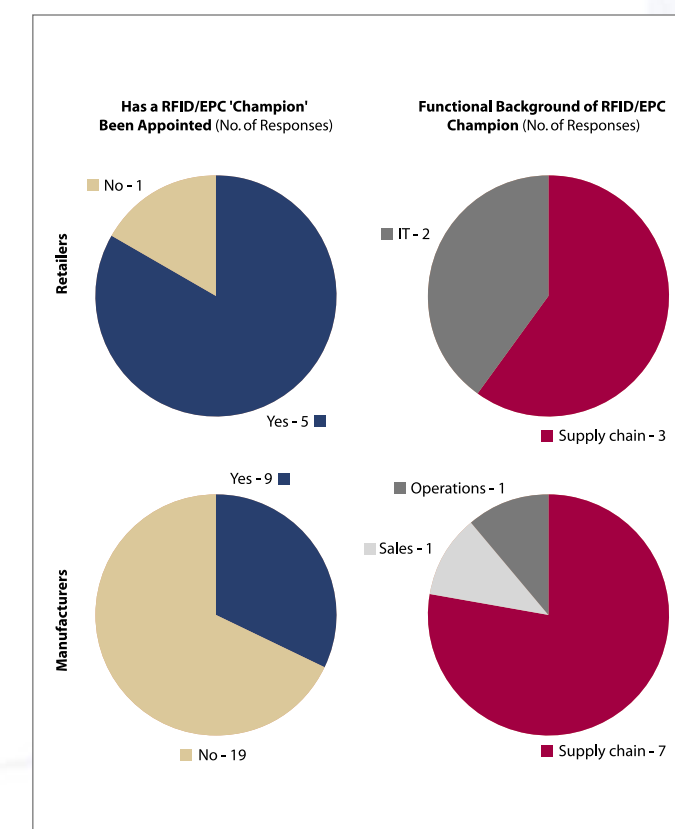

Figure 3.5

Seven companies, or around 14% of respondents, indicated they had assembled cross-functional RFID/EPC teams. All industry segments, with the exception of automotive (from which there was only one respondent) have taken this step.

Understanding of Benefits
The survey showed there is a general consensus that RFID/EPC will deliver significant benefits, most specifically in inventory management. Overall, more than two-thirds of the respondents nominated this area as the one where they expected "high benefits" from the technology. The next two areas nominated were elimination of shipping errors and improved on-shelf availability. Interestingly, the high benefit areas were the same for both retailers and manufacturers, although retailers are anticipating greater benefits. *(Figure 3.6)*
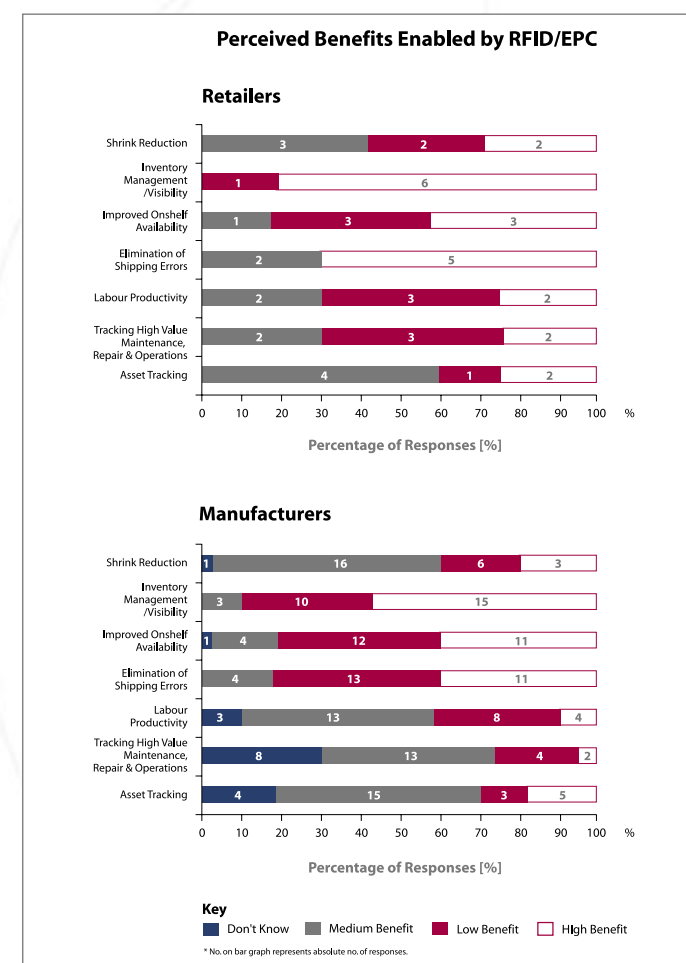

Figure 3.6

Shrink reduction scored lowest as an area of perceived high benefit, and was nominated by only 14% of respondents. Only nine manufacturers nominated shrink reduction as a medium to high benefit area, indicating that shrinkage is heavily dependent on the product category in which the manufacturer participates. An ECR Australasia study reported the value of overall stock loss among the supply chain and within retailer stores was A$942 million or 1.73% of industry turnover (source: A Guide

to Collaborative Loss Prevention, ECR Australasia, 2002). Other areas with low rankings were labour productivity, the tracking of high value maintenance and asset tracking.

Key Challenges
Respondents nominated cost issues and raising awareness of RFID/EPC as the key short term challenges to implementation. The cost of tags was identified as a significant challenge by more than 50% of respondents, with the cost of RFID hardware and the reliability of tags and readers following close behind. The cost of RFID software was also nominated in the "significant challenge" category. *(Figure 3.7)*
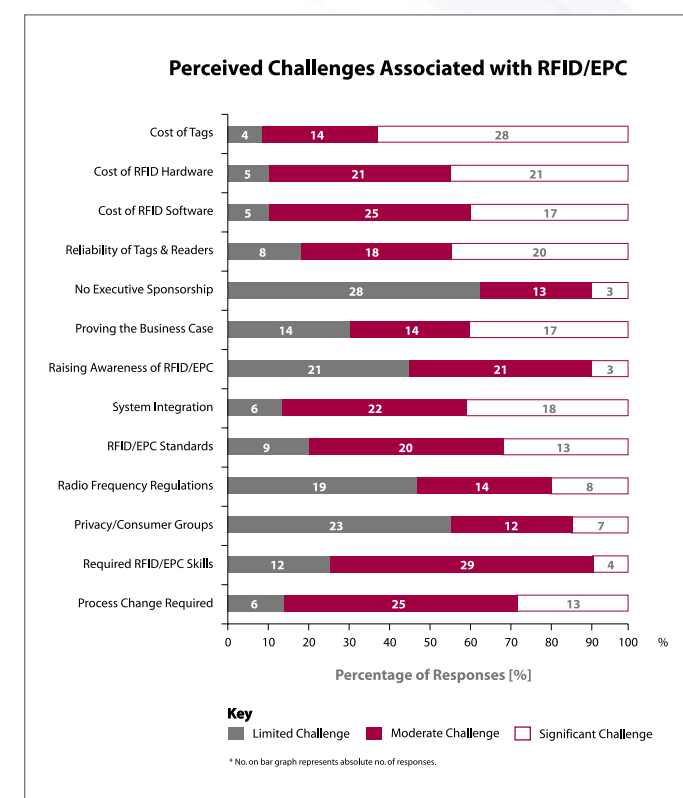

Figure 3.7

Manufacturers are the ones who it is assumed will bear the cost of purchasing and attaching the tags, so it is not surprising that cost tops their list of perceived challenges. The retail industry, in comparison, nominates the cost of tags as only a moderate challenge. The cost of hardware and software and also the cost of system integration were identified as other key challenges. Process change was also nominated, but just over one third of respondents said this was a major challenge. More than 50% said it would be a moderate challenge.

Australasian retailers have not yet had to face significant pressure from consumer groups about privacy issues as have their counterparts in the US and Europe, who have seen this as another key challenge. Less than 15% of retail industry respondents named privacy issues as a significant challenge, a response which may stem from the less advanced state of RFID/EPC development here. Work is already

well advanced on an Australian Code of Privacy for RFID, under the chairmanship of the Australian Retailers Association and involving key industry and consumer stakeholders. Similar work is underway in New Zealand. (see related article). *(Figure 3.8)*

Also seen as less challenging issues were raising awareness and understanding, securing executive sponsorship, planning and conducting a trial and establishing a cross-functional team. Although raising awareness is an important short-term imperative, it is not seen as a significant challenge. Seeking executive sponsorship and planning and conducting a trial are seen as more important short-term challenges for retailers than for manufacturers.

