

Title	Food and Beverage Data Quality Framework
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Document Purpose

The purpose of this document is to be the central guide to the Food and Beverage Data Quality Framework. It complements the Executive level¹ document which describes the need for a data quality framework in the Australian Food and Beverage sectors.

The document is intended for all participants whose roles are defined herein. The main audience is Publishers/Suppliers who are required to deliver quality data into the National Product Catalogue (NPC).

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1.0 Food and Beverage Data Quality Framework

In any automated, digital process the quality of the data used to feed the process is critical. The Australian Food and Beverage sectors are now comprised of many automated digital processes that have been designed around accurate item data. When the quality of the data feeding these processes is low, significant costs are incurred.

The GS1 Australia Food and Beverage Data Quality Framework has been developed to address the data quality issues. The framework provides the information needed to implement sustainable data quality practices. It requires ongoing commitment from all stakeholders to be successful.

2.0 Scope of the Framework

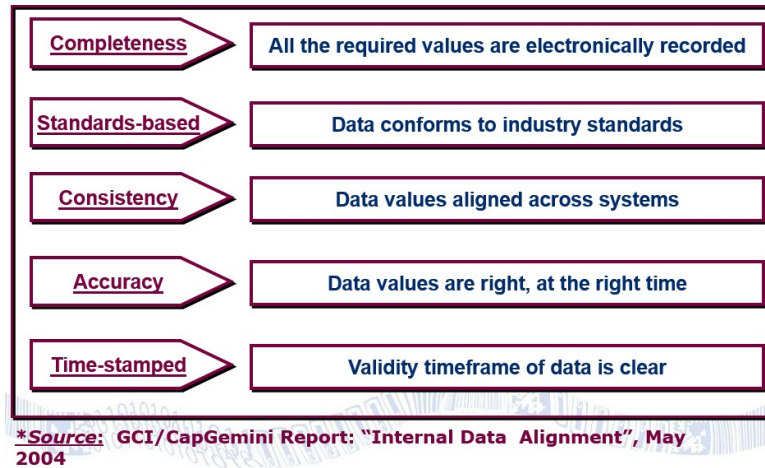
The scope of the Data Quality Framework is to remediate all data quality issues within the NPC and to develop and implement sustainable data quality management processes.

2.1 Remediation of Data Quality Issues

A key aspect of the Data Quality Framework is the automated generation of monthly data quality reports by GS1 Australia. The reports will be issued to both Publishers and Recipients to provide visibility of critical data issues and specific areas of error concentration. Publishers are required to review their report and correct any data quality issues identified by the reports. GS1 Australia offer a dedicated support to Publishers for the remediation of data quality issues.

2.2 What is Data Quality?

Underpinning the importance of understanding the meaning of the term “Data Quality”, the GS1 Global Office defines it with following pillars:



The NPC provides data validation using sophisticated rule-based tools. There is a diagram depicting the end-to-end validation process further down in this document.

The NPC validator can verify data to ensure that it is valid through a series of logic-based rules.

However, validated data does not necessarily equate to correct data. The NPC Validator cannot verify the accuracy of the populated individual field value. For example:

- A Country of Origin code may be present but may be the incorrect or unrelated code the for the specified item.
- A price may be present and correctly formatted but is no longer current and therefore should have been end-dated.
- Product dimensions may fall within valid tolerances, but the overall dimensional attribute value may be incorrect.
- Ingredients may have changed, resulting in a replacement product, but the update has not been made in the NPC.

This framework addresses policy and procedure around data quality from the supplier source, right through to the recipient systems that use the data. It is about remediating data that is already in the NPC as well as ensuring data quality sustainability. Each of the role owners have a responsibility for their part in the end to end data processes.

2.3 Why Data Quality

Trusted data quality exchanged between trading partners is critical to the efficient operation of the Australian Food and Beverage sectors. To realise the full potential of the NPC, trading partners must ensure that quality product and pricing information is aligned across their systems.

In the absence of reliable data, trading partners are forced to set up additional means to control data quality, resulting in increased complexity and costs.

2.4 Central Source of Truth – NPC

The Australian Food and Beverage sectors use the NPC⁸ as a data sharing tool for suppliers to publish standardised item data to Recipients. This framework objective focuses on the quality of the data in supplier systems, the NPC and in buyer systems.

