



GS1 Data Quality Framework

Version 3.0

Issue 2, October 2010

Document Summary

Document Item	Current Value
Document Title	GS1 Data Quality Framework Version 3.0
Date Last Modified	October 2010
Current Document Issue	Issue 2
Status	Final
Document Description	Best practices and activities for the improvement of data quality.

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Log of Changes in Issue 2

Issue No.	Date of Change	Changed By	Summary of Change
Draft v0.1	24 September 2009	Gabriel Sobrino	First draft of content lay-out
Draft v0.2	10 December 2009	Gabriel Sobrino	Example of chapter developed for review
Draft v0.3	25 January 2010	Gabriel Sobrino	Revised chapter example with feedback from Daniëlle Hoekstra, Anna Nilsson and Fiona van der Linde.
Draft v0.4	29 January 2010	Gabriel Sobrino	Added content on chapter 2; modification of chapter 1 as suggested by the group during the call of 25 January 2010.
Draft v0.5	3 March 2010	Gabriel Sobrino	Added revisions on sections 1 and 2.2 provided by team members. Added sections 2.3 and 2.4.
Draft 0.6	22 March 2010	Gabriel Sobrino	Edited appendices as defined during the call of 8 March 2010; included chapters 3 and 4 on the main body of the document; applied changes based on feedback received by the group on section 2; included illustrations,
Draft for Public Review	29 March 2010	Gabriel Sobrino	Final edits and changes suggested by the group.
Final Draft	28 April 2010	Gabriel Sobrino	Final modifications based on the public review comments that were received.
Draft for Ratification	3 May 2010	Gabriel Sobrino	Final clean-up of the document.
Issue 1	20 May 2010	Gabriel Sobrino	Document finalisation for publication.
Issue 2	28 October 2010	Gabriel Sobrino	Minor typos corrected.

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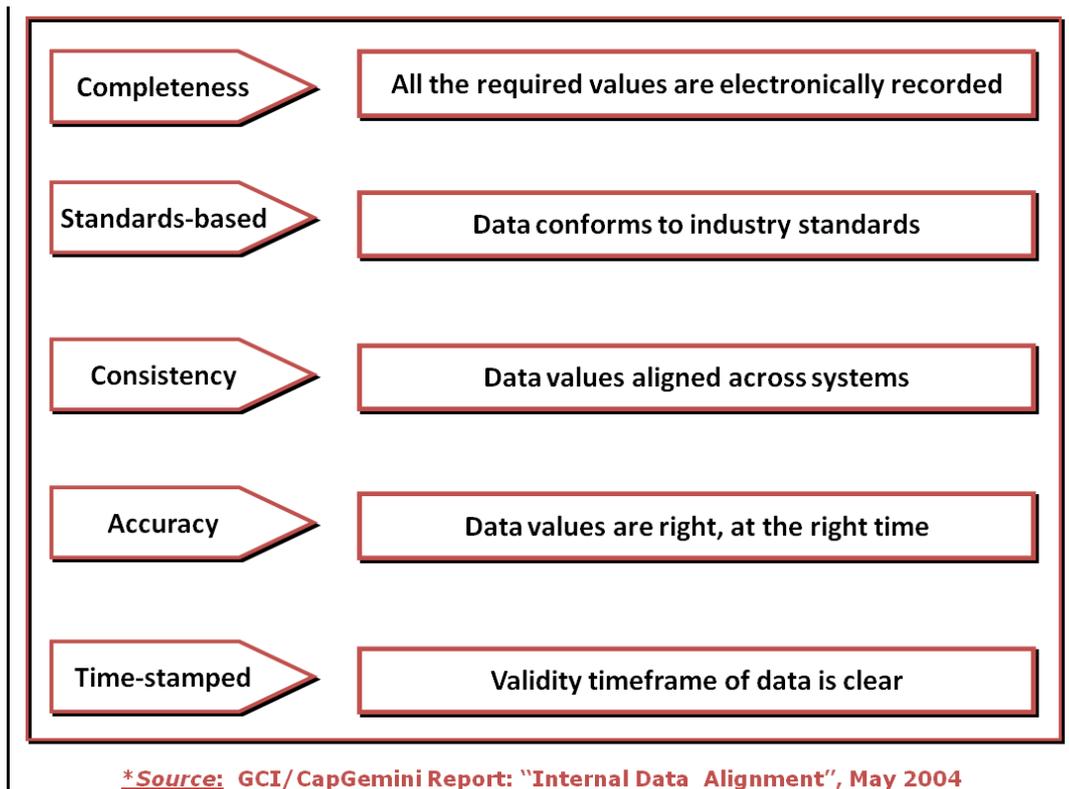
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1. Introduction

1.1. Benefits of Good Quality Data

Good quality data is foundational to collaborative commerce. Good quality data is defined as the state achieved when data conforms to all of the following five principles:



! **Important:** While sometimes the terms 'Data Quality' and 'Data Accuracy' are erroneously used as synonyms, users of this document should always bear in mind that 'Data Quality' refers to a number of principles being in place, whereby 'Data Accuracy' is merely the element referring to the accurate description of a trade item's characteristics.

By improving the quality of data within the end-to-end global supply chain, trading partners will reduce costs, improve productivity and accelerate product speed to market; for example, more accurate information on product weights and dimensions will contribute to better freight utilisation, eliminate the need for multiple measurement of the same product along the supply chain and reduce the number of resources required to re-work planogrammes.

Suppliers of data have a responsibility to timely synchronise good quality data and in return, recipients of data must have the internal processes and procedures in place to protect the integrity of data they synchronise with their trading partners. For example, Purchase Order data sent to a supplier should be consistent with data received via the Global Data Synchronisation Network (GDSN).

1.2. Overview of the Data Quality Framework

1.2.1. The Data Quality Framework

The Data Quality Framework was developed as a voluntary, sector-neutral, standardised solution that would enable trading partner collaboration in order to achieve the benefits of good quality data, regardless of their size, role or activity. The Data Quality Framework is based on a data quality industry protocol that consists of i) a data quality management system to validate the existence and effectiveness of key data management business processes and ii) an inspection procedure to physically validate product attributes.

This protocol has been included on the Data Quality Framework along with other elements to further expand on the areas where trading partners can collaborate in order to realise the benefits of good quality data.

Currently the Framework contains the following components:

1. **Data Quality Management System (DQMS):** provides guidance for organisations to establish, implement, maintain and improve a series of processes and activities related to the management of information and data quality of their master data output. This Data Quality Management System is critical to the medium to longer-term vision for consistent high quality data to flow through the global supply chain. This system will focus on the existence of internal business processes, procedures and common performance criteria.
2. **Self-Assessment Tools:** offers organisations means to perform a self-assessment against the key elements of the Data Quality Management System in order to reveal opportunities for improvement of the management of data quality. The self-assessment procedure can be used as a 'gap analysis' tool to show and prioritise the areas where an organisation could realise improvements.
3. **Product Inspection Procedure:** defines a standardised approach for the inspection of the characteristics of trade items and the comparison to their master data. GS1 standards are referenced in the inspection procedure, such as the GS1 GDSN Package Measurement Rules, the Global Data Dictionary (GDD), etc.
4. **Reference Documentation:** additional appendices that point to external documents or expand on the information provided on any of the previous sections.



Note: Besides the elements described above, additional implementation and reference tools are available to support the use and application of the Data Quality Framework. Please refer to the '**Data Quality Framework Implementation Guides v3.0**' for further information on how to use these tools.

1.2.2. Scope

While the best practices recommended by the Data Quality Framework can enhance any data management process, it is important to highlight that the Data Quality Framework was developed mostly with *product master data* as a main focus. In the future the Data Quality Framework may be expanded to cover more specific areas such as location/party data, consumer data, etc.

In the same way, the Data Quality Framework is a sector-neutral solution, however, the majority of implementations of the Data Quality Framework have occurred mostly fast-moving consumer goods retail supply chains.

1.2.3. Governance

GS1 has been entrusted with overall stewardship of the Data Quality Framework and its components; the GS1 Data Quality Steering Committee has been established to further define how to support the overall stewardship and management of the Data Quality Framework, including programmes for its implementation and adoption.

GS1 will further support the overall stewardship and management of the Data Quality Framework, including programmes for the implementation of the Framework through self-assessment and accreditation/certification procedures.

1.2.4. Guiding Principles

In developing the Data Quality Framework, the following guiding principles have been adhered to in order to ensure it remains a neutral, harmonised tool for data quality management. The Data Quality Framework:

1. Is based on user needs (e.g., suppliers and recipients of data)
2. Is voluntary like all GS1 Standards yet it is strongly encouraged within the Global Data Synchronisation Network (GDSN) community
3. Is implemented based upon requirements of a **given trading partner relationship**;
4. Is comprehensive in its structure and potential implementation, yet provides for flexible implementation, as required by the trading partners
5. Minimises implementation, management and other additional costs to the global supply chain and enables readily quantifiable benefits to all supply chain partners
6. Is complementary to and evolves with changes to GS1 standards
7. Is based on a data quality industry protocol formed by two components: i) data inspection against product characteristics and ii) a data quality management procedure to validate the existence and effectiveness of key data management business processes
8. The inspection component defines a standardised approach for product inspection (e.g., use GS1 measuring rules, inspect common attributes, use a common sample size and leverage GS1 packaging tolerances). It accounts for small, medium and large enterprises
9. The Data Quality Framework provides guidance for organisations to establish, document, implement, manage, maintain and improve their data quality management system
10. Enables trading partners to choose their approach to implement and/or comply to the Data Quality Framework's recommendations and requirements
11. Is based on an open system, whereby entities may offer services for product inspection and compliance assessments based on the Data Quality Framework document
12. Is open for use by any business entity to use the document including solution providers -- its widespread application is actively encouraged. However, official certification cannot be provided by non-accredited organisations
13. Has been subject to an industry review period
14. Includes ongoing governance to provide stewardship over the future development of the document and any programmes for its adoption
15. Is based on a principle that manufacturers own and are responsible for the data they synchronise through their "Home Data Pool" and that they do not accept any third-party updates in the public domain (without their consent)

It is accepted that future evolution of the Framework will continue to adhere to these guiding principles.

2. The Data Quality Management System

A Data Quality Management System (DQMS) is a series of documented, periodically-reviewed procedures that are implemented within an organisation to maintain and support the production of good quality data.

A DQMS is a natural enhancement to the data management processes that companies in the industry have already developed and implemented internally to manage their product information.

Due to its nature, a DQMS involves a wide spectrum of areas and activities and it supports bringing together different functional elements of the organisation into a single, harmonised work-stream. However, this also means that there are multiple ways in which a DQMS can be set up within companies and that there are several 'starting points' for this work.

Companies willing to start a (or review their current) DQMS are encouraged to identify their priorities and opportunities with their trading partners in order to focus adequately on the areas that yield the greatest benefit.

 **Note:** For a first time exploration of opportunities and capabilities, it is recommended to make a discovery self-assessment which can help reveal general areas of attention. For more information about the self-assessment procedure and questionnaire, please refer to [section 3 "Self-Assessment"](#).

Acknowledging the importance of having standardised reference parameters over an 'optimal', the industry designed the first versions of The Data Quality Framework as a collection of best practices and desirable behaviours that contribute to the creation of a DQMS. The list of these recommended practices came to be known as 'The Data Quality System Requirement' which were one of the main components on which the rest of the Data Quality Framework was built upon.

 **Note:** The original Data Quality Management System Requirements can be found for a reference within the document for guidelines for testing services against the Data Quality Framework.

In order to help organisations navigate all the elements that interact within the context of a DQMS, the following section has been created as a 'compass' that can point organisations to the key areas of the organisation where said DQMS recommendations play a significant role in enhancing the performance of the organisation in relation to the quality of its product information.

The sections below are organised in functional areas for which different types of activities have been identified.

The functional areas are:

- **Organisational capabilities** that define the organisation's action capacity
- **Policies and standards** needed to provide governance and reference
- **Business processes** which drive the day to day operation
- **Systems capabilities** necessary to support the business

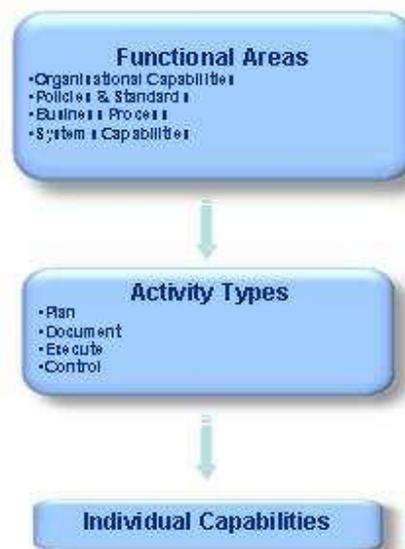
Within each one of those functional areas, there are four main types of activities where the recommended Data Quality Management System Requirements (DQMRS) play a role and should be considered as part of an organisation's approach. These types of activities are:

- **Plan.** Refers to all activities related to the definition of a strategy and approach used to develop the opportunities that an organisation wishes to pursue. All activities under this

section help an organisation plan for the path towards achieving internal and external organisation goals.

- **Document.** The activities here contained deal with the formal documentation of the processes and procedures executed as part of the daily operations of the organisation. These capabilities help build a clear context around the way in which the activities of an organisation are defined and maintained for operational excellence.
- **Execute.** These activities look at the practical execution of processes within the organisation and the areas of attention that should be considered to support uniformity in the fulfilment of tasks by different areas.
- **Control.** Relates to the continuous control and measuring of results and impact of the actions taken by the organisation. Also supports the assessment of possibilities for continuous improvement.

Organisations using this document are advised to use the combinations of functional areas and type of activities to easily locate specific capabilities where the application of the Data Quality Framework's recommended best practices is essential for a high quality data output.



- ✓ **Note:** Please refer to the 'Data Quality Framework Implementation Guides 2010' for further detail in the application and use of the sections below.

- ! **Important:** Please remember that these guidelines are intended to be applicable across different industries and types of organisation, therefore these are merely to be used as a reference and do not represent a specific prescription for implementation.
- ! **Important:** Ultimately, the implementation of any of the areas below is relative to the individual needs of the specific relationship between two trading partners. Any actions should be prioritised according to the particular circumstances of the organisations executing them.

The following matrix provides an overview of the capabilities for a data quality management system organised by functional area and activity type:

	Organisational Capabilities	Policies & Standards	Business Process	System Capabilities
Plan	Executive sponsorship - Mission & vision; Accountable leadership; Staff roles & skill sets; Data owners & stakeholders; Data governance office.	Mission & vision; Goals & objectives; Guiding principles; Success measures; Action plans; Policy & standards management	Initial data entry & setup; Ongoing data maintenance; Processes involved in the information's life-cycle	Unified data repository; Design & architecture; Workflow, user interface; Data validations; Security, access controls; Revision/change history; External publication; Internal publication
Document	Governance organisational structure; Roles & responsibilities; Personal objectives; Reporting alignment	Mission, goals, principles and success measures; Governance model, decision process; Data definitions & standards; Security & use policy; Audit procedures; Documentation standards; Risk Management; Customer feedback policy	Operating procedures; Process flow diagrams; Job aids, work instructions; Performance metrics	System requirements; Operating procedures; Performance metrics
Execute	Education & awareness; Internal communication; Training	Education & awareness; Documentation management; Policies & standards management; Data issue management; Training; Customer feedback resolution	Education & awareness; Performance management; Process issue management; Change management	*See note on section 2.4.3
Monitor	Organisational capability review; Review of personal objectives	Policy & standards review	Workflow controls; System validations; Performance reporting on service levels; Performance reporting on data quality; External & internal feedback; Process compliance audits; Product measurements; Review & reporting of audit results; Monitor impact of erroneous data	Performance reporting on service levels

2.1. Organisational capabilities

2.1.1. Plan

- Executive sponsorship - Mission & vision
 - **What:** Secure endorsement from the executive levels of the organisation for the projects to improve data quality in the organisation.
 - **Why:** The implementation of any programmes or actions for data quality will require the organisation to commit not only to make the necessary resource investments but also to commit to certain cultural changes in the organisation. Without direct and clear executive sponsorship it will be very difficult to ensure the aforementioned conditions.
 - **Recommended to:** Show how improving data quality can directly support the mission and vision of the organisation; communicate the importance and impact of data quality across the organisation.
 - **Example:** A high-impact presentation for executives featuring the estimated costs of bad data on lost sales, out-of-stocks and other issues, also Internal websites, email newsletters, etc.
 - **Questions to ask:**
 - Is there an ongoing internal communication process on any aspect of data quality, to create awareness within the organisation on the importance of providing highly accurate data? (2.4.1)

- Accountable leadership
 - **What:** Define clear roles and responsibilities for the process leadership team and ensure they are understood and known across the organisation.
 - **Why:** For a process to flow efficiently, governance has to allow for clarity regarding the steps to follow in case controversies arise or decisions need to be taken along the execution.
 - **Recommended to:** Review that the responsibilities of the leadership of the process are balanced with their reach in the organisation and that support exists for them across multiple levels in the company.
 - **Example:** Description of data quality manager responsibilities
 - **Questions to ask:**
 - Do the manager(s) who are appointed have the responsibility and authority to ensure that processes needed for the data quality management structure are established, implemented and maintained? (2.1.2)
 - In case more than one manager is appointed: Has the division of responsibilities been recorded and communicated throughout the organisation? (2.1.3)

- Staff roles & skill sets
 - **What:** Define and clarify the exact profile of each one of the roles that are needed to successfully manage a DQMS in the organisation and plan the resources needed to support said roles.

