



by **Dr Caroline Chan**, RMIT University

Australian healthcare industry Data Crunch

Quantifying the benefits of accurate data in an electronically enabled supply chain



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Abstract

The Australian healthcare industry data crunch was commissioned by industry under the auspices of the National E-Health Transition Authority (NEHTA) Supply Chain Reform Group (SCRG), and developed in partnership between GS1 Australia, the Medical Technology Association of Australia (MTAA), NEHTA and Royal Melbourne Institute of Technology (RMIT). The report highlights the outcomes that can be gained from an in-depth study about data quality, using analysis of key business processes to identify potential benefits.

This is done by studying five scenarios within three business cases – procurement, external logistics and reimbursement of prostheses. The report identifies the benefits to all parts of the supply chain from bringing healthcare product data quality up to best practice. The aim of the Healthcare Industry Data Crunch report is to focus industry attention on the need for continual data quality improvement in healthcare ¹.

Introduction

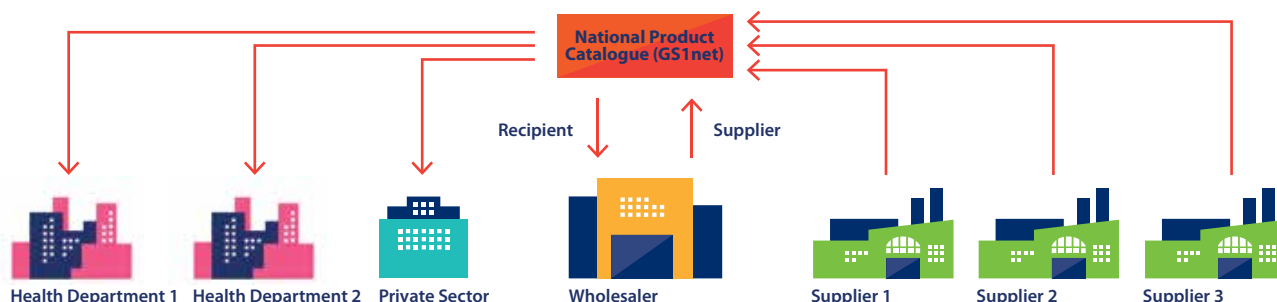
The Australian healthcare sector is a AUD\$120 billion-plus growing industry ², and with a rapidly growing population where 13.5% of residents are over 65 ³, the country can ill afford inefficient healthcare supply chain practices. The healthcare supply chain itself is complex, involving various players, with the ultimate objective of delivering the right product to the right patient at the right time. Accurate healthcare supply chain data is essential to achieve this objective.

The importance of quality product data in the Australian healthcare supply chain has been well understood for many years. As a result, data synchronisation was a primary focus in the NEHTA SCRG starting with the deployment of the National

Product Catalogue (NPC) in 2006. Hosted on GS1net, GS1 Australia's Global Data Synchronisation Network (GDSN) compliant platform, the NPC uses the GS1 Global Trade Item Number (GTIN) as the primary identifier for all products at all levels of packaging.

The NPC now contains more than 300,000 records and is being used by more than 400 healthcare industry organisations operating in Australia, encompassing global and local suppliers, distributors, public and private sector hospital networks, and retail pharmacy chains. Using the NPC, suppliers have the ability to provide standardised, consistent data in an automated way to trading partners across Australia including all healthcare jurisdictions, private sector networks, wholesalers and distributors, as detailed in Diagram 1.

Diagram 1: National Product Catalogue data flows



1 This case study is a summary of the full report, available from <http://www.gs1au.org/industry/healthcare/>
 2 Refer: <http://www.aihw.gov.au/australias-health/2012/spending-on-health/>; Note all monetary values quoted in this report are AUD
 3 Refer: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3201.0>



Seven years after the deployment of the NPC, the healthcare sector has seen a slowly increasing consistency and accuracy of product data. As a result, the industry is well positioned for a step-change to drive data quality further.

