

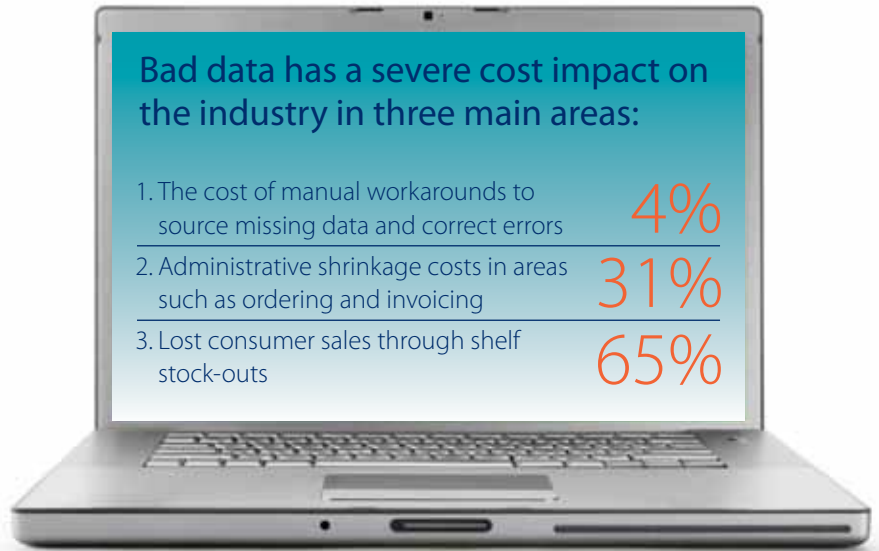


THE IMPACT OF BAD DATA ON PROFITS AND CONSUMER SERVICE IN THE AUSTRALIAN GROCERY INDUSTRY

A report for the retail grocery industry prepared by GS1 Australia in conjunction with IBM



Retailers are working with data that is inconsistent well over 80% of the time



CONTENTS

Executive Summary	2
Background	4
The Study	5
The Results	6
Cost Implications of Bad Product Data	9
Company in Profile: Kimberley-Clark	11
Looking Forward	12
Call to Action	14
Appendix	15

More than a decade ago, the Australian food and grocery industry recognised the impact of poor product supply-chain data. It embarked on a program to improve the quality and consistency of this data in 1998 when the EANnet data synchronisation service was commissioned.

Through a series of iterations and developments and the migration to the Global Data Synchronisation Network (GDSN)-compliant data pool GS1net, completed in 2008, the program has progressed through to the present day.

However, data synchronisation alone is not the answer to ensuring data quality. If the original data is inaccurate, the provision of master data to customers electronically means bad information is transferred at the speed of light. To ensure consistently high-quality data at the source, the key is to ensure data-gathering processes are correct. Once these processes are in place, the system of interoperable data pools that make up the GDSN network can be used share this accurate data with all relevant trading partners.

Our study shows that retailers and suppliers using data synchronisation show significantly higher data quality results than those who did not (fully) adopt data synchronisation

Major findings of the Australian study include:

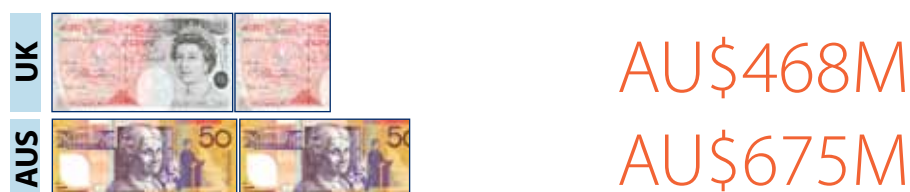
- Case pack and pallet data are considerably better aligned between supplier and retailers than SKU-level data
- The most accurate data fields were SKU height, net case configuration and pallet TI HI
- The least accurate data fields were gross and nett weight

In 2009 GS1 UK, in association with IBM, commissioned a report to examine the quality of product data that is the basis of many decisions affecting supply chain performance and underpinning a fully functioning and efficient grocery sector.

