



Implementation Guides

For the Data Quality Framework v3.0

Issue 2, October 2010

Document Summary

Document Item	Current Value
Document Title	Implementation Guides For the Data Quality Framework v3.0
Date Last Modified	October 2010
Current Document Issue	Issue 2
Status	Final
Document Description	A "user's manual" for implementers of the Data Quality Framework version 3.0

Contributors

Name	Organisation
Neil Abney	Procter & Gamble Co.
Peter Alvarez	GS1 Global Office
Kristin Andersen	Wegmans Food Markets
Andrea Ausili	GS1 Italy
Laura Benavides	GS1 Colombia
Robert Besford	GS1 UK
Greg Buckley	PepsiCo
Hugo Byrnes	Royal Ahold
Corey Cashmere	ConAgra Foods
Enrique Cruz	Helen of Troy
Jan Denecker	GS1 Global Office
Daniëlle Hoekstra	GS1 Netherlands
Alan Hyler	GS1 Global Office
Yohan Jeon	GS1 Korea
Mats Johansson	SCA
Varun Kapur	GS1 India
Robin Kidd	Nestle
Hanjörg Lerch	METRO Group
Fiona van der Linde	GS1 South Africa
Susie McIntosh-Hinson	GS1 Global Office
Allard Mes	Unilever N.V.
Teresa Moore	AAFES
Rebecca Nichols	The J.M. Smucker Company
Anna Nilsson	GS1 Sweden
Jon Peterson	3M
Carlos Ramos	GS1 Mexico
Sean Sloan	GS1 Australia
Gabriel Sobrino	GS1 Global Office
Roman Strand	GS1 Germany
Tanja Thomsen	GS1 Germany

Name	Organisation
Gina Tomassi	PepsiCo
Milan Vacval	Gladson Interactive
Patricia Vessey	Best Buy
Zoë Wilson	BISSELL Homecare, Inc.

Log of Changes in Issue 2

Issue No.	Date of Change	Changed By	Summary of Change
Draft v0.1	29 March 2010	Gabriel Sobrino	First draft of content lay-out
Draft v0.2	29 April 2010	Gabriel Sobrino	Expanded with feedback from the group and discussions from the physical meeting of 19 April 2010. Addition of sections 4,5 and 6.
Draft v0.3	7 May 2010	Gabriel Sobrino	Minor corrections and addition for section 5.3.
Issue 1	17 May 2010	Gabriel Sobrino	Minor typos corrected and issue of final version.
Issue 2	28 October 2010	Gabriel Sobrino	Minor typos corrected.

Disclaimer

Whilst every effort has been made to ensure that the guidelines to use the GS1 standards contained in the document are correct, GS1 and any other party involved in the creation of the document HEREBY STATE that the document is provided without warranty, either expressed or implied, of accuracy or fitness for purpose, AND HEREBY DISCLAIM any liability, direct or indirect, for damages or loss relating to the use of the document. The document may be modified, subject to developments in technology, changes to the standards, or new legal requirements. Several products and company names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

Table of Contents

1. Introduction	6
1.1. Purpose	6
1.2. Who should read this document?	6
2. Essential Steps for the Implementation of a Data Quality Management System	7
2.1. Introduction	7
2.1.1. Step 1: Top Management Commitment	8
2.1.2. Step 2: Appoint responsible manager(s)	9
2.1.3. Step 3: Start Data Quality Awareness Programmes	9
2.1.4. Step 4: Provide Training	9
2.1.5. Step 5: Create Data Quality Management Processes	9
2.1.6. Step 6: Develop Quality Management System Documentation	10
2.1.7. Step 7: Document Control	11
2.1.8. Step 8: Implementation and operation	12
2.1.9. Step 9: Internal Data Quality Audit	12
2.1.10. Step 10: Management Review	13
2.1.11. Step 11: Conformity assessments (optional)	13
2.1.12. Step 12: Continual Improvement	14
3. How to Conduct a Self-Assessment?	15
3.1. Why to self-assess?	15
3.2. How to conduct a self-assessment?	15
3.2.1. Step 1: Decide to self-assess	16
3.2.2. Step 2: Define the scope of the self-assessment	16
3.2.3. Step 3: Appoint an assessment leader	17
3.2.4. Step 4: Form an assessment team	18
3.2.5. Step 5: Educate the organisation about the self-assessment	18
3.2.6. Step 6: Research deployed capabilities	18
3.2.7. Step 7: Apply the self-assessment questionnaire	19
3.2.8. Step 8: Consolidate and analyse results	19
3.2.9. Step 9: Communicate results to the organisation	20
3.2.10. Step 10: Communicate results to trading partners (optional)	20
4. Product inspections and data accuracy KPIs	21
4.1. Why a KPI model?	21
4.2. When to use the KPI model	21
4.3. How to use the KPI model	22
4.3.1. Step 1: Conduct product inspection	22
4.3.2. Step 2: Customise KPI Model	22
4.3.3. Step 3: Analysis and reporting of the results	22
5. Ongoing Data Maintenance	24
5.1. A Framework for continuous improvement	24

5.2.	Product information life-cycle.....	24
5.3.	Best practices for maintaining data through time.....	25
6.	Miscellaneous Topics	26
6.1.	How to read section 2 of the Data Quality Framework.....	26
6.2.	Is the Data Quality Framework specific to a particular role in the supply chain?	28
6.2.1.	Step 1: Conduct a self-assessment using the scorecard.....	29
6.2.2.	Step 2: Review the results on the scorecard's capability matrix	29
6.2.3.	Step 3: Focus on the areas of attention	29
6.3.	In which order should I implement the capabilities from the Data Quality Framework	29


1. Introduction

1.1. Purpose

This document has been developed to provide practical information about the implementation and utilisation of the Data Quality Framework version 3.0.

The content of this document includes step-by-step instructions and recommendations for the utilisation of the different components of the Data Quality Framework within different scenarios where they may apply to.

