PRODUCT DATA LEAPFROG INITIATIVE

November 2018 | Version 1.0

Summary of pilots, workshops and Steering Committee discussions, prepared for the Leapfrog Pilots Steering Committee.

This document will serve as a basis for preparing the way to communicate to the CGF Board and to broader stakeholder groups.

Authors

Ruediger Hagedorn, CGF
r.hagedorn@theconsumergoodsforum.com

Sirko Siemssen, Oliver Wyman
sirko.siemssen@oliverwyman.com

The Consumer Goods FORUM — End-to-End Value Chain

OLIVER WYMAN

Agenda

1. PRODUCT DATA: STATE OF DEPARTURE AND CASE FOR ACTION

1.1. Recap on the need for 'Data Leapfrog'

The Consumer Goods Forum (CGF) Board confirmed, during the meeting in Singapore in June 2018, that product data accuracy and completeness present fundamental and urgent challenges to the success of both retailers and manufacturers in an omni-channel world. The need to move urgently and at scale beyond current industry and organisational paradigms makes it a CEO issue – one that can no longer be delegated to CIOs and CTOs.

In today's digital environment, products will go unsold unless they are associated with accurate, timely information that enables consumers to make purchasing decisions. That information amounts to hundreds or even thousands of attributes - from photos to package sizes and ingredients to sustainability profiles. And the list of possible product attributes continues to grow, as shoppers demand more information. Yet the way this information is captured, stored, and shared dates back 50 years. It is incapable of supporting how the industry works and how customers shop today. For example, 30 percent of online customers abandon their shopping carts because of poor product descriptions, and counterfeit goods cost brands $460 billion of lost sales p.a. The industry's efforts to address the problem in the short term – e.g. paying third party contractors or hiring more staff internally – are costly and not sustainable.

It was agreed in June that we should try a different approach to solving the problem, as unencumbered as possible by legacy thinking or technologies. Five 'Leapfrog pilots' were approved, each of which brings together coalitions of willing companies to design and test ways in which new technology could help solve the product data problem. And it was asked to come back to the Board at the November meeting with a practical demonstration and next steps.

During the September Board calls, it was also specifically requested to address the issues relating to GS1 governance.

1.2. CGF board actions: from 'Seven Principles for More Customer Transparency' to 'Data Leapfrog'

At the June 2017 meeting the Board passed a Resolution to support the rollout of digital consumer transparency solutions, an extract of which reads:

We therefore, as individual member companies, commit to support the following principles in all our countries of operation:

1. Individual countries are encouraged to adopt a nation-wide, industry-wide consumer solutions providing consumers with digital access to product information, defined and organised in a single consistent way.

2. Individual country solutions should provide consumers with a globally required minimum set of data attributes while also defining additional required and optional data attributes that take account of local law and reflect local consumer insight.

3. All data attributes – globally required, locally required and locally optional – should use Global Data Dictionary data definitions.

4. To ensure that consumers have access to accurate information no matter how they choose to find it, brands should simultaneously publish the transparency attributes via the Global Data Synchronization Network (GDSN) so that retailers and other e-commerce sites have access to those same, accurate data.

5. Individual country solutions are encouraged to provide multiple access routes, such as mobile scanning, web search, and click-through links to and from brand sites, in order to make them as easy as possible for consumers to use.

6. Individual country solutions should comply with a common data standard.

7. Individual countries are encouraged to promote locally to build a minimum level of consumer awareness of the consumer transparency solutions to encourage usage.

While the seven principles are still valid and must be deployed, the CGF Board raised the urgency of Product Data exchange and decided at the Board Meeting in November 2017 to try a different approach in solving the product data problems. This new approach aims to be as unencumbered as possible by legacy thinking and is built on testing and applying new technologies. Following this, five 'Leapfrog pilots' were defined and initiated - each of which brings together manufacturers and retailers into a "coalition of the willing" to design and test different ways in which new technology could help solve a defined part the overall product data problem.