Cost Due to Supply Chain Inefficiencies



Cost Due to Supply Chain Stocks



The UK and Australian reports show marked differences: the internal costs of the supply chain in Australia seem more streamlined than in the UK, while out-of-stocks and subsequent customer disappointment in the retailer or manufacturer is a bigger challenge in Australia than it is for our European counterparts.

The *GS1 UK Data Crunch Report 2009* showed that the accuracy of this data was exceptionally poor overall and suggested that the UK retail industry could save **£1 billion** in just five years by addressing the issue of poor data quality.

Following the publication of the UK report, in 2010 GS1 Australia commissioned a similar report to better understand the situation in Australia, where data synchronization with two of the three major retailers and more than 500 suppliers has been a feature of the industry landscape for several years.

Australian grocery retail is a highly competitive, fast-moving and rapidly changing industry. The major supermarket chains have developed supply chains that service a diverse range of outlets with an impressive and growing selection of products and merchandise. The supermarket groups are in a fiercely competitive environment and there is a threat of international players entering the market, following the success of Aldi in Australia. The retail sector is under constant pressure to innovate – to introduce new ways for consumers to buy (such as from the web and mobile devices), to provide extended product ranges and to address increasing demands from consumers and legislators.

The flow of information is critical to these developments. However, for some time anecdotal evidence has suggested that product data in the supply chain is of variable quality. To prove (or disprove) the 'bad data' argument, GS1 Australia, with IBM, compared data on grocery products held by the three major supermarket retailers and matched this against product data from four major suppliers.

The Australian Data Crunch Project has revealed that retailers are working with data that is inconsistent more than 80% of the time. Given the current overall health of the grocery retailing industry, it was surprising to discover such a high level of poor-quality product data currently being held by retailers.

We calculate that over the next five years, Australian grocery retailers and suppliers will experience over **AU\$350 million in profit erosion and AU\$675 million in lost sales** as a result of bad data. These are conservative estimates based on the combination of process inefficiencies, duplications and workarounds across the retailer and supplier's supply chains, together with administrative shrinkage and shelf stock-outs caused by inaccurate data. These estimates are supported by previous independent research conducted over the past decade.

The total cost of bad data in the Australian grocery supply chain will be **AU\$1.035 billion over five years**.

Although the Australian grocery industry had engaged in data synchronisation for some years, there is still concern about the overall quality of data being shared. Data synchronisation must be combined with appropriate validation to ensure the quality of data is maintained. With more than 300 business validation rules set down by the industry as the program has evolved, much of the data required by the major retailers is quality assured.

However, some data types cannot be checked by computer unless there is some level of human intervention. For instance, how does a computer determine whether the flavour of a new product is orange or lemon?

What are brand owners and manufacturers doing about the quality of their data? Businesses cannot operate efficiently within their own four walls by basing decisions on inaccurate information. Any problems are then magnified once bad data is used to support trading relationships.

The aim of this study was to determine the full extent of these issues among the top echelon of organisations in the Australian grocery sector. Those participating included:

The manufacturers provided the product data on all lines they supplied to their three major grocery retail trading partners. The retailers provided data for review on products they all supplied.

The total number of consumer units submitted was 3,271, while 3,144 trade unit-level pack details were provided.

A sub-set of data comprising the following fields was evaluated:

- Item Global Trade Item Number (GTIN)
- Item Depth
- Item Width
- Item Height
- Item Net Weight
- Item Gross Weight
- Trade Unit GTIN
- Trade Unit Depth
- Trade Unit Width
- Trade Unit Height
- Trade Unit Net Weight
- Trade Unit Gross Weight
- Trade Unit Case Configuration
- Pallet TI (Shipper boxes per pallet layer)
- Pallet HI (Layers per pallet)

The data was delivered to an IBM data centre and compared or 'crunched' across the various sources. All matches and deviations were recorded.

SUPPLIERS



SUPPLIERS & WHOLESALERS



PRODUCERS & SPONSORS



A total of 3,271 products were supplied for the study, however, only 782 consumer units and 788 trade units were matched to all three participating retailers.

The following details the percentage of items matched in all three retailers' databases against the suppliers' database.