The NPC adheres to global standards for data sharing and synchronisation across supply chains. It enables suppliers to provide master data to customers once, providing the opportunity to create a central “source of truth”. This “central source” has been very successful, but the “truth”, or quality, of the data needs to be addressed.

To that end, this framework focus is not specifically on the NPC, rather this framework is about the quality of the data within it.

The NPC provides validation tools and services to trap and identify “invalid” data. However, “valid” data is not the same as true “quality” data which must also be current and accurate.

The standardised nature of the data in the NPC means that a supplier’s internally-held data may need to be mapped or calculated before being sent to the NPC. Ensuring the mapping/calculation is accurate is part of data quality in the NPC. An example may be a supplier’s units of measure for a product must map to an identifying Global Trade Item Number (GTIN) in the product hierarchy.

2.5 What is a Data Quality Framework system?

A Data Quality Management (DQM) system is simply a set of processes that deliver quality data as its output.

Publishers/Suppliers will conduct a data quality self-assessment of the processes they use to capture, validate and verify Healthcare data. A standardised scorecard ¹is provided to prompt and record self-evaluation pertaining to data quality within organisations.

The self-assessment exercise will reveal the level of attention and process around data quality within the business and thus enable the planning and of a DQM system to address the identified data quality gaps and issues.

2.6 Sustainable Data Quality Management

Sustainable data quality is a critical aspect of the Data Quality Framework. The framework provides a framework for reviewing and or establishing Data Quality

¹ Food and Beverage Self-Assessment Scorecard available from the Industry section (Food and Beverage) within the GS1 Australia website

Management (DQM) within organisations. To assist Publishers to assess their DQM level, the framework includes a standardized spreadsheet-based scorecard tool⁹, customized for the Food and Beverage sectors. This user-friendly tool will allow suppliers to self-rate and produce a data quality score in the areas of:

- Strategy
- People
- Data
- Process
- Technology

Phase A: Action NPC Data Quality Report	Phase B: Conduct Data Quality Self- Assessment	Phase C: Plan DQM system	Phase D: Document & Implement DQM	Phase E: Review & Embed DQM	Sustained Data Quality
<p>Commit to the DQ Framework.</p> <p>Action NPC Data Quality Report – Begin data remediation</p>	<p>Manage and Complete Data Quality Self-Assessment using scorecard.</p> <p>Report results (internally)</p>	<p>Plan Data Quality Management (DQM) based on self-assessment</p>	<p>Document SOPs and Implement DQMS processes</p> <p>Report on data quality outcomes (internally)</p>	<p>Review and adjust SOPs</p> <p>Embed DQMS into Policy and finalise SOPs.</p> <p>Ensure DQMS authorities and succession in place</p>	<p>Conduct a second Data Quality (DQ) self- assessment to ensure that internal improvements have occurred.</p> <p>Monitor the NPC or internal DQ reports and action the necessary remediation</p>
Continuous Data Remediation					
Framework Outcomes	Framework Outcomes	Framework Outcomes	Framework Outcomes	Framework Outcomes	Framework Outcomes
<ul style="list-style-type: none"> Supplier committed to Framework Supplier has commenced remediation of their data 	<ul style="list-style-type: none"> Visibility of internal supplier data quality status Continued data remediation 	<ul style="list-style-type: none"> Supplier has planned a DQMS within their businesses Supplier has remediated existing NPC data 	<ul style="list-style-type: none"> Improved data quality across the business Improved stability of data quality for the business Clear identification of non-compliant suppliers 	<ul style="list-style-type: none"> DQM embedded across business Risk of data quality degrading over time mitigated 	<ul style="list-style-type: none"> DQ is a high priority and is embedded in business- as-usual processes DQ issues that arise, are identified and remediated earlier in the data lifecycle Subsequent analyses can show significant improvement in areas such as prosthetic rebate revenues and other areas previously impacted by low data quality

3.0 Phase A: Action the NPC Data Quality Report

Phase A requires internal business communication at a senior management level, stating the organisation’s commitment to the Data Quality Framework. The intention of the internal communication is to ensure that the business is aware of senior management support for the framework and to drive the accountability and change adoption across all levels of the business, effectively putting the Data Quality Framework into action.

Suppliers with data loaded to the NPC (Publishers) will be sent monthly **NPC Data Quality Reports**. As the NPC data validation rules have continued to expand and evolve over time, a post load validation is applied across all historical data to ensure its compliance to the current rule set and give opportunity for remediation (data quality monthly reports).