The five Pilots have been asked to come back to the Board at the November 2018 meeting with a practical demonstration of their solution, learnings and next steps as well as an outlook on what would be required for industrialisation and roll-out of the approach (*see exhibit from June 2018 Board meeting*):

Key Messages

- Prioritise Data as business issue and assume leadership at CEO-level
- All five Pilots acknowledged as valid and worth testing until November meeting
  - Show it can be done / demo
  - Cover business impact
- Prepare active decision readiness on November 8
  - Name "data owner" / connect to End-to-End Value Chain
  - Personal update to CEOs in September

The CGF is very grateful that several retail and manufacturing member companies have committed significant leadership and resources over the past months to establish and drive the pilots. Additionally, service providers (from the largest to recent start-ups) as well as GS1, the industry's data standards organisation, have participated in the development and testing.

2. FOUR MAIN FINDINGS FROM THE LEAPFROG PILOTS

Since June, senior product data and technology executives from around 40 leading companies have helped to drive one or more of the pilots. The organisations include:

- *Retailers:* Ahold Delhaize, Bumble Bee, Carrefour, eBay, Kroger, METRO, Migros Ticaret, Spar International, Target, Wakefern, Walmart, Wegmans
- *Manufacturers*: Colgate, Henkel, J&J, JM Smucker, Kellogg, Mondelez, Nestlé, PepsiCo, P&G, Tyson, Unilever
- *Service providers:* Capgemini, Crowd Analytix, Global Resonance, Google, IBM, SAP, Salsify, Oliver Wyman
- *GS1:* Several Market Organisations (MOs) and the Global Office

Each of the five pilots addresses a part of the problem that the industry faces. But taken together, they have demonstrated four main findings:

a. **The technology works.** Machine learning and related technologies can indeed address many of the industry's problems in generating and sharing product data. The evidence is that these technologies will improve accuracy, increase responsiveness and reduce the need for costly manual interventions. Indeed, they are already used by some retailers, manufacturers and Content Service Providers (CSPs).

b. **Technology will not deliver without organisational change.** Companies must also address organisational silos and legacy mindsets. Those that have established high-level single point accountability for product data appear to have made faster progress on data accuracy and completeness.

c. **Assist GS1 in transforming its governance approach.** GS1, as the industry's data standards body has important roles to play going forward. But it must be more focused, more business-led and more global if it is to play these roles with the speed, consistency and cost efficiency that the industry now needs.

d. **CEO and CGF Board leadership is critical.** The extent of change represented by the previous three findings means that CEOs can no longer delegate the issue of product data to their CIO or CTO – or to GS1. Without CEO leadership, our industry's 50-year old, entrenched technologies, mindsets and organisational silos are highly likely to prevent meaningful progress.

The following sections amplify each of these findings.

2.1. The technology works

Shoppers want timely, complete and accurate product data. The industry-wide system to deliver this has five components, listed below. Each of these, has serious weaknesses today, but the pilots indicate that they could be mitigated – or in some cases leapfrogged – with the help of more recent technology.

a. **A unique, universally adopted product identifier.** The closest thing we have to a unique product ID is the set of Global Trade Identification Numbers (GTINs), managed by GS1. But today many products carry an incorrect GTIN or none at all, because GTINs are not verifiable or easy to obtain. The many consequences include excess logistics costs and disappointed customers. The 'Verified by GS1' programme, launched in the USA has started to establish a central registry of all GTINs and, for each one,

a handful of product attributes that allow the GTIN to be verified.

The 'Central Data Registry' pilot has now taken the 'Verified by GS1' programme to over 10,000 GTINs in France and Turkey, demonstrating that it is possible to scale it globally. We now need to accelerate this scale-up.

b. **A globally consistent set of product attribute definitions.** Today, even the most basic information that trading partners need to exchange – the "core" product attributes required to identify, list, move and sell a product – lack agreed, common definitions, making it almost impossible to exchange data in a fully automated way. For those familiar with it, the Global Data Dictionary does not fully address this problem because it provides technical field specifications rather than user definitions.

The 'Product Attributes' pilot has put business leaders from 8 companies in charge of this problem. They have demonstrated that it is possible to agree on 45 mandatory attributes for all SKUs, plus definition of a product picture standard, as well as a further 120 attributes that are conditionally mandatory only for certain categories. In addition, more advanced companies can use AI technologies to translate automatically between different definitions for hundreds of other attributes. Going forward, we need to engage the rest of the industry in the core attribute definitions and set up a permanent group to maintain them; again, it must be global and business led.

c. **Fast, efficient ways to share data between trading partners.** Almost twenty years ago, the industry launched the Global Data Synchronisation Network (GDSN) to facilitate data sharing via a centralised database, using the technology available at that time. This system is operational though sometimes viewed as slow and costly. In addition, many retailers do not use it at all, so manufacturers need to find other ways to share data with them, adding extra cost.