Consumer Units

Knowing that a 1mm diversion could cause an error to be registered, GS1 Australia decided to allow for a tolerance of 10%. Even with that tolerance the percentage of matches was surprisingly low.

Depth and Width

The depth and width parameters indicated a poor correlation between retailers and suppliers. The average match of around one-third of items raises questions as to the accuracy of shelf-space planning mechanisms. One of the four suppliers matched in two-thirds of items, meaning the overall results were dragged down by the other three – one in particular.

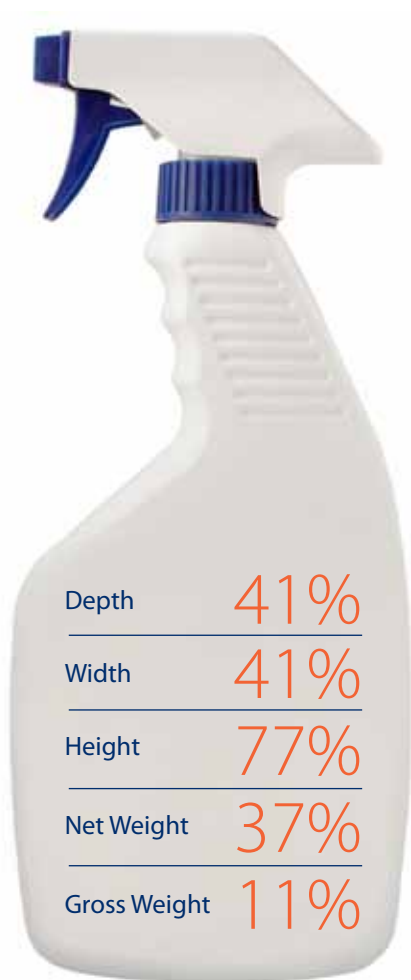
Height

Height was a different matter. Clearly the retailers place an emphasis on having this parameter accurately stored in their data files. Perhaps this is because if a product is too tall for the allocated shelf space there is nowhere for it to go, whereas an error in width or depth can be 'fudged' in shelf placement and has less impact.

Net and Gross Weights

The weight of consumer units is clearly not an area of significant priority for suppliers or retailers as there was minimal alignment. One supplier had nearly 50% alignment with the three retailers. There was more than 90% alignment for the majority of products for the one retailer who has undergone a significant data synchronisation program.

A lack of net- and gross-weight data, or incorrect data, could have a significant impact on retailers with self-checkout systems in place. It has been reported that 40% of all checkout transactions at the major retailers are now conducted via self-checkouts. However, these systems - which allow consumers to scan, bag and pay for items unassisted - depend on correct product weight data to verify that the item has been placed in the bagging area. Without this data the self-checkout will not function.





Traded Units

Dimensions (Depth, Width and Height)

Box and shipper dimensions were consistently misaligned between retailers and suppliers. Interviews with all three retailers revealed that this is an area of significant manual processing. All three ask suppliers to provide dimension data with new line submissions, through electronic means such as GS1net, or using more manual processes such as the Universal Buying Form (UBF). Yet all three then re-measure all new boxes supplied to distribution centres around the country and enter those measurements in their disparate warehouse management systems. All agreed there was little or no value having the original data from suppliers but they would consider using it if the data was reliable. However, for supplier data to be reliable, all suppliers must provide accurate data as there cannot be two systems in operation. So until suppliers can consistently provide this data to uniform industry standards, manual workarounds and duplication will remain.

A common error made when providing dimension specifications is to confuse the width and depth dimensions. The width is the narrowest side of the base; the depth the longer side. A GS1 Australia and Efficient Consumer Response Australasia (ECRA) study from 2007 identified errors of over 30% from a group of multi-national suppliers to the Australasian grocery sector. Part of this was due to confusion between width and depth and the transposition of these fields when mapped to the local data pool, GS1net. This led to the introduction of a validation rule whereby GS1net rejects data if the width for a trade unit item is greater than the depth.