While not intended to cover every possible situation or scenario in which the Data Quality Framework may be used, these implementation guides provides implementers with a general sense of how the document can be used as an important tool in the pursuit of sustainable, consistently high quality data output.


 **Important:** Users of this document are advised to remember that these implementation guides do not limit the usage of the Data Quality framework to the cases contained in this document nor do they prescribe company-specific formulas for implementation. Great care has been put in ensuring this document is applicable to most business scenarios independently from the sector, type of activity or profile that the user organisation has.

1.2. Who should read this document?

This document was written for all users and implementers of the Data Quality Framework. Since these guides provide some examples of how the Data Quality framework is used in practice, we recommend that this document is not only read by implementers of the Data Quality Framework, but also by anyone who would like to have a better understanding about the application of the Data Quality Framework.

Some of the scenarios described in these guides are:


- Conducting a self-assessment
- Implementing new processes, improvement on a data quality management system
- Identifying opportunities for improvement
- Identifying gaps and risks for quality management processes
- Identification of joint-opportunities for trading partners
- Performing objective and efficient physical inspections of products
- Producing a KPI ranking on the overall state and quality of an organisation's data

 **Note:** This document is intended to be employed as a reference rather than a training material. For more information about available training/educational materials about the Data Quality Framework, please consult your local GS1 Member Organisation (<http://www.gs1.org/contact>) or GS1's Data Quality resource materials at: <http://www.gs1.org/gdsn/dqf/library>

2. Essential Steps for the Implementation of a Data Quality Management System

2.1. Introduction

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. The Data Quality Framework, provides the basic requirements for organisations to implement a data quality management system to achieve good quality data.

 **Note:** For further guidance please contact your local GS1 Member Organisation. A list of all GS1 Member Organisations is available at GS1's website: <http://www.gs1.org/contact>

The best practices that form a data quality management system can be found in Chapter 2 of the Data Quality Framework (Data Quality Management System). These best practices are written in such a way that they can be implemented as a stand-alone improvements, or as part of any existing quality management system, (such as ISO 9000:2005, etc.).

Implementing data quality affects the entire organisation right from the start. If pursued with dedication, it results in a cultural transition towards an atmosphere of continual improvement. The process of implementing data quality will depend on:

- The sophistication of the existing quality management programme (if already implemented)
- The size of the organisation
- The complexity of its processes

Below, this document briefly describes the 12 general steps that should be followed through to help to implement a data quality management system successfully.

- Step 1: Top management commitment
- Step 2: Appoint responsible managers
- Step 3: Start data quality awareness programmes
- Step 4: Provide training
- Step 5: Create Data Quality Management Processes
- Step 6: Develop data quality management system documentation
- Step 7: Document control
- Step 8: Implementation and operation
- Step 9: Internal data quality audit
- Step 10: Management review
- Step 11: Conformity assessment
- Step 12: Continual improvement

2.1.1. Step 1: Top Management Commitment

Top management (managing director or chief executive) should demonstrate commitment and determination to implement a data quality management system in the organisation. Without top management commitment, no data quality initiative can succeed. Top management must be convinced that a compliance statement will enable the organisation to demonstrate to its customers a visible commitment to data quality. It should realise that a data quality management system will improve overall business efficiency.

Top management should provide evidence of its commitment to the development and implementation of the data quality management system and continually improve its effectiveness by:

- Communicating to the organisation the importance of meeting data quality, GS1 and customer requirements
- Helping in the definition of the organisation's data quality policy and make this known to every employee
- Ensuring that data quality objectives are established at all levels and functions
- Ensuring the availability of resources required for the development and implementation of the data quality management system
- Appointing a management representative to coordinate data quality management system activities
- Conducting management reviews

This type of top management commitment may be driven by:

- Direct marketplace pressure: requirements of crucial customers
- Indirect marketplace pressure: increased quality levels and visibility among competitors
- Growth ambitions: desire to exploit market opportunities
- Personal belief in the value of data quality as a goal and data quality management systems as a means of reaching that goal

The top management should identify the goals to be achieved through the data quality management system and document these. Typical goals may be:

- Be more efficient and profitable
- Produce products and services that consistently meet customers' needs and expectations
- Achieve customers satisfaction
- Increase market share
- Reduce costs and liabilities
- Increase confidence in the production system
- Improve speed of the supply chain
- Address ECR challenges and objectives

This information should be accessible to all employees and other relevant parties.

2.1.2. Step 2: Appoint responsible manager(s)

Data quality management systems are implemented by people. The first phase of implementation calls for the commitment of top management. The next step is to appoint a manager or managers who will be responsible for implementing and operating the data quality management system.

The manager is the person within the organisation who acts as the interface between organisation management and operations. The manager should also act as the organisation's "data quality management system champion," and must be a person with:

- Total backing and empowerment from the CEO
- Genuine and passionate commitment to quality in general and the data quality management system in particular
- The authority - resulting from rank, seniority, or both - to influence managers and others of all levels and functions
- Detailed knowledge of quality methods in general and data quality in particular



Important: Please note that on [section 3](#) of these guides ("How to conduct a self-assessment") a similar step regarding the appointment of a project leader is contained. It is important to differentiate them clearly; despite eventual similarities, the processes on sections 2 & 3 are independent from each other as both accomplish different objectives. Therefore, implementers of the Data Quality Framework should be careful to choose the right process for the right goal ([section 2](#) refers to the implementation of processes/changes while section 3 provides orientation on the execution of self-assessments only).

2.1.3. Step 3: Start Data Quality Awareness Programmes

Data quality awareness programmes should be conducted to communicate to the employees the aim of the data quality management system; the advantage it offers to employees, customers and the organisation; how it will work; and their roles and responsibilities within the system.

The awareness programme should emphasise the benefits that the organisation expects to realise through its data quality management system. The programmes could be run either by the implementation team or by experts hired to talk to different levels of employees.

