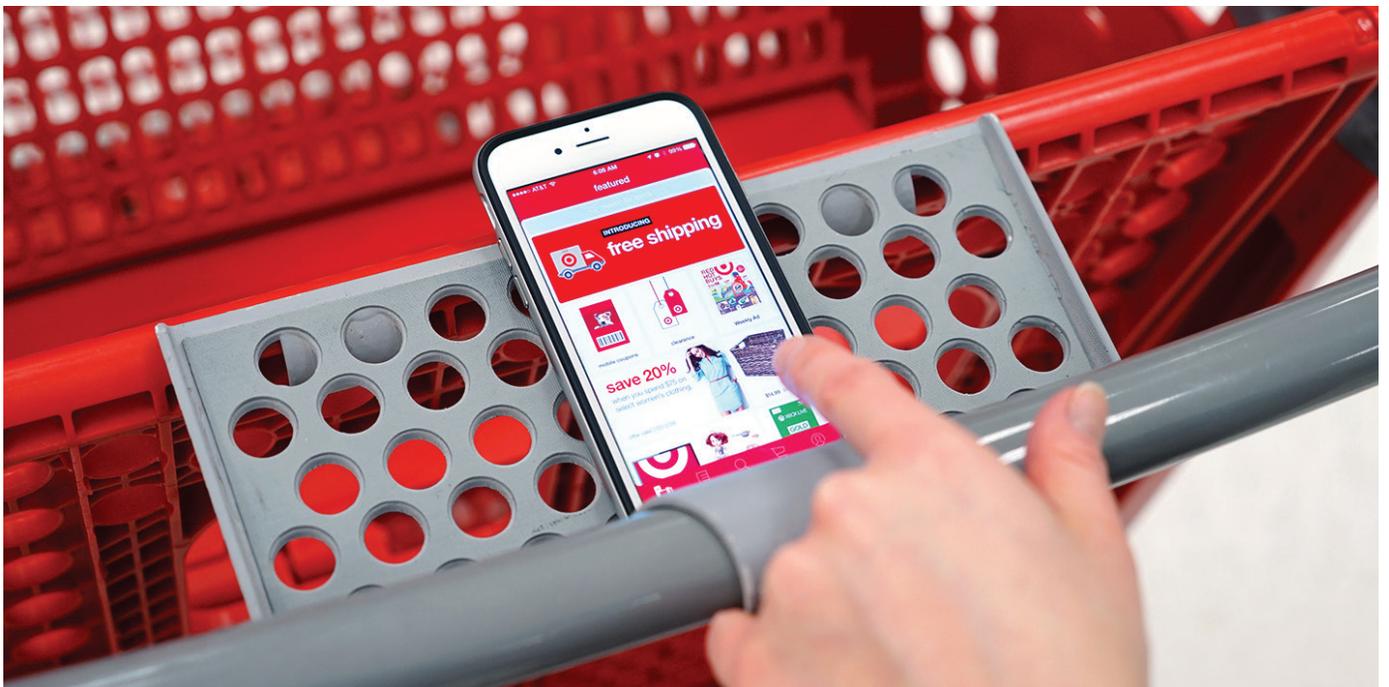




The Global Language of Business

# Driving Product Data Quality by the Numbers

Target, Johnson & Johnson Supply Chain, and LEGO Share the Value of  
Measuring the Quality of Product Data





Focus on the good things that happen when you have good data.



It saves money.