Net & Gross Weight

Net weight accuracy was very high at 93%. Weight is an occupational health and safety issue so all parties pay extra attention to it. However, one retailer commented that "weight is only an issue if it is in excess of 16kgs". Weight data is also used in transportation as transport companies are subjected to maximum weight and maximum cube regulatory limits.

Case Configuration/Net Content

This was the big-ticket item highlighted by all retailers in the survey. When goods arrive at a retailer's receiving bay and the carton net content, i.e. the number of consumer units, differs from the retailer's expectations and from what was ordered, everything suddenly stops. The supplier must be contacted and purchase orders and advance ship notices must be re-written and re-submitted before the receiving process can be advanced. In some instances, where differences cannot be resolved, trucks have been turned around and sent back.

These delays have a flow-on effect throughout the distribution centre and for the trucks of other suppliers waiting to meet their allotted delivery slots at the centre. The distribution centre must also come under increased scrutiny due to chain-of-responsibility legislation requirements. This also complicates the accounts reconciliation process, which is required to correct the issues.

The cost for individual organisations is high, but the overall cost to the industry is higher due to reduced service levels and more goods being out of stock.

TI/HI

TI/HI is a colloquial grocery term referring to the number of boxes per pallet layer (TI) and the number of layers stacked on a pallet (HI). This information is critical to retailers assigning pick slots in the warehouse. The pallet height ensures safety when putting pallets away in pick slots where there may only be clearance of around 100mm surrounding the slot. This allowance can be filled by a pallet stacked six or seven high if the measurements are out by only a couple of centimetres. As a result the pallet may topple over on the forklift driver.

Most of the results were in the 80%-90% range for these criteria; however, the number was dragged down by the supplier with the second largest volume of matched products who scored particularly poorly.

Cost Implications of Bad Product Data

In order to understand the impact of bad product data, GS1 Australia discussed the findings of the survey with representatives of large retailers and suppliers. The most likely cost implications of the data misalignment highlighted in the study fall into three main groups:

1. **Manual Workarounds** 4%
2. **Administrative Shrinkage** 31%
3. **Lost Consumer Sales** 65%

Manual Workarounds

At every stage of a product's journey through the supply chain, data is required to identify, process, handle, route and re-route these items successfully. Manual workarounds may be categorised into two major areas of cost implication:

1. **Invoice and Order Reconciliation**
2. **Manual Data Entry and Workarounds**

Invoice and Order Reconciliation

Any mismatch between the goods supplied and the original purchase order significantly affects the supply chain. At the very least, the goods are held up until the issue is resolved leading to stores being out of stock.

Depending on the variations, the receiver of the goods could return the goods entirely or, having made appropriate investigations, re-issue the purchase order so it matches the despatch advice. In some cases the truck will be kept waiting while investigations take place, causing a ripple effect through other suppliers and transport firms as strict delivery schedules are pushed out.

If the goods are accepted, it can take months to reconcile the differences, leading to payment delays, customers being put on credit hold and finance issues.

It is estimated these issues will cost the Australian grocery industry around \$31 million over the next five years based on current data inaccuracies.

Manual Data Entry and Workarounds

The Australian grocery retail sector is a low-margin, high-volume industry characterised by a relatively small market, large distances and low-growth population. Retailers have focused on taking costs out of their supply lines by taking greater direct control of product movements and economies in logistics.

Significant investments in technology such as barcoding, electronic messaging and data synchronisation have helped increase automation reducing manual handling and supply chain costs significantly.

When these processes, which rely heavily on the underpinning data, are subjected to inaccuracies, the whole system slows down and becomes extremely inefficient.

When bar codes are keyed in, rather than scanned, when messages fail because the item code is wrong, the price differs from what was agreed or the carton quantities vary, the supply chain ceases to operate properly.

Specific areas that have been identified as requiring manual entry and workaround include:

- transportation under/over utilisation
- storage under/over utilisation
- planogram errors
- material handling problems
- capacity constraints
- duplication of measurement
- product rejection
- record maintenance

Associated costs are expected to amount to AU\$13.5 million over the next five years.