The 'Federated Data Sharing' pilot has pursued an optional different approach to GDSN: peer-to-peer data sharing. The AI technology has already been proven to work by CSPs who take product data from manufacturers and other sources, translating it into the attributes required by retailers. The pilot has demonstrated a number of refinements with the potential to make the peer-to-peer model more widely accessible, even to smaller companies. Going forward, we must explore if it is possible to scale the peer-to-peer model globally supported by an open eco-system of technology and service providers. At the same time, for those companies that prefer a centralised approach to data sharing, we must assess the feasibility of dramatically overhauling GDSN.

d. **Efficient ways to extract data into the product catalogue.** Any company (retailer, platform or manufacturer) offering an on-line product catalogue faces a costly, labour-intensive task to extract what can amount to thousands of data attributes from multiple sources, then display them in ways that fulfil that company's unique marketing and merchandising strategy.

The 'Automated Product Data Creation' pilot has demonstrated that AI, machine learning and computer vision approaches at fast-increasing levels of reliability can extract many attributes automatically from two straightforward sources of product attributes – product images and written product descriptions. Estimated, today the technology can extract up to 600 product attributes this way and can be expected to deliver even more attributes going forward.

e. **Effective product data quality measurement and control processes.** Today, while we have commonly accepted dashboards and industry-wide performance metrics for many other trading partner interactions (such as logistics), we lack the equivalent for product data.

The 'Product Data Quality Dashboard' pilot has

built such a dashboard for the core set of product attributes, using agreed nomenclature. The pilot has also demonstrated that social media technology (instant messaging, workspace) can support communication and resolution of data quality issues.

2.2. **Technology will not deliver without organisational change**

While all companies could, in principle, embrace the direction set out by the leapfrog pilots, some may face internal barriers to rapid implementation:

- Product attributes sitting in multiple different legacy systems;
- Diffuse responsibility for product data, with no single executive in charge or no-one with a strong enough mandate to drive global consistency across a multinational;
- Hard to shift legacy thinking, with managers feeling that their careers and external relationships are vested in the industry's traditional processes.

To address these barriers, the more successful companies have: (a) established a global product data vision and strategy, owned at the highest level such as the corporate executive committee; and (b) established clear single accountability at a very senior level in the company for all product attributes.

2.3. **Assist GS1 in transforming its governance approach**

If the Board endorses the priorities set out above, then there is a clear need for an industry data standards body focusing on three roles:

1. Maximising* the use of GTINs as the unique, global industry standard product ID;
2. Providing global verification of all GTINs; and
3. Maintaining globally consistent definitions of the core set of product attributes and its related catalogue of global business validation rules.

To fulfil these roles with efficiency and speed, GS1 will need the consumer industry's leadership and help to:

- Change its governance model to allow much stronger, global, industry-led alignment;
- Refocus just on its core global data standards role;
- Thoroughly assess and address the root causes of low GTIN adoption, including their pricing if applicable.

*Anyone can use their own identifier or GTIN. However, if everyone endorses GTIN then the adoption will pick up. Should GTIN not meet the needs, 2 IDS can be added to the their systems.

3. PRODUCT DATA LEAPFROG AND THE FIVE CGF 'DATA LEAPGROG PILOTS'

The term 'leapfrog' has been defined as: (i) Making data exchange faster, easier and more efficient by (ii) using and deploying new technology and (iii) overcoming Legacy Thinking and Systems.

Objectives for the November 2018 meeting have been stated as:

- Each pilot to clearly demonstrate **"that it can be done"**, i.e. that there are new technical approaches/solutions that can and will improve data accuracy and (pre-competitive) data sharing in a much faster way – with real-life practical solutions.

- As a group, the pilots should indicate how they can together **create a workable technical and process-focused solution** to creating, storing, and sharing accurate data.

- The pilots should also provide options/suggestions for a **setup that is transparent and efficien**t – aiming for best results delivered faster at lowest cost to the industry.

Five pilots have been defined. Objectives, scope, participants, learnings and outlook for each will be shared in the following sections 3.1–3.5.