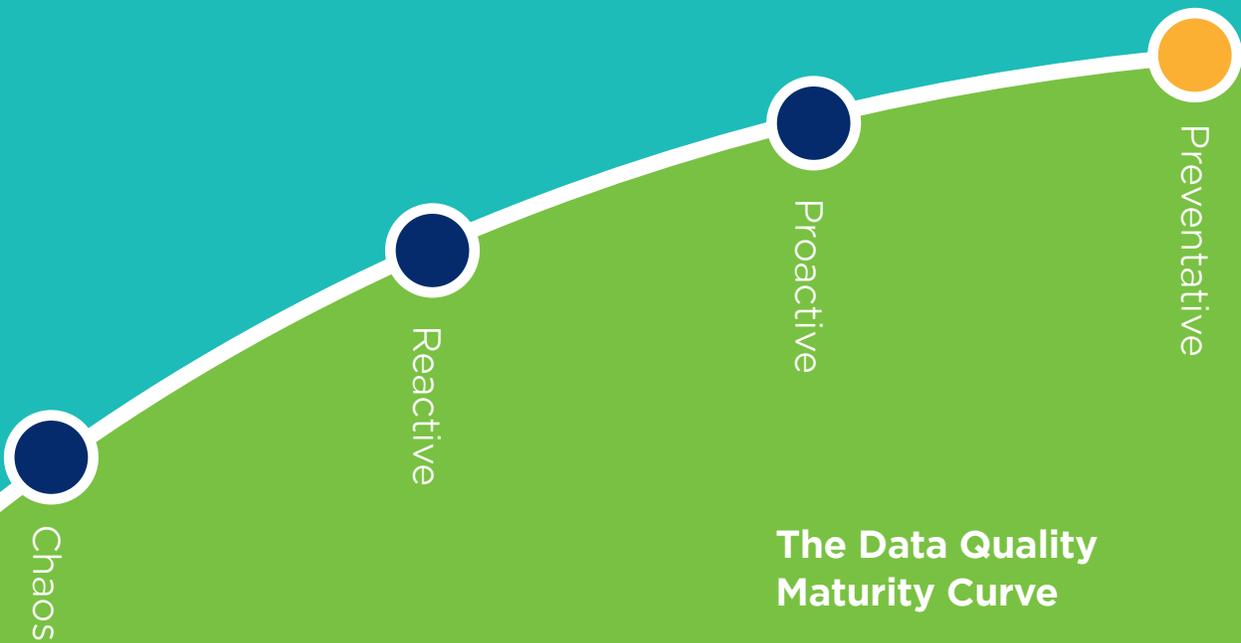


It saves time.



It saves your reputation.”

**Andy Nash** *Lead Product Owner, Target*



**The Data Quality Maturity Curve**

Target has undertaken a comprehensive effort to address product information data quality, recognizing the importance of the “single version of truth” in omni-channel commerce. As any company with a substantial online presence has discovered, consumers demand complete, accurate, and consistent product data when searching for a product and making a buying decision.

In the 2017 white paper, “Invest in High-Quality Product Data to Support Your Growth Strategy,” Target and two of its suppliers describe the importance of their investments in achieving high-quality data—not only for the benefit of their respective business operations but, as importantly, for the benefit of consumers in a fast-moving, omni-channel world.

Here Target shares more of its data quality journey with its determined approach to measure product information and report the results to its suppliers, including Johnson & Johnson Supply Chain (JJSC) and the LEGO® Group (LEGO).



**When considering everything that we could track and measure, this one metric—issues per item—would help us truly understand where we are and how we can make progress.”**

**Andy Nash** *Lead Product Owner, Target*

## Using Metrics to Simplify Data Quality

Andy Nash, lead product owner, heads the Target team responsible for developing software applications that address the company’s data quality challenges, including establishing metrics and reporting results.

To ultimately determine key data quality metrics, the team delved deeply into the specifics of some 200 product categories—ranging from swimwear to sweaters, from personal care products to pets—working closely with the Target buyers who are intimately familiar with the goods the retailer sells and the manufacturers that supply them.

“Based on research, our buyers fully understand the customer decision tree, including how the merchandise is researched online,” Nash says. “So, they understand the product’s attributes and the importance of data governance. I was able to write into code what I learned from our discussions.”

Target’s resulting data quality software solution—called Valor—created data quality rules specific to each product category. For example, in the area of liquid remedies in over-the-counter healthcare, anytime a unit of measure is not recorded as a “fluid ounce,” an error message is generated. Valor even simplifies the correction process.