Administrative Shrinkage

Shrinkage is an area identified in a number of local and overseas reports as an area of significant concern, with leakage from the product supply chain. Shrinkage is the difference between what is shipped by the supplier and what is finally sold to the consumer. It can be caused by a number of factors including theft, obsolescence, poor stock rotation, waste and general inefficiency. Shrinkage is said to add up to between 1.5% and 2% of a retailer's total sales.

General inefficiency and product misidentification are the main culprits. When you don't know exactly what or where a product is, it is easy for it to become unsaleable before you have time to promote it or mark it down for immediate sale. The end result is process-driven shrinkage.

This form of shrinkage, caused by bad data or inefficient transmission of data, is expected to cause around 10% of total shrinkage or around AU\$316 million in the Australian grocery industry over five years.

Lost Consumer Sales

Lost consumer sales due to stores being out of stock are a consistent and persistent problem in the Australian grocery industry. A worldwide study by the Grocery Manufacturers Association (GMA) on out-of-stock levels shows that a global average of 8% of all items were out of stock at the time of measurement.

The study clearly shows that retailers' sales are directly at risk if on-shelf availability is not effectively addressed. When a consumer cannot find the product they wish to purchase on the shelf they will:

- Purchase the product they want but at another retail outlet – the retailer loses
- Purchase an alternative product – the supplier of the original product loses
- Go without – both the supplier and the retailer lose.

In Australia, a 2007-2008 report into the current state of on-shelf availability in the Australian and New Zealand food and grocery industry by ECRA and Accenture found that the percentage loss in sales responses resulted in a weighted average of 4.4%.

The cost of lost sales due to bad data is expected to amount to AU\$675 million over five years.

Total Costs

The total cost of bad data in the Australian grocery supply chain will amount to AU\$1.035 billion over five years.

Kimberly-Clark

Kimberly-Clark Australia & New Zealand manufactures markets and sells leading health and hygiene products. The company was an early adopter of electronic data interchange (EDI) in its healthcare business as well as being one of the first companies to establish web-based business-to-business (B2B) trading in 1997.

It was also one of the first manufacturers to support data synchronisation through GS1net and all Kimberly-Clark products carry GS1 Bar Codes. In 2009 Kimberly-Clark established three new distribution centres with operations dependent on accurate synchronised material records, and the business approached GS1 Australia to deliver a data-quality solution to achieve this.

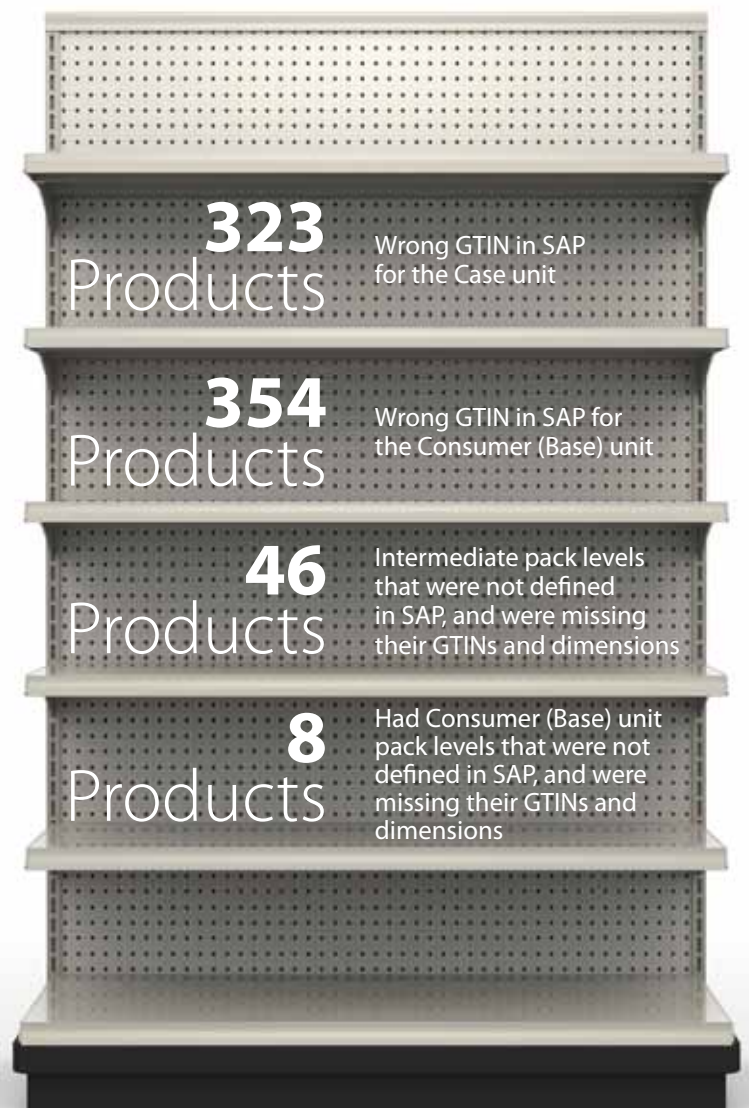
The objective of this audit was to assess and rectify errors with bar code numbers Global Trade Item Numbers (GTINs), product dimensions, weights, contents, item descriptions and physical packaging descriptions across all levels of packaging on a pproximately 1,193 imported items. The project also included physically reviewing a number of data attributes and comparing this data against internal systems to ensure information was accurate and complete.