3.1. Pilot 1: Product Attributes

- Collaborative *global* effort driven by four retailers (Ahold Delhaize, METRO, Migros, Walmart) and four CPG manufacturers (Johnson & Johnson, Nestlé, Pepsi, Procter & Gamble) plus several GS1 organisations (CZ/SK, FR, DE, US, EU and global) focusing on 3 target markets: the United States, Germany and Turkey.

- Looking for common *global* language by defining a core set of mandatory product *attributes* plus strong guidance on ensuring that the language used is understandable to all participants. Example:

  - Attribute Name: "GTIN"

  - Attribute Description: Global Trade Item Number®, unique identification number, verified by GS1

- Pilot reviewed attributes created by the industry (CPG), from listing sheets (retail/wholesale) and those used as mandatory attributes in several target markets across Europe and the US. The basic principle was to define attributes that are required for four process areas: (i) identifying the product, (ii) listing requirements, (iii) supply chain/moving & storing, (iv) selling in-store and displaying online.

- **Result 1:** Identification of 45 mandatory attributes for all SKUs, plus definition of a product-picture standard, as well as a further 120 attributes that are conditionally mandatory only for certain categories. The set is defined as a global mandatory set and should be used as such in all target markets across the globe. The order of magnitude seems consistent with (internal) attribute tables generated by several CPG-manufacturers across their channels.

- **Result 2:** Strong guidance on attribute names and definitions as well as product-picture standards. Results are documented and aligned between all participants.

- **Result 3:** Staging process for new products so that attributes can be provided in pre-defined steps rather than all at once.

- **Result 4:** A (simple) tool guiding small and medium enterprises to the mandatory set of attributes for their category, organised by set of business questions.

- **Learning 1:** There is a common core, that applies across product areas and countries.

- **Learning 2:** It is clear that this can be done if and when the industry participants actively drive the process. This is helped by the fact that there seems to be wide-spread belief across pilot participants that a useful first step is to agree on and then fix a core set of attributes.

    - **Leapfrog:** Improve alignment: A global and business led and based on mutually agreed definitions between retailers and manufacturers, under the neutral governance of GS1.

- **Learning 3:** The definition of common *attributes* seems to find broad support. However, there are diverging views around the suggested strong guidance on *one common attribute value* nomenclature (voiced at the E2E Steering Committee). Companies can choose different ways to adopt this internally: Either they re-define attribute values or find technology to support the translation.

- **Learning 4:** Staging process for providing information to the retail/wholesale in case of new product introduction – not all information is available in the product creation process, preliminary information is provided first and finalised as the product gets created.

- Outlook:

    - Review of more categories ;

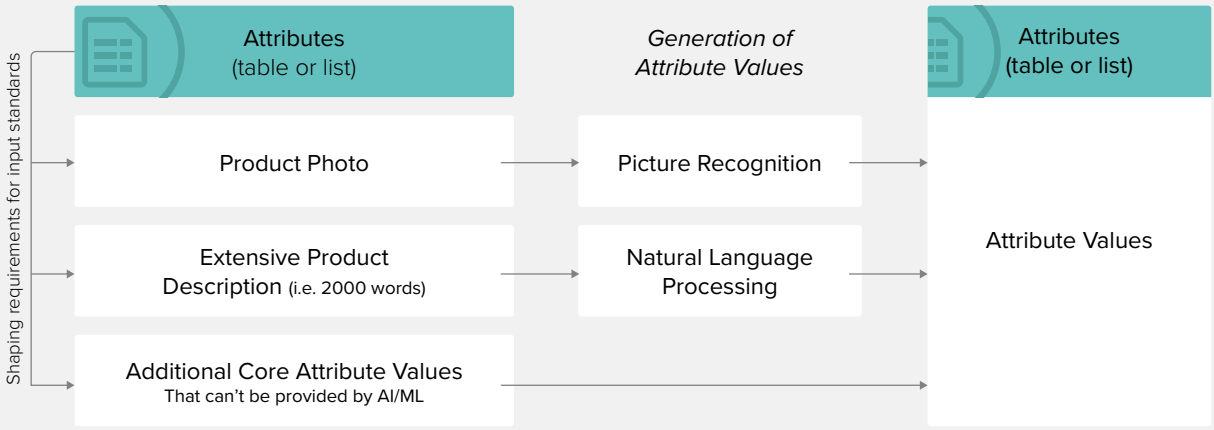
    - In the past, agreement and alignment on a minimum set of attributes did not lead to breakthrough results in terms of data provision, sharing or quality. Is the new piloted industry-led and global setup realistic for further roll-out? Review learnings from the *global* setup of GS1 Healthcare for the more *local* GS1 Retail setup.