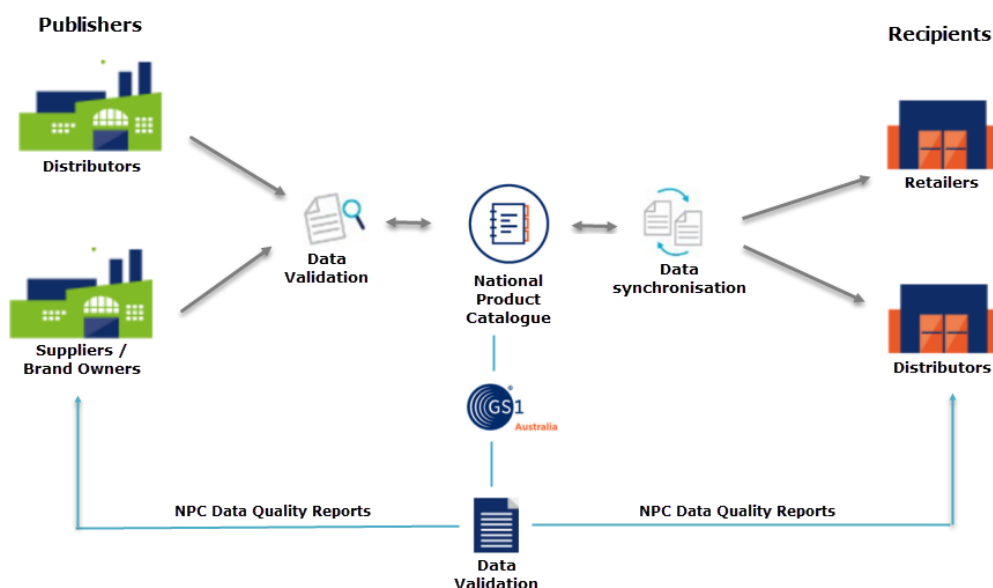
Data Recipients will also receive a monthly data quality report listing the data quality status of each of their trading partners (publishers). The Data Recipient summary report will group Publishers in accordance with their data quality status or ranking.

A comprehensive list of items (GTINs) identified as errors will be included within the Publishers Data Quality reports. The Data Publisher is responsible for the correction and or data enrichment and the re-publication of these items.

Support for data remediation activities is available by contacting your National Product Catalogue Customer Support Advisor, alternatively please email NPCcustomersupport@gs1au.org or call **1300 227 263** (option 4, 1 and then 2).

3.1 Data validation Process: end-to-end

The diagram below shows the end-to-end flow of master data, via the NPC, from Supplier/Publisher to Buyer/Recipient.



At the first point of “Data Validation” a standard set of validation rules are applied to data before it can be loaded into the NPC. The applicable rule set can vary slightly, depending on the intended Data Recipient. All data must be validated before loading to the NPC¹¹.

The format and channel of the validation report received by a Publisher depends on the data load method. There are four methods of uploading data into the NPC, two are manual and two are automated as follows:

Manual Data Upload Options

- Publisher Excel file load
- Publisher Graphical User Interface (GUI)

Automated Data Upload Options

- NPC Certified Product (Middleware)
- In-house developed upload (XML) files

4.0 Phase B - Data Quality Self-Assessment Scorecard

The purpose of completing a self-assessment is to provide a deeper level of understanding of the current state of data and the related data processes.

The identification of gaps either within data or processes will become an enabler for sustainable data quality. Completion of the self-assessment exercise may bring to light further opportunities within the business for the use of reliable data.

The first self-assessment will be completed in phase A of the framework implementation and then repeated a second time towards the end of the phased framework, once improvements have been implemented.

The Self-Assessment Scorecard tool provides an ability to benchmark data quality performance based on the achieved score. Demonstrated commitment to data quality is shown in the improvement of scores.

The Scorecard tool can be used to compare performance across functional areas or across product ranges etc. adopting best practices from the higher performing areas to improve others.

Results can be communicated to key Data Quality Framework stakeholders within your business to reflect the trend of data quality sustainability across the sector.

User instructions are located on the first worksheet.

5.0 Phase C – Plan Data Quality Management (DQM)

Data quality and process gaps identified through the Self-Assessment process may require varied approaches to achieve an end goal of sustainable, fit-for-purpose data quality. Depending on the level of process complexity, identified gaps may be simple to close or you may require data mapping/translation or other processes to be

carried out. Determining these requirements will provide the basis for the business Data Quality Management (DQM).