2.1.4. Step 4: Provide Training

Since data quality management systems affect many areas in the organisation, training programmes should be devised for different categories of employees. The data quality implementation plan should make provision for this training. The training should cover the basic concepts of data quality management systems and the standard and their overall impact on the strategic goals of the organisation, the changed processes, and the likely work culture implications of the system. In addition, initial training may also be necessary on writing data quality manuals, procedures and work instruction; auditing principles; calibration; testing procedures, etc.

2.1.5. Step 5: Create Data Quality Management Processes

In essence this is the implementation and operational plan. This thorough and specific plan should cover all the objectives established by the top management.

It should include:

- The availability of information that describes the origin of the data
- 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

In addition, the organisation should determine its product data database and IT infrastructure, which should include:

- The security of the integrity of the data
- Suitable formatting for data processing and storage
- Accessibility for review and verification purposes
- Access provisions and limitations
- Traceability of amendments
- Suitability for internal and external data exchange

Then a Data Publishing Procedure should be established, detailing:

- The process how to get to 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 applicable GS1 Standards (such as GTIN and GLN allocation rules, Global Data Dictionary, GDSN Package Measurement Rules)

2.1.6. Step 6: Develop Quality Management System Documentation

Documentation is the foundation on which a data quality management system is built. It is the most common area of non-conformance among organisations wishing to implement quality management systems.

- Documentation of the data quality management system should include:
 - Documented statements of a data quality policy and data quality objectives
 - A data quality manual
 - Documented procedures and records
- Documents needed by the organisation to ensure the effective planning, operation and control of its processes

Quality documentation is generally prepared in the three levels indicated in the example in the box below.

Level A: Data quality manual

- ❑ States the scope of the quality management system; describes the processes of the data quality management system and their interaction. Generally gives an organisation profile; presents the organisational relationships and responsibilities of persons whose work affects data quality and outlines the main procedures. It may also describe organisation's data quality policy and data quality objectives.

Level B: Data quality management system procedures

- ❑ Describes the activities of individual departments, how data quality is controlled in each department and the checks that are carried out.

Level C: Data quality documents (forms, reports, work instructions, etc.)

- ❑ Work instructions describe in detail how specific tasks are performed; include drawing standards, methods of tests, customer's specifications, etc.
- ❑ Presents forms to be used for recording observations, etc.

A list of the documents to be prepared should be drawn up and the responsibility for writing the documents should be assigned to the persons concerned in various functional departments. They should be advised to prepare the drafts within a specific time frame.

Documentation of the output of the system comprises the records of the organisation. This documentation verifies the validity of the process from which it came – the proof - and is the basis for an (internal) audit.

2.1.7. Step 7: Document Control

Once the necessary quality management system documentation has been generated, a documented system should be created to control it. Control is simply a means of managing the creation, approval, distribution, revision, storage, and disposal of the various types of documentation. Document control systems should be as simple and as easy to operate as possible.

Document control should include:

- Approval for adequacy by authorised person(s) before issue
- Review, updating and re-approval of documents by authorised person(s)
- Identification of changes and of the revision status of documents
- Availability of relevant versions of documents at points of use
- Identification and control of documents of external origin
- Assurance of legibility and identifiability of documents
- Prevention of unintended use of obsolete documents

Remember, that when anything changes, whether it is the system, the procedures or underlying standards, the documentation needs to be changed as well.

The principle of document control is that employees should have access to the documentation and records needed to fulfil their responsibilities.

2.1.8. Step 8: Implementation and operation

The implementation progress should be monitored to ensure that the data quality management system is effective and meets the data quality policy objectives. A monitoring method should be established. The activities include:

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

The preventive action should include provisions to:

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

In general, when planned results are not achieved, corrective action should be taken as appropriate to ensure conformity of the data quality management system.

2.1.9. Step 9: Internal Data Quality Audit

As the system is being installed, its effectiveness should be checked by regular internal data quality audits. Internal data quality audits are conducted to verify that the installed quality management system:

- Conforms to the planned arrangements and to the data quality management system requirements established by the organisation
- Is effectively implemented and maintained

Even after the system stabilises and starts functioning, internal audits should be planned and performed as part of an ongoing strategy.

A few staff members should be trained to carry out internal auditing. Ideally, audits should evaluate not only the performance of the data quality management system but also the data output. The Data

Quality Framework's product inspection procedure (Chapter 4) and for self-assessment process (Chapter 3) should be used as the principle for these audits.

- ✓ **Note:** For more information on self-assessments, please refer to [section 3](#) "How to conduct a self-assessment".

2.1.10. Step 10: Management Review

When the installed data quality management system has been operating for three to six months, an internal audit and management review should be conducted and corrective actions implemented. The management reviews are conducted to ensure the continuing suitability, adequacy and effectiveness of the quality management system. The review should include assessing opportunities for improvement and the need for changes to the quality management system, including the quality policy and quality objectives.

The input to management review should include information on:

- Results of audits
- Reports from data quality management inspections
- Data user and stakeholder feedback
- Process performance and data and product conformity
- Status of preventive and corrective actions
- Follow-up actions from previous management reviews
- Changes that could affect the quality management system
- Recommendations for improvements

Management reviews should also address:

- 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
- Pitfalls to effective implementation, like lack of CEO commitment, failure to involve everyone in the process, and failure to monitor progress and enforce deadlines

2.1.11. Step 11: Conformity assessments (optional)

Due to market demands and specific trading partner relationships, an organisation may be required to conduct a conformity assessment. Organisations are advised to conduct internal audits that correct system deficiencies before starting a conformity assessment regardless of its form.

- ! **Important:** If no conformity assessment is required by trading partners, organisations are still strongly encouraged to perform continuous data quality audits (see [Step 9](#)), always pursuing high-performance results and a constant improvement over previous marks.



Note: In case an organisation is asked (by its trading partners) to undergo a self-administered compliance assessment, the procedure described on [section 3](#) “How to conduct a self-assessment” should be utilised.