- **Why:** It is essential to have a reference regarding the performance expected from the people executing the activities of the DQMS. It will also help ensure that people receive the training needed for their tasks.
 - **Recommended to:** Rely on the project leadership to define the best set of skill needed for each part of the process. Ensure that profiles are aligned and compliment different organisational areas.
 - **Example:** Job descriptions, checked by HRM, QA management
 - **Questions to ask:**
 - Has the organisation defined the data quality management roles and responsibilities? (2.1.1)
 - To what extent has the organisation identified what skills and talents are required in managing data quality? (2.3.1)
- Data owners & stakeholders
- **What:** Identify and appoint the owner(s) of the data across the organisation and make sure that in cases where more than one data owner is present, the relationship between them is clear and is consistent with the overall structure of the DQMS.
 - **Why:** Clear data ownership is fundamental for reliable governance of the process.
 - **Recommended to:** Emphasise that 'data ownership' refers to the person who is responsible for coordinating actions for the improvement and maintenance of the information; in this capacity, data ownership refers to the oversight of the data and helping decide on the best ways to secure its integrity.
 - **Examples:** Responsibility Assignment Matrix (RAM or RACI Matrix)

	Category Manager	Logistics	Data Manager
Legend: R = Responsible for I = Informed C = Consult			
Data entry on the system			
Generate GTIN	I	I	R
Measure product	I	R	C
Provide marketing data	R	I	C
Validate product information	R	I	C
Enter into system	I		R

Example of a RACI Chart

- **Questions to ask:**
 - Is the ownership of the data within the organisation defined, documented, implemented and/or regularly reviewed? (1.3.1)

- Roles & responsibilities
 - **What:** Ensure that all the roles and responsibilities defined for the staff involved in the process during the planning phase are properly documented and made available for the organisation.
 - **Why:** Documenting the roles and responsibilities is necessary to define the competencies for the staff that is to execute them; it will allow a better evaluation of performance just as it will help the organisation to provide them with the right tools and knowledge.
 - **Recommended to:** make sure the roles and responsibilities are consistent with the governance model.
 - **Examples:** Documented description of management responsibilities
 - **Questions to ask:**
 - Has the organisation defined the data quality management roles and responsibilities? (2.1.1)
 - Do the manager(s) who are appointed have the responsibility and authority to ensure that processes needed for the data quality management structure are established, implemented and maintained? (2.1.2)
 - In case more than one manager is appointed: Has the division of responsibilities been recorded and communicated throughout the organisation? (2.1.3)

- Personal objectives
 - **What:** Include data quality-related performance goals as part as the personal objectives of the staff involved in the DQMS in order to promote further involvement and formalisation of those objectives in people's roles.
 - **Why:** It will provide not only formality to the relevance of data quality for the organisation but also additional motivation for people to excel at the data quality-related tasks.
 - **Recommended to:** Help personnel define goals that are realistic but valuable for each one of their roles.
 - **Examples:** Required competencies for the functions on the process,
 - **Questions to ask:**
 - To what extent has the organisation identified what skills and talents are required in managing data quality? (2.3.1)
 - To what extent does the organisation evaluate the effectiveness of the actions taken to increase the competencies of personnel regarding data quality? (2.3.5)

- Reporting alignment
 - **What:** Define standardised reporting procedures so that performance across the organisation can be measured on the same terms.
 - **Why:** Harmonised reporting methods will help ensure that the organisation is measuring progress evenly and that results show the real state of the organisation.
 - **Recommended to:** Apply the same scales for measurement across multiple areas and the same type of reporting for information.
 - **Examples:** Documented guidelines for the realisation of internal audits.

- **Questions to ask:**
 - Does the organisation make use of standardised monitoring and measuring processes? (1.3.3)

2.1.3. Execute

- Education & awareness
 - **What:** Conduct the necessary education programmes needed to ensure people understand what data quality is and what is its impact and importance to the company and its clients.
 - **Why:** There must be clear understanding of the concept and role that data quality has in supporting good results for the organisation in order to promote higher acceptance.
 - **Recommended to:** Try to link data quality to the daily activities that people have; even those not directly related will find it interesting to see how many touch-points exist across the organisation.
 - **Example:** Internal newsletters, announcements, meetings and sessions to inform personnel of changes.
 - **Questions to ask:**
 - To what extent does the organisation maintain appropriate records of education, training, skills, and experience? (2.3.4)
 - Is there an ongoing internal communication process on any aspect of data quality, to create awareness within the organisation on the importance of providing highly accurate data? (2.4.1)
- Internal communication
 - **What:** Engage in communications across the organisation to show how these initiatives support the main organisational objectives, mission and vision.
 - **Why:** There must be clear understanding of the role that data quality has in supporting good results for the organisation in order to promote higher acceptance.
 - **Recommended to:** Develop messages that speak to the particular context of the different areas involved in the process.
 - **Example:** Internal newsletters and websites, announcements, meetings and sessions to inform personnel of changes.
 - **Questions to ask:**
 - Is there a process in place to keep the organisation up-to-date regarding the GDSN requirements? (1.2.2)
 - Are the results of audits shared within the organisation? (2.2.2)
 - Is there an ongoing internal communication process on any aspect of data quality, to create awareness within the organisation on the importance of providing highly accurate data? (2.4.1)
 - Are the results on the performance indicators communicated within the organisation and if applicable to 3rd party service providers? (3.1.7)

- Training
 - **What:** Provide the necessary technical training to the personnel involved so they can perform their functions as described in the documented roles and responsibilities.
 - **Why:** It is essential to ensure that people have the right knowledge and skill sets they need to obtain satisfactory results in the execution of their tasks.
 - **Recommended to:** Define training programmes based on the documented roles and personal objectives.
 - **Example:** Execution of training programmes based on personal training records and evaluations.
 - **Questions to ask:**
 - Is there a process in place to keep the organisation up-to-date regarding the GDSN requirements? (1.2.2)
 - To what extent are people working with master data part of an ongoing training program? (2.3.3)
 - To what extent does the organisation maintain appropriate records of education, training, skills, and experience? (2.3.4)
 - To what extent does the organisation evaluate the effectiveness of the actions taken to increase the competencies of personnel regarding data quality? (2.3.5)

2.1.4. Control

- Organisational capability review
 - **What:** Conduct periodical reviews of the documentation of the governance structure, process flow, roles and responsibilities and ongoing training programmes to evaluate the effectiveness and/or to define improvements.
 - **Why:** Continuous improvement is the fundament of a good process. The governance structure needs to be updated periodically to catch up with internal changes and variations that may appear naturally through the years.
 - **Recommended to:** Form a committee responsible for the conduction of periodical reviews to the documentation and process. Ensure the reviews are not too close to become irrelevant but not too far apart to become obsolete.
 - **Example:** Yearly holistic review of objectives and performance; auditing compliance of the process to policies/goals.
 - **Questions to ask:**
 - Is the ownership of the data within the organisation defined, documented, implemented and/or regularly reviewed? (1.3.1)
 - Does the organisation periodically audit the Data Quality Management Structure? (2.2.1)
 - Are the results of these audits shared within the organisation? (2.2.2)
 - To what extent do the people who manage data quality have the right talents and skills set? (2.3.2)
 - To what extent are people working with master data part of an ongoing training program? (2.3.3)

- To what extent does the organisation maintain appropriate records of education, training, skills, and experience? (2.3.4)
 - To what extent does the organisation evaluate the effectiveness of the actions taken to increase the competencies of personnel regarding data quality? (2.3.5)
 - Based on the results of the analysis of performance indicators, are the necessary follow-up actions executed? (3.1.6)
- Review of personal objectives
 - **What:** Along with the personnel, review the degree of progress that they had in regards to their personal objectives over data quality.
 - **Why:** Evaluation of results is needed to re-calibrate actions that may need corrections or to update the goals that people have.
 - **Recommended to:** Do this as part of the overall evaluation of the personnel.
 - **Example:** Compare performance and competencies of personnel to the documented target descriptions and goals.
 - **Questions to ask:**
 - To what extent has the organisation identified what skills and talents are required in managing data quality? (2.3.1)
 - To what extent do the people who manage data quality have the right talents and skills set? (2.3.2)

2.2. Policies and Standards

2.2.1. Plan

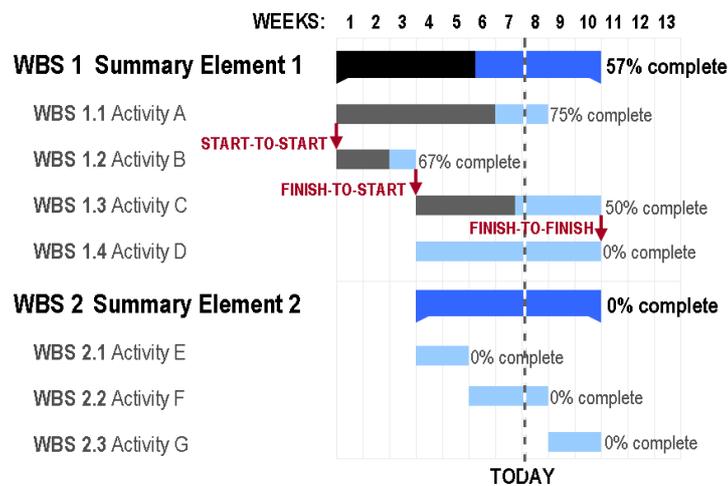
- Mission & vision
 - **What:** Develop and/or update the mission and vision statements to reflect the expectations for the medium to long-term planning of the organisation in regards to the management of the quality of their data.
 - **Why:** A good mission statement goes a long way; having a clear direction for the medium and long term helps daily and short-term operations to stay focused to the grander objectives of the organisation.
 - **Recommended to:** Ensure that the mission and vision for quality support the general direction and planning of the organisation; data quality is as much as part of a product as anything else, so make sure that integration is reflected on the mission and vision.
 - **Example:** Mission and vision statements.
 - **Questions to ask:**
 - Does the organisation have a data quality policy? (1.1.2)
 - Is there an ongoing internal communication process on any aspect of data quality, to create awareness within the organisation on the importance of providing highly accurate data? (2.4.1)

- Goals & objectives
 - **What:** Develop and/or update the objectives and milestones that the organisation has to achieve in order to fulfil its mission and vision for data quality.
 - **Why:** In order to walk towards the desired state for the organisation, progress has to be measured through a consecution of goals along a roadmap.
 - **Recommended to:** Make sure the objectives defined conform to the SMART (specific, measurable, attainable, relevant, time-bound) criteria.
 - **Example:** Definition of quarterly KPI's for the organisation.
 - **Questions to ask:**
 - Does the documentation of this data quality management structure includes data quality management manual, objectives and targets? (1.1.3)

- Guiding principles
 - **What:** Plan and establish the leading policies and principles that will direct the execution of the Data Quality Management System as well as its further development.
 - **Why:** It is necessary that an organisation adheres to key unchanging principles that lead to its long-term vision in order to prevent it from diverging from its objectives.
 - **Recommended to:** Derive the principles from the core values of the organisation and the long-term vision.
 - **Example:** List of core guiding principles.
 - **Questions to ask:**
 - Does the organisation have a data quality policy? (1.1.2)
 - Is there an ongoing internal communication process on any aspect of data quality, to create awareness within the organisation on the importance of providing highly accurate data? (2.4.1)

- Success measures
 - **What:** Define the criteria that establishes what is considered successful performance within the measurable objectives,
 - **Why:** Having a measure of what represents satisfactory performance will not only give more depth to the monitoring of goals and KPI's but it will also allow the organisation to define when certain maturity has been achieved in the roadmap allowing it to progress to the next stages.
 - **Recommended to:** Successful performance should be realistic but ambitious enough that it represents a leap forward for the organisation.
 - **Example:** The minimum score required in audits and/or performance evaluations.
 - **Questions to ask:**
 - To what extent are the objectives on data quality management measurable? (1.1.4)

- Action plans
 - **What:** Develop plans for the roll-out/implementation of improvement measures and programmes.
 - **Why:** Formalised planning is necessary for the successful execution of any improvement actions.
 - **Recommended to:** Have a standardised approach to the development of actions plans; consider that the same planning criteria may be used for anything from new training programmes to system implementations,
 - **Example:** Plan to implement new validations on the data, plans to train and evaluate personnel.



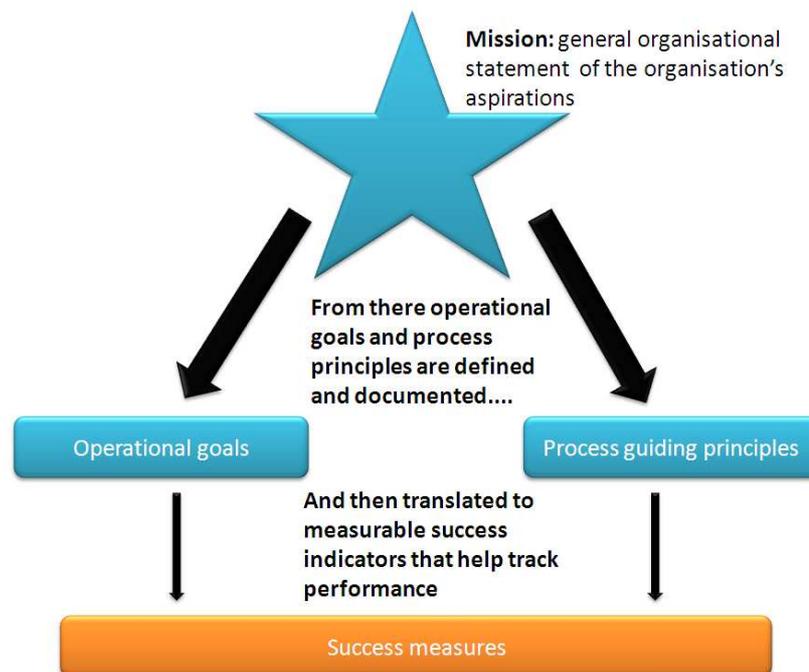
Plans can be controlled through Gantt charts (example taken from www.wikipedia.org)

- **Questions to ask:**
 - To what extent does the documentation of this data quality management structure contain the data quality management action plans? (1.1.5)
 - Do the audits result in documented, communicated and implemented action plans, if required? (2.2.3)
- Policy & standards management
 - **What:** Define responsibilities and processes for the management and maintenance of the policies and standards that support and guide the Data Quality Management System.
 - **Why:** In order to maintain a cycle of continuous improvements, it is important to ensure that the guiding principles and policies of the Data Quality Management System can evolve along with the organisation; for that purpose, it is necessary to manage and continuously update those elements.
 - **Recommended to:** Make sure that there are clear internal responsibilities for the different elements that need to be maintained and that the full organisation is aware of the importance of adopting all policy and standard changes.
 - **Example:** Participation on Global Standards Management Process (GSMP) to maintain standards updated for the organisation; application of change management methodologies.