5.1 Senior Management Commitment and Appointment

What must a DQM system achieve? It must enable the business to reliably deliver quality data into the NPC. Ensuring cross functional accountability within the roles of the business responsible for the data inputs through every stage of the data management processes. Includes prompt remediation action of data quality issues and the related process gap closure to ensure sustainable data quality.

Due to the critical nature of data quality within the Food and Beverage sectors, it is a requirement to have a defined system with documented processes irrespective of business size.

For a small business, perhaps supplying only a few products, the DQM System may be quite simple, requiring the participation of one or two people to check data accuracy in every instance. This may be achieved by the introduction of a data quality manual that identifies data related roles and responsibilities and is rigorously followed.

In a larger business, the DQM system has many touchpoints across multiple areas in the business so it requires the support of senior leadership to be successful. It may involve the appointment of senior managers for each of the areas of data ownership over the various business process owners, such as:

- Regulatory
- Marketing
- Packaging
- Logistics
- Administration
- Sales (pricing)

Data quality directors or stewards may form a business group and provide the focal point for all data-related needs within the group. They may be a cross- departmental team of data governance staff who are responsible for data quality end-to-end. These people must be engaged to help plan and implement the Data Quality Management system.

5.2 Data Quality Awareness and Culture

Culture around data is changing. The quality of the data about a product is now as important as the product itself.

Preparing the business to embrace data quality means creating a culture around its importance. Early engagement with Data Recipients gives opportunity to work with them and provide case studies on how they are affected by data quality and in turn provide data quality insights from the supplier business perspective.

Everyone involved in data quality roles has a responsibility for their part in the

process. The raising of awareness of the impact of poor data can assist in the development of a sense of necessity/pride. Reward and recognition for individuals that show commitment to good data quality can drive the adoption of a best practice/process culture.

Development of a clear set of objectives for Data Quality Management system. DQM objectives can be derived from sources such as data quality issues:

- Identified by customers
- Appearing in NPC Data Quality Reports
- Process or other gaps identified in the Self-Assessment process

5.3 Create Data Quality Management Processes

The Data Quality implementation and operational plan must ultimately meet all the objectives set for your Data Quality Management system.

The Self-Assessment includes questions about the topics below:

- Finding the origin of the data; how does it get created and where is it stored?
- What format is it in relative to the requirements of the NPC data set?
- What operations. For example, mapping or translation must be done to transform data into valid NPC data?
- How is data verified? Who is authorized to verify data?
- How are updates/amendments traced?
- Does the business adhere to GS1 standards for?
 - Measurement of items
 - Item numbering allocation (GTINs); new items and changed items
 - Location allocation (GLNs)
- How is authorization for data to be published externally to customers via the NPC achieved?
- Will data be in a central database with secure/authorised access? If not, how will it be aggregated ready for publication?
- Does the business understand and accommodate the scope of item publication required by your Customers? E.g. only ranged items vs all items
- Is pricing published at the required level using correct location identifiers (e.g. state or region codes)?
- Identify the internal processes that trigger or should trigger the creation or updating of master item or price data

5.3.1 Food and Beverage NPC Data Considerations

- a. How does the business currently represent a product and its levels of packaging (units of measure), versus the GTIN and GTIN hierarchy structure of the NPC?
- b. Assuming a product with 3 levels of packaging (Case, Base and Intermediate), where the order unit is the Intermediate unit:
 - I. What happens if a change is made to the Case level (requiring a new GTIN) without changing the Base? How will this flow into NPC?
 - II. What happens if a change is made to the Intermediate level (requiring a new GTIN) without changing the Base? How will this flow into NPC?
 - III. What happens if a change is made to the Base level (requiring a new GTIN)? How will this flow into NPC?
- c. Can a given GTIN be present and active in more than one of the internal Item Masters at the same time? How will this flow into NPC?
- d. How is the rollover from current product variant to a new product variant managed? How is an End Date applied to the old version? How will this flow into NPC?

Classification structure:

- a. What is the current Product Classification method/structure (defined by the business for internal reporting), versus the UNSPSC and GPC classification structures? How will the data translate from internal to NPC?

Item data attributes:

- a. What NPC data attributes (for industry and/or individual Recipients) currently exist in internal systems? Are they in the same format as NPC?