Experiments and Pilots
Several Australasian companies have already progressed from the 'learn' to 'experiment' phase, and most are expected to move to this point within the next two years.

To date, two companies – Amcor and Visy - report that they have completed initial trials, while another three have commenced but not completed the trial exercise. *(Figure 3.9)* Packaging companies are again leading the way, with three companies from within this sector having completed a trial and one expected to commence within one year. Retailers are also active, with one trial already underway and

three expected to commence within two years. Two retailers, however, report having no plans for a trial.

Respondents who have conducted RFID/EPC experiments to date report positive results. All companies which have conducted trials have either extended the scope or duration of the experiment or plan to extend their pilots to a third party. None reported that they had put their RFID/EPC experiments on hold indefinitely as a result of their trial.

The number of experiments is only going to grow in the short term, with twenty-four companies reporting that they expect to experiment in the next two years. Fifteen manufacturing companies expect to begin an experiment after one year and within two.

These responses would indicate that there is an implicit assumption that RFID/EPC can deliver benefits, and the technology is worth testing even in the absence of a retailer mandate. Any reluctance to experiment could have more to do with the current cost of tags than the lack of a retailer mandate. Companies may also be waiting for the reliability of the equipment to improve and for the standards issue to stabilise.

Key learnings from the pilots have supported the business case for change, with companies reporting positive benefits. Responses include that the pilots delivered "unexpected benefits in addition to what was
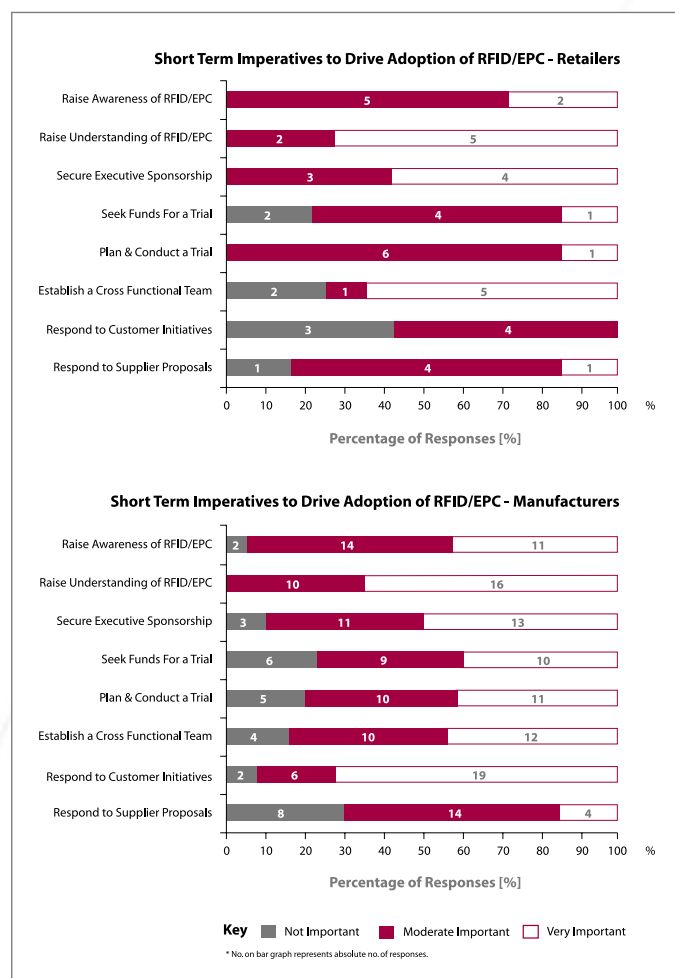
Short Term Imperatives to Drive Adoption of RFID/EPC – Retailers

- Raise Awareness of RFID/EPC: 5 | 2
- Raise Understanding of RFID/EPC: 2 | 5
- Secure Executive Sponsorship: 3 | 4
- Seek Funds For a Trial: 2 | 4 | 1
- Plan & Conduct a Trial: 6 | 1
- Establish a Cross Functional Team: 2 | 1 | 5
- Respond to Customer Initiatives: 3 | 4
- Respond to Supplier Proposals: 1 | 4 | 1

Percentage of Responses [%]

Short Term Imperatives to Drive Adoption of RFID/EPC – Manufacturers

- Raise Awareness of RFID/EPC: 2 | 14 | 11
- Raise Understanding of RFID/EPC: 10 | 16
- Secure Executive Sponsorship: 3 | 11 | 13
- Seek Funds For a Trial: 6 | 9 | 10
- Plan & Conduct a Trial: 5 | 10 | 11
- Establish a Cross Functional Team: 4 | 10 | 12
- Respond to Customer Initiatives: 2 | 6 | 19
- Respond to Supplier Proposals: 8 | 14 | 4

Percentage of Responses [%]

Key: ▪ Not Important ▪ Moderate Important ▫ Very Important
* No. on bar graph represents absolute no. of responses.

Figure 3.8

originally anticipated," that they had shown the "potential for reduced labour" and that the technology had "senior management commitment." Tellingly, the pilots had also shown that the "EPC global solution works."

The only negative comments flowing from the experiments related to the tailoring of the technology to specific business circumstances, the size and cost of the chips, and some hardware and software issues. Companies are beginning to understand the real-world challenges of implementation. One company reported that in its particular case, there was a "difficulty in reading (RFID information) through liquids."

In terms of the specific types of RFID/EPC technology being used in pilots, the majority have focused on tags and readers, and to a lesser extent the EPC network and middleware. There have been five experiments with tags and readers, two experiments with EPC networks and middleware *(Figure 3.10)*. While the responses indicate a willingness to experiment among most companies, slightly more than 20% report that they have no plans to conduct a trial and just under 20% say they will conduct a trial when requested by customers.

Four companies have moved beyond the 'learn' phase to the 'evaluate' phase, and four companies report they plan to conduct a pilot with a third party within the next three months. As companies move into the 'evaluate' phase, the issue they face is to identify the benefits of RFID/EPC and to prepare a supporting business case. More than 50% of the respondents indicated that they had not yet identified benefits, or developed a business case. *(Figure 3.11)*

To date, only three companies – or under 10% of the survey respondents – report that they have developed a business case which details the potential quantitative and qualitative benefits of the technology.
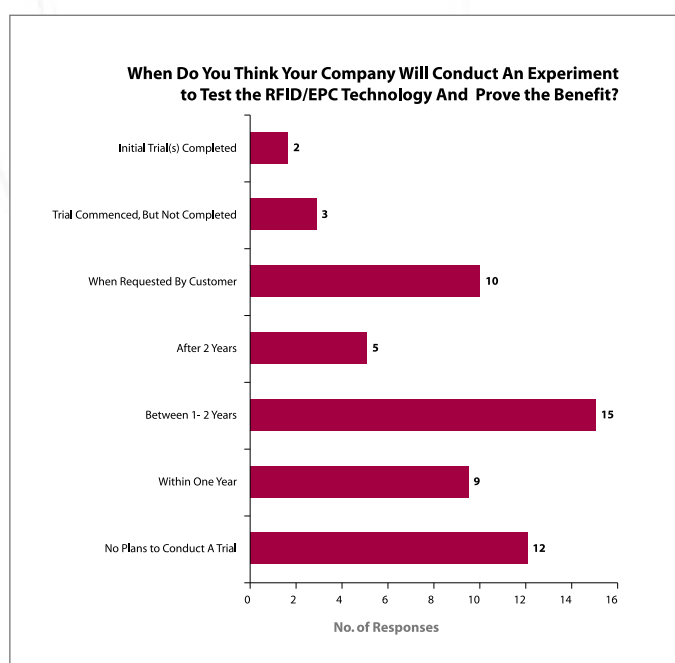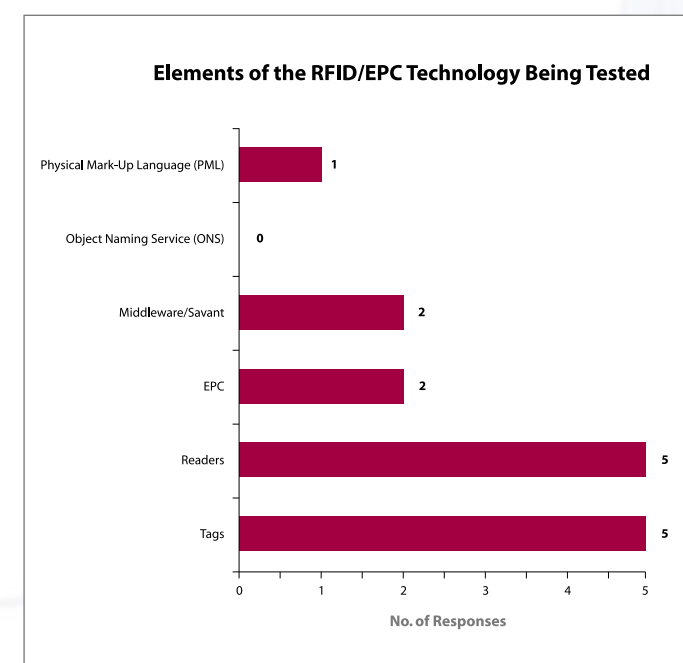
When Do You Think Your Company Will Conduct An Experiment to Test the RFID/EPC Technology And Prove the Benefit?