- **Questions to ask:**
 - Does the organisation have a data quality policy? (1.1.2)
 - Does the organisation have a GTIN, GPC and GLN allocation policy? (2.5.1.6)

2.2.2. Document

- Mission, goals, principles and success measures
 - **What:** Record and formally put down all guiding principles, goals and definitions that the organisation planned.
 - **Why:** Formal documented policies and goals are essential; documentation of the policies and principles allows the organisation to refer back to the original vision and objectives in order to remain on scope.
 - **Recommended to:** Ensure these elements are documented on a repository that can be accessed by anyone within the organisation. (See figure below for relation chart of mission, goals, principles and success measures).



- **Example:** Data quality policy for the organisation, mission and vision statements.
- **Questions to ask:**
 - Does the documentation of this data quality management structure includes data quality management manual, objectives and targets? (1.1.3)
 - To what extent are the objectives on data quality management measurable? (1.1.4)

- Governance model, decision process
 - **What:** Create formal documentation of the governance structure and responsibilities within the Data Quality Management System.
 - **Why:** Having a clear charter for the governance structure will make the operation easier and will give legitimacy to all actions within the process.
 - **Recommended to:** Make sure the governance structure is available to everyone and that it is adjusted as needed depending of the feedback of the process.
 - **Example:** Governance charts for the process, chartered responsibilities for every level in the governance structure.
 - **Questions to ask:**
 - Is the ownership of the data within the organisation defined, documented, implemented and/or regularly reviewed? (1.3.1)
 - Does the organisation periodically audit the Data Quality Management Structure? (2.2.1)
 - Are the results of these audits shared within the organisation? (2.2.2)

- Data definitions & standards
 - **What:** Maintain internal documentation for the organisation regarding the requirements and definitions for the data that is managed within the Data Quality Management System and preferably, for the organisation as a whole.
 - **Why:** Compliance to these technical specifications and standards is the leading criteria used to determine whether data is correct or not.
 - **Recommended to:** Ensure that the documentation on standards is constantly updated and readily available across the whole organisation.
 - **Example:** Copies of the GS1 Package Measurement Rules, GDD, definitions.
 - **Questions to ask:**
 - To what extent has the organisation implemented processes to guarantee that the data output produced by the Data Quality management System comply with GDSN requirements for data synchronisation? GDSN requirements include all corresponding standards such as GDD definitions, GTIN Allocation rules, GDSN Packaging measurement Rules, etc) (1.2.1)
 - Is there a process in place to keep the organisation up-to-date regarding the GDSN requirements? (1.2.2)

- Security & use policy
 - **What:** Define and document specific policies for the safeguard of the integrity of the data, in terms of its accessibility, edit-rights, privacy, etc.
 - **Why:** These policies (and their enforcement) are necessary to protect the data's integrity.
 - **Recommended to:** Make sure the security and access-rights policies enforce the structure defined by the governance model.
 - **Example:** Different access levels (edit, read-only, etc) given to personnel depending on their role in the process.

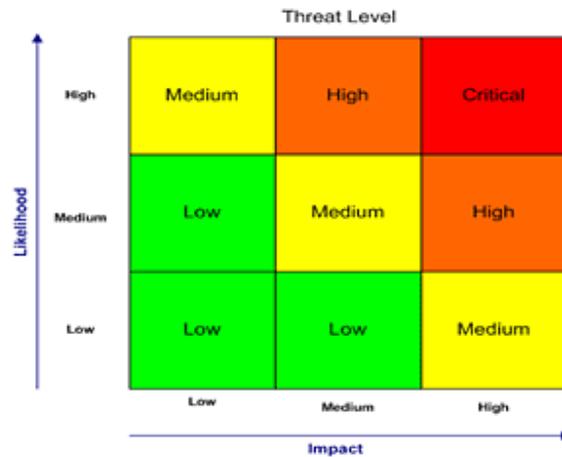
- **Questions to ask:**
 - To what extent does the database structure have access authorisation procedures? (1.4.2)
 - Does the organisation have a structure in place to ensure the security of data from unauthorised change? (1.4.3)
 - Does the data publishing procedure include: appropriate authorisation? (2.5.3.5)

- Audit procedures
 - **What:** Define and document a standardised protocol for the execution of internal audits of the performance of the Data Quality Management System and its data output.
 - **Why:** Formal rules and procedures to conduct evaluations and audits ensure reliable and objective results.
 - **Recommended to:** Develop these audit guidelines in line with the **audit** criteria used for other areas of the organisation.
 - **Example:** Product inspection procedure of the Data Quality Framework.
 - **Questions to ask:**
 - Do the audits result in documented, communicated and implemented action plans, if required? (2.2.3)
 - Is there a process for determining the criteria, scope, frequency and methods for executing internal audits of the data quality management system? (3.3.1)

- Documentation standards
 - **What:** Establish minimal requirements and conventions for the documentation of the process.
 - **Why:** Standardised documentation makes their management easier and ensures the quality of the content.
 - **Recommended to:** Ensure the documentation allows for the tracking of changes, that it is time-stamped and that previous versions can be clearly identified from the current ones.
 - **Example:** Templates for minutes, audit inspections, etc.
 - **Questions to ask:**
 - Do you have a procedure implemented to facilitate changes to the Data Quality Management System? (1.1.7)

- Risk Management
 - **What:** Identify and assess possible risks and document risk-assessments criteria in order to prioritise/evaluate actions carried out in the Data Quality Management System,
 - **Why:** Clear risk assessment helps an organisation focus on the actions that deliver the greatest value and support to general organisational objectives,
 - **Recommended to:** Use consistent criteria on the assessment of risks.

- **Example:** Risk-assessment matrixes.



Example of a risk management matrix

- **Questions to ask:**
 - To what extent does the documentation of this data quality management structure contain the data quality management risk identification, risk assessment, and risk control actions? (1.1.6)
- Customer feedback policy
 - **What:** Establish a policy for the management and processing of customer feedback, including complaints.
 - **Why:** A customer-feedback policy will allow everyone within the organisation to process customer feedback correctly improving the response given by the organisation to its customers.
 - **Recommended to:** Make your customer policy known not only to those directly involved with customers, but to all that contribute to the process so they are aware of the organisation's commitments to their customers.
 - **Example:** Guidelines for the timeframe in which customer complaints/requests should be answered.
 - **Questions to ask:**
 - Is a documented procedure in place for handling customer complaints concerning data quality? (3.2.1)
 - Are improvement actions initiated based on the analysis of customer feedback? (3.2.2)
 - Are formal responses issued to customers in regards to their data quality complaints? (3.2.3)

2.2.3. Execute

- Education & awareness
 - **What:** Roll-out programmes to create understanding of the policies, goals, governance and principles of the Data Quality Management System.
 - **Why:** Implementation of policies and governance starts by engaging everyone in the organisation and creating awareness and understanding about the measures.
 - **Recommended to:** Customise the message to different parts of the organisation; showing people where they fit in the process is a great way to create engagement and acceptance.
 - **Example:** Email newsletters, internal website, internal informational sessions.
 - **Questions to ask:**
 - Is there an ongoing internal communication process on any aspect of data quality, to create awareness within the organisation on the importance of providing highly accurate data? (2.4.1)

- Documentation management
 - **What:** Execute plans for periodical revision and maintenance of the documentation of the Data Quality System,
 - **Why:** Necessary to have a real continuous improvement cycle and to keep the process always relevant and updated.
 - **Recommended to:** Establish a fixed frequency for the revision of the documentation.
 - **Example:** Periodical policy revisions.
 - **Questions to ask:**
 - Do you have a procedure implemented to facilitate changes to the Data Quality Management System? (1.1.7)

- Policies & standards management
 - **What:** Apply the defined procedures for the management/modification of standards, policies and technical specifications.
 - **Why:** Necessary to have a real continuous improvement cycle and to keep the process always relevant and updated.
 - **Recommended to:** Participate in industry groups for external standards; internally, have executive reviews of current policies.
 - **Example:** Process to adopt internally new standard definitions.
 - **Questions to ask:**
 - Is there a process in place to keep the organisation up-to-date regarding the GDSN requirements? (1.2.2)
 - To what extent does the review include assessing opportunities for improvement and the need for changes to the data quality management structure, including the data quality management policy and objectives? (4.1.2)

- Data issue management
 - **What:** Establish a process to investigate and result data inconsistencies that are either found by the organisation or reported by customers.
 - **Why:** Being able to track discrepancies to the source is essential for future prevention of errors.
 - **Recommended to:** Make sure the process is connected to the internal governance model and the customer-feedback policy to ensure efficient processing of discrepancies both internally and externally.
 - **Example:** Process to track changes on the data; records of previous versions of the information.
 - **Questions to ask:**
 - Do the audits result in documented, communicated and implemented action plans, if required? (2.2.3)
 - To what extent does the data publishing process include all necessary provisions to ensure that product data attributes published into external data pools can be traced back to its origin? (2.5.3.4)

- Training
 - **What:** Verify that the training programmes that have been planned contain the right content and can provide the necessary technical information.
 - **Why:** Necessary to ensure that training programmes contain information that is relevant and necessary for participants.
 - **Recommended to:** Align training updates to other external/internal review periods for standards and policies; that will simplify the maintenance process of the documentation,
 - **Example:** Reviews of the content of training courses.
 - **Questions to ask:**
 - To what extent are people working with master data part of an ongoing training program? (2.3.3)
 - To what extent does the organisation evaluate the effectiveness of the actions taken to increase the competencies of personnel regarding data quality? (2.3.5)

- Customer feedback resolution
 - **What:** Implement or update procedures to process and resolve customer feedback.
 - **Why:** Customer feedback should be used as input for further improvement of the Data Quality Management System.
 - **Recommended to:** Ensure the customer feedback resolution process ties-in correctly to the data issue resolution procedure,
 - **Example:** Key-account management policies, service level agreements (SLA's).
 - **Questions to ask:**
 - Are improvement actions initiated based on the analysis of customer feedback? (3.2.2)
 - Are formal responses issued to customers in regards their data quality complaints? (3.2.3)

2.2.4. Control

- Policy & standards review
 - **What:** Conduct periodical revisions of the documentation, principles, standards and guidelines that support the Data Quality Management System to ensure they remain relevant and up to date.
 - **Why:** Recurring evaluations of the documentation are required to improve the performance of the process and to ensure that the context on which the Data Quality Management System runs remains relevant for the organisation.
 - **Recommended to:** Conduct these reviews based on the organisations policies for audits.
 - **Example:** Yearly reviews of goals, updates to standards.
 - **Questions to ask:**
 - Does the organisation periodically audit the Data Quality Management Structure? (2.2.1)
 - Does the organisation have a GTIN, GPC and GLN allocation policy? (2.5.1.6)
 - Are the results on the performance indicators communicated within the organisation and if applicable to 3rd party service providers? (3.1.7)
 - Does the management periodically review the organisation's Data Quality Management System and performance on data quality? (4.1.1)
 - To what extent does the review include assessing opportunities for improvement and the need for changes to the data quality management structure, including the data quality management policy and objectives? (4.1.2)
 - Are records of the reviews kept? (4.1.3)
 - Does the review input include the results of audits? (4.1.4)
 - Does the review input include reports from data quality management inspections? (4.1.5)

2.3. Business Process

2.3.1. Plan

- Initial data entry & setup
 - **What:** Define a process for the initial set up of product information in the organisation's back-end systems so that all data entered is only entered when verified to be reliable.
 - **Why:** Ensuring that only reliable data is ultimately added to the an organisation's internal systems is fundamental for supply chain efficiency. Controlling the process for either creating item data or entering into the back-end systems is the first step to guarantee that the data and its subsequent evolution are based on quality foundations
 - **Recommended to:** Ensure that all data is verified before being entered and set up in internal systems; monitor that the data conforms to any internal policies that the organisation may have, for instance, policies to allocate new GTIN's to products; finally make sure that there data entry process is protected against access by unauthorised parties.
 - **Example:** Centralised GTIN allocation and product set up for the organisation.

- **Questions to ask:**
 - Does the organisation have a specific process for generating and checking the data for new products, prior to first distribution of new products? (2.5.1.2)
 - Does the organisation review the procedures for data input and creation for adequacy? (2.5.2.2)

- Ongoing data maintenance
 - **What:** Define a process for the continuous update and maintenance of data that has been set up in the organisation's systems so that it is always relevant and up to date with the latest changes in the product.
 - **Why:** As the information of a product changes and evolves through time, its consistency has to be guaranteed along the product's life to ensure it is always reliable; for that purpose a process must be in place to prevent changes from affecting the quality of the information.
 - **Recommended to:** Have clear internal guidelines for product changes and who should those be communicated to; again it would be important to ensure that changes are also validated against the right version of the product before entered and that the data is not modified by anyone without the necessary authorisation to do so (including minimal requirements for the data before changes become definitively recorded).
 - **Example:** Cross-functional product development teams that ensure that changes that affect the product are shared across all areas and not just that involved; locking certain 'key' attributes (e.g. dimensions, weights) so they can not be edited without proper consultation.
 - **Questions to ask:**
 - Does the organisation make use of a single source of the truth for product master data to manage and share data with trading partners? (1.4.1)
 - Is there a process in place to identify and communicate changes/corrections to the data itself? (1.4.5)
 - Does the organisation have a process in place for checking product data during the product lifetime (ongoing check)? (2.5.1.8)

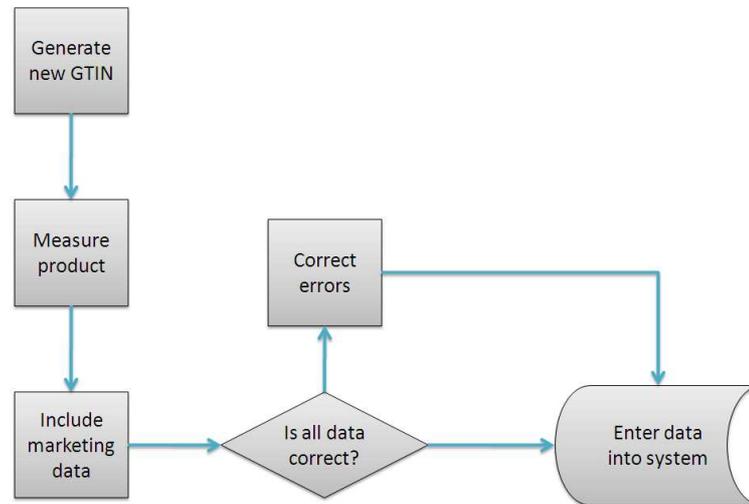
- Processes involved in the information's life-cycle
 - **What:** Develop a general strategy for the management of the information of a product that reflects the specific needs of each of the phases of the product's life-cycle.
 - **Why:** Master data is an integral part of the product itself and should evolve in the same way than the product along its life-cycle, from development and launch to the market to eventual discontinuation.
 - **Recommended to:** Analyse the type of changes that will most likely occur in each phase of the product's life-cycle. For instance a product that has stabilised in the market may be subject to less extreme changes than one that is being introduced and needs much more dynamic promotion. That will help the organisation plan better for the best way to approach the maintenance of that product's data at all stages.
 - **Example:** Planned product audits at specific phases of the product's life-cycle.
 - **Questions to ask:**
 - Does the organisation periodically audit the Data Quality Management Structure? (2.2.1)
 - Are the results of these audits shared within the organisation? (2.2.2)

- Do the audits result in documented, communicated and implemented action plans, if required? (2.2.3)

2.3.2. Document

- Operating procedures
 - **What:** Record clear guides for the execution and operation of the data quality management process. These operation manuals should document the different scenarios and situations that may occur during all sort of procedures that come into play during the management of information.
 - **Why:** In order to be able to properly execute a process clear operating guides and procedures must be available for participants to know how to proceed. Without a clear documentation of the process it will be difficult to enforce any policies and measure any value and progress.
 - **Recommended to:** Start by documenting the most common and important procedures within the data quality management system and gradually expand from there.
 - **Example:** Documented new item set-up process.
 - **Questions to ask:**
 - To what extent does the organisation use equipment as recommended by GS1 in the 'GDSN Package Measurement Rules Implementation Guide' within all relevant data quality management processes for dimensions measurement? (1.3.4)
 - Has the organisation got operational processes needed for product measuring and data generation (in accordance with GS1 requirements)? (2.5.1.1)
 - To what extent has the organisation determined appropriate methods for the recording of measurement data? (2.5.1.4)
 - Does the organisation have approved processes and procedures for data input? (2.5.2.1)
- Process flow diagrams
 - **What:** Develop flow diagrams that reflect the operating procedures and interaction between the actors in the process.
 - **Why:** Flow diagrams are a very helpful reference tool for people executing the procedures as they give a quick, clear high-level idea of how a process works.
 - **Recommended to:** Make the diagrams as specific as they need to be, different flow diagrams may be elaborated for data, documents and process flows.

