

Tech-Clarity

Reducing Cost of Quality for Consumer Packaged Goods

***Top CPG Performers Move
Beyond “Brute Force”
to Drive Quality and
Compliance***



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Executive Overview

Quality management is critical to the success and profitability of a Consumer Packaged Goods (CPG) company. According to Tech-Clarity research, Successful Products Begin and End with the Customer, over three-quarters of CPG Companies say higher quality is required to drive competitive differentiation. It's also clearly important to deliver customer satisfaction, safety, regulatory compliance, corporate responsibility, and overall company profitability.

To better understand how they address this crucial need, we surveyed over 175 CPG companies and examined their quality management challenges, processes, organizational structure, technology use, and performance. We found that these businesses face significant quality management issues. We also discovered that they're taking action. Specifically, about two-thirds of CPG companies are going beyond what's currently required by adopting formal quality management processes and systems such as those used in the pharmaceutical and life sciences industry.

CPG companies are mitigating quality risk through “brute force” quality management that adds significant operational cost.

A key finding of the study is that while companies are able to avoid significant negative quality impacts relatively well, many suffer from excessive internal costs related to quality challenges. Based on these findings, we believe that CPG companies are mitigating quality risk through “brute force” quality management that adds significant operational cost. Top Performers, however, achieve better quality results at lower cost. How do they do this? The survey shows that they take different approaches to managing quality. Specifically, they are more likely to:

- Take a more integrated approach to quality along geographic, organizational, and product lifecycle dimensions
- Adopt a more digital approach to managing quality, relying less solely on paper and isolated electronic documents
- Enable quality management with more automation and advanced technology, including automated data collection, analytics, and product documentation automation
- Use more integrated solutions to manage quality and pursue a platform approach to quality solutions

Top Performers are able to simultaneously improve quality and maintain cost of quality. Others can learn from them to reduce errors, rework, and adverse events without incurring excess internal cost.



The Quality Imperative

Views of Quality Management vary. Although most agree it's a top priority and corporate responsibility to protect consumer safety and brand value, they also recognize it's a significant cost. This is particularly true for the cost of complying with a vast array of regulatory demands.

Product quality and reliability are the top drivers of product profitability.

The bottom line, and common ground perhaps, is that Quality Management is critical to the financial wellbeing of a company. Tech-Clarity research shows the link between quality and profitability. For example, recent survey results from 7 Ways to Beat Your Competition at NPDI indicate that product quality and reliability are the top drivers of product profitability, ahead of product performance, innovation, time to market, and cost! In addition, Successful Products Begin and End with the Customer reports that 81% of CPG Companies say higher quality is required to drive competitive differentiation. Quality was ranked higher as a competitive factor than the average across industries, and the top differentiator for CPG.

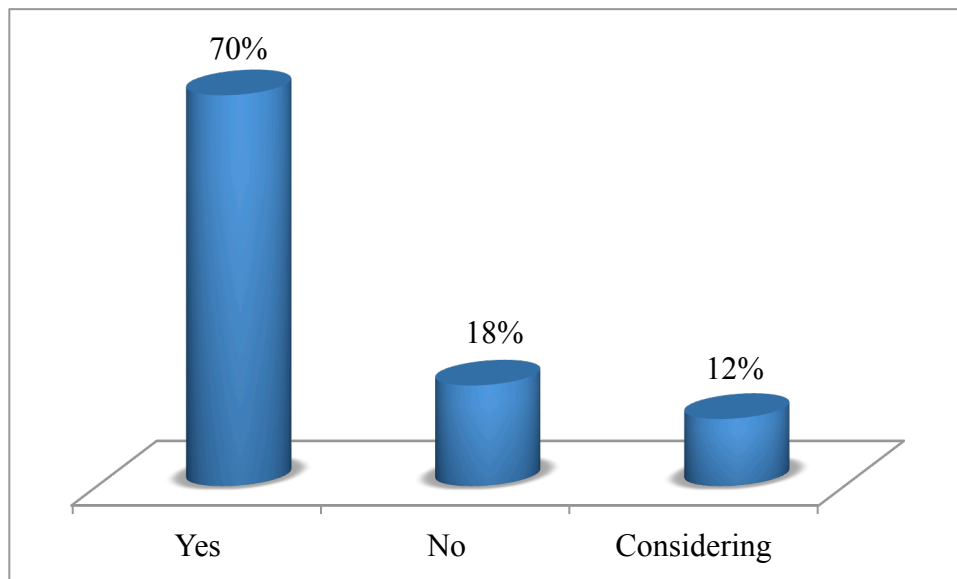


Figure 1: CPG Companies Adopting Formal QMS Similar to Life Sciences Industry

Quality management is clearly an important discipline for any CPG company and they're investing time and money into quality management. In some cases, they're going beyond what they're legally compelled to offer. For example, about two-thirds of CPG companies responding to this survey are adopting formal quality management processes and systems like those used in the pharmaceutical / life sciences industry (Figure 1). For example,



they may be implementing approaches such as those specified by the FDA’s quality management systems mandates.

