The Devil is in the (Product Data) Details

How to Overcome Poor Product Information to Boost Omni-channel Strategies

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Product Data Benchmarking Study

Capgemini conducted a product data visibility study in early 2012, with a follow-up study completed earlier this year. The objective was to evaluate product data visibility in retailer channels by examining 30 global retailers in the grocery sector based in US, UK, Canada, Netherlands, Sweden, Switzerland, and Australia.

The retailers selected were leading omni-channel and pure-play online grocers in their respective geographies.

For the study, these companies' online sites were analyzed for 13 key product attribute dimensions. For each attribute, we defined three maturity levels, from "Basic" to "Leader," with Basic as "having the bare minimum of product data visibility" and Leader defined as "having best-in-class product data visibility."

Key Findings

Some of the compelling insights, in addition to the analysis discussed in the main text, include:

- There is a lot of room for collaboration between retailer and consumer product (CP) manufacturers to offer more innovative and value-added content.
- Even though CP companies have a significant amount of information available in their product pages, this depth of information is not reflected in the retailers' pages.
- Retailers should benchmark their visibility against "Leaders" or best-in-class grocers and provide intelligent tools to make product pages more helpful and engaging.

Introduction

Consumer behavior has changed forever. The path to purchase is no longer linear. It might now include social media, an app, internet research, an in-store visit, and an online purchase, in no particular order. Consumers are less engaged with the industry's traditional communication platforms (e.g., television, radio or print) to obtain product information, and yet they often require much more information beyond what is available on the product label.

Moving rapidly between the online and physical world, they expect consistent product information along their individual paths to purchaseI. As a result, product information, which is important for trading partners, is also important for the customers.

For this reason, product data management should no longer be the exclusive purview of IT and supply chain executives. All business domains—especially buying, merchandising, sales, marketing, and customer service—have critical dependencies on product information. Companies without accurate and robust product data are experiencing lower online purchases, higher returns, and risk brand damage, and are unable to maximize the value of their end customers.

The analysis that follows includes data collected from a global product data benchmarking survey of 30 global retailers and the in-depth interviews of executives of leading retail and consumer packaged goods (CPG) companies. Also provided is an overview of the technology landscape and the reasons why more than software is required to overcome the hurdles posed by inaccurate product data in an omni-channel environment. An example on how the world's largest retailer has tackled product data challenge and started reaping benefits is cited. We conclude with steps on how to kickstart product transformation.

The State of Online Product Information

The Challenges

The interviews with leading industry business representatives from retail and CPG companies revealed that inaccurate, incomplete product data poses following challenges:

1. **Lost omni-channel sales.** When descriptions or images of the displayed products are missing, or seem inaccurate, consumers will find another item or abandon their carts and switch to another retailer, leading to lost revenue or, worse still, a permanently lost customer.
2. **Missed customer expectations.** 25% of consumer returns from online purchases are directly attributable to the consumer not receiving what they expected. This is often the result of poor, missing, or incorrect item descriptions and photos, and puts further pressure on margins.
3. **Error handling.** Most processes used to set up items on both the manufacturers' and retailers' side are cumbersome, do not scale well to a large number of SKUs, and lead to countless inaccuracies. Incorrect data causes invoices to be rejected and products not listed. As a result, both retailers and manufacturers spend a significant amount of manual effort correcting data errors and omissions.
4. **Website traffic and search engine optimization.** Sub-optimal or incomplete attributes will preclude an item from showing up on searches as often as it should. These lower hit rates correlate directly with fewer buying opportunities.

When there is no physical contact with the product, having extensive and accurate product data is a competitive advantage. It is used to generate keywords for online searches, to enable selection based on product characteristics (such as ingredients, nutrition, lifestyle, and origin), to project confidence in the brand, to facilitate a smooth transaction, to reduce after-sale returns, and to create customer stickiness and loyalty.

Online Channels

Carol's gluten-free daughter is coming home for the weekend, throwing Carol into a slight panic. What can she make that her daughter will eat?

An online search for gluten-free foods at her local supermarkets returns mixed results. On the day we accessed these sites, one midwestern grocery chain had 304 gluten-free items available, a national natural foods chain had 766. A west coast chain had no results for gluten-free, while an east coast chain, long known in the industry for its customer focus, listed 2,528. Yet even the popular east coast chain was well below the approximately 6,000 gluten-free food items available through Walmart.com and Amazon.com.

Companies like Amazon and Walmart have more complete product data compared to most, and that gives them a competitive advantage. Minced garlic, for example, shows up on Amazon's list of gluten-free foods but not in the results for many of the grocery chain stores, although these stores certainly sell minced garlic, a naturally gluten-free food. When products don't show up in a search, they are not part of the consumer's consideration set. They cannot be added to the cart. Retailers do not even know they have lost an opportunity.

Perhaps Carol needs minced garlic for a recipe. One grocer's online store shows 11 products from 6 brands. There is a photo of each along with the product name and the weight of the contents. But that is it. Nothing is clickable, and not even prices are displayed until an item is added to your list, which requires signing in.

Contrast that with Walmart's several pages of relevant results, sortable by price, top brands, and in-store availability. The retailer's site also offers various filters for the search results, including ones for dietary needs, price range, and customer ratings. Clicking on the product image opens a page with a larger photo, additional product details, similar items, FAQs, and the product's nutritional label.

This disparity in available product information is not limited to the US. To evaluate the visibility of digital product data in retailer channels globally, Capgemini analyzed the websites of 30 global retailers in the grocery sector based in the UK, US, Canada, Netherlands, Sweden, Switzerland, and Australia. We selected retailers who were the leading omni-channel or pure-play online grocers in their respective geographies.

After an analysis based on 13 key product attributes, online sites were characterized as being at one of three possible maturity levels for digital product visibility: Basic, Advanced, and Leader (see Fig. 1).

Not surprisingly, 50% or more of the retailers studied were in the Basic category for almost every set of attributes, and