2.1.12. Step 12: Continual Improvement

Implementation of a data quality management system is only the beginning of a process to maintain and sustain data quality through time. Organisations should continually seek to improve the effectiveness and suitability of the data quality management system through the use of:

- Quality policy
- Quality objectives
- Audit results
- Analysis of data
- Corrective and preventive actions
- Management review

3. How to Conduct a Self-Assessment?

3.1. Why to self-assess?

A self-assessment is a valuable exercise that can be conducted by an organisation at any time and may be started either as an internal initiative or as a request from trading partners. A self-assessment may be performed by an organisation for a number of reasons, being the most important:

- **To identify points of improvement/opportunities in the internal processes for data quality:** Any organisation – regardless of the level of sophistication of the data quality processes they have in place – may use a self-assessment to highlight the areas that could be expanded or improved in order to facilitate higher levels of quality for the data. In this case, the results of the self-assessment will act as a compass that points to the specific actions that could be implemented to immediately reinforce (or jump-start) a more thorough data quality management system within the organisation.
- **Join collaboration:** The self-assessment exercise may also be used in collaboration with trading partners to point to not only internal, but joint areas of opportunity. This is achieved by discussing the results of a self-assessment with trading partners. Ideally, two organisation that agree to use the self-assessment to explore joint opportunities for improvement would each conduct its own self-assessment and then both sides would discuss the results in order to identify common points to follow and develop further.



Important: Please note that in this scenario, even though the final assessment results are discussed among trading partners, the execution of the self-assessments themselves is always performed by one organisation without interference or involvement from external parties.

- **Self-assessment:** The self-assessment questionnaire also has a scoring model that indicates a 'minimum threshold' of compliance with some of the most important best practices from the Framework.


While self-assessment should not be the absolute goal for an organisation, achieving the minimum score for self-declaration would allow the organisation to self-declare in accordance to the guidelines for self-declaration defined by the GS1 Data Quality Steering Committee. The value of a self-declaration is to be defined by each trading partner within the context of the specific trading relationship between the parties involved.

- **Benchmark:** Finally, the self-assessment procedure may be used as a benchmark that helps compare practices between different areas of an organisation. The self-assessment questionnaire is in itself an objective measure of deployed processes for data quality. A company may want to use the self-assessment as a means to compare work methods between different regions, for instance. It can also be focused as a benchmark between organisational departments or even categories or products. These comparisons can be useful to 'export' successful measures across different areas of the organisation or even to different countries. It is also a valuable enabler for the roll-out of GDS in new locations.

3.2. How to conduct a self-assessment?


Regardless of the reason why a company chooses to conduct a self-assessment, there are recommended best practices for the execution of a self-assessment. Following these best practices will not only ensure that the exercise is conducted efficiently but will also guarantee that the results are neutral, objective and reliable.

We strongly encourage all users of the Data Quality Framework and its self-assessment procedure to follow the recommended process for self-assessment.

-  **Note:** The process described below for a self-assessment was developed by documenting the approach that different organisations took when conducting self-assessments during the 'Data Quality Challenge' pilot. These best practices are therefore developed by actual users of the Data Quality Framework for the industry.

The steps to conduct a self-assessment are:

- Step 1: Decide to self-assess
- Step 2: Define the scope of the self-assessment
- Step 3: Appoint an assessment leader
- Step 4: Form an assessment team
- Step 5: Educate the organisation about the self-assessment
- Step 6: Research deployed capabilities
- Step 7: Apply the self-assessment questionnaire
- Step 8: Consolidate and analyse results
- Step 9: Communicate results to the organisation
- Step 10: Communicate results to trading partners (optional)

-  **Important:** Please remember these steps are used only in the execution of a self-assessment; for more information on the series of steps for implementation of a Data Quality Management System, please refer to [section 2](#) of this document: "Essential Steps for the Implementation of a Data Quality Management System".

3.2.1. Step 1: Decide to self-assess

The first step is naturally to decide to conduct a self-assessment and to secure the necessary endorsement to do so. A self-assessment may be the result of a request of a trading partner, or it can be an internal initiative. In both cases, top management commitment and endorsement is essential for a self-assessment to be useful for the organisation.

We recommend to look at [section 2.1.1](#) of this guide for more information on how to garner executive support. Once that the decision to self-assess has been approved and supported by the top management, the organisation may proceed to the following steps.

3.2.2. Step 2: Define the scope of the self-assessment

The organisation must begin by identifying what the reason is for conducting a self-assessment; based on the goals that the organisation has for the exercise, it must be then scoped what the extent of the processes that assessment should cover. Some factors that can help defined the scope are:

- Product categories
- Product life-cycle (e.g. new introductions vs. line items)
- Brands
- Complexity of data management process
- Type of change in the data
- Manufacturing facilities/locations

An example of how these factors may be combined to identify the scope is for instance, conducting a benchmark self-assessment between the processes for the management of the data of new item introductions of frozen products vs. the management of data of new item introductions for say, shelf-stable items.

! **Important:** Once it has been defined, the scope has to be clearly documented and available at all times in order to keep the self-assessment exercise focused.