If a rule is written that can determine the correct value with 100 percent certainty using other data points, Valor fixes the incorrect value automatically.

## Target Simplicity: Issues per Item

To keep metrics uncomplicated, Target settled on a simple, yet powerful top metric for data quality: issues per item.

This helps the retailer see the scope and type of product data quality issues that need attention. “When considering everything that we could track and measure, this one metric—issues per item—would help us truly understand where we are and how we can make progress,” says Nash.

“We’re shifting our focus to being as close to zero on issues per item for new products and on being proactive,” Nash continues. “A product that goes on our website tomorrow should have no errors detected. That’s our goal. Instead of changing the numbers based on categories, we’ve changed it based on time and being proactive versus reactive.”

“We have found that our suppliers are motivated by metrics,” Nash says. “We have seen significant improvements in our overall data quality since we started regularly sharing our findings with them.”

## Using Technology to Climb the Data Quality Maturity Curve

As part of its data quality measurement program, Target’s software application (Valor), allows users to:



**Create data quality business rules**



**Automatically remediate issues**



**View dashboards of results to see how data scores against these rules**



**Send rule results to other applications**

## Consistent Use of Metrics Allow for Quick Improvements

Target's Nash admits, that at the outset, a project of this breadth seemed overwhelming and chaotic, considering the hundreds of thousands of items Target carries and the average of 100 attributes per item.

Once the data quality software went live, and adoption of its rules became embedded in the Target culture, data quality became more manageable, errors became less omnipresent, and progress came into view.

### 60% Fewer Errors in Just Seven Months



As a result, Target's key metric of 2.1 issues per item has decreased to 0.9, a 60 percent improvement.

### Proof Positive

Nash also believes in the power of a positive approach. "Focus on the good things that happen when you have good data. It saves money. It saves time. It saves your reputation."

Measuring compliance and realizing sales is an important step in getting leadership and organizational buy-in, Nash believes. "Sometimes in the product information data quality space, you have to extrapolate and maybe use a conservative estimate, relying on back-of-the-envelope math. Translating your data quality actions into tangible revenue and savings—that can be compelling with real impact."

"We have experienced increased conversion, meaning our customers looked at a product online—a product on which we had improved data quality—and they bought it at a higher rate," says Nash. "That goes into the bank, making it about real dollars, not just metrics."

Target has quantified the cost of fixing a data issue that arises: the time it takes to find a ticket, research it, and then fix it. Based on the number of issue incidents and the time it takes to resolve them, the cost of fixing data quality issues can easily run into the millions of dollars, not just in labor costs, but in lost sales, as well.

"We're actually correcting less data, which is really good. We don't have fewer items. We actually have more, but we're having to correct less data. It's metrics like this that give a time value, a dollar value to it as well," Nash says.

### Removing Root Causes of Inaccurate Data

"We're now looking at root cause prevention," Nash reports. "It essentially means we enforce the rules in the system. As data comes into our ecosystem we block those that have issues, almost like a firewall."

Target finds itself at a proactive stage in its data quality journey, having gone from its initial reactive stage of correcting bad data on existing products, moving through to the prevention of errors within categories, and auto-correcting those where possible.

"There are also preventative soft skills that come through training, education, and awareness. The software from a technology standpoint is just one part of the data quality measurement program," says Nash.



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*Andy Nash, Lead Product Owner, Target*

### JJSC Addresses Issues per Item

Soft skills were also a part of JJSC's data management process. "We started with education," says Dylan Lippincott, analyst, Global Data Synchronization with JJSC. "We brought GS1 US® in to educate our supply chain data management and global packaging teams on standards-based package measurement and Global Trade Item Number® (GTIN®) management rules, since we know GTIN assignment and package measurement mistakes are common but preventable root causes of product data quality issues."



Because turnover is inevitable, GS1 Standards reference materials, along with yearly refresher courses, are important components of the data quality continuum. Consistency in applying standards is paramount.