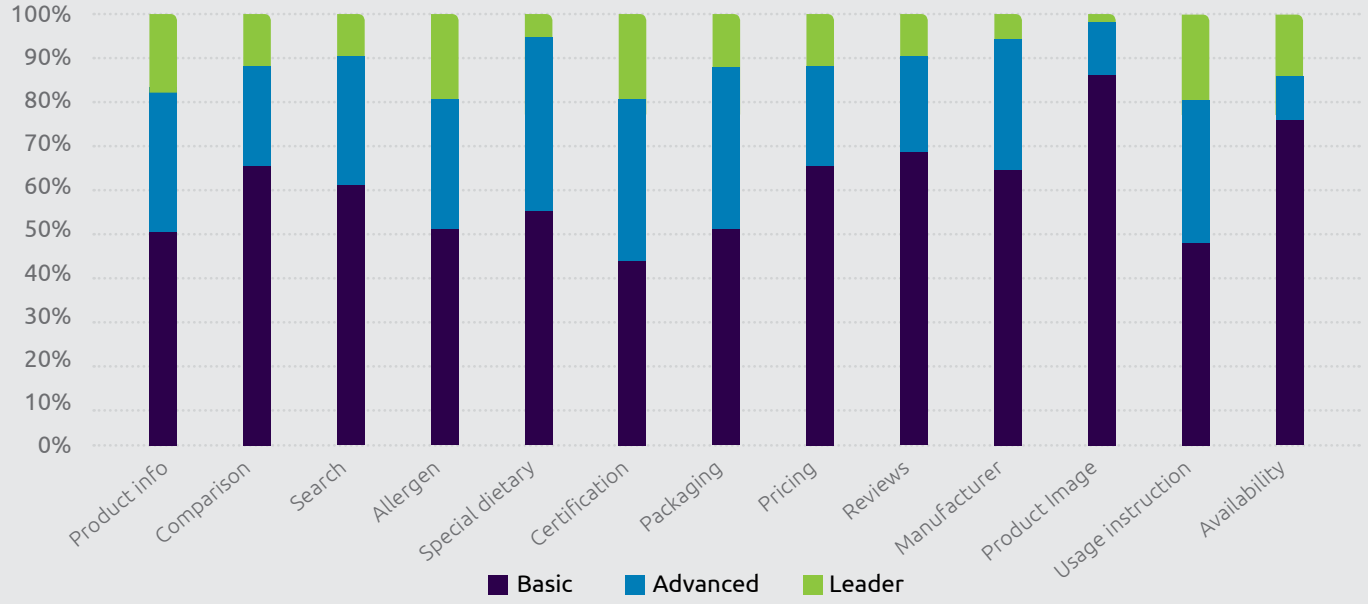
the greatest percentage of Leaders (21%) appeared in the more regulated categories of Certification, Allergen, and Usage Instructions.

In most categories, the depth of product information has increased significantly since the survey was first conducted in 2012. New benchmarks have been created, raising the bar for best practices. What once described a Leader in 2012 for several attributes qualifies as merely "Advanced" or even "Basic" today.

Retailers did not fare as well for pricing, where the best-in-class model includes special offers and links to available promotions.

Except for a few US-based grocers, the attribute Product Availability is not focused on at all by other geographies. Poor visibility into product availability—as in if a product is in stock, how many remain, or what is the expected, return-to-stock date—shows that many retailers still have limited inventory integration across their physical and online channels.

Figure 1: Maturity Level of Product Data Attributes



Further analysis was conducted to categorize the grocers for the depth of available data. We looked at retailer-specific data separately from data provided by the manufacturer (see Figure 2).

Grocers have provided in-depth information for usage instructions, search, and product comparisons, and have added online tools to help consumers better understand the data. We found considerable depth of information at each visibility maturity level (from Basic to Leader) for these attributes to be above the median scores.

More retailer-to-manufacturer collaboration can improve the visibility and depth of content for the attributes product description, product packaging details, manufacturer details and product images. Syncing with the brand manufacturer's content can provide more structured product data. In the UK, Waitrose displays information about the sustainability and recyclability of the product's packaging in easy-to-read tables. Alibaba's B2B site features a microsite for each vendor. Customers can even send questions to the manufacturer via Alibaba.com.

In other analyses, we categorized the grocers for their digital maturity based on the given attributes across visibility and depth (see Figure 3).

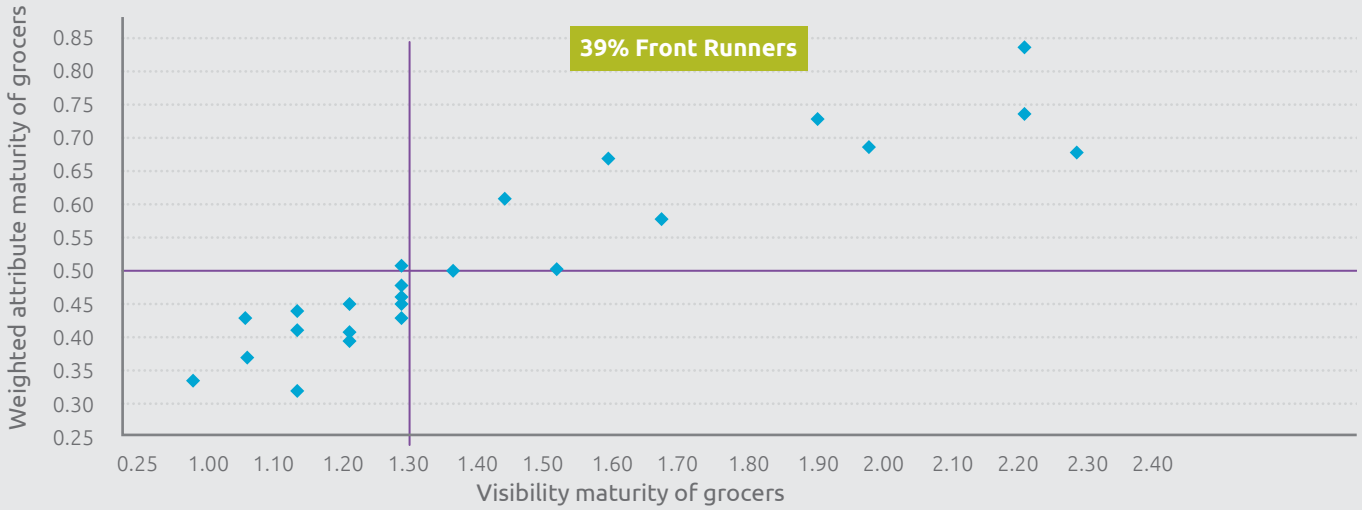
The Front Runners category consists of the omni-channel and pure-play online grocers in the US and UK that lead in best practices and operate in geographies where e-commerce is well evolved.

The other EU regions studied (The Netherlands, Sweden, Switzerland), Canada, and Australia (apart from a few attributes) and even multi-channel US grocery retailers are severely lacking in product data visibility and compare weakly against the leaders.

The resulting matrix is essentially polarized with those in the Slow Starters quadrant needing to learn best practices from the Front Runners.

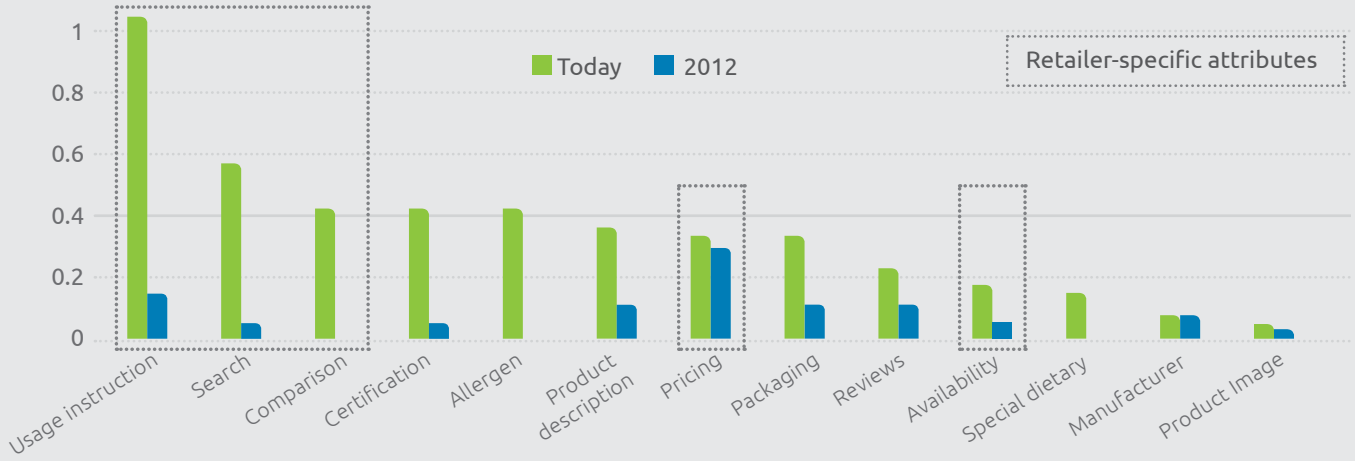
Figure 2: Digital Maturity Mapping of Grocers

Digital maturity mapping of grocers (based upon MIT digital maturity matrix).