3.2.3. Step 3: Appoint an assessment leader

To ensure the self-assessment is successful a project or 'assessment' leader must be appointed within the organisation. The role of the assessment leader will be to coordinate the overall execution of the self-assessment within the organisation. Some of the responsibilities of the assessment leader are to:

- Coordinate education/training needs for self-assessment participants
- Plan the timeline of the self-assessment
- Promote awareness and participation in the self-assessment across the organisation
- Identify key participants and stakeholders of the data quality management process
- Integrate an assessment team to help guide the exercise
- Facilitate communication across different areas of the organisation
- Reach out to subject-matter experts and ensure that the questions are addressed by the people with the right knowledge
- Control the timelines and deadlines for delivery of the answers
- Facilitate dialogue for the resolution of questions, discrepancies during the execution of the self-assessment
- Facilitate knowledge and information regarding standards, source documentation
- Consolidate results from the assessment
- Lead the discussion and analysis of the findings
- Ensure results are communicated and presented to the rest of the organisation

In order to fulfil these actions, it is highly desirable for the assessment leader to possess the following qualities:

- Must have absolute endorsement from the top Management/CEO to conduct and lead the assessment exercise
- Must have good communication with all areas of the organisation
- Must have authority out of rank and seniority to influence other areas of the organisation and ensure their collaboration.
- Must be familiar with the data management and data quality management processes of the organisation
- Must have a good understanding of the role of each area that takes part in the process
- Must be familiar with GS1 standards and must be aware of the degree of usage these have within the organisation
- Desirable experience in conducting assessment exercises

3.2.4. Step 4: Form an assessment team


Once appointed, the assessment leader is responsible to identify key participants on the data quality management process that should participate in the self-assessment. The result should be the formation of an assessment team which will provide leadership for the execution of the self-assessment. It is recommended that the assessment team includes a senior member of each one of the areas involved in the self-assessment.

The assessment team will be led by the assessment leader and its role is to support the assessment leader in the execution and monitoring of the self-assessment process. The assessment team should convene regularly to monitor progress, discuss findings/issues and ensure the execution can continue under good circumstances.

The members of the assessment should also play an important role in communicating the importance of the self-assessment to their respective departments and they should work towards involving everyone in the effort.

3.2.5. Step 5: Educate the organisation about the self-assessment

The assessment leader, with the support of the assessment team, is responsible for ensuring that people understand the importance of the self-assessment and that they have the necessary knowledge to participate in the process and to answer the questions from the self-assessment questionnaire. Reviewing the self-assessment questionnaire along with participants is a great way to achieve this. If at any point a lack of knowledge is identified amongst the participants, the assessment leadership must ensure that the necessary training/education is provided before going further with the self-assessment process.


 **Important:** A crucial aspect about educating the organisation about self-assessments is to explain the significance of the exercise and to provide the right context in which the assessment is done. It is essential to be clear in these aspects in order to prevent people from having misconceptions about the purpose of an assessment that may affect the quality of the results. In concrete, it must be clarified that the self-assessment is not used to evaluate people's performance or to make them liable for processes, but rather explain that the assessment focus in the collective workings of the everyone under an integrated process.

3.2.6. Step 6: Research deployed capabilities

An important preparatory step is to gather information about the organisation's processes and operations ahead of the assessment. This will help researching answers much easier and it will also help everyone become familiar with the current status of the organisation.

This can be done as a follow up of the education process; the research includes consolidating work manuals, process descriptions, and all other relevant documentation so that it is always available for reference during the self-assessment.


Finally, this will also help the participants provide a clearer rationale/justification for the answers given to the different self-assessment questions.

 **Note:** If necessary, interviews with the owners/keepers of the documentation should be set up in order to discuss the content and applicability of the organisation's source documentation. Additionally, the assessment team should determine when the documentation is complete enough to move further with the self-assessment process.



3.2.7. Step 7: Apply the self-assessment questionnaire

Once all preparations have been completed and the people involved has been trained, the organisation may proceed to answer the self-assessment questionnaire.

The assessment leader is responsible to assign the questions from the self-assessment questionnaire to the people in the organisation best suited to answer them. The assessment team will then ensure that people are able to provide the answers along with the rationale for them

 **Important:** The assessment leader is not responsible for answering the questions himself; his responsibility lies rather in ensuring that well-founded answers are given by the other participants and that the self-assessment questionnaire is completed within the determined rules defined for the assessment.

When answering the questionnaire, it is important to remember at all times to:

- Remember to position all questions under the context of the defined scope from section [3.2.2](#)
 - Ensure that a rationale and/or justification for the answers is always provided; this will be essential to guarantee integrity
 - Record all discrepancies
 - Record the trail of discussions around the answer to a question
 - Also, it is highly recommended to keep the scoring model and point value of questions away from the people
-  **Note:** The Data Quality Framework v3.0 is bundled with an Excel-based scorecard that helps organisations answer the self-assessment questionnaire and calculate the results automatically. The scorecard also helps to point out to the areas where the most opportunities lie for a company. In the scorecard, there are spaces provided for organisations to keep a log of the discussions around questions or to provide the rationale for the answers. Please refer to the 'Read Me!' tab of the self-assessment scorecard for more information.
-  **Note:** MS Excel 2007 or higher is required to run the KPI scorecard correctly.

3.2.8. Step 8: Consolidate and analyse results

The assessment leader, with support from the assessment team, will consolidate results and produce a final summary of the results, showing at a minimum:

- Which areas are the strongest and which the weakest in the organisations current processes
- Which areas fall within the organisation's priorities
- Which lessons were learned/discovered during the self-assessment that previously had been overlooked?
- If relevant, what score did the organisation reach in the self-assessment questionnaire
- Which aspects constitute an important risk if not addressed?
- Recommended actions for the management based on the self-assessment reports
- If applicable, if the organisation is able to self-declare or not

3.2.9. Step 9: Communicate results to the organisation

Once the results have been analysed and consolidated, the assessment leader should ensure that the outcome is communicated to all participants and to the organisation as a whole along with an explanation of what the way forward is going to be based on the results. Having a clear set of follow-up actions will motivate the organisation.

3.2.10. Step 10: Communicate results to trading partners (optional)

In scenarios where a trading partner request originated the need for a self-assessment, or where joint collaboration has been agreed, an organisation may disclose and discuss the findings and results of the self-assessment with its trading partners in order to find joint opportunities for further collaboration.

Adhering to these steps when conducting a self-assessment will greatly increase the value of a self-assessment and will drastically improve the results.