- Initial Trial(s) Completed: 2
- Trial Commenced, But Not Completed: 3
- When Requested By Customer: 10
- After 2 Years: 5
- Between 1- 2 Years: 15
- Within One Year: 9
- No Plans to Conduct A Trial: 12

No. of Responses

Figure 3.9

Elements of the RFID/EPC Technology Being Tested

- Physical Mark-Up Language (PML): 1
- Object Naming Service (ONS): 0
- Middleware/Savant: 2
- EPC: 2
- Readers: 5
- Tags: 5

No. of Responses

Figure 3.10

Has a High Level Business Case Been Developed For Your Company's RFID/EPC Experiment?

- Yes a business case detailing the potential quantitative and qualitative benefits associated with RFID /EPC has been developed: 3
- The potential benefit areas associated with RFID / EPC have been identified and described, but not quantified.: 4
- Business case has not been developed, but qualitative understanding of the benefit areas associated with RFID / EPC has been articulated: 11
- Business case has not been developed and the benefits of RFID / EPC have not been identified.: 26

No. of Responses

Figure 3.11

This is a significant development, and suggests that companies are already understanding the benefits of RFID/EPC collaboration with their supply chain partners. Two of these companies have documented a formal RFID/EPC vision, suggesting they have concluded that the technology offers benefits, and that their executive leadership is committed to future implementation. One company – Visy - reports it is ready to advance to the 'adopt' phase, and it is assessing further options for the roll out of RFID/EPC.

More positively, four companies have moved beyond the 'learn' phase to the 'evaluate' phase, and four companies reoprt they plan to conduct a pilot with a third party within the next three months.

Linfox Case Study

As a provider of logistics services to some of the leading products manufacturers and retailers, Linfox expects to be at the forefront when the wave of RFID/EPC implementation begins in Australia.

Linfox provides not only the transport services it is best known for, but also operates 25 warehouses around the country for household names such as Mars, Masterfoods, Kellogg, Heinz, Colgate and Gillette. According to Damian Jones, general manager of the Fast Moving Consumer Goods stream for Linfox, the company has been taking a "keen interest" in RFID developments.

"We are running national distribution centres for many of the leading consumer goods companies, and quite often it is our IT systems which are running inside the warehouse as well," says Jones.

"So if a retailer says they want to get into RFID, and these companies need to tag their goods and pass their information on electronically, then we as their warehousing provider need to be able to do that."

Jones says he expects a Linfox roll-out will be in conjunction with one of the company's major customers at distribution centre level. Several of its customers – such as Gillette and Procter& Gamble – already have market-leading experience with RFID

overseas and will be able to leverage that when it comes to adoption in Australia.

Jones sees the main benefits of RFID/EPC as in reducing errors, providing traceability and delivering "certainty of information."

"So issues like inventory accuracy improve, and we won't have errors in moving product in and out of distribution centres and particularly in areas where you have higher value, smaller volume product it will start to prove itself very quickly."

Linfox has three groups within the company monitoring RFID/EPC developments. The IT warehouse group, the distribution centre development group and Jones as head of the fast moving consumer goods stream are all closely following the technology, and share their knowledge with each other.

"We see ourselves as helping our customers facilitate change in their businesses to meet what is coming down the track," says Damian Jones.

"So if, as has occurred overseas, an Australian retailer comes out and mandates RFID tag use, there is going to be a mad implementation scramble and I want to make sure that Linfox is on top of the technology at that time and well placed to roll it out."

Woolworths Case Study

In the UK, Woolworths sells home furnishing, clothing and entertainment products. The company, concerned about supply chain shrinkage, wanted to track the movement of clothes from a distribution centre to a store.

The £40,000 RFID pilot, completed in 1999, delivered an on-shelf availability improvement of around 6%, a success which made the company realise the potential of the technology.

With tags still too expensive to use at the item level, Woolworths decided to tag the 20,000 dollies which came out of an automated picking centre in Swindon, with a view to migrating it over to the tracking of its 90,000 roll cages.

Under the Woolworths system, a picked item is associated with a tote box which is put on dollies with RFID tags, and the information is integrated back into the software system.

The dolly is then tracked as it moves across the distribution centre to the despatch bay and is put onto a truck. The truck is then secured and tracked using GPS until it gets to the store.

When the truck arrives, a geofencing exercise confirms that the driver is where he says he is, and the system tells him which dollies to unload. The tags on the dollies are read with a handheld scanner, and the store confirms it has received all the dollies it was supposed to receive.

Under this system, Woolworths has tracked goods worth more than US$200 million, without the need for item-level tagging. The main benefit has been in preventing errors occurring when goods are loading onto trucks. The system provides an audit trail in the event of theft and has helped the company handle reverse logistics. There has also been a reduction in inventory and labour costs, while another side benefit is that the company is losing fewer dollies, which cost £100 apiece.

"The discussion in our organisation has moved from one of stability to one of performance," says Geoff O'Neill, Woolworths' director of Strategic Projects.

"As the cost of tags has fallen, my CFO is no longer talking about the cost of the tags, but about their capabilities.
Source: RFID Journal

Procter & Gamble Case Study

In 2001, Procter & Gamble increased production at one of its Spanish plants. The company invested in some new equipment, but it was clear that it also needed new procedures for loading the pallets.

Otherwise, with forklifts loading 33 pallets onto delivery trucks every 20 minutes, the dock area would become a bottleneck. And with the pallets being sent directly to customers, P&G needed to ensure that the right pallets were put on the right trucks.

As they pondered the problem, P&G examined a barcoding solution the company had developed for its SAP warehouse management system. The barcode solution was accurate enough, but was too slow, and would add 40% onto the loading time. As an alternative, P&G explored an RFID solution suggested by one of its Spanish engineers.

One problem was the cost of the tags – at around US$1 apiece it was too expensive to put them on the tens of thousands of pallets a year which would pass through the facility.

So the tags were set in the warehouse floor, and the readers were mounted on the forklifts. By this method, drivers would be able to identify the pallets they were moving, and ensure they were loaded onto the right trucks.

For a cost of under US$100,000, the solution was implemented and went live in five months.

Now, the drivers can load pallets 40% faster with the RFID system than with barcode. And because of the speed, P&G has saved itself the cost of buying more forklifts, and hiring drivers for them.
Source: RFID Journal

Alien Technology Case Study

RFID/EPC technology is set to become part of a company's core Enterprise Resource Planning (ERP) system in future as information from tags is linked back through readers and middleware, according to Andrew Berger of Alien Technology. London-based Berger is European vice-president of Alien, the California-headquartered company that has become a leading producer of RFID tags and readers.

He sees the development of an open and non-proprietary system based on global standards, with information from the tags seamlessly integrated back through readers and middleware and into ERP planning and production processes to deliver supply chain benefits. Alien Technology, which has exclusive rights to the patent for "Fluidic Self-Assembly (FSA)" technology, is manufacturing tags and readers for most of the early major RFID/EPC implementations at organizations such as Wal*Mart, Tesco, the US Department of Defence and San Francisco Airport.