The company decided to focus on externally procured stock-keeping units (SKUs), which in the past had not been as rigorously controlled as internally manufactured SKUs. The company suspected that the bar coding and data on these SKUs was not meeting GS1 standards.

During the physical audit products' bar codes were scanned, packaging levels opened and pack quantities counted and recorded. The team measured all stock dimensions and recorded gross and net weight. The actual audit covered 907 products comprising 1,526 packaging levels. The audit focused on products for which the data was suspected to be inaccurate. It found that:

- Dimensions for almost 100 per cent of consumer (base) and intermediate units, and a high percentage of case units, were missing or wrong in SAP.
- Weights for almost 100 per cent of all units were missing or wrong in SAP.
- The contents of some Cases, Intermediate and Consumer (Base) units for a few materials were wrong in SAP.

Some 18 months later, Kimberly-Clark's data was consistently of a higher quality than its competitors in this Data Crunch Study, scoring much greater alignment with all retailers.



Retailers and suppliers are constantly seeking fresh supply chain initiatives to speed products to market faster and utilise warehouses, delivery vehicles and shelf space more effectively.

Key performance indicators funnel down to two imperatives: increasing sales and reducing costs. While the objectives are clear, there is little understanding of just how far collaboration between suppliers and retailers and the implementation of fresh supply chain initiatives that deliver sales growth and cost economies depend on a solid foundation of accurate, clean and consistent product data.

An additional compelling reason for retailers and suppliers to take action to improve efficiency and manage the quality of product data more effectively is the increasing demand for better information coming from consumers, government, regulators and pressure groups.

Consumer Health

Consumer concerns about healthy eating and allergies place a growing responsibility on retailers and manufacturers to provide more information on product ingredients including eggs, milk, fish, soya, wheat and nut content. The consequences of getting this information wrong could be serious for the consumer, the supplier and the retailer who would be exposed should inaccurate data cause consumers to be harmed. Any resulting bad media exposure could have a severe impact on brand image.

New Consumer Outlets

Consumers exercising increased choice are driving supermarkets to offer alternative shopping outlets. There has been a rapid increase in convenience stores and online outlets offering home delivery. As technology advances, there will be an inevitable demand for grocery shopping from mobile devices and, no doubt, through other as-yet-unknown channels in the future.

Each new channel places fresh demands on the retailer for new sizes, packs and categories of product, which in turn multiply the volume of product information that needs to be sourced and maintained. This exponential demand for data can only be managed effectively through a high-quality, centralised data management process that ensures consistency and accuracy.

Walmart has recently admitted the folly of reducing choice and options within a category, a trend that was being followed in Australia. We would expect a reversal to be reflected locally, with retailers keen to increase the selection for consumers to keep them in their stores. This will result in the need to manage more data.