“We initiated a procedure that we call the ‘confirmation process’ at JJSC. It’s really mandating that any new item launched has to go through the packaging lab to be scanned, measured with calipers, weighed—a variety of tests to make sure the product data matches what’s in our SAP system,” Lippincott says.

JJSC has also eliminated the ability to copy and paste dimensions to reaffirm to the packaging engineers that every product, no matter how similar it may appear to an existing package, must be checked for the most accurate data.

As the manufacturer of more than 800 stock-keeping units (SKUs) with Target, JJSC also fully appreciates what is involved in systemic data quality efforts and the role of measurements.

“We created a framework for an internal data quality and data governance team to audit ourselves,” advises Lippincott. “Target gives us feedback regularly, including the results of their data quality measurements. This allows us to sharpen our focus. We know it directly impacts our certification with Target and our accuracy percentage.”

While Target’s data quality efforts can be viewed as a widespread horizontal endeavor, suppliers like JJSC must engage in a deep vertical initiative.



**Our internal team is well organized and comprised of subject matter experts. We have representation from our global data synchronization and packaging teams that sees to dimensions and weights. And we have the representation from supply chain data management responsible for data fields, such as net content.”**

**Dylan Lippincott** *Analyst, Global Data Synchronization, JJSC*

JJSC looks at its brands holistically. “Our internal team is well organized and comprised of subject matter experts. We have representation from our global data synchronization and packaging teams that sees to dimensions and weights. And we have the representation from supply chain data management responsible for data fields, such as net content,” Lippincott says.

In addition to physical characteristics, marketing information is a key part of JJSC data conversations. A product attribute may not involve a weight or measure, but a color description or an efficacy claim. All of these elements require data stewards communicating regularly and consistently.

“The customer is at the center of what we do and we work to create solutions to transform the customer experience,” adds MJ Wylie, with Global Data Synchronization Strategy & Deployment, JJSC. “We understand how important a digital presence is to our customers and how valuable our digital assets are. We leverage data to increase connectivity and transparency.”

## A Day in the Life of a Product’s Data Quality

**Before the summer season, Target pulls together its data strategy team for outdoor furniture to discuss what new products look like, their attributes, and how they will be assigned.**

Target evaluates any customer complaints and whether they are due to bad product data. Reviewing the data quality rules in the data quality software application for patio furniture, they’ll assess if those rules are still accurate.



- Do they need to be tweaked?*
- Do they need to be deactivated?*
- Are new data points needed?*

A data quality analyst makes any needed changes in Target’s data quality software application, whether it’s deactivating rules, editing rules, or writing new rules. Target’s data quality application can be updated to standardize the way a brand shows up online, including the way a trademarked logo appears.

During a test, let’s say:

- 1,450 items fail, while 14,550 others pass.
- The automated corrective action is used to fix all of the items that failed the test simply due to non-standard branding.
- Any remaining items that cannot be corrected through automation will require someone to manually choose a value that is acceptable and remediate it.
- Errors go into the responsible individual’s scorecard. The individual can organize the needed fixes by downloading the errors directly from the scorecard using a web-based tool.

When the process runs as intended, an error is fixed before the suite of patio furniture launches on the website or is distributed to stores.

## LEGO Takes Brick-by-Brick Approach

Another Target supplier, the LEGO® Group, points to the critical need of quality data. After all, how can you build the ship or castle shown on the LEGO box without all the right components inside the box?

“We value the feedback that we receive from our partners, but it isn’t the only driving factor,” says Dan Fusco, master data associate, LEGO Systems, Inc. “A lot of what we do is for our internal stakeholders who use the data, so we’re always striving for as much perfection as possible across the entire lifecycle of the product and throughout the ecosystem of commerce.”