The company is also educating industry on RFID/EPC through its Alien RFID Academy sessions, which teach supply chain executives about the workings and benefits of the technology. The RFID Academy held its first Australian session in July in Melbourne.

"RFID technology basically introduces a new dimension," says Berger.

"But while it is highly effective in the supply chain there aren't that many people around who have a deep knowledge of UHF technology and what it does and doesn't do, so our Alien RFID Academy is all about taking the knowledge and the training and starting to build a cadre of people in Australasia who have this knowledge and these skills."

Berger says that while the RFID/EPC business case for retailers is clear enough, there was some uncertainty among manufacturers on how to extract benefits.

"My take is that if you go down a slap and ship approach you can only build in cost, you can't build in benefits," says Berger.

"The place where there are benefits to be had is in demand and supply planning, and that's the place where manufacturers need to be thinking about the absolute visibility of what is happening in the supply chain.

"Slap and ship is an interim solution which allows companies to comply with mandates, but I think it will create frustration around costs which will lead people to do something more constructive."

Surveying the variety of middleware providers currently developing software to communicate with RFID readers, Berger sees a number of migration paths, but all of them leading back into core ERP.

"We are seeing people set themselves up from new to build middleware and they have the advantage of speed and funding to get the middleware in the market early," he says.

"A second group are existing ERP or warehouse management system vendors who are building an RFID front end to their existing systems.

"The complexity of their existing systems means its going to take longer to get an RFID front end but once they've got it they would have the two pieces integrated, which is where the benefits can really start."

Berger also strongly urges Australia to adopt the 4 watt standard for RFID readers (New Zealand already has a 4 watt standard), saying that the difference between the current one watt standard and four watts, which determines the distance at which tags can be read "makes a very significant difference" to supply chain performance.

"Its not a human safety issue its more to do with a radio interference issue and I think that the US has shown that 4 watts is a very effective way of using RFID in the supply chain."

04
Australasia's RFID/EPC Future

There is a consensus that Australasia will follow the US and Europe with the adoption of RFID/EPC, but the timetable is by no means fixed. With the lack of a mandate from a leading retailer, and with the retail industry focussing more broadly on supply chain initiatives, Australasia has a window in which it can learn from and be influenced by overseas developments.

Australasian companies can use this window to take a holistic, end-to-end supply chain approach to the issue, and use it as an opportunity to re-engineer their supply chain performance. In doing that, they should be aware that there is no 'one size fits all' RFID/EPC approach, and every company will need to make their own decisions on how best to leverage the technology in their own specific contexts. *(Figure 4.1)*

While a retail mandate is the most likely catalyst in Australasia, this is by no means a given, and manufacturers, government or another third party could emerge in the near future to add some momentum. Exporting Australasian products companies supplying RFID mandated customers overseas, for example, could be a catalyst.

With the pilots at global retail leaders such as Wal*Mart, Tesco and Metro based at the case and pallet level, it can also be reasonably assumed that the initial adoption in Australasia will also be based on cases and pallets, and will not initially extend to the tagging of individual items. In fact, there are no globally published plans for organisations to tag at item level at this stage. Australasian companies can plan for their RFID/EPC futures in the safe knowledge that their initial implementations will be at this level.

Industry Action Plan

Australasian corporates are still at the beginning of their RFID/EPC journeys, and – in addition to conducting their own research – could benefit from industry-wide leadership to promote collaboration, standards, and the sharing of information. *(Figure 4.2)*

An effective "company tool-kit" needs to be developed to drive the transition from theoretical to practical knowledge. This tool-kit should

RFID/EPC Strategy Implications

RFID/EPC is not a "one size fits all" solution and will deliver varying levels of value across companies and industries, according to Jeffrey Russell, Accenture's managing partner for supply chain in South-East Asia.

For that reason, Russell's advice to companies – particularly manufacturers - is to develop their own business case to understand the potential impact of RFID/EPC on their own operations.

In the case of manufacturers complying with a retail mandate, regardless of the potential value from RFID/EPC, then that knowledge "fits into a commercial response."

"If you sit down collaboratively and say that there is X in this for me and I'm having to spend Y, and how we are going to deal with this in the context of our trading terms, then it becomes another commercial discussion," says Russell.

"The fundamental challenge still outstanding is who is going to bear the cost and how are they going to distribute it, and likewise the value."

Russell says that Accenture studies have shown that the potential value from RFID/EPC varies by category.

"But because of the extended supply chain, with more collaboration between customers and suppliers, what one company does can change the economics of a whole industry," says Russell.

"Nowadays there is a more enlightened view that if you strip out costs in a supply chain you are stripping out costs for everyone, and that saving will be distributed accordingly, and as far as the consumer."

There will also be cases, he says, where companies see a limited opportunity to improve their supply chain performance through RFID/EPC but make the investment because of the high value to them of customers who need RFID/EPC enabled goods.

"The message is that RFID/EPC is a bit like the barcode was 20 to 30 years ago," says Russell.

"Its coming, and the question is how do you sit down and work out how you are going to realise value from it".

"And the reality is that the nature of that return is a little different for different manufacturers and wherever you sit in the supply chain."

Accenture RFID/EPC Strategy Matrix

Adopt Early - When ROI is high and compliance is not mandatory, leverage RFID/EPC to create new business models, capture new revenue streams and seize the early mover advantage.

Watch & Learn - When ROI is low and compliance is avoidable, watch the market, learn from others, and wait - in time, the commoditisation of RFID/EPC technology will yield new economics and new opportunities.

Maximise - When ROI is high, maximise benefits through transformational change by creating an RFID/EPC - centric value chain.

Comply - When ROI is low and compliance is mandatory, focus on a reliable, quick, low-cost solution that will enable high-value learning and lay a foundation for the future.

The RFID journey begins
To help companies set the right course of action, the Accenture RFID/EPC Strategy Matrix can help companies determine how to incorporate the technology at a rate that will deliver value and raise business performance to a level that justifies - what can be - a significant investment in the technology.

The Accenture RFID/EPC Strategy Matrix examines a number of key dimensions in supply chain, market share, and product category. For product category, considerations like price, margin, and susceptibility to theft or counterfeiting, and likelihood of out-of-stock are weighted. By placing themselves in one of the quadrants, companies can determine the potential value of RFID/EPC in the short term, and can also consider longer-term strategies for implementation. The matrix features categories that include; "watch & learn", "comply", "adopt early" and "maximise".

Watch & learn : Companies in this group are not supplying retailers who are mandating compliance, nor are they facing governmental regulations. This allows them the time to wait and evaluate benefits. When it's time to make a move, the technology will have matured and the associated costs, decreased.

Comply : Companies in this quadrant have a large share of wallet with their customers and/or feel regulatory pressure to act. While, many cannot see the business case for complying, most feel compelled to move ahead. Companies here need a quick, low-cost solution that will enable high-value learning and lay a foundation for the future.

Adopt Early : Players in this group have a small share of category spend with compliance customers but see the ability to leap ahead in business performance and enhance their marketplace positioning by innovating using RFID/EPC. Companies in this space tend to be middle-market companies that, with RFID/EPC, could meet or exceed the capabilities of their competitors. They may also be larger companies with different product segments and categories that only want to unleash the technology on one product segment for now.

Maximise : This group has pressure to comply, but does so enthusiastically because they see positive return on investment. Companies in this space tend to be market dominators that through RFID/EPC, could make further innovations in business operations - and open the door to transformational opportunities.

Figure 4.1

Privacy Code of Practice

Consumer privacy has emerged as a key issue in the emergence of RFID/EPC and is being addressed through the development of a Privacy Code of Practice.

Under the chairmanship of the Australian Retailers Association (ARA), a committee with representatives from retailers, manufacturers, standards organizations and consumer groups have been meeting during 2004, and is on schedule to have a draft Code ready for distribution and comment in the last quarter.

"When barcode scanning first came in consumers were a bit afraid about what the technology could do, so we introduced a Code of Practice to re-assure consumers," says Fiona Wilson, the EAN Australia representative on the committee.

She says that discussions on the Code have so far progressed well, with no "showstopping" issues that haven't been able to be resolved through discussion and compromise.

Charles Britton, who represents the Australian Consumers Association on the committee, says that while the process is analogous to the barcoding Code of Practice, there are some important differences and the earlier code "can't just be a cookie cutter."