Product Traceability

Increasingly diverse products and product sources place a heavy burden on retailers to track the origins of product batches and distribution through the supply chain. It is important to know the constituent ingredients of products in case any ingredient becomes the subject of a health alert, so action can be swiftly taken to identify all affected products and withdraw relevant batches. Identifying ingredients across the many tens of thousands of products handled by a major grocery chain, and tracking products through complex supply chains requires comprehensive product attribute data from the supplier that is readily available at a central point, rather than buried within a maze of spreadsheets in local stores and warehouses, or simply missing from the entire organisation.

Diverse Products & Sources

The variety of products sourced by supermarket chains is constantly growing, with an average product life of 2.3 years. Sourcing products is also becoming more complex. Fruit, vegetables and grocery products are arriving from more and more countries, with different cross-border taxes and quotas, a variety of weight and volume systems, and different labelling, packaging and language standards.

This diversity adds to the complexity of product data and increases the risk of error if data quality is not properly managed.

At the other extreme, supermarkets are responding to environmental pressures to reduce their carbon footprint by sourcing produce where possible within a tight radius of local stores. Small local producers have less sophisticated methods of measuring, shipping and packing products and providing product information. Retailers will need to accommodate these extremes of international and local product sources within their data repositories.

Environmental Issues

Grocery retailers and suppliers are faced with growing pressure from consumers and lobby groups for comprehensive information about how products, packaging, product sourcing and distribution logistics impact the environment. The type and nature of environmental information are continually evolving, adding to the quantity and scope of product attributes that need to be collated, stored and maintained.

Meeting information demands from consumers, pressure groups and regulators while at the same time increasing the volume and diversity of stores, consumer outlets, products and suppliers places a heavy toll on the quantity, quality and availability of product information. Couple with this the financial imperative to move products faster through the supply chain, reduce stock and maintain high shelf-availability for consumers, and there is an irresistible imperative to improve the quality and performance of product data management.

The supply chain continues to function and satisfy the needs of consumers, but at a high financial cost in manual workarounds, a high incidence of lost sales and significant product shrinkage.

In the past, rapid market growth and the expansion of large grocery retailers have compensated for the hidden costs in keeping the supply chain functioning. However, retailers need to pay more attention to raising efficiency levels and streamlining activities. Improving the quality of product data and reducing the time and effort it takes to obtain, manage and distribute consistent and accurate information across the business will play an important part in delivering operational benefits.

As the grocery industry becomes more complex, product life cycles shorten and consumer outlets become more varied, the demand for faster delivery of more diverse and accurate data will increase.

Additional pressures are being imposed by consumers, governments, regulators and pressure groups demanding more information on nutritional, environmental, packaging and other product attributes.

To keep pace with these demands and manage product information efficiently and economically, retailers and suppliers will need to collaborate to maintain and exchange accurate product data.

What should retailers and suppliers do to improve data quality, taking costs out of the supply chain and increasing top-line revenue by serving customers better?

- Review the GS1 Data Quality Framework (DQF) and employ it throughout their businesses
- Develop capabilities to check and publish master data through GS1net and using tools available from GS1net-certified partners
- Work off a single repository that feeds all sales channels
- Ensure proper security and governance as set out in the DQF.

The GS1 Data Quality Framework

The Data Quality Framework (DQF) provides an industry-developed best practice guide for improving data quality and allows companies to better leverage their data-quality programs, ensuring a continuously improving master data generation cycle. It details the crucial processes and capabilities that help organisations improve their data integrity and maintain a sustainable high-quality data output.

The DQF can be downloaded from www.gs1.org/gdsn/dqf/data_quality_framework

Documents and reports referred to in this report:

ECRA/EAN EANnet Feasibility Study – 2002

GS1/ECRA Accurate Product Measurement – Items and Trade Units – 2007

ECRA Guide to Collaborative Loss Prevention – 2002

GS1 UK data Crunch Report – 2009

ECRA/Accenture; The On Shelf Availability Challenge – 2007-2008

Other sources include:

IBM Global Benchmarks – Retail Industry

Retailer Interviews conducted by GS1 Australia & IBM – 2011

www.rateinflation.com

ABS Retail Trade, 2010 sales (estimated) Food Retailing



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