- **Example:** Flow charts of different processes using standard flow chart symbols.



Flow chart diagram example

- **Questions to ask:**
 - Is there a process in place to identify and communicate changes/corrections to the data itself? (1.4.5)
 - Has the organisation defined the data quality management roles and responsibilities? (2.1.1)
 - Has the organisation got operational processes needed for product measuring and data generation (in accordance with GS1 requirements)? (2.5.1.1)
- Job aids, work instructions
 - **What:** Create technical work instructions and reference material that help people in the organisation know how to carry out certain activities and/or optimise the use of all work tools and systems.
 - **Why:** Specific technical work instructions are essential if we want to guarantee that activities are performed satisfactorily across the organisation.
 - **Recommended to:** Verify the availability of any tools (like optical character recognition (OCR) equipment and/or software) or procedures available for verification of non-dimension attributes such as: net content, ethical/organic/dietary declarations, packaging hierarchy, etc.. It is also suggested to include any technical manuals as part of internal training programmes.
 - **Example:** Instruction manuals for measuring equipment and/or software; step-by-step manuals for measuring items, internal reference glossaries of terms, etc.
 - **Questions to ask:**
 - Does the organisation have work instructions available to support data quality management processes? (1.3.2)
 - Are the tools that require calibration being calibrated within your organisation (either by internal or external certified service providers), according to requirements? (1.3.5)

- **Why:** Formalising and externalising performance management will provide the organisation with an objective and effective way to monitor and improve the performance of the data quality management system.
- **Recommended to:** Reflect performance management tasks in the governance structure that the organisation has developed for the data quality management system.
- **Example:** Protocol for periodical performance metrics revisions
- **Questions to ask:**
 - To what extent are the GS1 GDD definitions on attributes applied internally? (2.5.1.3)
 - To what extent is the GTIN policy applied within the organisation? (2.5.1.7)
 - Does the organisation have approved processes and procedures for data input? (2.5.2.1)
 - Does the management periodically review the organisation's Data Quality Management System and performance on data quality? (4.1.1)

- Process issue management
 - **What:** Execute activities for the identification, analysis, processing and resolution of issues and disruptions that may appear in the data quality management system.
 - **Why:** It is essential to have a process for conflict/issue resolution that prevents ensures that the same problems are prevented in the future.
 - **Recommended to:** Ensure that issue-escalation and resolution rules are clearly communicated as part of the education programmes conducted by the organisation. Also bear in mind that this activity has to result in further preventative actions that will keep errors and issues from reappearing in the future.
 - **Example:** N/A
 - **Questions to ask:**
 - After recurrence of known failures, are steps taken to prevent them recurring? (3.1.4)
 - Based on the results of the analysis of performance indicators, are the necessary follow-up actions executed? (3.1.6)
 - Does the review input include status of preventative and corrective actions? (4.1.8)
 - Does the review input include recommendations for improvement? (4.1.11)
 - Does the review input include the evaluation of the KPI results? (4.1.12)
 - Does the review output include decisions and action related to improvement of the effectiveness of the data quality management structure? (4.1.13)

- Change management
 - **What:** Establish a process to manage the implementation of changes within the organisation's data quality management system.
 - **Why:** Having a good process for change management contributes to quicker and better adoption of new procedures within the organisation.

- **Recommended to:** Connect change management procedures with the organisation's internal communication programmes for awareness and education as these two areas are mutually complementary.
- **Example:** N/A
- **Questions to ask:**
 - Do you have a procedure implemented to facilitate changes to the Data Quality Management System? (1.1.7)

2.3.4. Control

- Workflow controls
 - **What:** Monitor compliance level of the process and its data output to the expected performance criteria across the data quality management system in order to measure the degree in which the organisation adheres to the defined policies and standards.
 - **Why:** Successful execution of a data quality management system depends on ensuring that the different checks that have been built into the workflow are applied and that data (and processes) are controlled and monitored to ensure the output conforms to the defined minimum requirements.
 - **Recommended to:** Be pragmatic with the checks your organisation establishes for the data and the process; these controls are based on the performance metrics defined so successful monitoring depends on having KPI's that can be tracked and measured in an efficient way.
 - **Example:** Implementing consistency checks for information
 - **Questions to ask:**
 - Is there a process in place to identify and communicate changes/corrections to the data itself? (1.4.5)
 - Does the organisation have approved processes and procedures for data input? (2.5.2.1)
 - Has the organisation established, maintained, and documented the operational processes needed for internal data publishing? (2.5.2.3)
 - Have critical success factors (key elements that ensure a satisfactory performance) been established in the processes for external data publishing? (2.5.3.1)
 - Has the organisation established and maintained procedures to control the process of publishing product data into external data pools? (2.5.3.2)
 - Does the data publishing process include all necessary provisions to ensure that product changes published into external data pools is based upon the most relevant version of the product? (2.5.3.3)
 - To what extent does the data publishing process include all necessary provisions to ensure that product data attributes published into external data pools can be traced back to its origin? (2.5.3.4)
- System validations
 - **What:** Monitor the results of the application of automated validations performed by systems in order to track down frequent errors and issues.
 - **Why:** This activity will allow the identification of commonly recurring errors, which helps the organisation focus in areas that need specific attention.

- **Recommended to:** Organisations that do not have internal systems to validate product information may leverage the validations performed by their data pool and analyse the reports received from them over the validations failed.
- **Example:** Statistics on most common reasons why products fail a validation.
- **Questions to ask:**
 - Does the organisation have a specific process for generating and checking the data for new products, prior to first distribution of new products? (2.5.1.2)
 - To what extent are the GS1 GDD definitions on attributes applied internally? (2.5.1.3)
 - Is the output data in compliance with standards of the GS1 accepted units of measure? (2.5.1.5)
 - To what extent does the data publishing process include all necessary provisions to ensure that product data attributes published into external data pools can be traced back to its origin? (2.5.3.4)

- Performance reporting on service levels
 - **What:** Track the performance on the agreed KPI's of service levels offered to trading partners.
 - **Why:** While service level agreements (SLA's) may not specifically cover data quality, the performance on service level goals is a valuable insight into the impact that bad data is having on the organisations performance.
 - **Recommended to:** Identify the key data that supports the different SLA objectives and goals; that gives the organisation visibility into the information whose improvement can result in direct benefits for the customers.
 - **Example:** Controlling late metrics for deliveries, order processing, etc.
 - **Questions to ask:**
 - Does the organisation make use of standardised monitoring and measuring processes? (1.3.3)
 - Which monitoring methods on master data management are used within the organisation to evaluate and track the data quality management processes and procedures? (3.1.1)
 - Are performance indicators defined for each process in the Data Quality Management System? (3.1.2)
 - To what extent are these performance indicators tracked and communicated? (3.1.3)
 - To what extent are all corrections suitable, made in both the product master data and the published data (if relevant)? (3.1.5)
 - Based on the results of the analysis of performance indicators, are the necessary follow-up actions executed? (3.1.6)

- Performance reporting on data quality
 - **What:** Monitor the organisation's performance on the defined goals for data quality (minimum quality requirements for the data output).

- **Why:** Measuring the performance level on data quality will help the organisation understand it areas of opportunity and ensure the data output meets consistent high quality levels.
- **Recommended to:** Ensure the KPI results are communicated and shared across the organisation and with customers.
- **Example:** Metrics on items with no errors, reports from customers, etc.
- **Questions to ask:**
 - Does the organisation make use of standardised monitoring and measuring processes? (1.3.3)
 - Does the organisation periodically audit the Data Quality Management Structure? (2.2.1)
 - Is the output data in compliance with standards of the GS1 accepted units of measure? (2.5.1.5)
 - To what extent are these performance indicators tracked and communicated? (3.1.3)

- External & internal feedback
 - **What:** Control that the processing of feedback both from internal and external users/clients is executed according to the established policies and procedures of the organisation.
 - **Why:** Proper processing of customer feedback is essential for the continuous improvement of the data quality management system, prevention of future errors and the fulfilment of agreed service levels.
 - **Recommended to:** Share the results with key contact-points for customers about the opportunities to improve feedback management.
 - **Example:** Reports on actions undertaken as a result of customer complaints or suggestions.
 - **Questions to ask:**
 - Does the review input include data user and stakeholder feedback? (4.1.6)
 - Does the review output include decisions and action related to improvement of customer related requirements with respect to data quality management? (4.1.1.5)

- Process compliance audits
 - **What:** Conduct internal audits of the adherence that the organisation has in practice to the defined processes set up within the data quality management system.
 - **Why:** A process is only as effective as the people executing it want to make it: if the established protocols and procedures are not consistently applied and followed the data quality management system may fail to achieve its goals. Conducting periodical audits to verify that procedures are followed as expected is key to guarantee results are met.
 - **Recommended to:** Look for alternatives to set up neutral audits on process compliance; some organisations may entrusts these audits to other areas of their organisations such as quality control or standard compliance departments in an effort to make it as objective as possible.
 - **Example:** Audit on application of defined policies, processes and roles across the organisation.
 - **Questions to ask:**

- Does the organisation periodically audit the Data Quality Management Structure? (2.2.1)
 - To what extent is the GTIN policy applied within the organisation? (2.5.1.7)
 - Does the organisation review the procedures for data input and creation for adequacy? (2.5.2.2)
 - Which monitoring methods on master data management are used within the organisation to evaluate and track the data quality management processes and procedures? (3.1.1)
 - Based on the results of the analysis of performance indicators, are the necessary follow-up actions executed? (3.1.6)
 - Is there a process for determining the criteria, scope, frequency and methods for executing internal audits of the data quality management system? (3.3.1)
 - Does the review input include process performance? (4.1.7)
 - Does the review input include status of preventative and corrective actions? (4.1.8)
 - Does the review input include follow-up actions from previous management reviews? (4.1.9)
 - Does the review input include changes that could affect the data quality management structure? (4.1.10)
 - Does the review output include decisions and action related to improvement of the effectiveness of the data quality management structure? (4.1.13)
 - Does the review output include decisions and action related to improvement of the effectiveness of the data quality processes to ensure data quality and accuracy? (4.1.14)
 - Does the review output include decisions and action related to improvement of customer related requirements with respect to data quality management? (4.1.15)

- Product measurements
 - **What:** Ensure that the methodology for conducting product inspection is always followed when executing product measurements, either within a monitoring audit, a first-measurement of new products or as part of the maintenance process of the data,
 - **Why:** The ultimate proof of the effectiveness of the data quality management system lies in ensuring that data will successfully match when inspected at any given time.
 - **Recommended to:** Make sure you compare the right product to the data that will be published. Compare the results of internal product audits to the levels of quality reported by customers and identify any potential mismatch that could be caused by external factors.
 - **Example:** Monthly random inspections on existing products.
 - **Questions to ask:**
 - Does the organisation make use of standardised monitoring and measuring processes? (1.3.3)
 - Are the tools that require calibration being calibrated within your organisation (either by internal or external certified service providers), according to requirements? (1.3.5)

- Review & reporting audit results

- **What:** Set up executive management reviews of the results of all audits conducted on item data and the data quality management system.
- **Why:** Besides being important for the continuous improvement of the organisations processes, showing the results and benefits of the data quality management system is an important factor that contributes to stronger sponsorship for the process.
- **Recommended to:** Focus on the results of that have strategic value to the organisation, such as cost reduction, added value for customers and better process visibility.
Example: Executive management reports on performance.
- **Questions to ask:**
 - Does the organisation periodically audit the Data Quality Management Structure? (2.2.1)
 - Is there an ongoing internal communication process on any aspect of data quality, to create awareness within the organisation on the importance of providing highly accurate data? (2.4.1)
 - Based on the results of the analysis of performance indicators, are the necessary follow-up actions executed? (3.1.6)
 - Are the results on the performance indicators communicated within the organisation and if applicable to 3rd party service providers? (3.1.7)
 - Is there a process for determining the criteria, scope, frequency and methods for executing internal audits of the data quality management system? (3.3.1)
 - Does the review input include recommendations for improvement? (4.1.11)
 - Does the review input include the evaluation of the KPI results? (4.1.12)
 - Does the review output include decisions and action related to improvement of the effectiveness of the data quality processes to ensure data quality and accuracy? (4.1.14)
 - Does the review output include decisions and action related to improvement of customer related requirements with respect to data quality management? (4.1.15)
- Monitor impact of erroneous data
 - **What:** Monitor and record the known issues that result from poor data quality in order to create a clear map of the repercussions that erroneous data causes.
 - **Why:** Clearly identifying and monitoring these issues will help to position the real-life consequences of bad data for the organisation.
 - **Recommended to:** Try to quantify the costs of the errors caused by the data; doing that shall help in forming a very clear picture of the impact of bad data quality for the organisation.
 - **Example:** Metrics on out-of-stocks caused by erroneous order/content information.
 - **Questions to ask:**
 - Does the review input include status of preventative and corrective actions? (4.1.8)

2.4. System Capabilities

2.4.1. Plan

- Unified data repository
 - **What:** Establish a central data repository for the organisation that consolidates all final data for external publication.
 - **Why:** A central data repository for all 'final' product data is essential to support the organisation's vision for one single source of the truth for products.
 - **Recommended to:** Study well the organisation's needs and long term aspirations before choosing the type of central repository that will be used (e.g. "in-house" development vs. Solution provider, etc.).
 - **Example:** PIM (Product Information Management) systems.
 - **Questions to ask:**
 - Does the organisation make use of a single source of the truth for product master data to manage and share data with trading partners? (1.4.1)
 - Does the data publishing process include all necessary provisions to ensure that product changes published into external data pools is based upon the most relevant version of the product? (2.5.3.3)

- Design & architecture
 - **What:** Set up a systems architecture design for the organisation that supports not only the data quality management system considering all related systems such as data pools, internal data repositories, etc.
 - **Why:** This will provide the organisation with a clear vision and plan for the interaction between the support systems the organisation makes use of, which results in effective deployment of the systems.
 - **Recommended to:** Requirements for the system architecture should be drawn from the organisation's priorities identified in the vision and planning,
 - **Questions to ask:**
 - To what extent does the database structure ensure traceability of amendments (change history)? (1.4.4)

- Workflow, user interface
 - **What:** When applicable and possible, establish definitions and requirements for the interface used to facilitate the utilisation of internal systems by the users.
 - **Why:** Ensuring the functionality and practical applicability of the organisation's systems is an important measure that simplifies the execution of the process.
 - **Recommended to:** Review match between roles and system complexity to ensure there is balance between both factors.
 - **Example:** User-friendly systems interfaces, on-screen help, etc.

-  **Note:** This capability is optional and does not direct to any question in the self-assessment questionnaire. It is to be used merely as a reminder of the importance of

including these elements in system-planning whenever that is within the organisation's capabilities.