"I think this technology is going to need consumer trust to work, and industry needs to work with the full range of reactions which are going to be in the market if it is going to build trust," says Britton.

"We are not being alarmist about this technology but we have to think of the practical difficulties for the average consumer and what will be the concerns in the mind of consumers."

Britton says the main consumer issues of RFID/EPC are around control, and the potential covert use of the technology.

Consumers, he says, need to be reassured that information about them will not be tracked without their knowledge, and it is also important that the technology not be an inconvenience for consumers who want tags de-activated at the point of purchase.

"Done properly, I think this technology could be a 'win-win' because there could be some consumer benefits as well," says Britton.

provide practical guidance for individual teams to conduct RFID/EPC experiments.

Contents of the tool-kit could include, but not limited to:
- A step by step guide to planning and conducting a RFID/EPC pilot
- A business case framework to help businesses identify RFID/EPC benefits *(Figure 4.3)*
- A framework to help companies to identify the business processes delivering the greatest benefit from RFID/EPC. *(see appendix)*

ECR Australasia will support the development of this tool-kit.

A second, concurrent task is to build awareness and understanding, and create a community of interest. Knowledge in Australasia on RFID/EPC still remains at the largely theoretical level, and still tends to be limited to a core group of people in most companies. The community of interest will provide a forum to enable RFID/EPC practitioners to discuss and resolve practical challenges. Continuing the education process will help build knowledge to a critical mass of organisations. This process of raising awareness and understanding will include seminars, teleconferences and the wide distribution of both local and international case studies. Work is currently underway to incorporate RFID/EPC into the EAN Supply Chain Knowledge Centre. This facility will provide a hands-on experience for participants in the application of RFID/EPC and is expected to be operational later this year. EAN Australia and EAN New Zealand will continue to support the co-ordination of these initiatives.

A third task is to establish and communicate Australasian RFID/EPC standards. If RFID/EPC is to be rolled out successfully, a core pre-requisite is an established standards framework. Current and proposed standards are set out in figure 4.4. One of the most important issues is for the Australian wattage standard for readers to be raised from one to four watts, to bring it in line with New Zealand and allow accurate reading at greater distances from tags. This issue is currently being considered by the Australian Communications Authority and resolution is expected by the end of the year.

As part of the overall standards framework, a Privacy Code of Practice needs to be developed by industry and consumer stakeholder groups. RFID/EPC cannot thrive as an enabling technology for business if the social policy implications of its implementation have not been resolved. The Australian Retailers Association, supported by EAN, ECRA, Australian Consumer Association, retailers and manufacturers, will assist in the co-ordination of this initiative.

The fourth key task is to manage RFID/EPC communications, to ensure that all relevant stakeholders – including consumers, government, industry bodies and businesses – are kept up to date on developments. Sharing information is a vital part of what should be a collaborative industry journey, and a consistent, widely-distributed communications strategy is essential.

EAN Australia and EAN New Zealand will support the co-ordination of communications initiatives.
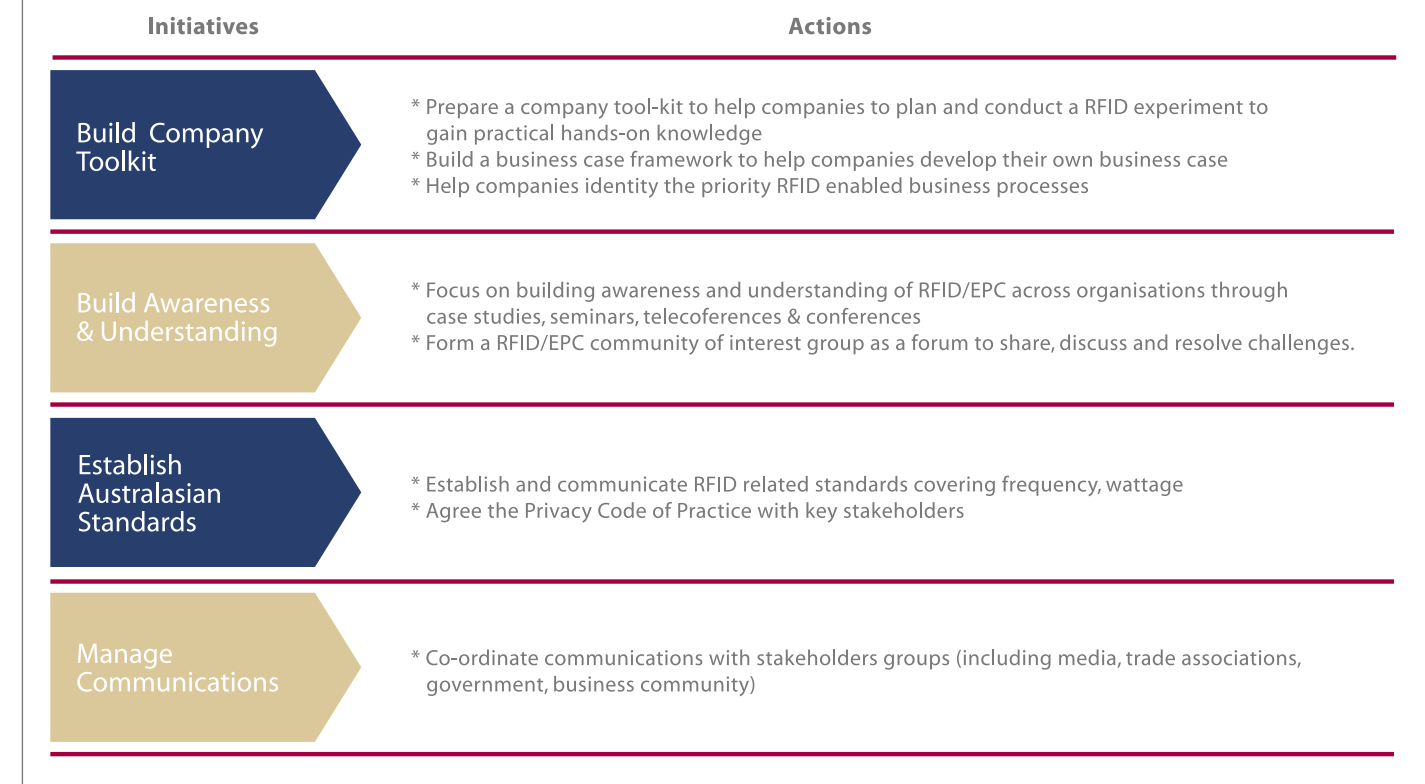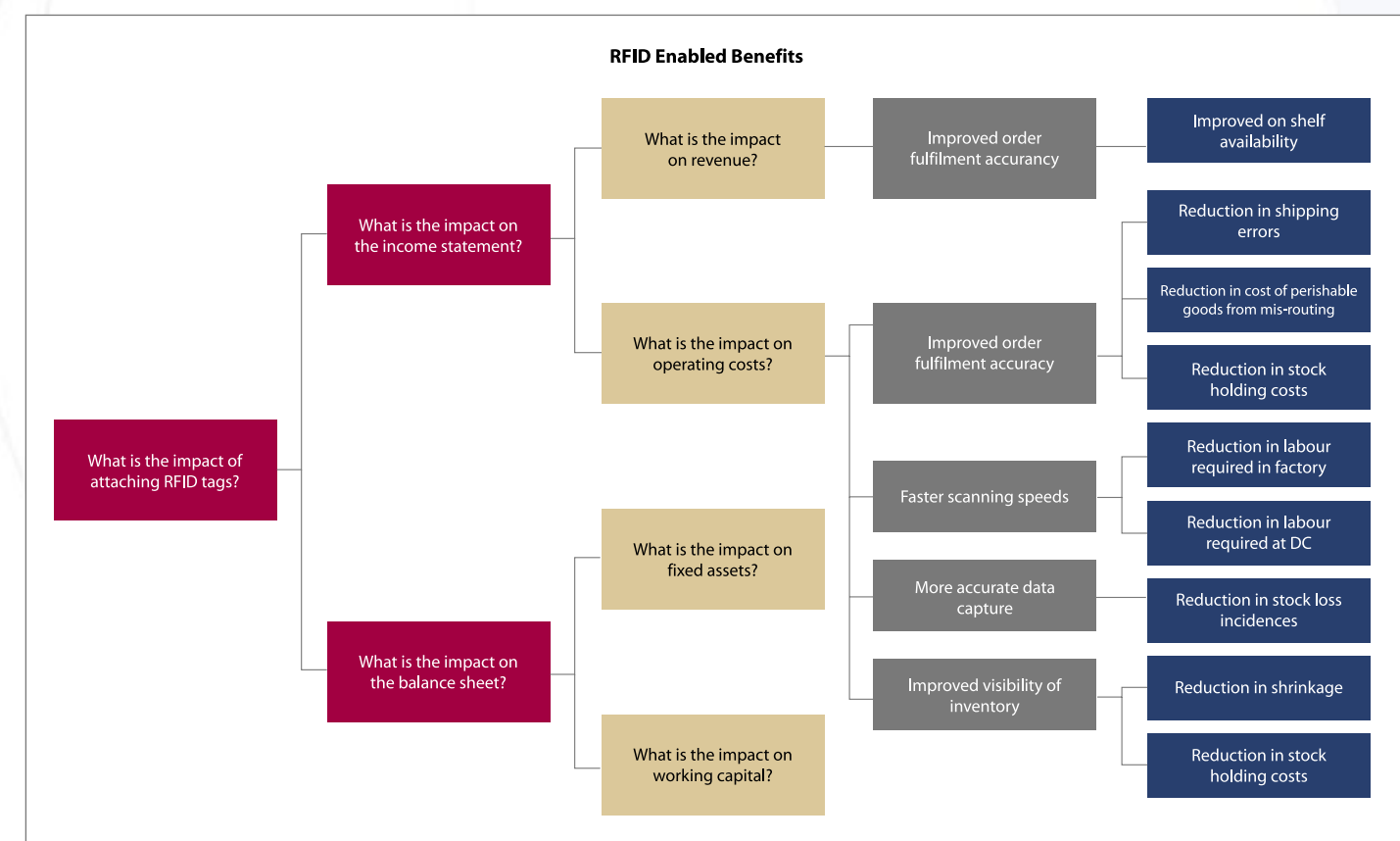