**Vertical and horizontal lines represent the median points for the two dimensions in the figure.*

Figure 3: Depth of Attributes Displayed by Grocers with Leading Practices.



Product comparison, Allergen and Special Dietary are new attributes added to the current study.

What Does This Mean, and Why Is It Important?

Like Carol, consumers look for information online throughout their shopping journey, from early awareness and product research to product searches and filling an online shopping cart. Consumers expect accurate and complete product data. They make buying decisions based on what they research online. This is challenging for two reasons.

The number of data attributes needed to support consumer needs has exploded. Five years ago, it was not necessary to identify minced garlic as gluten-free. Today, you can lose sales by neglecting to do so. As consumers' tastes and dietary habits change, new keywords become important differentiators. Tagging a product as organic, fair-trade, all natural, free range, kosher, sugar-free, grass-fed, low-fat, or hormone-free does not restrict your market; in fact, it may actually expand it.

While most retailers in the Advanced category include certifications in the product name, and provide certification agency details in the product page, special dietary requirements are not treated like Allergens or Certifications. Only a few grocers implement best practices for these categories.

consistently current data. The existing process flows and systems no longer fit the speed of change demanded by the market. This deficiency affects virtually all processes at both retailers and CPG companies, from supply chain to marketing, and from online to physical stores. The slow setup of new items, as well as their inaccurate descriptions, incorrect images, and incomplete set of attributes negatively affects sales, customer satisfaction, and loyalty.

Where Is the Data?

There is a deluge of product information, both structured and unstructured; it is often siloed within organizations, created, shared and applied unevenly, not well maintained or managed. And it is constantly increasing due to the requirements for transparency—from regulatory and compliance organizations like the FDA and other governing bodies—adding to a burgeoning list of attributes. Yet while data volume and complexity are increasing, the standards for sharing product information are lagging.

In our research, manufacturers consistently identified one problem as the large number of product attributes requested by retailers. Many of these attributes are not standardized for the industry, and retailers all have different requirements for images. In some cases, the information requested cannot be

Figure 4: Digital Maturity Mapping of Grocers

Having a purchase order does not guarantee online product sale. Product searchability and accurate product information is the key.

To optimize products for search engines and for the consumers who use them requires online sellers to consider all possible variations of a description, including the following: "preservative free," "no preservatives," "no added preservatives," and "does not contain preservatives." This problem is exacerbated by a lack of industry naming standards and an inability to keep up with the ever-changing, ever-expanding list of consumer preferences and keyword search data strategies.

The number of product changes and new product introductions, as well as the need for near-real-time synchronization of product data, makes it difficult to provide consumers with

verified, forcing the manufacturer to submit inaccurate data on a deadline or risk being unlisted.

Retailers, for their part, must deal with a growing number of product variants—mostly in regional differences, shorter lifecycles, and perishables—but also as a result of offering a "long-tail" (endless aisles) and "marketplace" assortment online. Both the proliferation of product data and growing consumer demand have been driving up the amount of both structured and unstructured data attributes for every product.

Some retailers complained that the product data they receive from the manufacturer often is of poorer quality than the

product information made available by the manufacturer on their own digital channels. However, manufacturers pointed out that not all retailers refresh the data at the same pace, resulting in different data appearing at different times at retail locations. This can lead to the perception of inaccurate data and a lack of trust from consumers.

Yet it has never been more important for retailers and manufacturers to work together.

Manufacturers also find it difficult to store consumer-facing information in a structured and automated way, which poses challenges for exchanging product data seamlessly with the retailers. Moreover, most product packages cannot display all the information deemed important by consumers. Hence, the store is a useful channel for providing the consumer with product information. Besides the product data available on the label, retailers provide enriched information, such as the identification of similar items, suggestions for add-on purchases, and the ever-more important consumer ratings and reviews.

Still, both groups see the need for a collaborative approach toward standards in general and, more specifically, toward establishing a minimal set of core data to populate relevant product attributes.

What is needed is a "single version of the truth" for products and a near-real-time synchronization so that all channels have current information. Product data have become so important to facilitating sales that data ownership and data governance must be put into place along with flexible and agile systems.

Bad data costs U.S. businesses more than $611 billion each year.

Source: Data Warehousing Institute

The Urgency: Why Now?

Accurate product data in an all-channel environment has a huge impact on business and technology and, because there is no overnight solution, it is important to act now.

Consumer Product Goods (CPG) is a $1.3 trillion sector still dominated by traditional channels. While digital commerce in this sector is just 2%, it represents a huge opportunity[II]. An increase to just 5% of the sector is equivalent to a $40 billion per year incremental opportunity. Add to that the ROPO effect (research online, purchase offline) and the increase of in-store digital engagement and the positive impact of accurate, online data can be even greater.

CPG's e-commerce growth has accelerated in the past few years, and its total digital sales growth is more than 13 times the category's growth as a whole. It is time for those with only the most basic of product attributes to start paying more attention to their online data.

Recent studies and client engagements of Capgemini clearly indicate that retailers and CPG companies are increasingly focused on making the transition to e-commerce and omni-channel commerce. It is also evident that a mere addition of a couple of fields in the product information database is not enough to enable this transition.

In a research study conducted by Forrester in North America, 71% of prospective online buyers rely on product information and content, whereas only 57% say they look for shipping costs[III].

Transparency is becoming more crucial for consumers in their decision making. Research by Label Insight found that 73% of consumers surveyed said they would be willing to pay more for products that they felt provided transparency via complete, accurate product data[IV].

Specific information related to ingredient sourcing, origin, and traceability (for example, diamonds and minerals), supplier ethics and practices (such as child or forced labor), as well as environmental and ecological impact (greenhouse gas emissions, carbon footprint, etc.), have become important to consumers—and risen to the public agenda—seemingly overnight. Failing to meet these expectations can

make consumers suspicious of the CPG industry and susceptible to criticism from social and traditional media.

Retailers and consumer products suppliers have always collaborated to better serve the consumer. They must work together even more closely to solve this important issue.

Digital Disruption Is Upon Us

Over the past few years, the transformation of the business landscape has posed challenges to the conventional retail stores. Today e-tailers, CPG manufacturers, and both large and small retailers are all competing for the same customer. Growing popularity of online shopping has removed some of the traditional barriers to entry such as capital, labor, marketing, and logistics, giving rise to a new set of competitors. Traditional retailers increasingly find it difficult to differentiate their offerings from online competitors. In such a situation, placement of product information on packaging labels becomes a competitive advantage. Product information is useful for improving online searchability by enabling selection based on product characteristics (such as nutrition facts, lifestyle attributes, and origin). Adequate product information inspires customer confidence in the brand, facilitates a smooth transaction, reduces after-sale returns, and creates customer stickiness and loyalty. Despite being aware of the multiple benefits, even the large retailers have not fixed this problem until now.