Since the complexity of a self-assessment depends on factors such as:

- Scope
- Size of the organisation
- Number of participants



Note: There is no specific timeline or resource planning that can be given for all self-assessments as the scale will always vary in every specific situation. Yet, as a general reference, it was observed during the 'Data Quality Challenge' pilot that those companies that followed these steps were able to complete all steps within an average of 4 weeks among suppliers and 5 weeks among retailers.

4. Product inspections and data accuracy KPIs

4.1. Why a KPI model?

The ultimate proof of the capacity of an organisation to produce and maintain good quality data lies always within the product information itself; good practices and good internal processes will always be reflected in the superior quality of the data output.

In addition to this, the factual quality of an organisation's product information is also a crucial aspect that reveals clues to internal problems or opportunities within the organisation's processes. An analysis of the data output of an organisation will always offer clear indications of whether something is not quite right in the data management process.


Therefore, in order to be able to measure the degree in which product information can be considered of good quality, a series of objective, parametric measures are required. These measures can be expressed as key performance indicators (KPI) that can be periodically monitored to verify the actual accuracy of the data.

Data accuracy KPIs are mostly related to the degree in which the (electronic) product information stored in a repository is consistent with the physically observable characteristics of the trade item.

Most organisations have developed very comprehensive proprietary internal KPIs which are used to monitor the state of their data as well as to provide possible flags of issues in their processes. Within a collective effort supported by key industry members, a KPI model for the Data Quality Framework was defined as a means to:

- Provide trading partners with a neutral, common set of KPIs for data accuracy
- Cover the most commonly synchronised attributes across all regions
- Offer a basic structure to validate the effectiveness of data quality management systems deployed within an organisation

The KPI model is contained on Chapter 4 of the Data Quality Framework version 3.0 and an Excel-based scorecard is included in the Data Quality framework packet for users who want to jump-start the use of the suggested KPI model.

 **Note:** The usage of the KPI model included on the Data Quality Framework is voluntary and does not replace internal KPI models defined or agreed between trading partners; it simply provides a starting point in for organisation when there is no previously-agreed-upon KPI model. Trading partners are free to expand and enrich the Data Quality Framework's KPI model with any additional attributes and measurements relevant to their business.

4.2. When to use the KPI model

The KPI model has been designed in such way that it can be used flexibly under different circumstances. Since the KPI model is focused entirely on measurements of the accuracy of basic data elements (such as brand name, GTIN, linear dimensions), it is applicable to almost all products.

The KPI model should can used for any of the following scenarios:

- As a means to report the results of product audits: the KPI model is a good way to offer structured results of product audits as it proposes a logical way to group related attributes.
- As a benchmark: the KPI model may be used as a reference to compare the accuracy of the data performance of two different entities.
- To track progress on improvements: the KPI model can be also used to compare the progression of data accuracy within the organisation by striving always to improve the results obtained every time the KPIs are measured.

4.3. How to use the KPI model


The KPI model is complementary to the **Product Inspection Procedure** described in the fourth chapter of the Data Quality Framework version 3.0; the KPI model is to be used as a way to analyse and present the results of the product inspections executed by an organisation.

The typical steps to use the KPI model are:

- Step 1: Conduct product inspection
- Step 2: Customise KPI model
- Step 3: Analysis and reporting of the results

4.3.1. Step 1: Conduct product inspection

Perform a product inspection as prescribed throughout chapter 4 of the Data Quality Framework version 3.0. Remember that product inspections can be set up by a number of different reasons such as: routinary internal audits, performance assessments, etc.

 **Important:** The Product inspection should be planned and scoped beforehand according to the recommendations included in the Data Quality Framework.

4.3.2. Step 2: Customise KPI Model


Based on the scope and purpose of the inspection, the organisation must define if the basic KPI model fits the inspection's purpose; organisations are free to make changes in the content of the KPI model, in order to customise it for their specific needs. Some of these changes can be for instance:

- Adding attributes to the different categories in which the KPI model is structured
- Adding specific performance targets to certain attributes/KPI categories
- Removing attributes from the categories that are not relevant for the organisation
- Ignoring KPI categories not relevant/not applicable to an organisation

A typical example of an expansion is for instance, to add the attribute 'net weight' to the 'Dimension & Weight Accuracy' sub-division of the KPI model; another example of how the model can be customised for use would be the case where an organisation ignores the 'Dimension & Weight Accuracy' category because their products are non-physical services (such as airtime/credit for mobile telephones).

Whenever expanding or modifying the content of the KPI model organisations should be mindful of the original criteria behind each KPI classification in order to keep changes consistent.

Once the organisation has adapted the KPI model in the best way to suit the specific objectives of their product inspections, the analysis of the data may be produced.

 **Note:** The full description and structure of the KPI model can be found on Appendix 4 of the Data Quality Framework version 3.0.

4.3.3. Step 3: Analysis and reporting of the results

Once the results from the product inspections have been recorded they need to be analysed and presented in a way suitable for reporting; first, to analyse the results a comparison between the

data that was inspected on the products needs to be compared to the data that exists on a repository (electronically) about the same item.


The differences/discrepancies between the physically inspected data and the electronic records should be noted and counted in order to be able to report statistically what the state of the data was found to be.


This process can be done in a number of different ways and each organisation is free to decide the best solution/approach for this exercise.

However, in order to facilitate that process, a scorecard has been created for the basic KPI model proposed by the Data Quality Framework. The KPI scorecard is an Excel-based tool that provides basic functionality to companies that use the basic KPI model without changes.

The scorecard allows users to populate the data collected during a product inspection and the data stored on a repository against which the inspection information will be compared. Once both sources have been populated, the scorecard will automatically calculate the accuracy levels of the product data based and will report that according to the KPI Model of the Data Quality Framework.

The results are presented on the last tab of the scorecard showing on total and per each level of the hierarchy what the performance and accuracy is on each attribute and grouping of attributes according to the KPI model.

-  **Note:** MS Excel 97-03 or higher is required to run the KPI scorecard correctly.