- Data validations
 - **What:** Define the set of validations that need to be developed into the organisation's systems.
 - **Why:** Necessary to ensure comprehensive controls exist for errors that can be detected through automated checks.
 - **Recommended to:** Incorporate industry-wide validations (e.g. GDSN) and verify consistency of internal one with market practices in order to avoid conflicts.
 - **Example:** List of official GDSN validation rules.
 - **Questions to ask:**
 - To what extent has the organisation implemented processes to guarantee that the data output produced by the Data Quality management System comply with GDSN requirements for data synchronisation? GDSN requirements include all corresponding standards such as GDD definitions, GTIN Allocation rules, GDSN Packaging measurement Rules, etc) (1.2.1)
 - Is there a process in place to keep the organisation up-to-date regarding the GDSN requirements? (1.2.2)
 - To what extent does the organisation use equipment as recommended by GS1 in the 'GDSN Package Measurement Rules Implementation Guide' within all relevant data quality management processes for dimensions measurement? (1.3.4)

- Security, access controls
 - **What:** Establish system requirements that safeguard the information's integrity and that enforce the organisation's policy for governance, edition and/or management of the data.
 - **Why:** Systems are a great way to enforce edit rights and change control for item information if access levels are built in into the system.
 - **Recommended to:** A great deal of the security and access rights requirements can be extracted from the organisation's governance model and documented roles and responsibilities matrix.
 - **Example:** Password-protected edit rights for key data.
 - **Questions to ask:**
 - To what extent does the database structure have access authorisation procedures? (1.4.2)
 - Does the organisation have a structure in place to ensure the security of data from unauthorised change? (1.4.3)
 - Does the data publishing procedure include: appropriate authorisation? (2.5.3.5)

- Revision/change history
 - **What:** Establish requirements for the recording and storing of changes in the product information.

- **Why:** This enables the organisation to be able to track changes on the data to the source which is crucial for the resolution of discrepancies and to have visibility into the data along its life-cycle.
- **Recommended to:** Make sure that record of changes and revision history include as a minimum when, how why and by who were changes made.
- **Example:** Log of changes on the data.
- **Questions to ask:**
 - Does the organisation have a structure in place to ensure the security of data from unauthorised change? (1.4.3)
 - To what extent does the database structure ensure traceability of amendments (change history)? (1.4.4)
- External publication
 - **What:** Define system requirements for the tools that will be used to publish item data externally (i.e. beyond the organisation's firewall, such as to trading partners, etc.).
 - **Why:** Internal and external definitions for data may be in some cases different and therefore all systems to be used for external publication must help verify that data conforms to the right specifications of the intended external audience.
 - **Recommended to:** Leverage the organisation's data pool strategy to strengthen external publications.
 - **Example:** Limiting the types of changes possible to the data once it has been logged in for external publication.
 - **Questions to ask:**
 - Is there a process in place to identify and communicate changes/corrections to the data itself? (1.4.5)
 - Have critical success factors (key elements that ensure a satisfactory performance) been established in the processes for external data publishing? (2.5.3.1)
 - Has the organisation established and maintained procedures to control the process of publishing product data into external data pools? (2.5.3.2)
 - Does the data publishing process include all necessary provisions to ensure that product changes published into external data pools is based upon the most relevant version of the product? (2.5.3.3)
- Internal publication
 - **What:** Define system requirements for the tools that will be used to publish item data internally (i.e. within the organisation's firewall, such as to other areas within the organisation, etc.).
 - **Why:** Internal and external definitions for data may be in some cases different and therefore all systems to be used for internal publication must help verify that data conforms to the right specifications of the intended internal audience.
 - **Recommended to:** Leverage internal communications and resources to optimise internal publication of items.
 - **Example:** Quality requirements for the data of a new product that is communicated between different departments.

- **Questions to ask:**
 - Has the organisation established, maintained, and documented the operational processes needed for internal data publishing? (2.5.2.3)

2.4.2. Document

- System requirements
 - **What:** Develop a formal requirements document that contains all the requirements identified during the system requirements planning activities (see section 2.4.1).
 - **Why:** This is necessary not only to evaluate if there are gaps between the requirements and current deployed capabilities, but also important to steer the development of the systems in case there are requirements not yet included (e.g. issuing RFP's etc.)
 - **Recommended to:** Document the requirements in a way that they link to the specific parts of the data quality management system and organisational goals that they are meant to support. That will help when assessing the priority of each one.
 - **Example:** System requirements document.
 - **Questions to ask:**
 - To what extent has the organisation implemented processes to guarantee that the data output produced by the Data Quality management System comply with GDSN requirements for data synchronisation? GDSN requirements include all corresponding standards such as GDD definitions, GTIN Allocation rules, GDSN Packaging measurement Rules, etc)? (1.2.1)
 - Is there a process in place to keep the organisation up-to-date regarding the GDSN requirements? (1.2.2)
 - To what extent does the organisation use equipment as recommended by GS1 in the 'GDSN Package Measurement Rules Implementation Guide' within all relevant data quality management processes for dimensions measurement? (1.3.4)
 - To what extent does the database structure have access authorisation procedures? (1.4.2)
 - Does the organisation have a structure in place to ensure the security of data from unauthorised change? (1.4.3)
 - To what extent does the database structure ensure traceability of amendments (change history)? (1.4.4)
 - Is the output data in compliance with standards of the GS1 accepted units of measure? (2.5.1.5)
- Operating procedures
 - **What:** Document the workflows and procedures to operate the systems that support the data quality management system.
 - **Why:** This will help ensure that systems are utilised correctly and that applications supports the main objectives set for the data quality management system.
 - **Recommended to:** Integrate these operation procedures with the main workflow of the data quality management system to simplify the workflow definitions.

- **Example:** Integrated workflows that show the systems' interaction with the roles and tasks of the data quality management system.
- **Questions to ask:**
 - Does the organisation make use of standardised monitoring and measuring processes? (1.1.3)
 - Is there a process in place to identify and communicate changes/corrections to the data itself? (1.4.5)
 - To what extent does the data publishing process include all necessary provisions to ensure that product data attributes published into external data pools can be traced back to its origin? (2.5.3.4)
- Performance metrics
 - **What:** Establish and document the metrics and performance levels that will be used to measure the effectiveness of the organisations system architecture.
 - **Why:** Necessary to evaluate the degree in which the systems do meet their expected goals in supporting the organisation.
 - **Recommended to:** Incorporate these performance metrics in the overall measurements used to monitor the performance of the whole data quality management system as that will reduce the chance of missing potential gaps or misinterpreting performance results during management revisions of the process.
 - **Example:** System incidences, validation reports, etc.
 - **Questions to ask:**
 - To what extent are the GS1 GDD definitions on attributes applied internally? (2.5.1.3)
 - Is the output data in compliance with standards of the GS1 accepted units of measure? (2.5.1.5)
 - To what extent is the GTIN policy applied within the organisation? (2.5.1.7)
 - Does the review input include process performance? (4.1.7)

2.4.3. Execute

- ✔ **Note:** Organisations must ensure that issues found in the process (see section [2.3.3](#)) are escalated to the right person. When the process identifies a technology-related issue, it should be separated from operational/process-related issues in order to be address through the appropriate path.

2.4.4. Control

- Performance reporting on service levels
 - **What:** Monitor the performance of the organisations systems against the desired service levels/functionality performance expected from them.
 - **Why:** Periodical reviews of the relevance and applicability of systems to the organisation's process will help ensure that the business needs are well supported.
 - **Recommended to:** Ensure the KPI results are communicated and shared across the organisation and with customers.

- **Example:** Managerial reviews of organisational performance.
- **Questions to ask:**
 - Does the organisation make use of standardised monitoring and measuring processes? (1.3.3)
 - Which monitoring methods on master data management are used within the organisation to evaluate and track the data quality management processes and procedures? (3.1.1)
 - Are performance indicators defined for each process in the Data Quality Management System? (3.1.2)
 - To what extent are these performance indicators tracked and communicated? (3.1.3)
 - To what extent are all corrections suitable, made in both the product master data and the published data (if relevant)? (3.1.5)
 - Based on the results of the analysis of performance indicators, are the necessary follow-up actions executed? (3.1.6)
 - Does the review input include data user and stakeholder feedback? (4.1.6)

3. Self-Assessment

3.1. Introduction

To help organisations determine their level of compliance to the capabilities and best practices specified in [section 2](#) of the GS1 Data Quality Framework, a number of self-assessment tools have been developed in collaboration with the industry.

These self-assessments may be used for a number of different purposes:

- **Identification of internal opportunities:** the self-assessment can be used internally for benchmarking purposes and for internal improvement. Internal benchmarking can be done by comparing the results from the various internal organisational entities that have performed the self-assessment as it will reveal the areas of improvement on which an improvement agenda can be based.
- **Collaborative opportunity identification:** the self-assessment can also be a valuable tool to help identify opportunities within a given trading relationship; trading partners may perform their own self-assessments and then discuss common opportunity areas for joint-improvement.
- **Self-declaration:** the self-assessment may also be used by organisations seeking to establish a high degree of compliance to the recommended practices for an optimal data quality management system. Meeting the minimum threshold of compliance may allow an organisation to self-declare compliance to the Framework.



Important: There are no defined guidelines regarding the implications and practical consequences of self-declarations. When an organisation succeeds in self-declaring through the use of the tools provided in the Data Quality Framework, it will be up to the organisation itself and its trading partners to define the significance of the self-declaration on their trading relationship.



Note: Every organisation can choose at its own discretion, the best approach to a self-assessment.

3.2. Tools for self-assessment

The following self-assessment tools are currently available as part of the Data Quality Framework:

- **The self-assessment questionnaire (see [Appendix III](#) for reference):** the self-assessment questionnaire was developed based on the best practices for a data quality management system. The questionnaire contains 73 questions that relate to an organisation's data quality management capabilities and their deployment level within the organisation. This is the core component of the self-assessment process.
- **The self-assessment questionnaire scoring model (see [Appendix III](#) for reference):** a system that awards a certain score to the different activities that an organisation may have deployed within its data quality management system. The scoring model gives a high-level indication of how many of the recommended best practices for a data quality management system are in place within a given organisation.

- **Master data KPIs (see section [5.4.5](#) of Appendix IV for reference):** a model of KPIs that help organisations establish an indication of the level of accuracy of the data. The KPI model is based on the monitoring and inspection of some basic GDSN attributes.

Depending of the purpose of the self-assessment, organisations will have to define which combination of the tools described above needs to be used to allow them to meet their goals. It is important to note that while the degree of utilisation of these self-assessment tools is to be determined by each organisation, their application should always be executed according to the specified best practices and usage rules of the tools in order to ensure reliable results.



Important: Please refer to the ‘**Data Quality Framework Implementation Guides v3.0**’ for a comprehensive advice and best practices for the execution of a self-assessment and the correct utilisation of the tools contained in this document.

4. Product Inspection Procedure

4.1. Introduction

The overall purpose of this product inspection procedure is to help enhance data accuracy by applying a standardised methodology for the physical inspection/comparison of product data in order to ensure the results of the inspection are consistent and reliable.

The usage of this recommended procedure is highly encouraged though it is voluntary and it is not a prerequisite for using a GDSN certified data pool. Following all the established steps of the procedure may result in the facilitation of increased acceptance of published data by information recipients.

 **Important:** This inspection procedure is not aimed to be used as a solution for data accuracy, but as a means to verify objectively and reliably the quality of the information output of an organisation. Therefore the application of this inspection procedure should be accompanied by other elements of a data quality management system (as described on [section 2](#)) in order to offer a sustainable solution to the data quality challenge.

This product inspection procedure may also be used to monitor a series of KPIs developed to give a more granular indication of the accuracy levels of an organisation's data output. These KPI's may be used to track performance of the organisation and its data quality management system in maintaining acceptable levels of accuracy in the data.

The KPI model is an excellent option to measure accuracy levels as recommended on [section 2](#): Data Quality Management System.

 **Note:** Please refer to section [5.4.5](#) of Appendix IV: "Information for Product Inspections" for more information regarding the KPI model and the way to measure it.

4.2. Step 1: Inspection body selection

An organisation should appoint an appropriate body to perform product inspections following this recommended procedure. An appropriate inspection body is a qualified person or department with sufficient independence within the organisation to act objectively when conducting the inspections.

Inspectors must be familiar with the inspection goals and objectives and must understand all aspects that may affect the inspection (e.g. inspection protocols, use and limitations of measuring equipment, measurement rules, etc.).

The main requirements that the inspection body (i.e. the inspectors) should meet are:

- Independent status / sufficient safeguards for objectivity
- Inspection body was not involved in the original measurements
- Individual inspector experience and qualifications in the field of inspections

 **Note:** An organisation may choose not to establish an inspection body within its organisation and may employ a third party as inspection body. In this case, the organisation will be responsible to verify that the external inspection body has the right qualifications to conduct the inspections correctly. As a general recommendation, it is desirable that any external inspection bodies an organisation wishes to employ are as a minimum accredited against ISO/IEC 17020:1998 "General criteria for the operation of various types of bodies performing inspection".

4.3. Step 2: Inspection preparation

4.3.1. Scope of inspection

The organisation should start by defining the scope of the inspection, including the type and extension of the products that will be inspected, the information sources that will be compared and the goals and objectives for the inspection. The scope can be set by product type, location of production, target market, product category etc.. The scope should also determine the attributes that will be inspected and compared between the product and the data.

 **Note:** Please refer to section [5.4.6](#) of Appendix IV: “Information for Product Inspections” for more information regarding some recommended basic attributes for inspection.

The scope of the inspection shall be recorded in order to guide the rest of the inspection process and identify areas that are out of the scope of the inspection.

4.3.2. Sample identification

Based on the scope, a sample of products should be determined. The organisation should verify that sample sizes and sample criteria are applied accordingly. For instance, an organisation may want to take a sample that considers each ‘unique’ item on the sample as a different combination of GTIN/GLN/Target Market while in other cases (depending on the scope) each individual GTIN may count as a unique item.

 **Important:** To determine the right sample size, please refer to section [5.4.1](#) of Appendix IV: “Information for Product Inspections” where a statistically-representative formula for sample determination is included.

 **Note:** This procedure and sample determination process was developed exclusively to verify data that has already been produced and it is not aimed to be used as part of a data generation process on its own.

4.3.3. Inspection planning

Before the inspection, the organisation should collect and make accessible all data relevant to the product sample and verify that upon inspection the most recently published data is available to the inspection body.

Prior to the inspection the organisation should provide the inspection body with the recommended pre-inspection documents, which include:

- Sampling justification
- Product data sheets with all product data as published into the data pool
- The data supplier’s list of measuring equipment present at the inspection site
- Inspection reports of previous inspections.

 **Note:** The requirements for the pre-inspection documents mentioned above may be found on section [5.4.2](#) of Appendix IV: “Information for Product Inspections”.

The organisation and inspection body should define the appropriate measuring equipment to be used and the location(s) for the inspection. It is also essential to ensure that the products for inspection are readily available and clearly tagged for identification and there is safe and easy access to the products.

All these considerations should be defined based on:

- The number of products
- Types of products and packaging
- The number of sites to visit
- The extension of the site(s)
- The data supplier's preparation.

4.3.4. Measuring equipment

In order to ensure valid results, measuring equipment should always:

- Be calibrated or verified at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards; where no such standards exist, the basis used for calibration or verification shall be recorded
- Be checked, adjusted or re-adjusted as necessary
- Be identified to enable the calibration status to be determined
- Be safeguarded from adjustments that would invalidate the measurement result
- Be protected from damage and deterioration during handling, maintenance and storage.

4.4. Inspection

Inspection is performed by the inspection body in line with all reference documents as mentioned in this inspection procedure as well as principles of good practise.

Data is verified against the data published into the defined data source (data pool, internal systems, etc.) The data in contained in the data source should be found within the definitions of the applicable GS1 Standards to be considered correct. Data inspected should also match such definitions and specifications.