Digital commerce players are increasingly realizing that consumer-driven product data can help to distinguish buyers from online "window-shoppers". Managing robust, high-quality consumer-facing product information, content, and digital assets are new business capabilities.

Consumers often hesitate to buy products online because they are not sure what they are going to get. In stores, they can use their five senses to evaluate the product and make a decision. But even in-store, consumers are dependent upon the information provided beyond the label. That is why a trusted source of descriptive and digital product information is necessary—not just for e-commerce startups, but for established retailers as well.

Simply upgrading the main product image—making the label more readable and improving the product positioning and lighting—can net a 19% gain in sales. Accurate and up-to-date product data drives consumer confidence and trust, so that consumers feel that they are purchasing the right product, at the right price, in the right place.

The Three Imperatives: Data Storage, Data Quality, and Data Sharing

1. Data Storage

Historically, product attributes for CPG companies are "owned" by R&D and by the supply chain, with marketing enrichment handled as a separate process. For retailers, the ownership of product content rests with several functions, including supply chain, category management, and marketing. Retailers that own house brands or private labels further aggravate the problem. All the companies we studied have struggled to seamlessly integrate structured product data with unstructured marketing information.

Product content has become equally, if not more, important for consumers as it is for trading partners. From a CPG company perspective, e-commerce teams are increasingly playing a leading role in aggregating content from the multitude of internal and external sources. However, this has perpetuated a siloed channel perspective, resulting in duplication of effort and duplicate content creation, lack of agility, slower time-to- market, and an inconsistent consumer experience across channels.

The vast-built legacy systems of today poorly handle the data maintenance nightmare created by the exponential growth of data, the increasing numbers of attributes, the long-tail SKUs in omni-channel operations, and the rise of unstructured data including multi-media and consumer reviews. Another key challenge is the lack of standardized systems to collect, validate, and distribute data internally.

Thus arises the need for a comprehensive Product Information Management (PIM) system. PIM systems focus on the data required to market and sell products through one or more distribution channels. For many retailers, however, the PIM functions simply as a glorified product master database.

It is time for retailers and brands to start exploiting the full potential of their PIM systems to improve the customer experience. Key benefits of a more robust use of PIM include:

- Minimizing "lost" sales opportunities by suggesting alternative products
- Reducing returns thanks to better product content and attribute information
- Utilizing work flows so that multiple parties can curate product information
- Improving the consumer experience by enabling better product information in the call center and through self-service options
- Incorporating products in larger offerings, with headings such as a "Quick Weeknight Chicken Recipes" or "Get the Latest Holiday Looks Now"

2. Data Quality

In our interviews with retailers and brand manufacturers, we learned compelling insights about their challenges with internal data quality. According to one leading global consumer goods company, they indicated that their accuracy of product data, even with a small number of basic product attributes, was at a very low 68%.

Speaking more broadly, let's call that small set of basic product attributes the "inch deep" information. What's happened is that the growth in the number of SKUs from sub-brands, regional promotions, and product diversification have made the number of products that need basic product information a "mile wide." And now, it is no longer sufficient to be only an inch deep.

Consumer demand has exponentially increased the need for deeper (i.e., more detailed) data, both structured and unstructured. Companies are being asked to go a mile wide and a mile deep on product information, significantly increasing the level of complexity.

The capacity to manage this has typically developed through accretion, with widespread use of spreadsheets, manual processes and handovers, without formal processes to ensure data quality. An emphasis on keeping the data fluid and moving has pushed companies to become experts in improvising and finding quick solutions. Unfortunately, workarounds and improvisations are not particularly scalable.

Our research shows the retailers and brand manufacturers don't have a standard process to maintain data quality. Brand manufacturers prefer third-party catalogue service providers (CSPs) should provide data without any addition or modifications. Retailers lack cross-functional data governance structure to deal with product data obtained from multiple sources, and prefer that CSPs edit and standardize data on their behalf. An absence of standards results in poor communications and multiple ways of working.

There are increasing industry-driven data quality initiatives underway, facilitated by industry bodies such as GS1. GS1 has been developing solutions and recommendations over the past six years, including the GS1 Data Accuracy pilot currently running in the US. Yet the global product data deficit problem has remained intractable.

Some of the emerging solutions for data quality include:

- Data crawlers for data optimization when product data is obtained from multiple sources
- Data quality controls across traditional, big data, cloud, and machine learning platform architectures
- Product data dynamic classification audit and reconciliation for disruptive, innovative products
- In-memory, in-database, and in-stream processing to help facilitate data quality tool within modern-day platforms (cloud and big data)
- Emerging data quality tools for operational, analytics, and business intelligence needs along with strong dashboards, reporting, data profiling, and traceability capabilities (visualization)
- Semantic discovery of data

To achieve high-quality product data, companies will need to change the business processes that deal with it. Legacy systems currently in place have been developed for traditional retail processes and are not fit for new business models, and high volumes of data. Next to systems, organizational structure can offer significant benefit, such as establishing a regionally shared service center and authorizing a data governance organization.

3. Data Sharing

Companies today procure product information from a combination of sources and channels that include GS1, 1WSync, image pools, data crawlers, aggregators, and third-party providers. Multiple data sharing mechanisms, including Excel files, portals, forms, and unstructured emails, cause error and necessitate management of data redundancy and synchronization.

Authenticity of data is crucial for earning the trust of consumers. CPG companies and retailers refrain from using product information that is delivered by non-authoritative sources.

Product Information Management Framework: Beyond the Basics

Many PIM solutions have integrated Master data management (MDM), data quality, and data integration solutions. Some of the emerging capabilities in PIM solutions include:

- Scalability to include multiple SKUs, currencies, and different geographies
- Real-time collaboration between various stakeholders
- Integration across various business systems (such as CRM, ERP, commerce) for an end-to-end approach
- Enhanced search capabilities, query building, and visualization strategies

A cloud-hosted PIM helps manage the growing omni-channel challenges by:

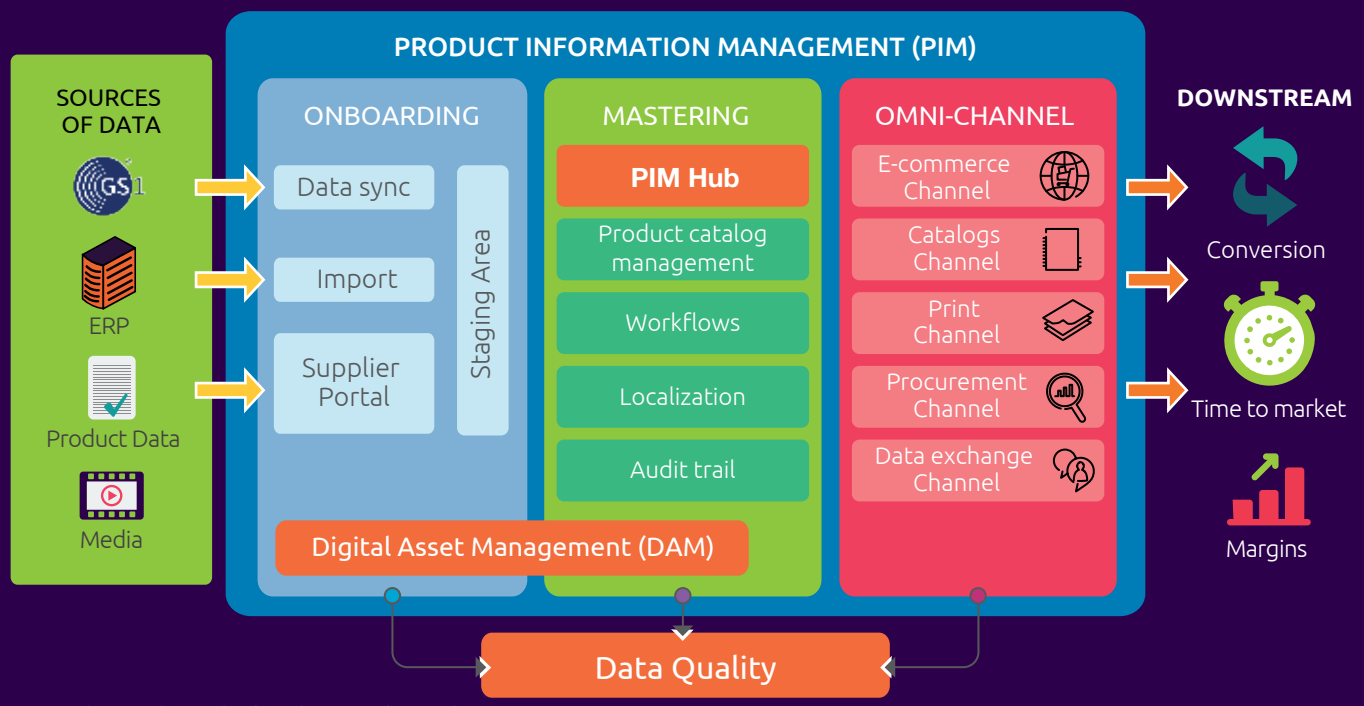
- Combining and synchronizing data from a growing number of sources (GDSN, Icecat, Syndi, Brandbank, Salsify, Shotfarm etc.)
- Providing interoperability and modularized handling of data
- Managing unique product content (and template requirements) as required by each channel and ensuring data consistency across all channels
- Handling and integrating unstructured product data

Of course, the quality of online product information is linked to the quality of the product data itself. A robust PIM solution is often a pre-requisite for a successful digital commerce business operation. Though PIM can meet most of the requirements of digital commerce, companies need to gain control over their digital assets and unstructured data.
A majority of retailers waste considerable time in searching for and retrieving digital content for each channel. Digital Asset Management (DAM) solutions—whether included within the PIM or as a stand-alone—will organize, categorize, verify, and store digital assets in a central repository and distribute them to various channels. Search and metadata management tools enable easy retrieval.

When considering PIM and DAM solutions, it is essential that the software is complementary, easily integrates with existing tools, and supports industry-specific classifications. Today's solutions should include API standardizations to make product data interoperable.

Fig 5 shows how PIM and DAM bridge the gap between sources and consumers of product information. There are several built-in features in leading PIM tools like supplier portals for faster supplier data on-boarding, GS1 sync for easy synchronization of product information, sophisticated catalog and workflow management features to organize and maintain product information for stores and for e-commerce catalogs, and localization features to expand market footprint in newer geographies. These can equip manufacturers and retailers with tools to, among other things, increase their brand visibility, reduce time-to-market and increase product margins.

Figure 5: Product Information Management



The Impact of Emerging Technologies

The Next Wave

A number of emerging technologies and tech developments are relevant to product identity, data sharing, data gathering, and data accuracy. To illustrate this, we have listed some technology developments that may eventually solve some of the issues we've identified in this white paper. These technologies need to be regularly reviewed for their level of maturity and for their ability to add value.

1. Cognitive Computing

Underpinned by machine-based learning and natural language processing, cognitive computing drives quick identification of new patterns and insights from unstructured data such as blogs, consumer reviews, videos, and photos. Analyzing the growing volume of unstructured data is the next compelling trend in big data analytics. IDC predicts that by 2020, 50% of all business analytics software will incorporate prescriptive analytics based on cognitive computing.

Leading PIM vendors are already looking at ways to build natural language processing and machine-learning capabilities into their tools. This would help them sift through unstructured content like PDF documents, product reviews, call center transcripts, consumer questions, and more to generate attributable information about the product. This attributable information can be user-generated or unstructured, as in the highlighted Cognitive Computing examples.

2. Open Standards and Standardized Interoperability

Dynamic data sharing across the product information cycle can only be achieved when open standards are combined with a service orientation that puts a focus on the consumer's data needs. This underlies all the other emerging technologies, as it enables retailers to collaborate effectively and achieve a limitless information flow across suppliers, distribution centers, retail stores, and consumers.

Case in Point: Use Cases for Cognitive Computing

- Integrate IBM Watson with a PIM tool to generate insights from product reviews on Amazon. For example, analyzing over 1,000+ buyer comments of a smartphone model can tell us about the product's relative battery life and most important user features.
- Use natural language processing (NLP) and machine learning to automatically categorize and classify products by reading through the product name or header. NLP can, for example, automatically map an inbound product named "frozen natural yogurt" to the correct place in the online product catalogue: In-store >dairy products > frozen section.

3. Next-Generation Product Identification

Soon, the Internet of Things will enable all products to be identified and traceable at the individual item level. But the current Global Trade Item Numbers (GTINs) and barcodes do not even support the granularity of data required today in an omni-channel world. A few interesting technology solutions are making it easier to append item-level details to basic product information data. These could help usher in a successful evolution without the need for a revolution. GS1 is working with the industry in resolving the need to accommodate more granular product data, such as for item-level traceability.

4. Internet of Things (IoT)

An array of new innovations will use the founding protocols of the internet to allow any electronic machine, device, object, or sensor to send data to anywhere else on the network. This could be to another machine, database, application, or smartphone—any connected, smart object.

The increasing bandwidth of wireless and mobile networks means they can be connected wherever they are, making the IoT incredibly powerful at gathering, sharing, and enriching data. IoT gives consumer products companies and retailers an entirely new way of collaborating with suppliers, other industries and consumers themselves. The growth of the IoT will be staggering. Gartner predicts there will be nearly 26 billion devices on the internet of things by 2020[v].

5. Image Recognition (IR)

IR technology is an output of machine learning and predictive analytics. It identifies products with a unique imprint of lines created during manufacturing. This is stored in the cloud so product authenticity and identity can be confirmed throughout the supply chain. IR also overcomes the challenges of traditional QR codes for dynamic data by enabling flexible and modifiable content in the cloud.

Emerging capabilities for image recognition include:

- Embedding Augmented Reality (such as videos and other digital content) once the image has been identified with the "learning algorithms"
- Directing consumers to relevant product pages and facilitating commerce directly from print media, bridging the gap between print and digital media

Case in Point: NFC RFID Sensor Tags and IoT

Diageo, a leading player in alcoholic beverages, announced the launch of "smart labels" to attack rampant counterfeiting in the industry. Diageo partnered with ThinFilm Electronics to attach OpenSense NFC-embedded sensor tags to bottles. The tags confirm authenticity and position the product itself as a key media channel, pre- and post-purchase, by allowing a seamless exchange of information between the sensors and NFC-enabled phones and tablets.