    - Missing information about the GS1 changes needed – we need full adoption of data dictionary GDD in all markets without changes to enable global product data exchange. 'Local' is no longer 'true'.

3.2. Pilot 2: Automated Product Data Creation

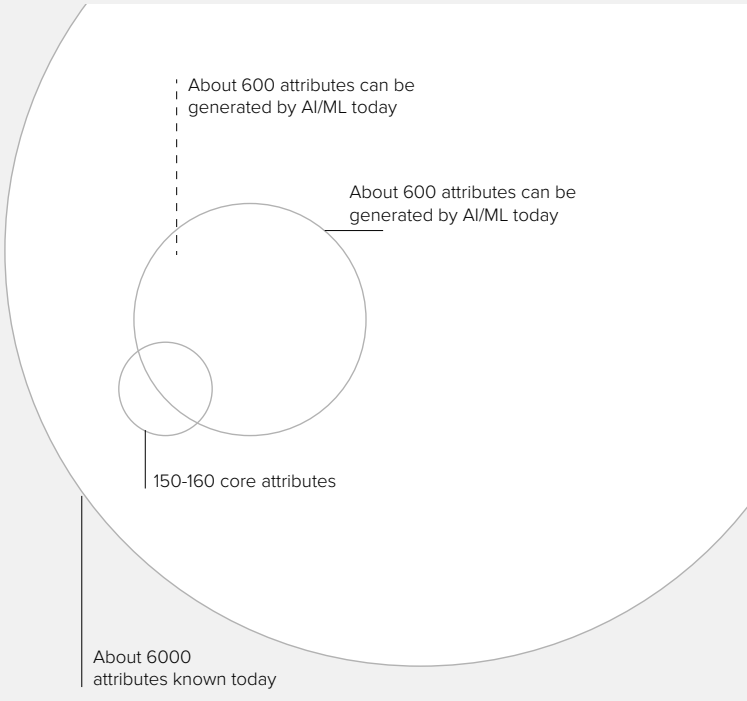
- Collaborative effort driven by three CPG-manufacturers (Colgate, Procter & Gamble, Unilever) and two Retailers (Walmart, METRO Cash & Carry) plus two technology companies (Google and CrowdAnalytics)
- Looking to demonstrate the efficient, automated classification and extracting of product attributes applying Machine Learning (ML), Artificial Intelligence (AI) and Computer Vision approaches – based on product images and a high quality (long) product description. *See exhibit below for clarification* (illustrative):

Attribute Values Generation applying AI/ML
As discussed by E2E-Supply Chain Steering Committee on September 17, 2018



- **Result:** Pilot generated proof for the feasibility of automated product classification and generation of values for 36 attributes based on product photos and descriptions across three pilot categories (toothbrush, mouthwash, hand soap). Precision/recall metrics to be categorised as production ready.
  - **Leapfrog:** new technology overcoming legacy approaches for a faster, easier and more efficient generation of higher quality data – for up to 600 attribute fields.
- **Learning 1:** Of the global universe of about 6,000 attributes across all product types, AI and ML can today automatically generate the values for about 600 attributes. However, unless explicitly provided in product descriptions, the modern technologies cannot generate all values for all core attributes as they include legal requirements etc. *See exhibit below for clarification* (illustrative):

Attribute Universe
As discussed by E2E-Supply Chain Steering Committee on September 17, 2018



- **Learning 2:** While the pilot focused on populating one table of attributes with a given nomenclature, the technology is also able to handle different output tables with different attributes, attribute values and nomenclature (i.e. different retailer listing sheets).

- Open as not in focus of the pilot:

  - It is not clear *how and by who* the new approaches can be deployed to generate and improve the quality across all industry participants and geographies - even for a set of core data attributes (In any case, it should be noted that the automatic generation and sharing of data beyond a core is consistently seen as a competitive area). At this point in time, the required capabilities reside within some industry participants, technology companies and third-party CSPs.