- 
Note: Organisations should aim for ultimately obtaining 100% data accuracy, though initial goals can be set on achieving minimum levels agreed by trading partners. Trading partners should use the KPI model from section [5.4.5](#) of Appendix IV: "Information for Product Inspections".
- 
Note: Some guideline indications of what different levels of accuracy may mean for an organisation are available on section [5.4.4](#) of Appendix IV: "Information for Product Inspections". These general interpretations are meant to provide orientation regarding the most convenient actions for an organisation depending on their current levels or accuracy.

4.5. Inspection reporting

Following each inspection it is highly recommended to prepare a written report that contains the following sections:

- Inspection summary

- Inspection scope
 - Reference documents
 - Overview of inspection findings / results / performance.
-  **Note:** The specific requirements for the inspection reports can be found on section [5.4.3](#) of Appendix IV: “Information for Product Inspections”. Note that the length and content of each section may be adapted according to the specific situation of each inspection.
-  **Important:** Inspection reports shall remain the property of the organisation and shall not be released without the organisation’s prior consent. It is also recommended that these reports are stored safely and securely until the next inspection report is issued, or for a period of five years if no further inspections take place.

4.6. Appeals procedure

The inspection body shall have a documented procedure for consideration and resolution of appeals against results of inspections. Procedures shall be independent of the individual inspector and will be considered by senior management of the inspection body. Records of the review and actions arising from appeals shall be maintained.

If necessary the organisation shall facilitate additional inspections to verify and resolve the appeal.

4.6.1. Complaints

The inspection body will have a documented procedure for dealing with complaints received from organisations and other relevant parties. Records of the review and actions arising from complaints shall be maintained.

4.6.2. Corrective measures

The organisation must prove that the inspection findings are input for corrective measures. Inspection findings must result in data corrections in the data as sent to the pool.



5. Appendices

5.1. Appendix I - Glossary

This appendix contains a list of terms that are used throughout this document; the definitions below apply to the context of the Data Quality Framework. In addition to the terms hereby included, users of this document are encouraged to also consult the GS1 Glossary which is available on the following link:

<http://gdd.gs1.org/GDD/public/searchableglossary.asp>

The GS1 Glossary is the ultimate reference source for all terminology used across all GS1 Standards, and documents.

Accreditation

Procedure by which an authoritative body gives formal recognition of the competence of a certification body to provide certification services, against an international standard.

Accreditation body

Agency having jurisdiction to formally recognise the competence of a certification body to provide certification services.

Audit

Systematic and functionally independent examination to determine whether activities and related results comply with a standard, whereby all the elements of this standard are covered by reviewing the data suppliers' manual and related procedures, together with an inspection of the data and the applicable products.

Auditor

Person qualified to carry out audits..

Certification

Procedure by which accredited certification bodies, based on an audit or an inspection, provide written or equivalent assurance that data and where applicable their management system and its implementation conform to requirements.

Certification body

Provider of certification services, accredited to do so by an accreditation body.

Data Accuracy

One of the five principles of data quality, accuracy is defined as the data reflecting the real characteristics of a product at the moment of inspection.

Data Quality

The simultaneous presence of consistency, completeness, accuracy, standards-compliance and time-stamping on the data.

Data Quality Management Structure

Refers to all aspects related to the governance of the Data Quality Management System (DQMS)

Data Quality Management System (DQMS)

It is a combination of policies, activities, governance and procedures that creates a general sequence of processes which interact to ensure that data managed by an organisation always complies to the five main principles for data quality.

Global Location Number (GLN)

A Global Location Number is the GS1 Identification Key used to identify physical locations or legal entities.

Global Product Classification

Global Product Classification is the GS1 standard for the classification of products. GPC is a four-tier classification system based on a hierarchy (Segment, Family, Class) and a Brick. To provide further granularity Bricks can be further characterised with Brick Attributes and the associated Brick Attribute Values.

Global Trade Item Number (GTIN)

A numerical value used to uniquely identify a trade item. A trade item is any trade item (trade item or service) upon which there is a need to retrieve pre-defined information and that may be priced, ordered, or invoiced at any point in any supply chain. GTIN is one of the keys of the GS1 System.

Global Standards Management Process (GSMP)

The Global Standards Management Process (GSMP) is the Global Process established in January 2002 by EAN International and the Uniform Code Council, Inc. (UCC) for the development and maintenance of Global Standards and Global Implementation Guidelines that are part of the EAN.UCC system.

Inspection

Examination of data and the applicable products, in order to verify that they conform to requirements.

Organisation

Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration.

Note: For organisations with more than one operating unit, a single operating unit may be defined as an organisation.

Self-assessment

Self-administered assessment of compliance to the requirements for a Data Quality Management System which is performed through the application of the self-assessment questionnaire included in the Data Quality Framework..

Target Market

Geographical region in which a particular product is intended to be sold, distributed and commercialised.

5.2. Appendix II – Reference Documents

The most up-to-date version of all GS1 Standards shall always be used for data quality management system audits, product measuring and inspection of data accuracy and general implementation the Data Quality Management System.

The latest version of all official documentation of the GS1 System is available at the **GS1 Knowledge Centre** (<http://www.gs1.org/gsm/kc>), which is the chief repository for all GS1 Standards.

The links below are also available at the GS1 Knowledge Centre and have been singled out as they may be of particular interest for users of the Data Quality Framework:

- Business Requirement Document For Data Synchronisation Data Model for Trade Item (Data Definition) http://www.gs1.org/docs/gsm/gdsn/Data_Synchronization_Data_Model_for_Trade_Item.pdf
- Global Data Dictionary <http://gdd.gs1.org/GDD/public/default.asp>
- GDSN Package Measurement Rules for Data Alignment including Standards Tolerances for Data Accuracy http://www.gs1.org/docs/gsm/gdsn/GDSN_Package_Measurement_Rules.pdf
- GDSN Package Measurement Rules Implementation Guide http://www.gs1.org/docs/gsm/gdsn/GDSN_Pack_Measure_Rules_Implementation_Guide.pdf
- GDSN Trade Item Implementation Guide http://www.gs1.org/docs/gsm/gdsn/GDSN_Trade_Item_Implementation_Guide.pdf
- GTIN Allocation Rules <http://www.gs1.org/gtinrules/>
- GLN Allocation Rules <http://www.gs1.org/glnrules/>
- GPC Published Standards <http://www.gs1.org/productssolutions/gdsn/gpc/>
- Miscellaneous data quality support documentation at GS1 <http://www.gs1.org/gdsn/dqf/library>

5.3. Appendix III – Self-Assessment Questionnaire & Scoring Model

Introduction

The following questionnaire has been developed as a means to help organisations assess compliance to an optimal data quality management system (DQMS). The questionnaire was developed based on the requirements for a DQMS and it is comprised of *basic questions* and *general questions*. Basic questions relate to essential elements of a data quality management system. The basic questions have been put in **Bold** in the questionnaire. There are 33 basic questions and 40 general questions.

In the questionnaire, the original requirements for a data quality management system are listed as a reference for organisations.

-  **Note:** Please refer to the “Data Quality Framework Implementation Guides version 3.0” for comprehensive advice over the use of the questionnaire.

Section 1: Planning

1.1 Data quality management information

The organisation shall have in place a documented structure that is designed and maintained to meet all of the requirements established under clause “3.2.1.1 General Requirements” of this protocol and to provide adequate support and information to the organisation for this. The structure shall include provision to support the development, implementation and achievement of the data quality management policy, strategy, risk identification, assessment and control, objectives, targets and plans. It shall also support all of the requirements related to implementation and operation, checking and corrective actions and the management review.

The information shall be accessible to all relevant employees and other relevant third parties including contractors as appropriate.

Questions

- 1.1.1 Does the organisation have a documented data quality management structure in place?
- Yes, implemented, documented and regularly reviewed
 - Yes, implemented and documented
 - Yes, implemented
 - Yes, documented
 - No
- 1.1.2 Does the organisation have a data quality policy?
- Yes, implemented, documented and regularly reviewed
 - Yes, implemented and documented
 - Yes, implemented
 - Yes, documented
 - No
- 1.1.3 Does the documentation of this data quality management structure includes data quality management manual, objectives and targets?
- Yes, implemented, documented and regularly reviewed
 - Yes, implemented and documented
 - Yes, implemented
 - Yes, documented
 - No (if no, go to 1.1.6)

- 1.1.4 To what extent are the objectives on data quality management measurable?
- 90% or more
 - From 50% to 90%
 - From 10 % to 50%
 - From 0% to 10%
- 1.1.5 To what extent does the documentation of this data quality management structure contain the data quality management action plans?
- 90% or more
 - From 50% to 90%
 - From 10 % to 50%
 - From 0% to 10%
- 1.1.6 To what extent does the documentation of this data quality management structure contain the data quality management risk identification, risk assessment, and risk control actions?
- 90% or more
 - From 50% to 90%
 - From 10 % to 50%
 - From 0% to 10%
- 1.1.7 Do you have a procedure implemented to facilitate changes to the Data Quality Management System? (*Includes all those interested on the data through intranet or other communication channels*)
- Example: test routines*
- Yes, implemented, documented and regularly reviewed
 - Yes, implemented and documented
 - Yes, implemented
 - Yes, documented
 - No

1.2 Data quality requirements

The organisation shall establish and maintain a procedure for identifying and accessing the data synchronisation requirements and other (legal) requirements that are applicable to data management. The organisation shall keep this information up-to-date. It shall communicate relevant information on data quality and other related requirements to its employees and relevant third parties including contractors. Within GDSN, the requirements considered in this section constitute the minimum recommended set of data quality requirements needed for satisfactory performance.

Questions

- 1.2.1 To what extent has the organisation implemented processes to guarantee that the data output produced by the Data Quality management System comply with GDSN requirements for data synchronisation? (*GDSN requirements include all corresponding standards such as GDD definitions, GTIN Allocation rules, GDSN Packaging measurement Rules, etc*)
- 90% or more
 - From 50% to 90%
 - From 10 % to 50%
 - From 0% to 10%
- 1.2.2 Is there a process in place to keep the organisation up-to-date regarding the GDSN requirements? [implementation and internal communication]
- Yes, implemented, documented and regularly reviewed
 - Yes, implemented and documented
 - Yes, implemented
 - Yes, documented
 - No

1.3 Data quality management processes

The organisation shall plan and carry out all data quality management processes under controlled conditions.

Controlled conditions shall include, as applicable:

- *The availability of information that describes the origin of the data*
- *The availability of work instructions*
- *The use of suitable equipment*
- *The availability and use of monitoring and measuring processes and devices*
- *The implementation of monitoring and measurement*
- *The implementation of release, delivery and post delivery activities.*

Questions

- 1.3.1 Is the ownership of the data within the organisation defined, documented, implemented and/or regularly reviewed?
Example: RACI chart, master data catalogue
- a) Yes, implemented, documented and regularly reviewed
 - b) Yes, implemented and documented
 - c) Yes, implemented
 - d) Yes, documented
 - e) No
- 1.3.2 Does the organisation have work instructions available to support data quality management processes?
- a) Yes, implemented, documented and regularly reviewed
 - b) Yes, implemented and documented
 - c) Yes, implemented
 - d) Yes, documented
 - e) No
- 1.3.3 Does the organisation make use of standardised monitoring and measuring processes?
(Standardised means that it is executed in the same way over and over – e.g. changes in measurements are not due to the way the operator executes them)
Example: Auditing
- a) Yes, implemented, documented and regularly reviewed
 - b) Yes, implemented and documented
 - c) Yes, implemented
 - d) Yes, documented
 - e) No
- 1.3.4 To what extent does the organisation use equipment as recommended by GS1 in the 'GDSN Package Measurement Rules Implementation Guide' within all relevant data quality management processes for dimensions measurement?
- a) 90% or more
 - b) From 50% to 90%
 - c) From 10 % to 50%
 - d) From 0% to 10%
- 1.3.5 Are the tools that require calibration being calibrated within your organisation (either by internal or external certified service providers), according to requirements?
- a) Yes
 - b) No

1.4 Product data database structure and IT infrastructure and safeguards

The organisation shall determine, provide and maintain the product data database(s) and IT infrastructure needed to achieve conformity to data quality requirements.

The database structure shall:

- *Secure integrity of the data in the database*
- *Be suitably formatted for data processing and storage*
- *Be accessible for review and verification purposes*
- *Have access provisions and limitations*
- *Ensure traceability of amendments*
- *Be suitable for internal and external data exchange.*

Questions

- 1.4.1 Does the organisation make use of a single source of the truth for product master data to manage and share data with trading partners?
- a) Yes
 - b) No
- 1.4.2 To what extent does the database structure have access authorisation procedures?
Attach: examples of security systems and tools that are used
- a) 90% or more
 - b) From 50% to 90%
 - c) From 10 % to 50%
 - d) From 0% to 10%
- 1.4.3 Does the organisation have a structure in place to ensure the security of data from unauthorised change?
Example: Restrict update rights capability, access rights
Example: IS backing up files (tapes available)
Example: Schedule review of security rights (right people entering data)
- a) Yes, implemented, documented and regularly reviewed
 - b) Yes, implemented and documented
 - c) Yes, implemented
 - d) Yes, documented
 - e) No
- 1.4.4 To what extent does the database structure ensure traceability of amendments (change history)?
Attach: examples of security systems and tools that are used
- a) 90% or more
 - b) From 50% to 90%
 - c) From 10 % to 50%
 - d) From 0% to 10%
- 1.4.5 Is there a process in place to identify and communicate changes/corrections to the data itself?
Example: Consistency checking by the data manager, registration of change history
- a) Yes, implemented, documented and regularly reviewed
 - b) Yes, implemented and documented
 - c) Yes, implemented
 - d) Yes, documented
 - e) No

Section 2: Implementation & Operation

2.1 Responsibilities

Responsible management shall ensure that data quality management responsibilities and authorities are defined, documented and communicated within the organisation.

Responsible management shall appoint a manager or managers who, irrespective of other responsibilities, shall have the responsibility and authority to:

- *Ensure that processes needed for the data quality management system are established, implemented and maintained*
- *Report to responsible management on the performance of the data quality management system and any need for improvement*
- *Ensure the promotion of awareness of data quality requirements throughout the organisation.*

If more than one manager is appointed, the division of responsibilities shall be recorded and communicated throughout the organisation.

Responsible management shall ensure that the integrity of the data quality management system is maintained when changes to the data quality management system are planned and implemented.

Questions

2.1.1 Has the organisation defined the data quality management roles and responsibilities?

Example: data quality manager responsibilities

- a) Yes, implemented, documented and regularly reviewed
- b) Yes, implemented and documented
- c) Yes, implemented
- d) Yes, documented
- e) No

2.1.2 Do the manager(s) who are appointed have the responsibility and authority to ensure that processes needed for the data quality management structure are established, implemented and maintained?

Example: data quality manager responsibilities

- a) Yes
- b) No (go to 2.2.1)

2.1.3 In case more than one manager is appointed: Has the division of responsibilities been recorded and communicated throughout the organisation? (*Refers to the Data Quality Management Structure*)

- a) Yes, or not applicable
- b) No

2.2 Reviews

At suitable stages systematic reviews of processes, procedures, documents and product data shall be performed by responsible management in accordance with planned arrangements:

- *To evaluate the ability to meet data quality requirements*
- *To identify any issues and propose necessary action.*

Participants in such reviews shall consist of representatives of functions concerned with data quality. Records of the results of the reviews and any necessary actions shall be maintained.

Questions

- 2.2.1 Does the organisation periodically audit the data quality management structure?
Example: Include review of processes, procedures, document, product data
Audits: prove of adherence to procedures outlined, adherence to internal requirements
- Yes, yearly
 - Yes, every two years
 - Yes, every three to five years
 - No, never
- 2.2.2 Are the results of these audits shared within the organisation?
Audits: prove of adherence to procedures outlined, adherence to internal requirements
Example: intranet / extranet / email
- Yes
 - No
- 2.2.3 Do the audits result in documented and implemented action plans, if required?
Including feedback from auditors and clients (retailers)
Example: training, change in equipment.
- Yes
 - No

2.3 Personnel, competence, skills and experience

Personnel performing work that might affect data quality shall be competent on the basis of appropriate education, training, skills and experience.