Product authenticity: The OpenSense tags are encoded permanently at the time of manufacturing with no ability to copy or modify at a later date. They are attached to each bottle and remain "readable" even after the factory seal is broken, thus confirming authenticity.

Source:https://www.nfczworld.com/2015/02/27/334319/diageo-unveils-smart-whisky-bottle-with-game-changing-nfc-tags/

Case in Point: Augmented Reality (AR)

1. The LEGO Company has set up augmented reality kiosks to show projections of packaged, in-store products. By giving consumers a real, hands-on feel of the product, the company has increased sales of their packaged kits and provided an optimized return on the AR investment.

   Source: http://www.geek.com/geek-cetera/lego-augmented reality-kiosks-heading-to-shops-worldwide-1195942/

2. Walgreens leverages Google's Project Tango to offer customized, in-store 3D maps to help consumers find the specific products they desire. The Google solution also offers product information and promotions that seem to "pop out" of the shelves as consumers navigate the aisle.

   Source: http://www.mobilecommercedaily.com/walgreens-to-fuse-digital-and-physical-experiences-via-virtual-shopping-technology

3. Tesco leverages augmented reality to offer additional content like nutritional data and other product information as consumers navigate the store aisles and scan special tags with their phones.

   Source: http://www.mobilecommercedaily.com/walgreens-to-fuse-digital-and-physical-experiences-via-virtual-shopping-technology

6. Computer-Generated Images (CGI)

This technology is hastening the end of traditional product photography and video-capturing. Some retailers and brands already use CGI in print catalogues and magazines, for commercials and for in-store interfaces, rendering 3D projections of products along with interactive content and e-commerce.

It is easy to generate 3D images (and videos) of the products relevant to the context of where it is used, both cheaper and more quickly. For example, these images can be used for interactive product pages on e-commerce sites, giving much more detail on how the product looks in real life. Augmented Reality experiences are also becoming more sophisticated thanks to CGI. Already used in fashion, augmented reality will be making its way into other product categories. A poster might turn into a video just by detecting a shopper's lingering attention, while product tags become increasingly interactive for shoppers as a result of supporting devices such as wearables and sensors.

Case in Point: CGI in Retail

Three out of every four images you see in IKEA's catalogue are 3D computer models. IKEA has been transitioning all of its product photography to CGI over the past eight years with significant cost savings. Once created, IKEA can customize its CGI renderings (currently over 25,000) to any market and geography—including updating them with the latest upholstery or bedding options—without the need to re-set and re-shoot products.

The CGI also benefits consumers. By embedding a scannable digital layer atop the print catalogue, IKEA enables consumers to capture and virtually see a 3D rendering of the furniture in any room of their home as well as to access additional product details.

Source: https://www.fastcodesign.com/3034975/75-of-ikeas-catalog-is-computer-generated-imagery

Another example is Tesco, who has webcams placed in-store to give 3D projection of products from their print catalogues. These displays include product data and links to other capabilities like e-commerce ordering.

Source: https://www.fastcodesign.com/3034975/75-of-ikeas-catalog-is-computer-generated-imagery
http://www.augmentedrealitytrends.com/augmented-reality-retail/tesco-follows-the-recent-augmented-reality-trends.html

7. Blockchain

There are several practical applications in the consumer goods and retail industry of recording transactions in a Blockchain system. Most notably, Blockchain can help ensure the authenticity of high-value products and protect both consumers and sellers from fraudulent transactions. Blockchain technology can also be applied for traceability, allowing for the transparent recording of not only how goods were produced, but also when (for freshness). This can also ensure that the product has been handled in compliance with social and environmental rules and regulations throughout the supply chain.

Not By Tech Alone…

Some of these emerging technologies will support a more efficient and effective way to identify products, share data with consumers, and gather data. But technology by itself will not solve the industry's issues. To achieve high-quality product data, companies will also have to change the data governance and business processes that deal with product data.

There needs to be a collaborative approach towards standards in general and, more specifically, a minimal set of relevant attributes based on consumer requirements. The GTIN Allocation Rules need to be accepted and implemented by all parties globally, and end-to-end throughout the supply chain, to ensure unambiguous identification.

It is shocking that this industry can organize itself for the quality and availability of products for the physical supply chain but not for the informational supply chain and for the product data that accompanies and enhances the customer experience. In our view, the product information supply chain must be properly managed to ensure both the depth and accuracy of information for driving trust and consideration as well as the width and optimization of information for driving purchases.

The increase in the number of product attributes—for traceability, to drive path-to-purchase, for expanding sales channels, SmartLabels and more—requires a single owner who will be accountable for the product information supply chain.

And the Fourth Imperative: Data Management

Most multi-brand retailers (in segments like food, fashion, DIY, and others) have a big challenge competing on assortment. A carton of orange juice can be the same for any given retailer, but retailers have different data requirements that, in turn, create complexity. Today, different sets of data have different owners. Logistic data is owned by the supply chain department, prices by marketing. A product data governance organization is needed to ensure alignment between the data stewards and data custodians.

Likewise, the increase in the number of product attributes—for traceability, to drive path-to-purchase, for expanding sales channels, SmartLabels, and more—requires a single owner who will be accountable for the product information supply chain.

To ensure that a focus on the consumer is maintained, a centralized (or at least regionalized) orchestration of data is necessary. The appropriate business processes to manage the end-to-end flow of product content for all channels, with responsibility for completeness, consistency, quality of data, and an ongoing drive towards standardization, must support this concentrated effort.

The orchestration capability should maintain feedback loops, ensure best practices across categories or markets, and drive increased efficiency and speed into operations. We see this orchestration capability best situated within a centralized or regional marketing function.

The acceleration of innovation and the availability of information across all channels means that the pace and cadence of old processes (such as batch updating) needs to change to an "always on" way of processing product data. What is true on Friday may not be true on Monday. In addition, there needs to be consistent feedback loops from retailers to manufacturers.

The Product Governance Role

Companies need a Data Czar—a Product information officer—to align the data needs throughout the enterprise and the supply chain and, most importantly, to focus on the consumer.

Such a role would be responsible for orchestrating data flows across internal business functions as well as with external partners to ensure adherence to standards such as GDSN. The orchestration capability would be required to work in tandem with any existing Supplier Master Data Management, and would have the added responsibility of ensuring process efficiency across both structured and unstructured product information.

We see the need for several time cycles—from annual planning cycles to near-real-time optimization—each having its own governance framework and business rules. For instance, the ongoing optimization of supplementary product images does not necessarily require the same governance as nutritional information.

The acceleration of innovation and the availability of information across all channels means that the pace and cadence of old processes (such as batch updating) needs to change to an "always on" way of processing product data. What is true on Friday may not be true on Monday. In addition, there needs to be consistent feedback loops from retailers to manufacturers.

Creating the right governance frameworks and processes to "test and learn," to efficiently incorporate consumer-generated content across both brand.com and retailer.com sites, to provide feedback into the product information lifecycle, and to be "always on" is proving difficult.

Global organizations exacerbate the situation. There can be lack of clarity on roles and responsibilities leading to a duplication of effort, no "single source of truth," and product information that is not appropriately localized to the market.