The participants

Four Australian state government jurisdictions and three suppliers participated in the study. Participants represent all functions within the healthcare supply chain. The supplier and jurisdiction sizes varied, ensuring all organisations were represented on both sides of the trading relationship.

Study participants

Role	Approx. number of orders / month	NPC status ⁴
Buyer	3,235	Integrated ⁴
Buyer	850	Integration project in progress
Buyer	900	Integration project in progress
Buyer	12,500	Integrated
Supplier	4,500	Data loaded
Supplier	47,000	Data loaded
Supplier	3,500	Data loaded

These organisations currently trade with each other to varying degrees, as detailed in Diagram 2. Each buyer represents up to 20% of their supplier's total sales volumes, ensuring the data crunch analysis and results have representative relevance.

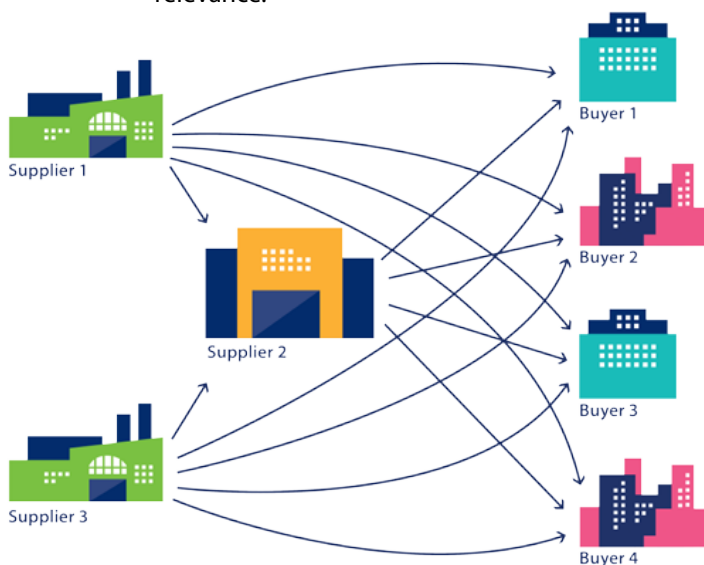


Diagram 2: Data Crunch participant trading relationships

⁴ Integrated means the supplier automatically pushes electronic messages containing changed data or new products to the NPC and the buyer receives automatic updates (via electronic messaging) of this changed or new data.

Business processes analysed

Procurement

The majority of procurement activity currently undertaken in the Australian healthcare sector relies on identification of products using the vendor item code and unit of measure. The vendor item code is the supplier's internal reference number or internal product number allocated to identify a particular product. Net content and unit of measure describe the amount of the product contained in a package.

Vendor item code data was provided in all data files. Results showed a minimum match of 28.6% and maximum match of 100%. Net content and unit of measure data was also provided in all files. Matching varied from 0% to 99.6% for the two fields. Anecdotal feedback indicates this is significant improvement on pre-NPC accuracy.

Participants advised that when the vendor item code and unit of measure are used during manual procurement processes, associated data fields, such as price and description, are often double-checked. However, when a GTIN is used to identify a trade item (product) at a specific level of content (i.e. a different and unique GTIN is allocated to each product at each level of packaging, refer to Diagram 3), double checking of the vendor item code and unit of measure is no longer needed.

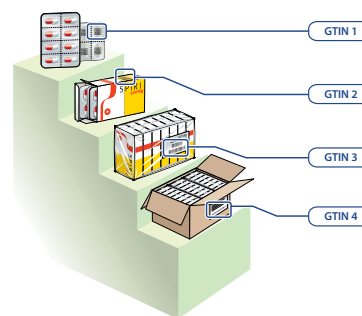


Diagram 3: Example healthcare product hierarchy

Participants indicated that their suppliers' customer service teams normally receive orders, review the total value and associated vendor item code, then divide the total by the number of items ordered to determine which unit of measure is being ordered.



Potential cost per annum of manual checking of unit of measure





Incorrect units of measure result in either undersupply or oversupply of goods. Undersupply could mean that hospital stores are unable to supply wards, which can potentially affect patient care levels. It was reported that at least once a month there is a need to place an emergency delivery order due to undersupply.