Industry Action Plan

Figure 4.2

RFID Enabled Benefits

Figure 4.3

Standards: Current & Proposed

Area	Current Standard	Proposed Standard
Electronic Product Code (EPC	EPC tag data standard version 1.1 This standard is applicable globally. This standard details a "pure" EPC structure as well as provides the mapping for the following EAN.UCC data structures into EPC numbers. • Global Trade Item Numbers (GTIN) • Serial Shipping Container Codes (SSCC) • Global Location Numbers (GLN) • Global Returnable Asset Identifier (GRAI) • Global Individual Asset Identifier (GIAI)	No changes currently under consideration.
Tag	Ultra High Frequency (UHF) Version 1 ultra high frequency (UHF) tags: • EPC Class 1 : Write once, read many • Class 0 : Read Only ISO 18000-6 : International standards for UHF	Generation 2 UHF tags. • In June the EPCglobal Hardware Action Group reached consensus on Generation 2 UHF tags, which will be a single standard to replace the current class 1 and class 0. The group aims to review comments on the draft with a view to publish as EPCglobal standards by September 2004. The generation 2 UHF tags will be taken through the ISO process with the aim of replacing the current UHF standards (ISO 18000-6), which will result in a single global standard for UHF tags.
	High Frequency EPC Class 1 ISO 18000-3 • EPCglobal have maintained the specifications created by Auto-ID center and there are 2 tag specifications within the 13.56 MHz range defined in ISO 18000-3.	• To date EPCglobal have not focused on HF specifications as the initial implementation is in the supply chain and the greater read range provided by UHF is seen as the preferred technology for most supply chain applications.
reader frequency	Global frequency range : 860 – 960 MHz • This is the global range for UHF tags and EPC tags within this range will be able to be read by readers operating anywhere within this range. Australia's frequency range : 915 – 928 MHz New Zealand's frequency range : 864 – 868 MHz USA's frequency range : 900 – 928 MHz	No Change Proposed. No Change Proposed. No Change Proposed. No Change Proposed.

Area	Current Standard	Proposed Standard
Reader Power	Australia's power : 1 watt	4 watts Submission is currently underway from EAN Australia to the Australian Communication Authority to increase the allowed power to 4 watts, with a resolution anticipated by the end of 2004.
	New Zealand's power : 4 watts USA's power : 4 watts	No change proposed. No change proposed.
Middleware (Savant)	Savant Specification 1.0 • This provides details of the reference model for middleware, which provide filtering of data within the EPC network. • Reference model for middleware (savant) has been released and many software vendors have EPC compliant middleware available today.	Specifications will be updated as required
Object Naming Service (ONS)	ONS version 1.0 • This details the functions of the ONS, which will direct enquiries related to where information related to specific EPC numbers can be found. • Specifications for ONS have been released and Verisign, a global organisation already responsible for providing ONS services globally, have been given the role of providing the root ONS registry globally. A platform is available to pilot the ONS today.	Specifications will be updated as required.
Physical Markup Language	PML core specification version 1.0 This details the function of the PML language which provides standardized vocabulary for communicating EPC related information. Detailed specification are available from the EPCglobal website.	Work is currently underway on completing these specifications. Additional PML languages will be defined as required.

Figure 4.4

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Appendix

1_RFID/EPC Benefit Areas by Process: Manufacturing

Process	Hypothesis	Operational Enhancement	Financial Impact	Symptoms of Value Opportunity	High Value	Moderate Value	LIttle or No Value
Purchasing/ Ordering	Suppliers apply RFID tags to inbound raw materials	• Reduce administrative costs - time & labour associated with reconciling shipping errors. • Reduce cost of measuring and enforcing supplier SLAs. Improve inbound order accuracy. • Reduce cost of raw materials - pay against actual material received vs. material invoiced. • Increased raw material turns - share downstream demand information in exchange for reduction in lead times/lot sizes.	Reduce SG&A Reduce COGS Reduce Working Capital	• Suppliers have poor order accuracy. • Order process relies on manual purchase orders. • Low raw materials inventories and high order frequency.		▲	
Receiving	Inbound raw material are tagged by suppliers. Receipts are matched against ASNs & orders as goods pass through readers at dock doors.	• Reduced labour cost by eliminating label scan or manual identification and reconciliation of goods. • Increased receiving accuracy from automatic matching with ASN and reduced inspection effort.	Reduce COGS	• Time consuming check-in, inspection and receiving process. • Manual receipt to order matching	▲		
Putaway	Raw materials & storage locations use RFID tags & reader capability to route forklift & update inventory positions.	• Reduce Putaway labour.	Reduce COGS	• Complex array of raw material storage locations. • Manual dispatch of putaway location.		▲	
Raw material inventory management	Raw material bins, pallets & containers have RFID tags.	• Reduced picking labour - RFID automates the find and select process. • Increased production yield from better QC of ingredients. • Reduced scrap/obsolescence from visibility to raw material ageing.	Reduce COGS	• Complex array of raw material storage locations. • Frequently excessive time wasted to locate misplaced inventory.		▲	
Vendor managed inventory	Suppliers apply RFID tags to inbound raw materials & are given responsibility for managing RM inventory.	• Eliminate RM Inventory from books. • Reduce administrative cost of managing orders.	Reduce SG&A Reduce Working Capital	• A VMI program has already been established. The company plans to establish an inbound VMI program.		▲	
WIP inventory management	WIP pallets or containers are RFID tagged & monitored during the production process.	• Reduced Picking Labour - RFID automates the find and select process. • Reduced scrap/obsolescence from visibility to WIP material ageing.	Reduce COGS Reduce Working Capital	• Component assembly production process. • Complex and/or variable production flow path. • Reusable assets/totes are used in production.		▲	
Finished goods inventory management	Finished cases & pallets are tagged as part of the packaging & palletising processes.	• Reduce Administrative Cost of monitoring FG inventory levels and location. • Readers update inventory data in real-time. • Reduce Safety Stock Inventory at the DC - visibility of FG inventory levels allows lower safety stock in the warehouse. • Improve Customer Service - Orders can be confirmed or expedited for product from FG inventory.	Reduce SG&A Reduce Working Capital	• Large finished goods holding area. • Poor finished goods inventory accuracy. Excessive search and locate time for "lost" finished goods.	▲		
Labour/Workforce management	Wage labour employees wear RFID tags to track time spent at tasks/locations	• Reduce cost of production labour - Allocate labour and resources more effectively. Measure productivity and labour inefficiencies.	Reduce COGS	• Dynamic and frequently changing labour requirements cause inefficient allocation of labour.			▲
Quality control	WIP containers are RFID tagged & can be tracked throughout the manufacturing process.	• Reduce Production Costs - Identify and alert potential quality problems earlier in the production process. • Reduce Administrative Costs - Data captured with RFID can be used for analyzing and monitoring product quality.	Reduce COGS Reduce SG&A	• Ineffective control mechanisms in the production process create quality problems.			▲

▲ Average assessment of potential value for each process area as determined by questionaire respondents.