Alexander Wagner who heads R&D Packing and Packaging Master Data, LEGO Systems in Denmark, points to a three-step process for the origination of LEGO product data that precisely mirrors the genesis of a LEGO product:

1. The product idea is developed, necessitating the need for descriptive product data.
2. LEGO elements to comprise the product are detailed—including new elements—requiring quantifying attributes such as the number of pieces, various elements such as building plates and building instructions, and element combinations.
3. Decisions are made on how the product will be packaged, involving measuring the product size, weight, and package dimensions.

While a GTIN is on every sold, finished product set, some LEGO pieces sold individually also have GTINs. Individual pieces—which may come in as many as 30 different colors—could add up to hundreds of GTINs and underlying data attributes.

As for governance, LEGO has an internal legal development plan that covers the timeline of a product, including when item data becomes available and when it is put into the system—an overarching system that incorporates data needs alongside the product itself.

“If Target finds deviance from a specific value, whether it is height, length, or width, we’re able to correct it fairly quickly,” Fusco says. “Although it doesn’t happen often, it helps us dig deeper as to what went wrong: was it a simple typo or a mismeasurement or values got swapped? We do a root cause analysis and then make changes for the future to improve our governance or improve our data quality.”

LEGO has built a data quality culture brick-by-brick and as Fusco puts it, “Good product data is as essential as the good finished product itself. Master data can’t exist without the physical product and the physical product can’t exist without the master data.”



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**Dan Fusco** *Master Data Associate, LEGO Systems, Inc.*

## GDSN: Conduit for Open Communication

LEGO first transacted business using the Global Data Synchronization Network™ (GDSN®) for one large customer. Now the data-sharing network is used for many of its customers globally. JJSC advises that the GDSN—based on its one-to-many relationship model—helps keep the company’s data consistent across its customer base.



The GDSN is a huge part of JJSC’s data governance process, using the network to supply Target with real-time data updates. When JJSC makes a change to its source system, Target knows immediately that a dimension, a weight, or another attribute has changed.

JJSC had products that hadn’t gone through GDSN, having been manually set up by a sales team. The company revamped the entire process with Target from a GDSN perspective, making it virtually mandatory that anything sold at Target had to run through GDSN first.

“For the products in scope, we steadily began increasing the quality of our data and passing Target’s audits that they do on a quarterly basis,” reports Chris Reed, global operations manager, Global Data Synchronization with JJSC. “There’s a direct relation. Using GDSN processes ensured that we were up to date.”





**None of this is ever 'one-and-done.' Everything is ongoing; maintenance is a huge portion of this, even after you've achieved good data."**

**MJ Wylie** *Global Data Synchronization Strategy & Deployment, JJSC*

### The Importance of a Culture Focused on Quality Data (and Products)

In keeping with LEGO core values that stem from promises not only to internal stakeholders and trading partners but especially to children and their enjoyment and safety, quality is a given and a must.

"LEGO considers data quality the responsibility of each and every individual within this company who handles master data, whether it's from its birth to its publication to its maintenance to its changes," says Fusco.

"Data quality is an integral part of our culture," adds Lippincott with JJSC. "We have increasingly become a data-quality minded organization, starting small to scale and focusing on the GS1 data quality model. For example, we implemented the [GS1 US National Data Quality Program](#) for thousands of our employees and more than 3,000 consumer SKUs."

"It's simple, but it's not easy. It takes time and commitment," Wylie from JJSC points out. "We could certainly have GS1 US come in and audit our entire database, correct it according to the audits, and be done with it," JJSC's Lippincott says. "But there's a whole process of maintenance: making sure new items are accurately set up, making sure everyone responsible for data is up to date and aware of GS1 Standards and any new rules. That's where a lot of the work comes in."

Wylie agrees. "None of this is ever 'one-and-done.' Everything is ongoing; maintenance is a huge portion of this, even after you've achieved good data.

"One of the advantages of the [GS1 US National Data Quality Program](#) is that we all work to talk the same language. We're all leveraging the same communications, using the same definitions—a common business language with GS1 Standards and processes."