  - There is also a question on how fast to scale it: building the models, training them and bringing them to a production level precision for potentially tens and hundreds of attributes requires some time. Each additional attribute will increase this effort as specific models are required.

3.3. Pilot 3: Federated Product Data Sharing

- Collaborative effort driven by three Retailers (Spar International, Walmart, METRO Cash & Carry), four CPG-manufacturers (Henkel, Unilever, Nestlé, Procter & Gamble), four technology companies (Google, SAP, Resonance Partners, Salsify) and Capgemini as orchestrator.

- The technology exists to share data, but the barrier to entry is high for small brands (difficult to fulfil different requirements of retailers) and large brands and large retailers often face inefficiencies. Current centralised data sharing technologies requires high upfront investment and continuous maintenance. The gaps in adoption of the technology and current processes are covered by manual work. Data management and sharing is often redundant and duplicative, not only between organisations but also within organisations.

- This pilot is looking to demonstrate how 'Federated Data Sharing' offers a new and more effective way to share accurate, trusted data across the end-to-end value chain (for both businesses and consumers) at lower costs.

- **Result 1:** The pilot-team has found proof that much of the technology needed for federated data sharing already exists and has demonstrated to work via various technology and CSPs.

- **Result 2:** The team has identified clear design principles for the industry adoption:

  - Low entry barrier (for companies all sizes);

  - Lowest cost across the industry (avoid duplications where feasible);

  - Adoption at global scale;

  - Discovery, verification and ownership of data-sources;

  - Adaptable solution (e.g. flexible attributes)

  - Freedom of choice regarding commercial technology and service providers.

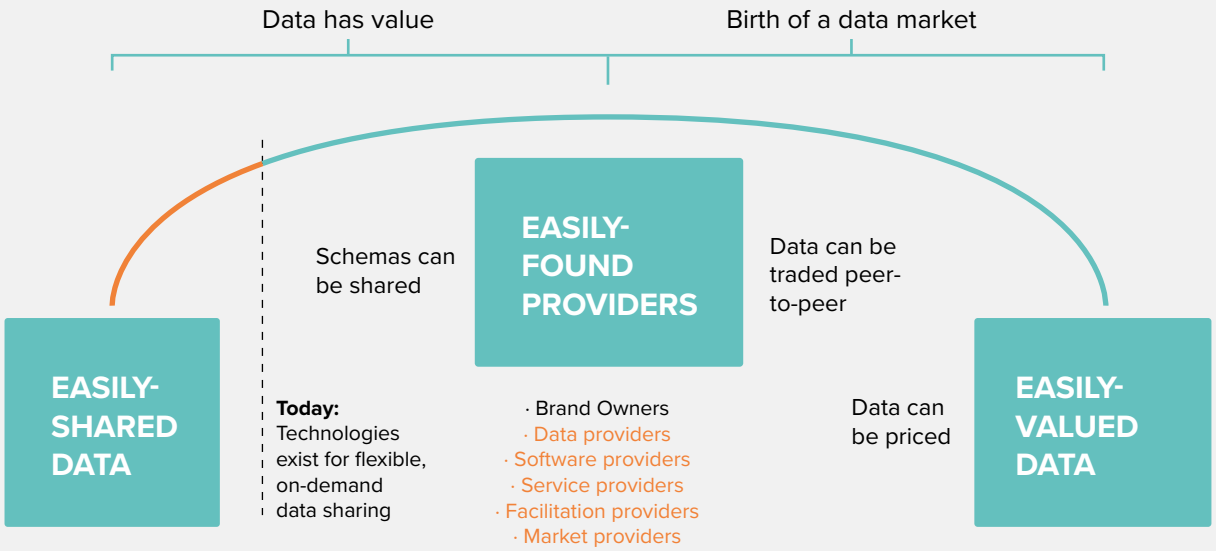
- **Result 3:** The team has defined a future roadmap for federated data sharing, with 3 key anchor-objectives:

  - **Easily-shared data:** flexible, low-cost, on-demand sharing in a federated manner.

  - **Easily-found providers:** transparency regarding access to the provider of product data.

  - **Easily-valued data:** ability to manage and share/trade the value of product data.

The 'Federated Data Exchange' Roadmap



- **Leapfrog:** Federated models for data-sharing promise to transcend the limitations in centralised and standardised data sharing in the industry today.