-  **Note:** For a full explanation of how to make use of the KPI scorecard, please refer to the 'Instructions' tab included on the scorecard. The scorecard is bundled in the Data Quality Framework v3.0 Packet.

It is important to mention that the value of this model is that it allows organisations to zoom in on specific areas of attention that may exist, for instance, an organisation can have a score of 100% accuracy on one category (say hierarchy data), by a low score on another one (for example, dimensions & weights); thanks to this level of granularity companies are able to easily identify the areas where the most errors are concentrated and work on specific enhancements.

5. Ongoing Data Maintenance

5.1. A Framework for continuous improvement

Data quality management is a continuous, day-to-day activity. Ensuring data quality does not end when a product is published to trading partners as that data will have to be maintained and updated throughout the life-cycle of the product. Therefore, it is essential that organisations have a vision for this need for constant data maintenance and engage in sustainable practices for data quality that contribute to a more efficient management of quality across time.

It is acknowledged that this area is, due to its nature, a very complex one; the Data Quality Management System (DQMS) described in the Data Quality Framework version 3.0 (on chapter 2) is the fundamental best practice for ongoing data maintenance processes that ensure quality on the data output.

The more an organisation adheres to the capacities for a DQMS that the Data Quality Framework recommends, the more likely it will be to maintain a sustainable output of high quality data optimising resources and preventing excessive costs of data control.

The DQMS from the Data Quality Framework is based upon daily operation of key processes across the organisation, a well-defined governance structure for the processes, the involvement of all participants and stakeholders, collaboration with trading partners, and clear and unambiguous documentation of all these factors.

When applied consistently, the capabilities from the Data Quality Framework will also create an internal cycle of continuous improvement which will enable internal processes to evaluate and identify opportunities for improvement for the DQMS as part of the data quality management process itself. This is essential to ensure that the DQMS evolves in accordance to the new challenges brought by an ever-changing marketplace.

As new best practices are established and more maturity is reached regarding ongoing data maintenance, this guide will be expanded with more detailed recommendations to succeed in maintaining data accurate, relevant and reliable through time.

5.2. Product information life-cycle

The dynamics of the management of the information of a product vary in each one of the stages of a product life-cycle: generally, product information tends to have many more changes in the early stages of a products life-cycle, as the data needs to adapt to constant specification/composition changes that a product typically undergoes during its market test/product introduction phases. Afterwards, during the early stages of the growth of a product in the market, the data is wont to change frequently as a result of constant promotions which are likely to be common in these phases.

Once the product has stabilised in the market, changes on the information will eventually become less frequent affecting mostly regulatory/commercial aspects rather than the product specifications themselves.

It is important that organisations mind these differences in the intensity of the changes of the data along these phases in order to be able to plan properly for each one of these phases. These differences translate to having a different focus during each one of the phases, for instance, in the early phases of the life-cycle the focus on measurements may be much starker given the higher likelihood of the dimensions changing then than in the later (and more stable) phases.

As the industry matures, these implementation guides will be eventually expanded with more granularity regarding the relevance of the capabilities of the Data Quality Framework to each phase of the product life-cycle.

5.3. Best practices for maintaining data through time

As a product goes through its life-cycle, trading partners will need to communicate and synchronise different versions of the information of a product. The GS1 Community of users has come together to define best practices for these processes which can be used as a reference for the industry. These recommendations were created within the "[GDSN Trade Item Implementation Guide](#)" and are contained within the following chapters:

- Chapter 11: Item Futurisation, which primarily describes the process of informing (in advance) about changes to the master data of a Trade Item.

In addition to Item Futurisation, additional means will be produced to facilitate the communication of preliminary (i.e. prototype, or in development) product information. As those sections and functionalities are developed the GDSN Trade Item Implementation Guide will be expanded further.



Important: We strongly recommend all users interested on management of the information's life-cycle to look at the aforementioned sections of the GDSN Trade Item Implementation Guide.

6. Miscellaneous Topics

6.1. How to read section 2 of the Data Quality Framework

Section 2 (Data Quality Management System) of the Data Quality Framework contains an elaborated description of all the capabilities that come together to form a good Data Quality Management System (DQMS) within an organisation.

This section has been written and organised in such a way that allows the capabilities to be extracted and used independently, according to the specific needs of each organisation. Therefore, ***the ideal approach to this section is not necessarily to read it entirely, but rather select the pieces and components relevant to each organisation!***

The self-assessment scorecard included in the Data Quality Framework v3.0 Packet can be used as a 'compass' to guide the organisation to the capabilities relevant to their particular situation.

The capabilities have been organised by 'functional area' (i.e. set of related topics that contribute to the execution of certain processes within organisations), which helps users identify the context in which a certain capability is expressed.

The functional areas in which capabilities have been grouped 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 functional area, capabilities are further separated into different activity/capability types, which define whether the activity is related to either planning, documenting, executing or controlling/monitoring actions. The combination of functional area and activity type provide a context in which an activity has to be understood and interpreted (see figure below).