Case Study:

Reinventing Product Data Acquisition and Use from The Ground Up

Consider the situation faced by one of the world's largest retailers not so long ago. Its hypermarkets, discount department stores, and grocery stores had a total of 50 million SKUs with more than 23 million in digital form. But the 23 million digital SKUs existed in disparate repositories, technologies, and tools—with over a million suppliers—and only 30% of these products were visible to online shoppers.

With products and suppliers in multiple silos, it was difficult to efficiently onboard SKUs. Despite issuing an enterprise attribute specification, 85% of the company's top 2000 suppliers failed to provide high-quality data. Of the data that did come in, more than 90% of it did not meet the established exchange web services (EWS) standards. The company was also concerned about the disconnected consumer experience between its stores and online, and the sub-par online experience that caused a high percentage of returns and "inaccuracy" charge backs.

A new approach was needed to establish a robust, reliable, and complete data foundation.

Working with Capgemini, the company reinvented its product information processes. A team of 65 people was deployed across three geographic regions to implement the following:

- **Optimize business processes** to acquire and onboard suppliers and product SKUs, mapping both for in-store and online sales.
- **Establish a supplier command center** to focus on outreach, provide education on required specifications, and to conduct relationship management with direct suppliers as well as third-party drop-ship and marketplace vendors.
- **Automate product data acquisition and enrichment** to speed up content curation, validation, and enhancement.
- **Improve supplier and item onboarding** to improve item setup on its website.
- **Create new data tracking and KPI dashboards** to capture daily and weekly activity on suppliers and the number of SKUs on boarded.

Data Source Identification	Product Data Acquisition	Data Validation	Integrate with Content Personalization	Push to Channels
• Retailer • Vendors / Suppliers • Content service providers • Content aggregators • Content creators • Catalog providers	• Attribute spec template • Supplier interface - Online update - Communication • Supplier onboarding - Education videos - Outreach program	• Product data manual and automated validation • Image validation and scrapping • Supplier and SKU data tracking for traffic and cycle time analysis	• Add relevancy tags • Dashboards for traffic analysis • Keyword and tag optimization • Keyword repository	• Triage with offer and shipping information to set up item in PIM • Append legal disclaimers, finance, buyer information • Make visible online

A Roadmap for Action

Moving Forward

There needs to be a focused, expert-driven approach to enable a product data exchange for both the retailer and supplier community in a standardized, collaborative, efficient, and coordinated fashion. Providing the right data at the right time to the right customer will mutually benefit CPG companies and retailers with higher sales and inventory turns.

But who should do what? In our view, we see different roles for different parties. Consumer Goods Forum (CGF) and GS1 should bring together stakeholders to work on a common understanding of the opportunities available and to build a framework via a bold vision and roadmap. Business partners should lead by example. There is a shared responsibility between retailers and suppliers.

Keeping up with today's technologically mature consumers like Carol requires the industry to adopt more advanced processes. But many smaller suppliers are not technically savvy enough for the job. They still send invoices by fax and don't have their inventory online. This lack of technology adds many days to the supply chain and to product data exchanges.

A critical task for the industry is to help move all suppliers to a more digitally mature state regarding data gathering, data quality, and data sharing. At larger companies, the emerging role of Data Czar or Product Information Officer will be instrumental in leading the way to a consumer-aligned data ecosystem, eliminating silos and ensuring data accuracy and completeness.

In our research, most parties agree that small, manageable projects will have a bigger effect in these fast-changing times. Any approach should be agile, scalable, and fast. However, a long-term vision must be embraced first in order to determine what needs to be done in these smaller, agile steps.

Assessing Your Current State

Where does your organization fit on the digital maturity map? Here are some questions to help you recognize the types of initiatives that may be needed for your company to become a Leader across the board.

- Is there a general understanding among company managers of the economic benefits of product data quality?
- Are your direct suppliers and customers connected with you digitally, or are manual processes still in use?
- Are there instances where different channels have different product information for the same item? If so, do you know why this happens?
- Is there a single point of contact or a workflow for ensuring data accuracy and completeness?
- How much time is spent correcting and editing data manually? Has this ever been quantified?
- Is there a clear line-of-sight for all product data from origin to consumer?
- Are keyword strategies deployed to ensure your products are found online?
- How complete and accurate is your digital product data? Are you able to collect and disseminate both structured and unstructured data, such as customer reviews and video?
- Can you mine the data for actionable product insights to improve attribution as well as to cycle back into the product development pipeline?

How We Can Help

Capgemini's Product Data Transformation Solution is a response to the growing need for information solutions that effectively manage large volumes of structured and unstructured data, produce accurate, enhanced and enriched data, and link business, supplier and customer information. In our view, there are ten essential steps to complete a product data transformation (see Figure 7). Your organization might be already following some of these steps. If your organization follows the remaining steps, it will gain from our ability to deliver correct product data, which is crucial for omni-channel success.

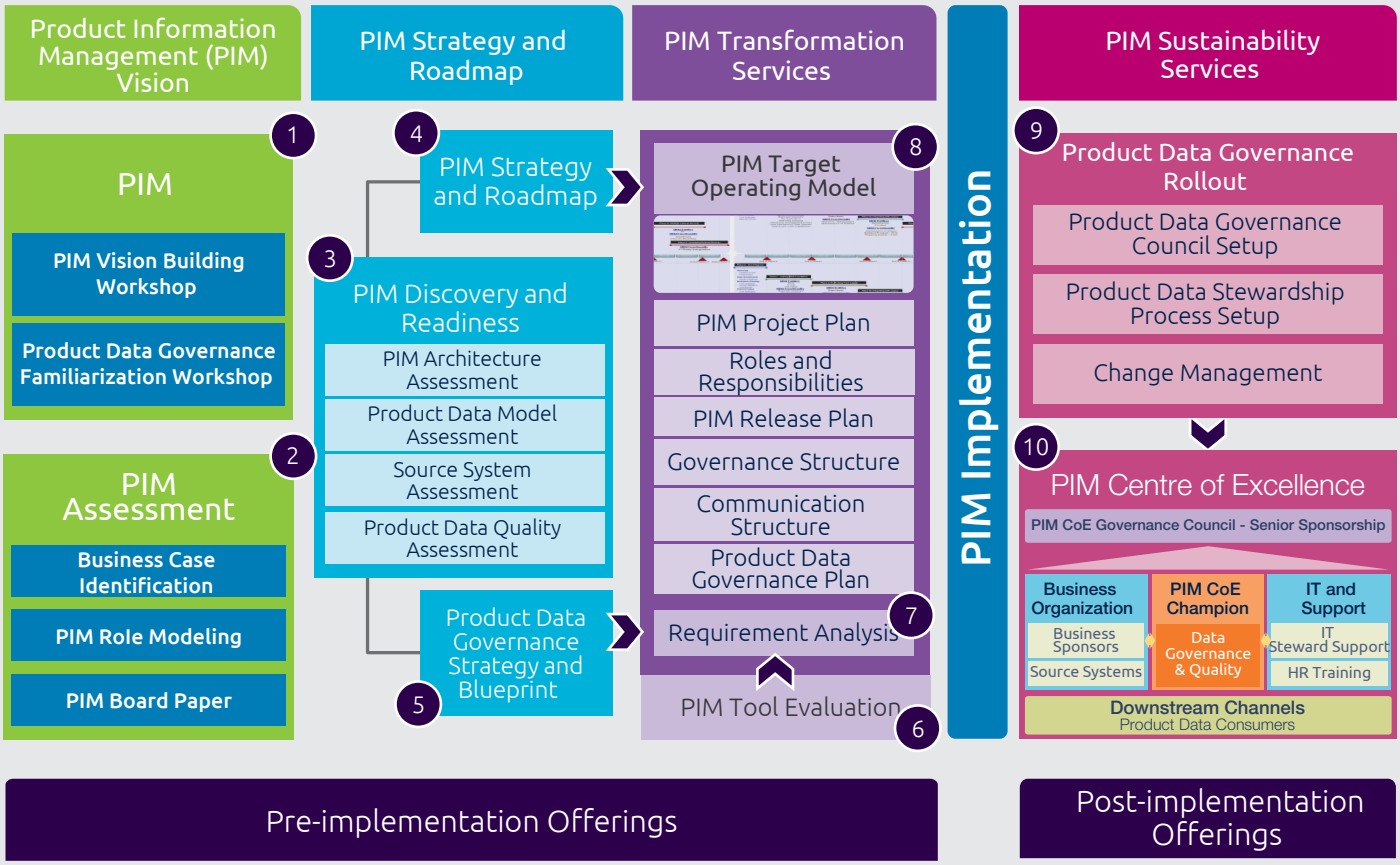
Capgemini's Product Data Transformation Solution includes creating the vision and strategy for product data management, transforming end-to-end product information flows, supporting processes and governance, selecting and implementing the right technology platform and matching business processes that enables an organization to improve product data collaboration.