Wylie continues, "Interpreting GS1 Standards in the same way our customers and our trading partners do and spreading that across our organization. In terms of simplifying things, the answer is leveraging standardization: the GS1 model of Identify, Capture, Share."

## Top Three Tips for Creating a Data Quality Culture

1

**Metrics**



2

**Collaboration**



3

**Transparency**



### When asked about advice for others, Target, JJSC, and LEGO offer the following:

Nash from Target responds, "Come up with a scoring methodology that works for your organization. Data quality **metrics** fit well into a retailer's metric-based world—earnings per share, store count, top sales, and more."

JJSC's Reed adds **collaboration** to the checklist of best practices that make a sustainable data quality program. "Working together end to end with packaging engineers, supply chain data management, and our customers to enhance existing processes is key. Externally, we have expertise from GS1 US and their data quality program along with input from Target and other customers that bring the data quality full circle."

Wagner with LEGO advises, "In the end, we learn from our mistakes. When we encounter a data error that impacts our customers or our business in some way, we share it. Being **transparent** about the error, working to uncover the root cause, and then sharing once more to make sure it doesn't happen again—that's a positive thing."



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**Alexander Wagner** *R&D Packing and Packaging Master Data, LEGO Systems*

## About Target

Minneapolis-based Target Corporation (NYSE: TGT) serves guests at 1,829 stores and at Target.com. Since 1946, Target has given five percent of its profit to communities, which today equals millions of dollars a week. For more information, visit Target.com/Pressroom. For a behind-the-scenes look at Target, visit Target.com/abullseyeview or follow @TargetNews on Twitter



## About Johnson & Johnson Supply Chain

Johnson & Johnson Supply Chain encompasses three segment supply chains (Pharmaceuticals, Consumer Products, and Medical Devices) that cover planning, sourcing, internal and external manufacturing, Customer Logistics Services, and the Supply Chain Strategy and Deployment. Additional enterprise-wide functions that are part of Johnson & Johnson Supply Chain include Quality & Compliance, Environment, Health, Safety & Sustainability, and Engineering & Technical Operations. [www.jnj.com](http://www.jnj.com)



## About LEGO

The LEGO Group is a privately held, family-owned company with headquarters in Billund, Denmark, and main offices in Enfield, USA, London, UK, Shanghai, China, and Singapore. Founded in 1932 by Ole Kirk Kristiansen, and based on the iconic LEGO® brick, it is one of the world's leading manufacturers of play materials. LEGO products are sold worldwide. [www.LEGO.com](http://www.LEGO.com)



## About GS1 US

GS1 US, a member of GS1® global, is a not-for-profit information standards organization that facilitates industry collaboration to help improve supply chain visibility and efficiency through the use of GS1 Standards, the most widely-used supply chain standards system in the world. Nearly 300,000 businesses in 25 industries rely on GS1 US for trading partner collaboration that optimizes their supply chains, drives cost performance and revenue growth while also enabling regulatory compliance. They achieve these benefits through solutions based on GS1 global unique numbering and identification systems, barcodes, Electronic Product Code-based RFID, data synchronization, and electronic information exchange. GS1 US also manages the United Nations Standard Products and Services Code® (UNSPSC®). [www.gs1us.org](http://www.gs1us.org)

## About the GS1 US National Data Quality Program

The GS1 US National Data Quality Program provides organizations with a comprehensive approach to data quality that encompasses:

- **Data Governance Process**—Validating that a data governance process exists within an organization to support the creation and maintenance of product data based on GS1 Standards.
- **Education and Training Protocol**—Confirming proper education and training on GS1 Standards within an organization with regard to creating and maintaining accurate product data.
- **Attribute Audit**—Auditing, verifying, and comparing product attributes to most recently shared data to enable trading partners to have confidence that the data shared is accurate, complete, and timely.



1	Data Governance Process
2	Education & Training Protocol
3	Attribute Audit

Learn more at [www.gs1us.org/DataQuality](http://www.gs1us.org/DataQuality)

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