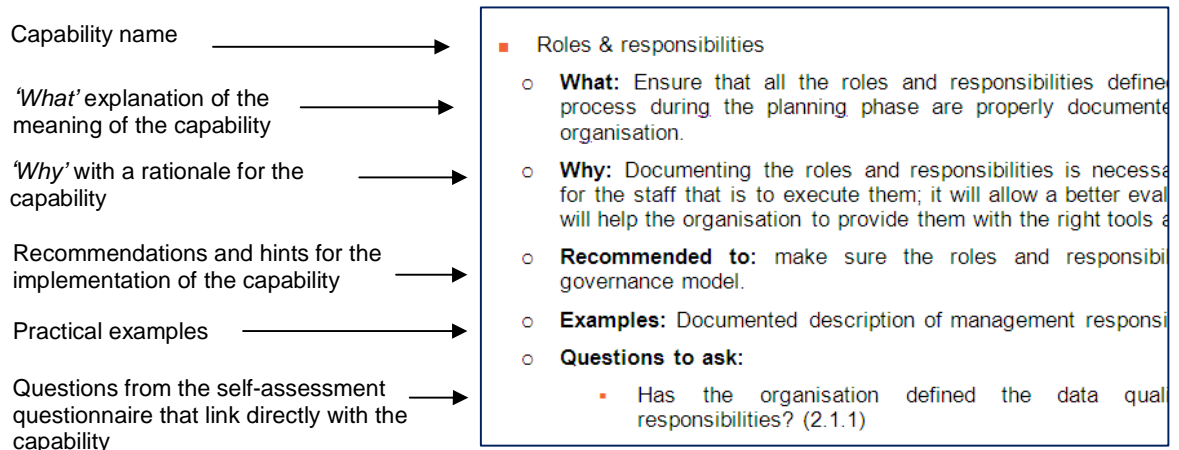


The following table summarises the capabilities contained within each functional area/activity type combination:

	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 audit results; Monitor impact of erroneous data	Performance reporting on service levels

Using this table as a reference, users of the Data Quality Framework can position all capabilities under the right light, for instance, the capability “Staff roles & skill sets” within Organisational Capabilities/Plan refers to the definition of roles and skills needed while the capability “Roles & Responsibilities” under Organisational Capabilities/Document refers to the formal documentation and recording of those same roles once they have been defined.

In order to provide further clarity about the meaning of each individual capability, the Data Quality framework has been written in a style that elaborates in detail the meaning of each capability. All capabilities are listed under the same format which includes the following components:



✔ **Note:** The capabilities are not prescriptive and can be adapted to the particular circumstances of the organisation implementing them; they simply define the context for the actions to be implemented. The actual form of the implementation is to be defined by the organisation that will implement them.

6.2. Is the Data Quality Framework specific to a particular role in the supply chain?

To give a short answer: no.

The Data Quality Framework was written as a sector-, industry- and supply chain role-neutral solution. Its applicability is not limited to a certain role, sector or activity within the supply chain.

However, it is acknowledged that certain capabilities from the Data Quality Framework's DQMS will not apply to all organisations; so if there is a particular capacity that does not fit your organisation's processes or profile it can certainly be ignored.

The end result is that when implemented, the capabilities from the Data Quality Framework that apply to an organisation will do the following:

- **For information providers:** it will ensure the necessary steps exist to guarantee that all data generated by the organisation is reliable and accurate and that all subsequent changes and modifications are done correctly and are communicated clearly
- **For information recipients:** the capabilities will ensure that the integrity of any information received from trading partners is preserved and that information becomes utilised in the way that the data source (information provider) intended.

✔ **Note:** These roles (information provider and information recipient) can be played by all sorts of organisations depending on the particular sector or context: for instance, a distributor may be both an information supplier and information recipient at the same time, a manufacturer may be an information recipient in an upstream flow, etc. Regardless of which organisation fulfils each role, the capabilities to ensure the capabilities applicable to each role will remain the same independently of the organisation and sector in question.


In order to identify which capabilities apply to your company (based on its role(s)) in the supply chain, the **Self-Assessment Scorecard** should be used. By using this scorecard an organisation can fill in the self-assessment questionnaire and obtain a visual representation of the capabilities where opportunities for improvement exists, regardless of its role in the supply chain.

The self-assessment scorecard can be put to this use following the following steps:

- Step 1: Conduct a self-assessment using the scorecard
- Step 2: Review the results on the scorecard's capability matrix
- Step 3: Focus on the areas of attention

6.2.1. Step 1: Conduct a self-assessment using the scorecard

Perform a self-assessment based on the recommended process described in these implementation guides and use the self-assessment scorecard to record the results and calculate the self-assessment score. It is strongly recommended to use the procedure and best practices for the execution of a self-assessment contained on [Section 3](#) of this document

 **Important:** At this stage, it is important to leave blank any questions that do not apply to your business and answer only those that are relevant to your organisation's processes.

6.2.2. Step 2: Review the results on the scorecard's capability matrix

The last tab on the scorecard contains a matrix similar to the one included on [section 6.1](#) of these guides, however, next to each individual capability, the self-assessment scorecard will place a visual indication of the status of that particular capability based on the answer provided.

- A green mark means the capability is well established
- A yellow mark means the capability has some deficiencies and may not be functional
- A red mark means the organisation has important weaknesses on that capability

With this system, the matrix will provide a very accessible visual map that points to where the issues are concentrated across the organisation's processes.

6.2.3. Step 3: Focus on the areas of attention

To identify where the major concerns and opportunities lay within your organisation's processes, simply look for the highest concentration of yellow and red marks which point to areas on which the organisation has not yet realised its full potential. Those red and yellow capabilities should provide you with an initial roadmap for further action and improvement.

6.3. In which order should I implement the capabilities from the Data Quality Framework

The order in which the capabilities from the Data Quality Framework can be implemented varies depending the priorities, needs and situation of each company that uses it.

However, in general terms, it can be said that for a 'generic' implementation plan, the order in which capabilities should be implemented/approached would be:

Phase 1

- Organisational Capabilities/Plan
- Organisational Capabilities/Document
- Policies & Standards/Plan
- Policies & Standards/Document

Phase 2

- Organisation Capabilities/Execute
- Policies & Standards/Execute

Phase 3

- Business Process/Plan
- Business Process/Document
- System Capabilities/Plan
- System Capabilities/Document

Phase 4

- Business Process/Execute
- System Capabilities/Execute

Phase 5

- Organisational Capabilities/Monitor
- Policies & Standards/Monitor
- Business Process/Monitor
- System Capabilities/Monitor

The following matrix shows graphically the order in which the activities should be approached:

	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 audit results; Monitor impact of erroneous data	Performance reporting on service levels

Key:

▪ Light Green:	Phase 1
▪ Dark Green:	Phase 2
▪ Red:	Phase 3
▪ Gold:	Phase 4
▪ Blue:	Phase 5