The organisation shall:

- *Determine the necessary competence for personnel performing work that might affect data quality*
- *Provide training or take other actions to satisfy these needs*
- *Evaluate the effectiveness of these actions*
- *Ensure that its personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives*
- *Maintain appropriate records of education, training, skills and experience.*

Questions

- 2.3.1 To what extent has the organisation identified what skills and talents are required in managing data quality?
- 90% or more
 - From 50% to 90%
 - From 10 % to 50%
 - From 0% to 10%
- 2.3.2 To what extent do the people in place who to manage data quality have the right talents and skills set?
Example: job descriptions, checked by HRM, QA management
- 90% or more
 - From 50% to 90%
 - From 10 % to 50%
 - From 0% to 10%
- 2.3.3 To what extent are people working with master data part of an ongoing training program?
Example: Training program
- 90% or more
 - From 50% to 90%
 - From 10 % to 50%
 - From 0% to 10%

- 2.3.4 To what extent does the organisation maintain appropriate records of education, training, skills, and experience?
Example: HR recording via personal file
- 90% or more
 - From 50% to 90%
 - From 10 % to 50%
 - From 0% to 10%
- 2.3.5 To what extent does the organisation evaluate the effectiveness of the actions taken to increase the competencies of personnel regarding data quality? (*Refers to the identification of instances where more training is required for the personnel to perform correctly*)
- 90% or more
 - From 50% to 90%
 - From 10 % to 50%
 - From 0% to 10%

2.4 Internal communication

Responsible management shall ensure that appropriate communication processes are established within the organisation and that communication takes place regarding the importance of and performance on data quality.

Questions

- 2.4.1 Is there an ongoing internal communication process on any aspect of data quality, to create awareness within the organisation on the importance of providing highly accurate data? (*Refers to the continuous internal communication of the impact and importance of data quality and committing to it*)
- Example: Internal websites, email, newsletter, other tools*
- Yes, implemented, documented and regularly reviewed
 - Yes, implemented and documented
 - Yes, implemented
 - Yes, documented
 - No

2.5 Operational control

2.5.1 Product measurement and data generation

The organisation shall establish and maintain a procedure / procedures for product measurement and data generation in accordance with GS1 requirements. The measurement output data shall be: Stated in the standard units of measure defined by global international standards (GS1, ISO, UN/CEFACT, etc.)

The organisation shall determine appropriate:

- *Methods for measuring product attributes*
- *Measuring equipment*
- *Measuring location and conditions*
- *Personnel to perform the measurements*
- *Method for the recording of measurement data.*

These inputs shall be reviewed for adequacy.

The measurement output data shall be:

- *Stated in internationally accepted units of measurement*
- *Suitably formatted for review and data processing.*

Questions

2.5.1.1 Has the organisation got operational processes needed for product measuring and data generation (in accordance with GS1 requirements)?

Example: Reporting structure, responsibilities, work instructions, work flow routines

- a) Yes, implemented, documented and regularly reviewed
- b) Yes, implemented and documented
- c) Yes, implemented
- d) Yes, documented
- e) No

2.5.1.2 Does the organisation have a specific process for generating and checking the data for new products, prior to first distribution of new products?

Example: finished product may vary from design – reality check

- a) Yes, implemented, documented and regularly reviewed
- b) Yes, implemented and documented
- c) Yes, implemented
- d) Yes, documented
- e) No

2.5.1.3 To what extent are the GS1 GDD definitions on attributes applied internally? (*Refers to the degree in which the organisation makes use of these definitions internally.*)

- a) 90% or more
- b) From 50% to 90%
- c) From 10 % to 50%
- d) From 0% to 10%

2.5.1.4 To what extent has the organisation determined appropriate methods for the recording of measurement data?

- a) 90% or more
- b) From 50% to 90%
- c) From 10 % to 50%
- d) From 0% to 10%

2.5.1.5 Is the output data in compliance with standards of the GS1 accepted units of measure?

Attach: GS1 standards

- a) Yes
- b) No

2.5.1.6 Does the organisation have a GTIN, GPC and GLN allocation policy?

Example: GTIN: Global Trade Identification Number (attach documents)

GPC: Global Product Classification

GLN: Global Location Number

Example: (conditions under which change in product needs change in barcode)

- a) Yes
- b) No

2.5.1.7 To what extent is the GTIN policy applied within the organisation?

Example: (GTIN: Global Trade Identification Number)

- a) 90% or more
- b) From 50% to 90%
- c) From 10 % to 50%
- d) From 0% to 10%

2.5.1.8 Does the organisation have a process in place for checking product data during the product lifetime (ongoing check)?

- a) Yes
- b) No

2.5.2 Product master data input into internal data systems

The organisation shall establish and maintain procedures for data input and creation and shall review these for adequacy. The data input process shall ensure that received data is correctly entered into the internal (data supplier) database. Includes all data bases that are considered part of the 'behind the stage' processes of an organisation.

Questions

2.5.2.1 Does the organisation have approved processes and procedures for data input?

Example: Review of the data by the manager, validation of information, etc.

- a) Yes, implemented, documented and regularly reviewed
- b) Yes, implemented and documented
- c) Yes, implemented
- d) Yes, documented
- e) No

2.5.2.2 Does the organisation review the procedures for data input and creation for adequacy?

- a) Yes, yearly
- b) Yes, every two years
- c) Yes, every three to five years
- d) No, never

2.5.2.3 Has the organisation established, maintained, and documented the operational processes needed for internal data publishing? (*Internal data publishing refers to the communication of item data to internal functions such as sales, or marketing, which would then re-use the data with external customers*)

- a) Yes, implemented, documented and regularly reviewed
- b) Yes, implemented and documented
- c) Yes, implemented
- d) Yes, documented
- e) No

2.5.3 External data publishing

The organisation shall establish and maintain procedures to control the process of publishing product data into external data pools.

The data publishing process shall include all necessary provisions to ensure that product data published into external data pools is accurate, based upon the actual product characteristics and that published data can be traced back to its origin.

The data publishing procedure shall include:

- *Data publishing with sufficient safeguards for accuracy, integrity and completeness*
- *Data verification prior to publishing where the resulting output cannot be verified by measurement*
- *Data publishing co-ordination throughout the organisation and its production locations, business units, divisions and departments*
- *Appropriate authorisation*
- *Traceability back to source for verification and correction*
- *Adherence to GTIN/GPC/GLN-allocation rules.*

Responsible management shall appoint a manager or managers who, irrespective of other responsibilities, shall be made responsible for data publishing.

If more than one manager is appointed the division of responsibilities shall be recorded and communicated throughout the organisation.

Questions

- 2.5.3.1 Have critical success factors (key elements that ensure a satisfactory performance) been established in the processes for external data publishing? (*Critical success factors refers to the internal or joint pre-requirements that might exist to allow the external publication of data; for instance, approval of the data by the category manager*)
- a) Yes
 - b) No
- 2.5.3.2 Has the organisation established and maintained procedures to control the process of publishing product data into external data pools?
Example: organisational set-up, clear lines of responsibilities
- a) Yes, implemented, documented and regularly reviewed
 - b) Yes, implemented and documented
 - c) Yes, implemented
 - d) Yes, documented
 - e) No
- 2.5.3.3 Does the data publishing process include all necessary provisions to ensure that product changes published into external data pools is based upon the most relevant version of the product?
- a) Yes
 - b) No
- 2.5.3.4 To what extent does the data publishing process include all necessary provisions to ensure that product data attributes published into external data pools can be traced back to its origin? (*Refers to the ability to track the history of changes of the information both internally and externally published in any means*)
- a) 90% or more
 - b) From 50% to 90%
 - c) From 10 % to 50%
 - d) From 0% to 10%
- 2.5.3.5 Does the data publishing procedure include: appropriate authorisation?
- a) Yes
 - b) No

Section 3: Measuring & Monitoring

3.1 Monitoring processes and analysis

The organisation shall apply suitable methods for monitoring the data quality management system processes and, where applicable, measure results.

These methods shall demonstrate the ability of the processes to achieve policy objectives and shall include performance indicators defined at relevant functional levels within the organisation.

At regular intervals the performance of the data quality management system shall be evaluated against these performance indicators.

When planned results are not achieved, appropriate corrective action shall be taken to ensure conformity of the data quality management system.

Questions

- 3.1.1 Which monitoring methods on master data management are used within the organisation to evaluate and track the data quality management processes and procedures?
Answer: internal/external auditing, process performance indicators, user feedback
- 3.1.2 Are performance indicators defined for each process in the Data Quality Management System?
Example: feedback from clients, data reports
- Yes, always
 - Yes, most of the time
 - Yes, sometimes
 - No, never
- 3.1.3 To what extent are these performance indicators tracked and communicated?
- 90% or more
 - From 50% to 90%
 - From 10 % to 50%
 - From 0% to 10%
- 3.1.4 After recurrence of known failures, are steps taken to prevent them recurring?
- Yes, always
 - Yes, most of the time
 - Yes, sometimes
 - No, never
- 3.1.5 To what extent are all corrections suitable, made in both the product master data and the published data (if relevant)?
- 90% or more
 - From 50% to 90%
 - From 10 % to 50%
 - From 0% to 10%
- 3.1.6 Based on the results of the analysis of performance indicators, are the necessary follow-up actions executed?
- Yes, always
 - Yes, most of the time
 - Yes, sometimes
 - No, never
- 3.1.7 Are the results on the performance indicators communicated within the organisation and if applicable to 3rd party service providers?
Example: email, newsletter, internal website, etc
- Yes, always
 - Yes, most of the time
 - Yes, sometimes
 - No, never

3.2 Customer feedback

The organisation shall establish and maintain a documented procedure for dealing with external customer feedback (including complaints) received from data recipients and other relevant parties. This procedure shall include feedback analysis and a formal response to the data recipient or other relevant party.

Questions

- 3.2.1 Is a documented procedure in place for handling customer complaints concerning data quality?
- Yes, implemented, documented and regularly reviewed
 - Yes, implemented and documented
 - Yes, implemented
 - Yes, documented
 - No
- 3.2.2 Are improvement actions initiated based on the analysis of customer feedback?
- Yes, always
 - Yes, most of the time
 - Yes, sometimes
 - No, never
- 3.2.3 Are formal responses issued to customers in regards their data quality complaints?
- Yes, always
 - Yes, most of the time
 - Yes, sometimes
 - No, never

3.3 Internal Audits

The organisation shall conduct internal audits at planned intervals to determine whether the data quality management system conforms to the planned arrangements, the requirements of this section and the data quality management system requirements established by the organisation, and whether it is effectively implemented and maintained.

Audit programmes shall be planned, established, implemented and maintained by the organisation, taking into consideration the importance of the data quality management system processes and the results of previous audits.

The organisation shall establish and maintain a documented audit procedure that addresses:

- *Responsibilities and requirements for planning and conducting audits, reporting results and retaining associated records,*
- *Determination of audit criteria, scope, frequency and methods.*

The selection of auditors and the conduct of audits shall ensure objectivity and impartiality of the audit process.

Questions

- 3.3.1 Is there a process for determining the criteria, scope, frequency and methods for executing internal audits of the data quality management system?
- Yes, implemented, documented and regularly reviewed
 - Yes, implemented and documented
 - Yes, implemented
 - Yes, documented
 - No

Section 4: Management review of system performance

Responsible management shall review the organisation's data quality management system and performance on data quality at planned intervals to ensure its continuing suitability, adequacy and effectiveness. This review shall include the assessment of opportunities for improvement and the need for changes to the data quality management system, including the data quality management policy and objectives.

Records from management reviews shall be maintained.

The Review input shall include:

- *Results of audits*
- *Reports from data quality management inspections*
- *Data user and stakeholder feedback*
- *Process performance*
- *Data accuracy*
- *Status of preventative and corrective actions*
- *Follow-up actions from previous management reviews*
- *Changes that could affect the data quality management system*
- *Recommendations for improvement.*

The Review output shall include any decisions and actions related to:

- *Improvement of the effectiveness of the data quality management system and its processes to ensure data quality and accuracy*
- *Improvement of customer related requirements with respect to data quality management*
- *Resource needs.*

Questions

- 4.1.1 Does the management periodically review the organisation's Data Quality Management System and performance on data quality?
- a) Yes, yearly
 - b) Yes, every two years
 - c) Yes, every three to five years
 - d) No, never
- 4.1.2 To what extent does the review include assessing opportunities for improvement and the need for changes to the data quality management structure, including the data quality management policy and objectives?
- Example: Description of functioning auditing organisation*
- a) 90% or more
 - b) From 50% to 90%
 - c) From 10 % to 50%
 - d) From 0% to 10%
- 4.1.3 Are records of the reviews kept?
- a) Yes
 - b) No
- 4.1.4 Does the review input include the results of audits?
- a) Yes
 - b) No
- 4.1.5 Does the review input include reports from data quality management inspections?
- a) Yes
 - b) No

- 4.1.6 Does the review input include data user and stakeholder feedback?
a) Yes
b) No
- 4.1.7 Does the review input include process performance?
a) Yes
b) No
- 4.1.8 Does the review input include status of preventative and corrective actions?
a) Yes
b) No
- 4.1.9 Does the review input include follow-up actions from previous management reviews?
a) Yes
b) No
- 4.1.10 Does the review input include changes that could affect the data quality management structure?
a) Yes
b) No
- 4.1.11 Does the review input include recommendations for improvement?
a) Yes
b) No
- 4.1.12 Does the review input include the evaluation of the KPI results?
a) Yes
b) No
- 4.1.13 Does the review output include decisions and action related to improvement of the effectiveness of the data quality management structure?
a) Yes
b) No
- 4.1.14 Does the review output include decisions and action related to improvement of the effectiveness of the data quality processes to ensure data quality and accuracy?
a) Yes
b) No
- 4.1.15 Does the review output include decisions and action related to improvement of customer related requirements with respect to data quality management?
a) Yes
b) No

Scoring Model

The differentiation between basic and general questions has been taken into account in the scoring model. All basic questions are assigned a maximum of 8 points. Points assigned to general questions vary according to the question's complexity and relevance. For all questions, there is a maximum number of points, given to the most advanced answer category (A). The other multiple choice answers (B, C, D, E) are awarded a percentage of the maximum number of points. Although there are 33 basic questions and 40 general questions, the importance of the basic questions is indicated by having 66% of the total of 402 points.

The target level is set on 80% of the total score (402 points), which is 320 points.

This overall target equals the sum of the targets set on:

	Target
a. Basic questions:	211 points
b. General questions:	109 points
	Total: 320 points

Thus in order to reach a minimum level of compliance for self declaration, the targets on both basic and general questions have to be reached. That means at least 211 points have to be scored on the basic questions and 109 points on the general questions.



Important: Please remember that the scoring model provides only a general indication of overall compliance to the recommended best practices; it does not reflect the effectiveness or priority that every action has for a particular organisations. Also some self-assessments may not contemplate a goal of reaching a high-score (for instance, discovery self-assessments).