This incurs priority shipping costs at approximately AUD\$1,000 for each shipment to a regional location.

At a conservative estimate, considering both regional and metropolitan hospitals, catering for urgent deliveries due to undersupply has the potential to add AUD\$4.37 million per annum to Australian healthcare supply chain costs.

This cost does not include the time and effort required of staff to address the initial error and arrange the urgent order. Nor does this take into account the impact of stock unavailability delaying medical procedures and impacting patient care.

External logistics

Shipping goods between trading partners requires all parties to have accurate weights and dimensions for the products being shipped. These weights and dimensions can also be used for activities such as warehouse management, optimal shipment and transport packing, imprest layout planning and Occupational Health & Safety (OH&S) compliance.

The gross weight of the product, the dimensions, height, width and depth of the trade item⁵ were studied.

Findings indicated some participants could not provide product gross weight and dimensions data.

⁵ Refer: GDSN Package Measurement Rules, GS1 Standards Document Issue 1.11.1, Jun-2011.

⁶ Refer: <http://www.health.gov.au/internet/main/publishing.nsf/Content/health-privatehealth-prostheseslist.htm>

Participants advised that due to lack of accurate weights and dimensions, logistics units are packed 'as best as possible', recognising that there is a lot of expensive 'fresh air' (partially filled cartons) being shipped.

Each part of the healthcare supply chain is currently measuring the same products to collect weights and dimensions data. One participant hired a weight and dimensions measuring device for one month to measure, at carton level, the top 1,000 products traded by their business. Not only did they incur significant equipment hire and staff time costs, the measurements cannot be taken as absolutely correct as measuring weights and dimensions is considered an 'expert' task.

Based on information provided by participants, the need for even 50 industry supply chain partners to independently source product weights and dimensions for the same items, adds AUD\$6.98 million per annum to industry costs.

The overall labour costs across the sector would be much higher, and the logistics of moving items to measuring equipment is also complex and expensive.

Reimbursement of prostheses

As specified by the Private Health Insurance Act 2007, mandatory benefits for prostheses included on the Prostheses List must be paid by private health insurers to hospitals using these items. The Prostheses List contains the benefits applicable, and lists more than 9,000 products⁶. All are identified with a Prostheses Rebate or Billing Code (PRC), often assigned at the supplier product family level, rather than to individual products. Both public and private hospitals require a link between products (identified by their GTIN) and their PRC to ensure the correct claims.





PRC data was provided by three participants⁷. Results showed some positive matching (one file matching 41.5%), but overall results were considered inconclusive⁸. Participants indicated that accurate communication of the link between the GTIN and the PRC between suppliers and buyers is a significant issue.

The effort for hospitals across Australia in keeping the product to PRC relationships up to date manually is not only onerous but prone to error, as demonstrated by existing poor data-matching levels. All of this is done manually via phone calls from hospitals to sponsor (supplier) organisations. One participant claims their hospitals spend up to one hour per week per hospital phoning suppliers to verify codes.

When extrapolated across the Australian healthcare sector, time to make phone calls to suppliers to clarify PRCs has the potential to add AUD\$1.26 million to hospital resourcing costs. Sponsors (suppliers) will bear similar resourcing costs, so the financial impact would double.

The manual process of keeping the link between products and their PRC up to date often also means that rebatable items are not identified, leading to loss of revenue for the hospitals. One health services organisation had identified a variance between claimable products purchased and used, and those products actually claimed in the 2011–2012 financial year. This equated to AUD\$175,000 of lost revenue.

It is important to note that there are a large range of non-joint related prostheses, including stents, pacemakers and defibrillators. There would be additional savings should these product categories be studied.



Potential lost revenue from unclaimed joint replacement prostheses

Overall business implications

The five scenarios quantified in this study identified a potential total saving of AUD\$30 million per annum for the Australian healthcare supply chain.