- **Learning 1:** Scale is key. We need to allow for low-cost, scalable services through frequent re-use of capacity and capability. For this we need to create competition for the provision of services via an open eco-system of technology and service providers.

- **Learning 2:** Third-party CSPs (CSPs) have made a business out of managing product data from manufacturers, enriching it with additional data, and "translating" it to the attributes of the receiving party. CSPs are already deployed by certain CPG manufacturers and retailers, especially in North America and some Western European countries. If retailers choose to specify the use of third party CSPs for federated sharing, the only way to increase scale and efficiency is for them to accept any CSPs that meets agreed industry-wide criteria, and allow for freedom of choice.

- **Learning 3:** The North American smart label platform is based on a set of commonly agreed attributes, provided and stored by the product owners (both CPG brand manufacturers and retailers for their own brands), made accessible via unified web-based access that links users to the decentralised data storage points.

- **Outlook:**

  - Retailers and manufacturers need to make lower cost/lower barrier to entry data sharing a strategic focus with the goal of creating a competitive market that raises data quality.

  - A common exchange model for federated data sharing needs to be realised via a workgroup formed by a 'Coalition of the Willing', with volunteer retailers and manufacturers who wish to contribute insights and test new technologies for data sharing.

3.4. Pilot 4: Central Product Data Registry 'Verified by GS1'

- Collaborative effort by eight manufacturers (Johnson & Johnson, PepsiCo, The J.M. Smucker Company, Kellogg, Nestlé, Procter & Gamble, Colgate, Tyson), 11 retailers (Walmart, Carrefour, Bumble Bee, Ahold Delhaize, METRO Cash & Carry, Migros, eBay, Kroger, Target, Wakefern, Wegmans) and one technology company (Google) looking at three target markets (US pilot extended to Turkey and France)

- Aiming to ensure every product in the universe has a unique GS1 Global Trade Item Number® (GTIN®) and core set of standard product attributes allocated per rules and guidelines of GS1, that can be authenticated and validated by trading partners.

- A correct and verified identifier is a crucial enabler for any data sharing. If the identifier is unreliable, data exchange will be impossible. As data is global, the 'Verified by GS1' identifier needs to be a global initiative, accessible without high-cost barriers.

- Looking to pilot a global toolset for manufacturers to provide accurate input data to register GTINs with a core set of standard attributes, and for selling platforms/retailers to verify the GTINs in their catalogues are accurate, authentic, and match the information provided by the manufacturer. Based on a single registry of trusted product identity and data that is broadly available, kept current by product manufacturers, and helps ensure the pervasive and persistent use of GTIN across selling platforms.

    - In addition, providing a view on how to deploy new technology (Web Resolver) to access and share this data in the future (Future Sharing Framework).

- Scope of the pilot: GTINs were verified for more than 10,000 GTINs (in France three participants provided data, in Turkey one, in the US nine).

- **Learning 1:** (i) the data-import system is technically scalable (globally) via GDSN or spreadsheet (the two processes are requested). (ii) The GTIN Verification is fully automated and scalable. (iii) the attribute verification and reporting still needs improvement/automation (beyond pilot).

- **Learning 2:** Data availability and attribute verification remain the challenge. The viability of a central registry depends on/is linked to the leapfrog-results of the other pilots (Pilot 1: core attributes to support a GTIN, Pilot 2: data generation to provide those attributes, Pilot 5: measuring the quality of the attributes in the central registry). This needs to be developed further under guiding principles set out by The Consumer Goods Forum.

- To clarify: The verified GTIN and attributes remain the property and responsibility of the product manufacturers/owners.

- **Outlook:** It needs to be clarified how to increase the coverage of GTIN. Especially small suppliers do not yet fully use this identification standard. What changes need to be driven by GS1 to increase adoption rate?

3.5. Pilot 5: Product Data Quality Dashboard

- Collaborative effort driven by manufacturers, retailers, solution providers and GS1. The working group consists of participants from 1WorldSync (together with SmartDataOne), Ahold Delhaize, Colgate, GS1 US, IBM, Johnson & Johnson, JM Smuckers, Kellogg's, METRO, Mondelēz, Nestlé, Pepsico.