Process	Description	Benefits	Financial Impact	Conditions	Assessment
Production yield & efficiency management	WIP pallets or containers are RFID tagged & monitored during the production process.	• Reduce Production Costs - Increased productivity from ability to automatically request replenishment (enable pull system). • Increased yield from better staging, tracking, and alerting for WIP inventory levels. • Production runs and setup changes can be staged more efficiently. • Increase efficiency and/or visibility of putback processes.	Reduce SG&A Reduce COGS Reduce Working Capital	• High levels of scrap. • Low or declining production yield rates.	
Asset management	Assets used in manufacturing are RFID tagged by suppliers or upon acquisition. Asset inventory levels, locations, & usage patterns are continuously monitored.	• Reduce PP&E - Fewer assets required as a result of better visibility and more effective utilization. • Reduce Administrative labour required to track and inventory assets..	Reduce Fixed Capital (PP&E) Reduce SG&A	• Component assembly production process. • Tracking of reusable assets is a manual process.	
Asset management - maintenance & repair	Assets used in manufacturing are RFID tagged by suppliers or upon acquisition. Asset inventory levels, location, and usage patterns are continuously monitored.	• Reduce Administrative Costs - time required to manage scheduled maintenance and inspections. • Reduce Repair Costs - Improve the effectiveness of scheduled maintenance and inspections.	Reduce COGS	High rate of wear for reusable production assets. Damaged assets create quality control problems.	
Shipment staging (from manufacturing facilities)	Finished cases and pallets are tagged as part of the packaging and palletizing processes.	• Reduced Picking Labour - RFID automates the find and select process for staging outbound shipments.	Reduce COGS	• Mixed pallets and LTL shipments are staged adjacent to manufacturing operations.	
Compliance - regulatory	RFID tagged product will facilitate data capture required for regulatory compliance.	• Reduced administrative costs to complete regulatory reporting. Product genealogy data is more granular and accurate.	Reduce SG&A	• Manual processes used to track product genealogy.	
Compliance - lot tracking & recall	RFID tagging makes it possible to trace the lineage of products from production to the various locations throughout the supply chain.	• Reduce administrative cost of lot tracking. • Reduce cost of recalls by narrowing the target product group. • Reduce goodwill and brand damage resulting from recalls.	Reduce SG&A Reduce One-Time Operating Expenses Reduce Writedown or Impairment of Goodwill	• Manual processes used to track product genealogy. Poor lot tracking accuracy.	
Forecasting & Planning	Customers share EPC data thereby improving the quality, timeliness, and granularity of actual downstream demand information.	• Reduce Inventory and stock-outs - Improve forecast accuracy by narrowing the gap between forecasted and actual demand.	Increase Revenue Reduce Working Capital	• Poor forecast accuracy. • High safety stock levels. • Frequent and heavily promoted items. • Seasonal products.	
Promotions planning	Customers share EPC data thereby improving the quality, timeliness, and granularity of actual downstream demand.	• Reduce Inventory and stock-outs - Improve forecast accuracy by narrowing the gap between forecasted and actual demand. Anticipate and meet rapid fluctuations in demand.	Increase Revenue Reduce Working Capital	• Rate of on-shelf stock outs increases by more than 50% during promotions. • Poor coordination on promotions with customers.	

▲ Average assessment of potential value for each process area as determined by questionaire respondents.

2_RFID/EPC Benefit Areas by Process: Distribution

Process	Hypothesis	Operational Enhancement
Receiving/ Unloading	• Case tags are automatically registered on mixed pallets, speeding product and quantity identification.	• Unloading units/hour.
Receiving - receive	• Incoming pallets and cases with tags will streamline the receiving process by eliminating the need to enter receipt quantities and print and affix barcode labels.	• Receiving units/hour.
Receiving - putaway	• Tagging ensures product location is captured during putaway. • Manual label scans aren't necessary during putaway.	• Improved location integrity %. • Putaway units/hour.
Replenishment - picking	• Label scans are not needed when picking for replenishment. • Tags ensure the correct product / quantity is picked and stocked.	• Transfer pallets/hour. • Fill rate.
Replenishment - putaway	• Label scans are not needed when placing product in pick location. • Forward pick location tags ensure that product is stocked in the correct location.	• Transfer pallets/hour. • Fill rate.
Order Filing - case pick	• Label scans are not needed when picking. • Case tags ensure correct product is picked.	• Cases/hour. • Order accuracy %.
Order Filing - pallet pick	• Label scans are not necessary when picking pallets.	• Pallets/hour.
Shipping - load	• Loading process will automatically capture product, reducing the need to check each order for accuracy. • Loading process will automatically capture product, ensuring the product matches the order, and the ASN and bill of lading are correct.	• Transfer pallets/hour. • Fill rate.
Returns - receive	• Case tags automatically register incoming product, reducing the need to perform product lookups, review expiration dates and key in quantity	• Return lines/hour.
Returns - putaway	• Product and location label scans are reduced during putaway process	• Return lines/hour.

Financial Impact	Symptoms of Value Opportunity	High Value	Moderate Value	LIttle or No Value
Reduce labour cost	• Cases are removed from pallets and tallied on paperwork for subsequent entry into the receiving system	▲		
Reduce labour cost	• Manual paperwork utilised in receiving process. • Paperwork is keyed into receiving system.	▲		
Reduce labour cost Reduce working capital	• Low inventoryn accuracy % resulting from product "lost" in the warehouse. • Low fill rates related to inaccurate on-hand inventory quantities by location.		▲	
Reduce labour cost Increase sales	• Low inventory accuracy % resulting from product "lost" in the warehouse. • Low fill rates related to inaccurate on-hand inventory quantities by location.		▲	
Reduce labour cost Increase sales	• Low inventory accuracy % resulting from product "lost" in the warehouse. • Low fill rates related to inaccurate on-hand inventory quantities by location.		▲	
Reduce labour cost Increase sales	• Below average order accuracy % caused by incorrect product picking. • Low throughout in the case pick area relatec to manual order filing procedures.	▲		
Reduce labour cost	• Paper "tickets" utilised in order filing function. • Low order accuracy and/or large number of returns resulting from incorrect product picks.		▲	
Reduce labour cost Reduce transportation cost (ie. reduction in transporting the wrong product) Increase sales	• Significant labour hours spent on QA activities. • High value product increases need to ensure order accuracy. • Warehouse shrink resulting from putting wrong product in a shipment. • Order accuracy % and/or deductions resulting from invoice/shipment discrepancies. • Potentially manifested in AR days.	▲		
Reduce labour cost	• Large numbers of returns made to warehouse. • Significant labour hours used to process returns. • High potential for fraudulent returns of counterfeit or diverted product.		▲	
Reduce labour cost	• Large number of returned inventory awaiting processing or putaway.		▲	

▲ Average assessment of potential value for each process area as determined by questionaire respondents.