Capgemini's product data transformation solution offerings for both retailers and manufacturers include consulting services to select and implement the right platform of tools and/or third-party providers, as well as the management and automation of rich product data and content services to enable product data collaboration.

A complete product data transformation starts with a thorough understanding and assessment of the organization's current status and vision for the strategic role of product data. The transformation roadmap includes data acquisition, data governance, and process (re)design, task-technology fit, product data models, and product quality. Besides creating a vision, strategy and transformation roadmap, we can help you implement your new operating model and chosen technologies and tools to enable more effective and efficient product data management, powered by insights-driven reporting and analytics. We have extensive experience rolling out effective product data governance processes and are uniquely placed to support the transitional change management.

Our experts have worked with leading global consumer products and retail companies to help them reap the benefits of advanced business information solutions. We are an active participant in the Consumer Goods Forum and have a deep understanding of the issues confronting the industry. This, coupled with our presence in multiple countries, enables us to understand your local issues and create solutions to your unique challenges. We are committed to helping you solve your greatest challenges in collecting validating and sharing product data in today's omni-channel world.

Figure 7: 10 Essential Steps to Complete Product Data Transformation



Where to Start

The easiest way to get a better understanding of the omni-channel product data issues facing your company is to have a "Scan and Plan" workshop. In this session, Capgemini retail specialists will guide you through the following steps:

- **Scan**: We share our thought leadership and industry best practices, mapping these along with your current state and ongoing initiatives.
- **Focus**: We identify and explore the areas where your organization can improve and the benefits this will deliver.
- **Act**: We help you define your roadmap and plan concrete actions.

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6 Special thanks to Abirami for research assistance.

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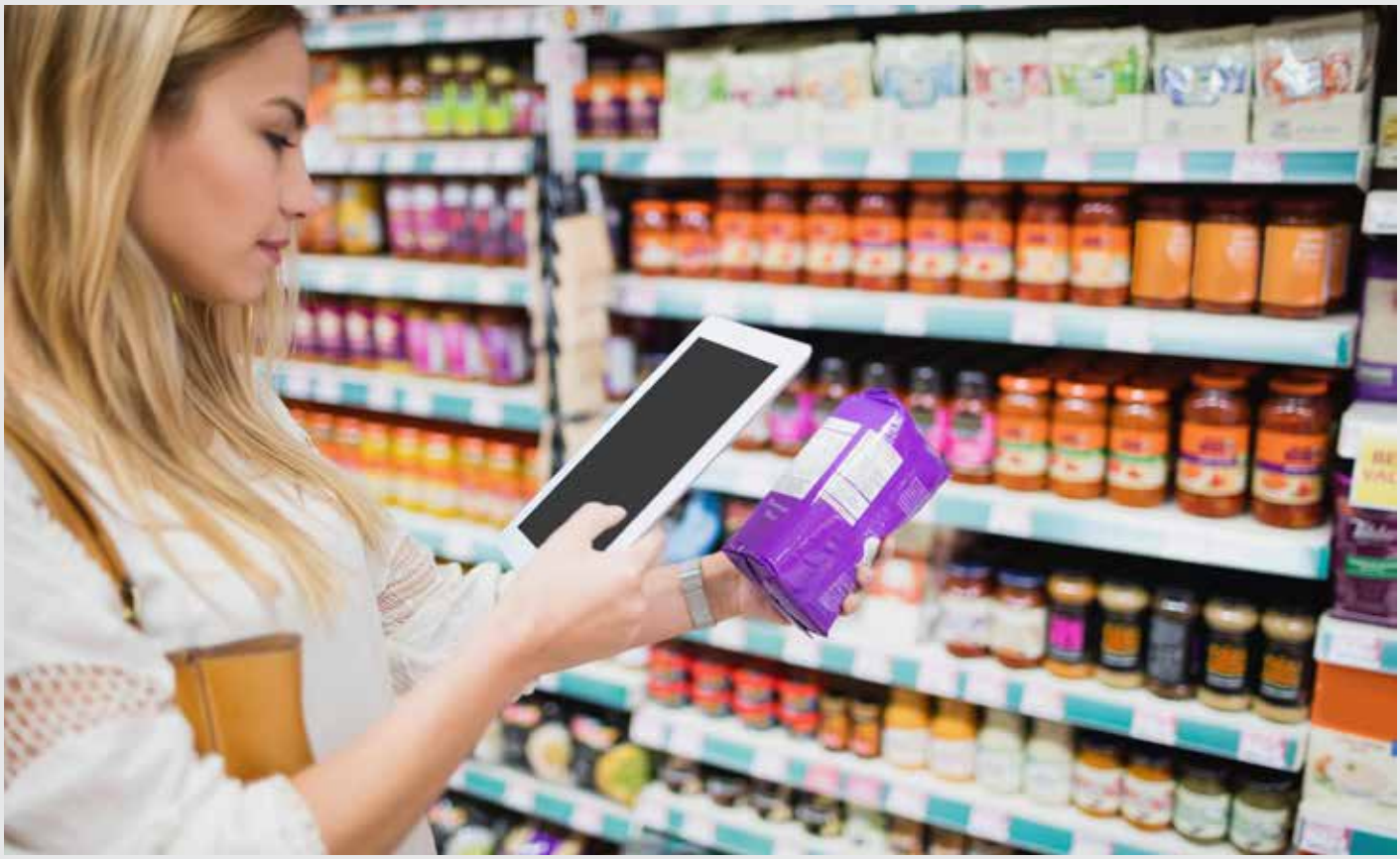

About Capgemini

A global leader in consulting, technology services and digital transformation, Capgemini is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of 200,000 team members in over 40 countries. The Group reported 2017 global revenues of EUR 12.8 billion (about $14.4 billion USD at 2017 average rate).

Learn more about us at

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