Another five areas of saving were also identified through the study but not qualified:

- Time and effort required of staff on both sides to address the initial error and arrange the urgent delivery
- Reverse logistics in the case of oversupply
- Rejection of prostheses claims due to inaccuracies, coupled with the cost of the supplier companies providing on-site staff to verify claim information
- Lost revenue from inaccurate linking of data to patient for non-joint related prostheses claims
- Stock being unavailable for patient care and associated costs of delayed or cancelled procedures



Conservative potential savings from improved data quality for all business processes met by the NPC data set

The future

All participants in this project have communicated their vision for the future involving an electronically enabled healthcare supply chain.

“Prior to the NPC, the industry kept applying short-term fixes to try to resolve their product data accuracy. Each short-term fix adds hidden resource costs and complexity. The introduction of the NPC means that half-efforts and short-term fixes can’t be used anymore. This ensures that best practice is implemented – a significant and positive change for the sector.”

⁷ It should be noted that this field only applies to a subset of products from some participants.

⁸ There is potential for incomplete data, as some products requiring a prostheses rebate code may not have had this included in the data files provided.





There has also been quantification of the time taken to advise trading partners of a single new product via various mechanisms, as detailed in Chart 1:

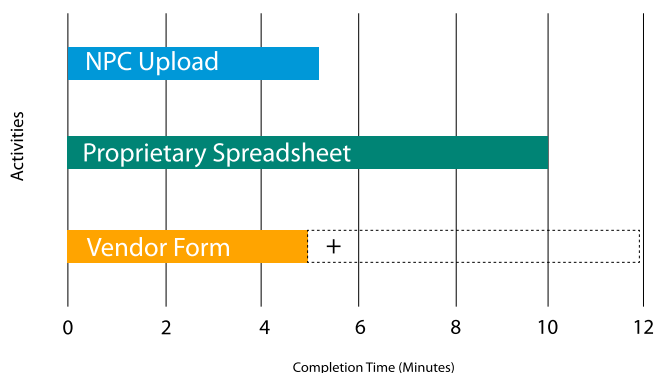


Chart 1: New product communication activities

- Uploading the same data to the NPC – initially 5 minutes to complete (including data validation); this provides communication to all key trading partners at once avoiding re-creation of data for different trading partners
- Completing a proprietary spreadsheet – 10 minutes (per buyer)

- Communication via a vendor form – 5 minutes to complete + time to email by each vendor for each customer.

The work involved in loading and maintaining the NPC, which provides accurate data to all public and key private sector buyers, is less than that for other methods of data communication.

The healthcare industry Data Crunch

The aim of the Healthcare Industry Data Crunch report is to focus industry attention on the need for continual data quality improvement in healthcare. The benefits of accurate data are confirmed via a number of scenarios. Clearly, the costs of inactivity and accepting poor-quality data as the norm are unacceptable.

The project participants call on all Australian healthcare companies to adopt the National Product Catalogue and work together to improve product data quality for supply chain efficiency and to improve patient safety.

About the authors

Dr Caroline Chan, Head of School Business IT and Logistics, RMIT University Dr Caroline Chan is a full Professor and is the Head of the School of Business IT and Logistics at RMIT University. Caroline undertakes research in the area of Business IT and Supply Chain Management, and has chaired and been involved in many academic and industry projects. Professor Chan has over 20 years teaching experience in Australia and overseas. Caroline holds a PhD in Information Systems (Deakin), MEng in Systems Engineering (RMIT) and BEng (Hons) in Electronics Engineering (Petra).

Mark Brommeyer, Manager Supply Chain, NEHTA Mark leads the Supply Chain Reform Programme at NEHTA, incorporating the National Product Catalogue (NPC), the eProcurement solution and purchasing reform. Having spent 30 years in the health sector, he has provided consultancy, project and change management services in public and private health sectors in Australia, New Zealand, Malaysia, China, England and Wales.

Mark is a Registered Nurse and has obtained a Bachelor of Applied Science in Nursing, a Graduate Diploma in Adult Learning and a Master's of Educational Administration (Open Learning).