2_RFID/EPC Benefit Areas by Process: Distribution continued

| Inventory management - cycle count | • Product within the DC will automatically register in the WMS as its case or pallet tag is read, reducing the need to perform cycle counts. | • Reduced labour hours. |
| Inventory management | • Product within the DC will automatically register in the WMS as its case or pallet tag is read, eliminating the need to perform annual physical inventory. | • Reduced labour hours. |

| Reduce labour cost | • Paper based cycle counting function.
• Large overall inventory variances captured during cycle counts.
• High value and high theft items. | |
| Reduce labour cost | • Paper based cycle counting function.
• Large overall inventory variances captured during cycle counts.
• High value and high theft items. | |

3_RFID/EPC Benefit Areas by Process: Transportation

Process	Hypothesis	Operational Enhancement
Arrival	Scanned trailer contents will improve prioritization of scheduled loads upon arrival allowing high priority items to be received first.	Fill Rate %.
Arrival	Trailer tagging of inbound loads will improve trailer visibility on the yard.	Annual yard management labor hours.
Arrival	Trailer tagging of inbound loads will improve trailer visibility on the yard.	Decrease carrier detention charges by proactively unloading trailers within allowable time window.
Arrival	Tagging will automatically and more accurately identify product when unloading which will reduce driver and equipment idle time.	Reduced driver/vehicle idle time.
Product Tracking	Tagging will enable visibility of product position in supply chain.	Reduce cycle time to resolve claims against carrier loss/damage.
Product Tracking	Automatic product indentification tied to customs information will reduce compliance delays.	Reduced customs fines & penalties.
Carrier Compliance	Trailer can be scanned by customer when it arrives.	• Increased visibility into lead times and compliance with service levels. • Potential to lower freight costs by only paying necessary level of service.

Financial Impact	Symptoms of Value Opportunity	High Value	Moderate Value	LIttle or No Value
Increase Sales	• Distribution center that receives goods from suppliers or other internal manufacturing operations. • Large volume of inbound loads and scheduling conflicts.			
Decrease Operating Expenses	• Large pool of trailers in yard. • Manual management of yard.			
Decrease Operating Expenses	• High level of preventable detention charges. • Company ownership of asset pool. • Low asset utilization. • Frequently "lost" trailers.			
Decrease Fixed Capital	• Company owned transportation assets and employed drivers.			
Decrease Working Capital	• Large number of carrier claims.			
Decrease Working Capital	• Large % of volume is imported. • Long lead times for imported items.			
Freight Costs	• Low on-time delivery percentage. • High freight/sales ratio.			

▲ ▲ Average assessment of potential value for each process area as determined by questionaire respondents.

Process	Hypothesis	Operational Enhancement
Diversion	• Downstream RFID-enabled visibility will make it possible to track and identify diverted product sales. • Improved information about diversion will enable measures to be taken to reduce or eliminate its rate of occurance.	• Reduce Administrative Operating Cost (identifying and tracking diversion). • Increase Price (or maintain price) - Maintain higher prices/margins by eliminating or mitigating the effects of off-price channels.
Deductions	• RFID/EPC information network enables automated notification and verification of deduction events (sales data, inventory data, order accuracy, markdowns, sales volumes).	• Reduce Administrative Operating Cost - Reduced costs for deductions processing. •Decrease Costs of Sales - Reduce unauthorized and unjustified deduction.
Charge Backs	• RFID technology improves the accuracy of supply chain execution (shipping, receiving, handling, billing and labelling accuracy).	• Reduce Administrative Operating Costs - Improved shipping/receiving accuracy reduces cost of verifying and tracking chargebacks. • Decrease Cost of Sales - Reduce unauthorized chargebacks.
Replenishment	• Case and pallet level tagging enable backstore inventory visibility. • Supplier's capability includes real-time replenishment requests are triggered from POS upstream through the supply chain (pull system).	• Increase sales from reduced OOS. • Reduce safely stock inventory from improved demand information and forecast accuracy.
Unsalables	• Downstream visiblity provides better management of expirations and product lifecycle management (phaseouts).	• Increase sales from higher sell through rates. • Lower cost of sales from reduced returns, deductions and discounting.
Recalls	• RFID tagging make it possible to trace the pedigree of products in various locations throughout the supply chain and pinpoint recalls.	• Reduce cost of recalls by narrowing the target product group. • Reduce goodwill and brand damage.
Regulatory Compliance	• RFID genealogy data enables increased accuracy and automation of ensuring regulatory compliance.	• Reduce Administration Cost - regulatory compliance.
Demand Planning	• RFID will enable better visibility to upstream material availability and constraints as well as downstream sales and inventory information.	• Reduce safety stock reduce OOS.
Promotion Management & Effectiveness	• RFID technology provides real-time visibility of promotional sales lift and the dynamic demand patterns associated with promotions.	• Increase sales and fill-rate from real-time replenishment and predicting stock outs. • Reduce downstream safely stock inventory required to support unpredictable demand pattern associated with promotions.
Merchandising/ Customer Insights	• Tags will increase the ability for retailers to capture market basket data, and sales by location in the store to enable better store planning and use of promotional space.	• Increased sales by working with customers to improve merchandising, promotions and product placement.

Financial Impact	Symptoms of Value Opportunity	High Value	Moderate Value	Little or No Value
Reduce SG&A Increase Revenue	• Customers frequently display irrational order patterns. • Trade fund or pricing programs that incent high levels of forward buying.		▲	
Reduce SG&A Reduce COGS	• High or increasing deductions/sales ratio. • Verifying and administering deductions is labor intensive.		▲	
Reduce SG&A Reduce COGS	• High or increasing chargebacks/sales ratio. • Chargebacks frequently "eat away" at expected margin. • Labor intensive administration processes.		▲	
Increase Revenue Decrease Working Capital	• High on-shelf out of stock rates at key customers. • High demand variability and safely stock levels.	▲		
Increase Revenue Decrease COGS	• Highly perishable products. • Excessive return rates of expired product. • Slow moving supply chain or low store velocities.		▲	
Reduce One-time Operating Expense Reduce Write Down or Impairment of Goodwill	• Recent events have a high probability of occuring. • Speed of recall greatly impacts cost and impact.		▲	
Reduce SG&A	• Regulatory requirement that impose minimum response times or data availability.			▲
Decrease Working Capital	• Poor forecast accuracy. • High safety stock levels. • Frequent and heavily promoted items. • Seasonal products.		▲	
Increase Revenue Decrease COGS	• Rate of on-shelf stock outs increases by more than 50% during promotions. • Poor coordination on promotions on customers.		▲	
Increase Revenue	• Customers are using market basket data to improve merchandising practices.		▲	

▲ Average assessment of potential value for each process area as determined by questionaire respondents.

Product Development/ Customer Insight	• Increased visibility to consumer purchasing patterns informs new generations of successful products.	• Increase sales from improving the product mix and success of new products as a result of customer insights. • Reduce product development and product launch costs as a result of higher product success rates.	Increase Revenue Decrease CSG&A (R&D)	• Unpredictable uptake of new products. • High cost to test market new products. • Short product life cycles.	
Personalized Marketing	• Consumer profiles can be married with RFID information to enable customer-specific promotions and advertising. • Retailer's capabilities may include real-time promotions. • RFID capabilities may be used in conjunction with loyalry programs.	• Increase Sales - Improve marketing effectiveness.	Increase Revenue	• Products are highly configurable. • Customer preferences are highly variable. • Fashion, fad or trend based products.	
Scan based trading	• Manufacturer's capability to operate in SBT environment is dramatically improved due to visibility of shelf and backroom inventory (and actively managing shrink). • Manufacturer can manage their replenishment process further downstream and better predict.	• Increased Sales - From reduced stock-outs by proactively managing inventory at retail location. • Increase Inventory Turnover - Lower safety stock from more accurate downstream demand information.	Increase Revenue Reduced Working Capital	• Business moving to a scan based trading business model.	
Smart Recycling	• Regulatory Compliance.	• Meet potential future federal mandates that required RFID tags on product packaging that must be recycled.	Reduce COGS (cost avoidance)	• TBD based on potential future regulations.	
Systemic shelf replenishment	• Tagging and shelf reading technology enables automatic replenishment: reducing OOS occurrences, and increasing sales.	• Reduce out of stocks.	Increase Sales	• High shelf velocity creates frequent out of stock.	
Trade funds management	• RFID technology will enable automated validation of trade program compliance.	• Manual validation of trade program execution will not need to occur. • Product placement will occur as agreed upon.	Decreased SG&A	• Correlation between POS timing and trade fund promotional events is suspect. • High diversion rates.	

▲ Average assessment of potential value for each process area as determined by questionaire respondents.

Useful Information Sources

EAN Australia	www.ean.com.au
EAN New Zealand	www.ean.co.nz
ECR Australasia	www.ecra.org.au
EPC Global	www.epcglobalinc.org
Auto-ID Centre	www.autoid-labs.com
Australian Food & Grocery Council	www.afgc.org.au
New Zealand Food & Grocery Council	www.afg.org.nz
GCI EPC Roadmap	www.gci-net.org
Accenture	www.accenture.com/silentcommerce