Scoring Template

Question	Answer	A	B	C	D	E	Points scored on basic questions	Points scored on general questions
1.1.1	B	8	7	6	1	0		
1.1.2	B	8	7	6	1	0		
1.1.3	B	8	7	6	1	0		
1.1.4		6	4	2	0			
1.1.5		4	3	1	0			
1.1.6		4	3	1	0			
1.1.7		4	3	3	1	0		
1.2.1	B	8	6	2	0			
1.2.2	B	8	7	6	1	0		
1.3.1	B	8	7	6	1	0		
1.3.2		4	3	3	1	0		
1.3.3		6	5	4	1	0		
1.3.4	B	8	6	2	0			
1.3.5		2	0					
1.4.1	B	8	0					
1.4.2	B	8	6	2	0			
1.4.3	B	8	7	6	1	0		
1.4.4	B	8	6	2	0			
1.4.5		6	5	4	1	0		
Subtotal								

Question	Answer	A	B	C	D	E	Points scored on Basic Questions	Points scored on general questions
2.1.1	B	8	7	6	1	0		
2.1.2		6	0					
2.1.3		4	0					
2.2.1	B	8	6	4	0			
2.2.2		4	0					
2.2.3		4	0					
2.3.1	B	8	6	2	0			
2.3.2	B	8	6	2	0			
2.3.3	B	8	6	2	0			
2.3.4		2	1	1	0			
2.3.5		2	1	1	0			
2.4.1	B	8	7	6	1	0		
2.5.1.1	B	8	7	6	1	0		
2.5.1.2	B	8	7	6	1	0		
2.5.1.3		4	3	1	0			
2.5.1.4		6	4	2	0			
2.5.1.5	B	8	0					
2.5.1.6	B	8	0					
2.5.1.7	B	8	0	0	0			
2.5.1.8		4	0					
2.5.2.1	B	8	7	6	1	0		
2.5.2.2		2	2	1	0			
2.5.2.3	B	8	7	6	1	0		
2.5.3.1		6	0					
2.5.3.2	B	8	7	6	1	0		
2.5.3.3		6	0					
2.5.3.4	B	8	6	2	0			
2.5.3.5	B	8	0					
Subtotal								

Question	Answer	A	B	C	D	E	Points scored on Basic Questions	Points scored on general questions
3.1.1		0	0	0	0	0		
3.1.2	B	8	6	4	0			
3.1.3		4	3	1	0			
3.1.4	B	8	6	4	0			
3.1.5		4	3	1	0			
3.1.6		4	3	2	0			
3.1.7		4	3	2	0			
3.2.1	B	8	7	6	1	0		
3.2.2	B	8	6	4	0			
3.2.3		4	3	2	0			
3.3.1		6	5	4	1	0		
Subtotal								

Question	Answer	A	B	C	D	E	Points scored on Basic Questions	Points scored on general questions
4.1.1	B	8	6	4	0			
4.1.2	B	8	6	2	0			
4.1.3		2	0					
4.1.4		2	0					
4.1.5		2	0					
4.1.6		2	0					
4.1.7		2	0					
4.1.8		2	0					
4.1.9		2	0					
4.1.10		2	0					
4.1.11		2	0					
4.1.12		2	0					
4.1.13		2	0					
4.1.14		2	0					
4.1.15		2	0					
Subtotal								

	Basic questions	General questions
Subtotal section 1		
Subtotal section 2		
Subtotal section 3		
Subtotal section 4		
Total Score		

Self-declaration standard	211	109
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Note: An automated (Excel-based) version of the self-assessment questionnaire and its scoring model is available within the 'Self-Assessment' scorecard provided as part of the 'Data Quality Framework Packet'.

5.4. Appendix IV – Information for Product Inspections

5.4.1. Sampling

The following steps shall be used to determine sample sizes:

1. Identify all trade items that fall within the scope defined by the organisation for the inspection(s)
2. The data supplier shall categorise the trade items based on their characteristics into sample groups. For example, classification by hierarchy/product type into:
 - a. Consumer (end user) trade items
 - i. Rigid packaging
 - ii. Flexible packaging
 - iii. Hanging items
 - iv. Cylindrical items
 - v. Multi-packs
 - b. Non-consumer trade items, no pallet
 - c. Non-consumer trade items, including a pallet

! **Important:** Each organisation shall define the best categorisation for the sample based on the scope of the inspection.

3. Within each sample group, a sample will be taken in accordance with the formula: $[\text{Sample} = \sqrt{n + 0.1n}]$, where n = number of articles. All items that are identical count as one article in the sample.

Example of sample sizes in each sample group based on the sample formula.			
N	sample	n	sample
1	1	500	73
5	3	1000	132
10	5	1250	161
25	8	1750	217
50	13	2500	300
100	20	3500	410
250	41	4000	464

4. The data supplier will strive for the widest variation in trade items possible, based on dimensions and the packaging material. However, it is recommended to select different trade items from the same hierarchy as much as possible.

5.4.2. Pre-inspection documentation requirements

Sample justification

- Total number of GTINs 'live' in the GDSN data pool
- Overview of GTINs considered like items
- Division of GTINs in sample groups (include Trade Item Description for reference purposes)
- Sample size for each sample group.

Product data sheet

- Data sheet for each GTIN subject to inspection with all product data as published into the data pool

Measuring equipment

- Overview of measuring equipment with relevant specifications (type, brand, serial number, etc.)
- Table to indicate which product attribute will be measured with what type of measuring equipment

Previous inspection reports

- If applicable, previous inspection reports shall be made available to the inspection body, for review

5.4.3. Inspection report requirements

The report contains the following sections:

1. Inspection summary
2. Inspection scope
3. Reference documents
4. Overview of inspection findings / results / performance
5. Action plan
6. Annexes

1 Inspection summary

- Brief summary of the inspection which states at least: organisation reference data, number of inspected GTINs and statement on performance in % of inspected GTINs

2 Inspection scope

- Organisation reference data (name, department/ business unit, address, contact person, etc.)
- Visited locations
- Number of GTINs

3 Reference documents

- References should be made to all documents used during the inspection, including version numbers and publication dates

4 Overview of inspection findings / results / performance

- Overview of all findings listed per GTIN
- Summary / conclusion with aggregated results
- Statement on performance in % of inspected GTINs

5 Action plan

- Overview of all inaccurate data for corrective measures by the organisation
- Other (additional) inspections planned to verify data accuracy

6 Annexes

- Overview of inspected GTINs and inspected packaging levels

5.4.4. Guidelines on KPIs targets for the Industry

The following guidelines were developed by the GS1 Data Quality Steering Committee as a means to provide trading partners with a general indication over the expected accuracy in the information.

These guidelines however, are not a mandated assessment tool, since they are simply meant to provide trading partners some context to further work on improving data quality and data accuracy.

Organisations will always be free to define different KPI levels and objectives either internally or in collaboration with other trading partners. These recommendations will simply offer some orientation over the general perspective from the Industry in regards to data accuracy.

 **Important:** The KPI levels below apply to all products types regardless of their packaging type or composition. Additionally, these KPI target levels are also applicable to all the different KPIs defined on section 5.4.5 of this appendix.

KPI Scores and meaning:

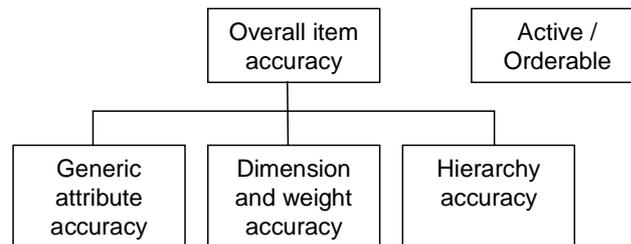
Score	Meaning
95% or higher	Reasonably good data; obtaining a score of 95% or higher on all or individual KPIs means that data is almost entirely reliable and that most trading partners are likely to accept the information. Organisations with a score in this range may choose to work closer to trading partners on specific opportunities in order to achieve 100% accuracy.
From 75% to 95%	Obtaining a score between 75% and 95% indicates that the information has significant problems, but that it is salvable data and could be improved if trading partners take the right course of action. An organisation obtaining a score in this range is encouraged to set immediate action to improve as well as committing to delivering results. Some trading partners may choose to still accept this data at their discretion.
Less than 75%	Poor quality data; obtaining less than 75% percent on all or individual KPIs means that the data is mostly unreliable and that most trading partners are unlikely to accept the data. Organisations with a score in this range are strongly advised to fully revise their data synchronisation and data quality programmes.

5.4.5. Master data quality KPIs

The following KPI model has been developed as a means to monitor key data accuracy measurements and validate the efficacy of a data quality management system.

This Data Quality KPI Model covers the following KPIs:

1. Overall item accuracy
2. Generic attribute accuracy
3. Dimension and weight accuracy
4. Hierarchy accuracy
5. Active/Orderable



When an organisation has solid internal processes for the management of the quality of the data, the information output should reflect the effectiveness of these internal processes by obtaining consistent high marks on the KPI measurements. If the information obtains low results on the KPIs, it is to be taken as an indication that the assessment of the internal processes requires further revision and correction.

Note: The KPI model here described is applicable to all sections of the Data Quality Framework (i.e. it is an aide in the implementation of section 2 “The Data Quality Management System”, section 3 “Self-Assessment” and section 4 “Product Inspection Procedure”).



5.4.5.1. Master data quality KPIs definition

KPI-definition

1. Overall item accuracy

Definition The percentage of items that have accurate and complete values for all data attributes included in the scope of the KPI Model.

2. Generic attribute accuracy

Definition The percentage of items that have the GS1 standards correctly applied and have accurate and complete values for all generic data attributes (see list below).

Attributes

- globalTradeItemNumber (GTIN)
- classificationCategoryCode (GPC Code)
- tradeItemDescription*
- netContent

 **Note:** The attribute “tradeItemDescription” is to be populated according to current conventions defined by definitions of the GS1 System and is used for information purposes only.

3. Dimension and weight accuracy

Definition The percentage of items that have the GS1 standards correctly applied and have accurate and complete values for all dimension and weight attributes (see list below) based on the GDSN Package Measurement Rules (including tolerances).

Attributes

- depth
- width
- height
- grossWeight

4. Hierarchy accuracy

Definition The percentage of items that have the GS1 standards correctly applied and have accurate and complete values for all hierarchy attributes (see list below).

Attributes

- totalQuantityOfNextLowerLevelTradeItem
- quantityOfTradeItemsPerPalletLayer
- quantityOfTradeItemsPerPallet
- quantityOfLayersPerPallet
- quantityOfCompleteLayersContainedInATradeItem
- quantityOfTradeItemsContainedInACompleteLayer
- quantityOfNextLevelTradeItemWithinInnerPack

 **Note:** For applicability rules for attributes please refer to the table on section 5.4.6 of this appendix.

5. Active / Orderable

Definition The percentage of items in the home data pool that are still active/orderable or have an accurate end date

5.4.5.2. How to inspect and measure the Active/orderable KPIs

This KPI measures the percentage of items in the home data pool that are still active/orderable or have an accurate end date.

- Take all items from the Manufacturer Home Data Pool and match them with the manufacturer ordering systems.
- Count the number of items that occur in both the data pool and the ordering system.
- Count the number of items that do not occur in the ordering system but have a valid (in the past) end date in the data pool.
- Sum up the two counts and divide them by the number of items in the Manufacturer Home Data Pool.
- Multiply the result with 100% and the KPI score is generated.

5.4.6. List of GDSN attributes for product inspections

The Global Data Dictionary (GDD) attributes provide the starting point for the framework. It is expected that the framework will evolve to include more data attributes and business information as exchanged between trading partners, with the evolvement of the GDD.

- ✔ **Note:** These attributes are just a recommended set of attributes that cover the most basic trade item information that is usually exchanged. Trading partners can, at their own discretion, expand or reduce this list focusing on the attributes relevant to their business.

Item name	Definition/explanation	Applicability ¹	Recorded result	Category ² (KPI)
globalTradeItemNumber	A particular Global trade item Number, a numerical value used to uniquely identify a trade item. A trade item is any trade item (trade item or service) upon which there is a need to retrieve pre-defined information and that may be planned, priced, ordered, delivered and or invoiced at any point in any supply chain.	All levels	The individual GTIN, or Not Found	Generic attributes
classificationCategoryCode ³	Global EAN.UCC classification category code. Unique, permanent 8-digit key.	All levels	Individual GPC code	Generic attributes
tradeItemDescription ⁴	An understandable and useable description of a trade item using brand and other descriptors. This attribute is filled with as little abbreviation as possible while keeping to a reasonable length. Free form text field, this data element is repeatable for each language used and must be associated with a valid ISO language code. Field length is 178 characters. This should be a meaningful description of the trade item with full spelling to facilitate message processing. Retailers can use this description as the base to fully understand the brand, flavor, scent etc. of the specific GTIN in order to accurately create a product description as needed for their internal systems.	All levels	Description provided by the manufacturer	Generic attributes
netContent	The amount of the trade item contained by a package, usually as claimed on the label.	Consumer unit	Declared quantity or weight [pieces, g/lbs]	Generic attributes
Depth	The measurement from front to back of the trade item ⁵ . Needs to be associated with a valid UoM.	All levels	Depth (mm/in)	Dimensions & weight
Width	The measurement from left to right of the trade item. Needs to be associated with a valid UoM.	All levels	Width (mm/in)	Dimensions & weight
Height	The measurement of the height of the trade item. The vertical dimension from the lowest extremity to the highest extremity, including packaging. At a pallet level the trade itemHeight will include the height of the pallet itself.	All levels	Height (mm/in)	Dimensions & weight

Item name	Definition/explanation	Applicability ¹	Recorded result	Category ² (KPI)
grossWeight	Used to identify the gross weight of the trade item. The gross weight includes all packaging materials of the trade item. At pallet level the trade itemGrossWeight includes the weight of the pallet itself. Needs to be associated with a valid UoM.	All levels	Gross weight (kg/lb)	Dimensions & weight
totalQuantityOfNextLowerLevelTradeItem	This represents the Total quantity of next lower level trade items that this trade item contains.	All levels except consumer unit	Quantity	Hierarchy attribute
quantityOfTradeItemsPerPalletLayer ⁶	The number of trade items contained on a single layer of a pallet. Only used if the pallet has no GTIN. It indicates the number of trade items placed on a pallet layer according to supplier or retailer preferences.	Trade Unit levels (when pallet unit has no GTIN allocated)	Quantity	Hierarchy attribute
quantityOfLayersPerPallet ⁶	The number of layers that a pallet contains. Only used if the pallet has no GTIN. It indicates the number of layers that a pallet contains, according to supplier or retailer preferences.	Trade Unit levels (when pallet unit has no GTIN allocated)	Quantity	Hierarchy attribute
quantityOfTradeItemsPerPallet ⁶	The number of trade items contained in a pallet. Only used if the pallet has no GTIN. It indicates the number of trade items placed on a pallet according to supplier or retailer preferences.	Trade Unit levels (when pallet unit has no GTIN allocated)	Quantity	Hierarchy attribute
quantityOfCompleteLayersContainedInATradeItem ⁶	The number of layers of the base trade item found in a trade item. Does not apply to the base trade item unit.	All levels except base unit	Quantity	Hierarchy attribute
quantityOfTradeItemsContainedInACompleteLayer ⁶	The number of trade items contained in a complete layer of a higher packaging configuration. Used in hierarchical packaging structure of a trade item. Cannot be used for trade item base unit..	All levels except base unit	Quantity	Hierarchy attribute
quantityOfNextLevelTradeItemWithinInnerPack ⁶	Indicates the number of next lower level trade items contained within the physical non-coded grouping (innerpack).	All applicable levels with inner-pack groupings	Quantity	Hierarchy attribute

 **Important:** The attributes recommended in the table above are just a suggested starting point for product inspections. Organisations may freely expand or reduce the list based on their local needs, priorities and their agreements with their trading partners. For practical purposes, the KPI Scorecard provided with the Data Quality Framework considers this list as the basis for the attributes it helps verify.

 **Note:** The “GDSN Package Measurement Rules for Data Alignment” should be used for correct measurement.

¹Applicability as to the levels of the trade item hierarchy, including inner packs.

²This indicates in which type of KPI is a specific attributed considered

³To be inspected for existence only, however code 99999999 is not allowed (unless no other category is available for that product).

⁴For information purposes only.

⁵Also referred to as length.

⁶Please note that these hierarchy attributes do not apply at the same time to all items; please refer to the applicability of each attribute in order to determine their relevance and usability for a specific item.

5.5. Appendix V: Previous Contributors

In preparing version 3 of the Data Quality Framework, the team were very mindful of the solid foundation laid by many contributors in the earlier versions and the original thinking and leadership across the community. It is with pleasure and gratitude we record the names of those contributors and their companies who were responsible for the original versions of the Data Quality Framework.

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