Price attributes:

- a. What NPC Pricing attributes (for industry and/or individual Recipients) currently exist in internal systems? Are they in the same format as NPC?

5.3.2 Supplier Process Considerations

5.3.2.1 New Product Development/Introduction:

- What changes to current process are needed to capture all the item data attributes, especially those not currently captured? Is there a need to change Product Hierarchy structure? Is there a need to change Product Classification structure?
- How is the repeatability of this process assured (across any silos/geographies that may exist)? Is there clear ownership and clear roles and responsibilities?
- If the new product will not be available to every customer, or not at the same availability date, how will the control "ranging"/publication to the right customer(s) at the right time(s) be achieved?

- What metrics are currently tracked (or need to be tracked) to monitor this process to ensure it performs to target, and can be used to surface opportunities for continuous improvement, and to drive accountability?

5.3.2.2 Product Lifecycle & Rollover Management:

- What changes to current process are needed to have visibility and control over the end availability date of the old version, and the start availability date for the new version? By target market and/or by Recipient?

5.3.2.3 Price Administration

- What changes to current process are needed to capture all the price attributes, especially those not currently captured?
- How is visibility and control managed over the end date of the old prices, and the start date for new prices? By Recipient?

For each area, determine how the business can ensure the reliability/repeatability of this process (across any silos/geographies that may exist)? Is there clear ownership and clear roles and responsibilities?

What metrics are currently tracked (or need to be tracked) to monitor this process to ensure it performs to target, and can be used to surface opportunities for continuous improvement, and to drive accountability?

Each of the above analyses may yield a “gap” between current versus target state for which the business must determine how to close via:

- A. Process changes
- B. System changes and integration
- C. People changes to skills/competencies, roles, accountabilities, including managing staff continuity

5.3.2.4 Supplier IT Systems Considerations

- Will systems architecture be completely internal, or will there be utilisation of the services of middleware providers?
- What changes will need to be made?
- What integration will be required to connect systems?
- How will adds/changes be detected to data since last extract and upload to NPC?
- How will the publication of the right products to the right customers, at the right point(s) in time be managed?

5.3.2.5 Education & Training

Schedule and plan sessions for staff who are impacted by this project. This will include the data stewards and those who create, source and enter data into business systems.

6.0 Phase D - Document & Implement DQM

Documentation of the Data Quality Management system should include:

- Statements of a data quality policy and data quality objectives
- A data quality manual
- Documented procedures and records

The implementation progress should be monitored to ensure that the DQM system is effective and meets the policy objectives. A monitoring method should be established.

The activities include:

- Procedure for dealing with user feedback
- Data verification
- A review of the data input and processing procedures
- Product master data management
- Preventive action

The preventive action should include provisions to:

- Review data quality issues (including user feedback)
- Determine the causes of data quality issues
- Determine and implement action needed to ensure that data quality issues do not recur
- Correct data in the product master data

7.0 Phase E – Review & Embed DQM System

The review phase of the Framework measures the outcomes of the project against the original objectives and is required to ensure the business has adopted the necessary changes to sustain the achieved objectives. The following activities are included in this phase:

- Review of the Data Quality Policy
- Review of the Data Quality Management system objectives
- Repeat the Self-Assessment Scorecard and compare results to the previous results
- Ensure all issues presented in your monthly NPC Data Quality Reports from GS1 have

been addressed

- Audit of data quality processes against the SOPs as written and subsequent adjustment as needed.

8.0 Sustained Data Quality

On completion of the project review the business has moved from a project phase to business-as-usual. The expected outcome being sustainable data quality underpinned by policies, processes and role responsibilities embedded within the business.

The adoption of metrics enables the business to measure data quality as part of the DQM system.

Monthly NPC Data Quality Report will be sent to data publishers and recipients from GS1. The success of the Data Quality Framework will have resulted in few if any validation errors appearing in the report. Data quality sustainability can be measured by these reports. National Product Catalogue Customer Support Advisor(s) are available to assist data publishers and recipients - **1300 227 263** (option 4, 1 and then 2).

Completion of periodic self-assessments can be used as a tool to assist in achieving the goal of the highest possible scorecard result.

Fostering a collaborative relationship with customers regarding data quality can give a common understanding of data usage and data quality issues when they arise.