- A pilot has been performed between three manufacturers (Kellogg's, Mondelēz, Nestlé) and one retailer (METRO Cash & Carry). The target was to exchange product data based on the German FMCG profile and to demonstrate that high data quality can be achieved very quickly based on:

- A defined quality standard like the German FMCG profile;

- High transparency about the Data quality transparency;

- A user interface which supports the supplier to provide high quality from the start (Do-it-Right-First-Time (DRIFT).

Each supplier had to provide at least 10 items to METRO Cash & Carry. The dashboard/reporting mechanism provided feedback and transparency on their individual product data quality and the progress status regarding the data transfer. In order to expedite the speed of data exchange a social media collaboration system has been deployed for the pilot. This technology accelerated and efficiently supported the global communication between all suppliers, recipient and data pool during the pilot phase.

- **Results:** Kellogg's, Mondelēz and Nestlé have provided 100% data quality to METRO Cash & Carry during the very short pilot phase (net data management time, 3 days). Feedback mechanisms in the 1Worldsync tools supported the suppliers to avoid sending wrong data. The so-called DRIFT principle embedded in the user interface helped to see where and why data was vetted as incorrect by the machine. Very fast cycle to provide 100% accurate data to METRO (despite the fact that no supplier ever used the tools used during the MVP). The dashboard/report gave full transparency regarding data quality and data exchange progress throughout the pilot

- **Learning 1:** Many technology components already exist and can be leveraged on a global level to improve quality of product data within the industry (from a dashboard up to collaboration tools).

- **Learning 2:** Strong governance relative to a smart global data profile and data quality standard is necessary (the German FMCG GDSN profile and data quality standard is a multiyear community effort). The lack of common global data models (list of attributes, code lists) as well as common and global business validation rules is the main barrier to speed and efficiency in this area.

- **Learning 3:** Communication and transparency are key to success. Instruments like a dashboard and moderated collaboration forums are a must have to expedite and facilitate global data exchange.

- **Learning 4:** Technical platform provides support and guidance for all users to achieve high data quality in short time. However, bigger organisations should have dedicated and qualified product data experts. They should be the center point for all aspects related to product data exchange. Permission and access all departments and divisions (e.g. product management, supply chain management, marketing) within their organisation facilitates the effort.

- **Outlook:** In this context, we need to define and maintain a catalog of global business validation rules. This catalog must be public, in order to be used by manufacturers (and ensure data quality at source) up to the consumer in order to build trust. Please note: quality is composed of several dimensions, e.g. Completeness, Conformity, Accuracy, Uniqueness, Consistency, Timeliness, Integrity, Security/Confidentiality. While many elements can leverage technology, some elements can only be done through physical checks. Further, define and maintain collaboration mechanisms leveraging new technologies. In order to keep it simple and efficient, focus must be on defining the necessary roles across the value chain, the high-level engagement framework (ensuring compliance with legislations).

4. NEXT STEPS
(FROM NOVEMBER 2018)

1. Seek to drive efficiencies by merging AI and innovation-driven initiatives, such as 'Federated Data Exchange' and 'Automatic Data Creation' into one single initiative. Other initiatives can be added at a later stage if applicable (e.g. Data Quality Dashboard).

2. Continue with the 'Global Data Attributes' and 'Verified by GS1' pilots as planned.

3. Develop a holistic, technology-driven vision of product data for the industry by June 2019, along with an accelerated implementation approach, highlighting any key decisions that the Board needs to make.

4. Develop a strategy to promote and share best practices. For example, via 'Data Symposiums'.

About The Consumer Goods Forum

The Consumer Goods Forum ("CGF") is a global, parity-based industry network that is driven by its members to encourage the global adoption of practices and standards that serves the consumer goods industry worldwide. It brings together the CEOs and senior management of some 400 retailers, manufacturers, service providers, and other stakeholders across 70 countries, and it reflects the diversity of the industry in geography, size, product category and format. Its member companies have combined sales of EUR 3.5 trillion and directly employ nearly 10 million people, with a further 90 million related jobs estimated along the value chain. It is governed by its Board of Directors, which comprises more than 50 manufacturer and retailer CEOs.

For more information, please visit: www.theconsumergoodsforum.com.

Authors

Ruediger Hagedorn, CGF
r.hagedorn@theconsumergoodsforum.com

Sirko Siemssen, Oliver Wyman
sirko.siemssen@oliverwyman.com

The Consumer Goods FORUM

End-to-End Value Chain

OLIVER WYMAN