9.0 Party Roles and Responsibilities

This section of the document is important because it not only defines roles relative to the NPC it also documents the responsibilities within each role for this Data Quality Framework.

9.1 Supplier/Publisher

Data published into and shared via the NPC data pool remains the responsibility of the supplier/publisher.

Suppliers are responsible for ensuring that all data attributes requested by their trading partners are provided, that the data is accurate and fit for the intended purpose(s), and that it is updated on a timely basis to ensure currency and the continual ability of the data to be used. This constitutes quality data.

Supplier/Publisher may choose to maintain their data publication into the NPC via direct integration using XML messaging, by utilising a middleware solution, or by contracting a third party to load/maintain their data or by entering data using the NPC "Publisher" GUI.

Regardless of the method of load, it is critical that supplier/publishers have processes in place to maintain the highest possible quality of the data. Ideally the publication

of data into the NPC should become part of the new product introduction process as this ensures that all data is sourced and maintained throughout a product's lifecycle.

Suppliers/publishers control who has access to their data via PUBLICATION and the use of party identification (via GLN¹⁵). It is an important role of suppliers/publishers to work with their trading partners/buyers/Recipients to address identified issues with data, including but not limited to the data quality, missing products and pricing discrepancies to ensure the data they provide is always accurate and fit for purpose.

Suppliers/publishers will be provided with reports, tools and support to remediate your data and to plan and implement processes to ensure the delivery of ongoing quality master data.

Staff from the areas of product and price administration, regulatory, packaging, marketing and potentially other areas will be involved. Those who create, source and communicate master data about Food and Beverage products will be asked to research the processes used to create or source the data that must be provided into the NPC. The business will make improvements to those processes and then embed them, via training and documentation, into standard operating procedures and policy.

Specific responsibilities for Supplier/Publisher – Data Quality Framework:

- Provide written confirmation of commitment to the Framework when invited
- Provide a senior management contact for the Framework
- Remediate NPC data in response to NPC data quality reports
- Conduct a Data Quality Self-Assessment
- Implement a Data Quality Management system (DQM) within the organisation
- Embed the Data Quality Management System (DQMS) into policy and 'business-as-usual'
- Participate in Sustainable Data Quality

9.2 Buyer / Recipient

The engagement of suppliers/publishers should be led by the buyer/recipient with support from GS1 Australia.

Data published to buyers/recipients via the NPC must be quality data directly from the product source. The process eliminates recipient's need for repetitive processes to source, load and maintain product and pricing data. It also ensures that recipients are using correct, current data when transacting with suppliers/publishers.

Buyer/recipients should provide feedback to suppliers/publishers on an ongoing basis regarding the products required, issues with the data, new data requirements and the reason why the new data is being requested and how it will be used.

Buyer/recipients need to ensure that appropriate work-flows are in place to ensure that supplier/publishers data from the NPC is supporting other uses/systems within

the organization. Area's/functions such as Warehouse Management, Resource planning, Sales/Merchandise systems, Procurement tools, Inventory management, Internal catalogues, or specialist systems.

Buyer/Recipients need to have a robust process for reviewing the data during initial synchronisation to ensure data between suppliers/publishers and buyers/recipients is aligned for consistency between both source and user systems.

Any issues found during this process or subsequently should be addressed to the supplier/publisher immediately to allow the supplier/publisher to investigate, confirm or amend the data within the NPC. Failure to raise concerns and reinforce the need to update data undermines the value of the process and solution.

Specific responsibilities for Buyer/Recipient – Data Quality Framework:

- Commit to the Framework
- Drive and assist supplier/publisher action to remediate data quality
- Contribute to the understanding of how data is used by providing use cases for the data that has been requested, including;
 - Where the information will be used within their business
 - The systems/IT solutions that require the data
 - The processes the new data will support
- Provide documented visibility of the processes used during initial synchronisation with a supplier.
- Provide documented visibility of the processes used to query data and to accept corrected data.

9.3 GS1 Australia

GS1 Australia is a not-for-profit membership-based industry body. GS1 hosts the NPC and supports NPC suppliers/publishers and NPC buyers/recipients.

GS1 Australia's role in this Framework is to support members who are remediating their data as part of the Framework, via GS1 Australia's National Product Catalogue Customer Support team as well as generating and sending the monthly NPC Data Quality report to NPC members.

GS1 Australia will also support the management of the Framework to help drive the desired outcomes as stated.