Formal quality management processes are valuable, but require a significant investment. These initiatives must be managed to ensure investments are efficient and pay off in more than simply “checking the box” for approvals. How can companies deliver high quality without incurring excessive cost? This survey aims to find out.

Managing Quality Carries Enterprise-Level Challenges

Managing quality is complex and brings about many challenges. The top challenge identified by the survey, reported by over 1/3 of participants, is collecting quality data (Figure 2). Companies struggle to gather the data they need because it’s typically spread out across the organization and its information systems. Trusted data is a key ingredient to any quality initiative, because it allows Quality and management personal to track metrics over time for improvement. A trusted pool of quality data also creates a foundation for more advanced analytics to develop quality insights.

The top challenge identified by the survey is collecting quality data.

Capturing, managing, and sharing accurate, timely data is challenging. Data related problems show up repeatedly in our research, including Successful Products Begin and End with the Customer, which finds that CPG companies work on outdated product information 25% of the time.

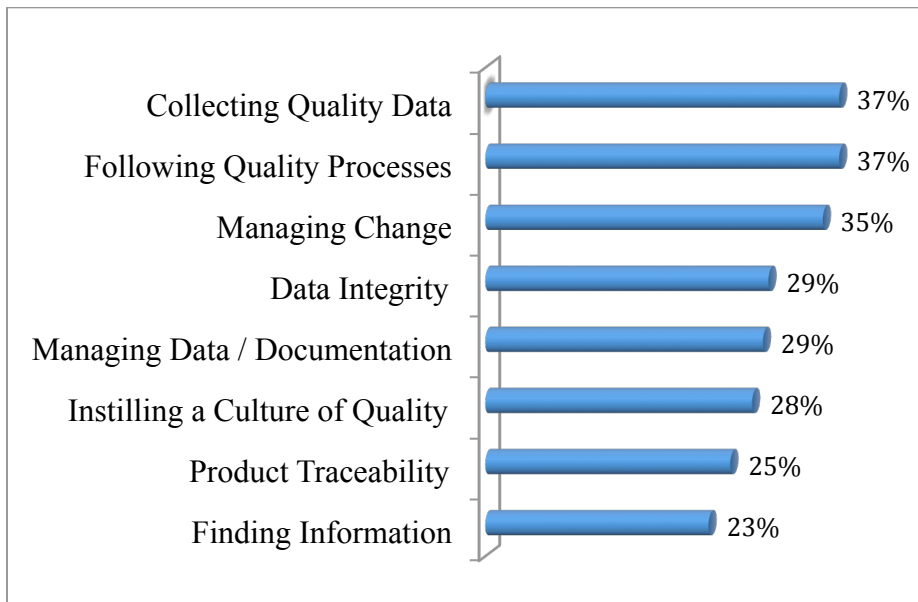


Figure 2: Quality Management Challenges in CPG



Part of the problem is how information is collected from the lab and the plant floor. Manual data collection is slow, leads to errors, and results in non-digital information that can't be effectively leveraged or shared. This results in outdated, inconsistent, and/or missing quality data. In addition, quality data is frequently decentralized and aggregating quality information can be hampered due to different languages, formats, and locations.

Consistently following quality processes a commonly reported challenge.

Other challenges include organizational and informational issues. Consistently following quality processes a commonly reported challenge, reported by over one-third of participants. Consistency of processes is a key way that companies can implement quality improvements because standardization provides the ability to improve over time.

The next, also reported by just over one-third of respondents, is a process issue – managing change. Change management is a challenging process. It's also absolutely crucial to implementing quality improvements, and when done poorly can actually create quality problems because changes are introduced in an uncontrolled manner. These challenges show that Quality Management, like any enterprise-level initiative, requires people, processes, and technology to work together to be efficient and effective.

Quality and Mistakes Avoided with Brute Force

The challenges above are frustrating to organizations, but more importantly lead to significant business impacts. The most frequently reported impact is excess internal cost (Figure 3). Cost of quality is a big concern for companies, and Quality Management can incur significant expense. Cost is, by far, the most common issue.

Companies report a range of impacts due to errors, whether they are caught prior to release and result in rework or if they create quality “leaks” that lead to negative quality events after release such as recalls, observations, or warning letters.

Beyond cost, companies report a range of impacts due to errors, whether they are caught prior to release and result in rework or if they create quality “leaks” that lead to negative quality events after release such as recalls, observations, or warning letters.

Why do companies report excess cost so much more frequently than the next most common impacts? We believe it's because companies spend extraordinary, “brute force” effort and cost to prevent errors. CPG companies often compensate for disconnected approaches to quality and silos of information that leads to inefficiency.

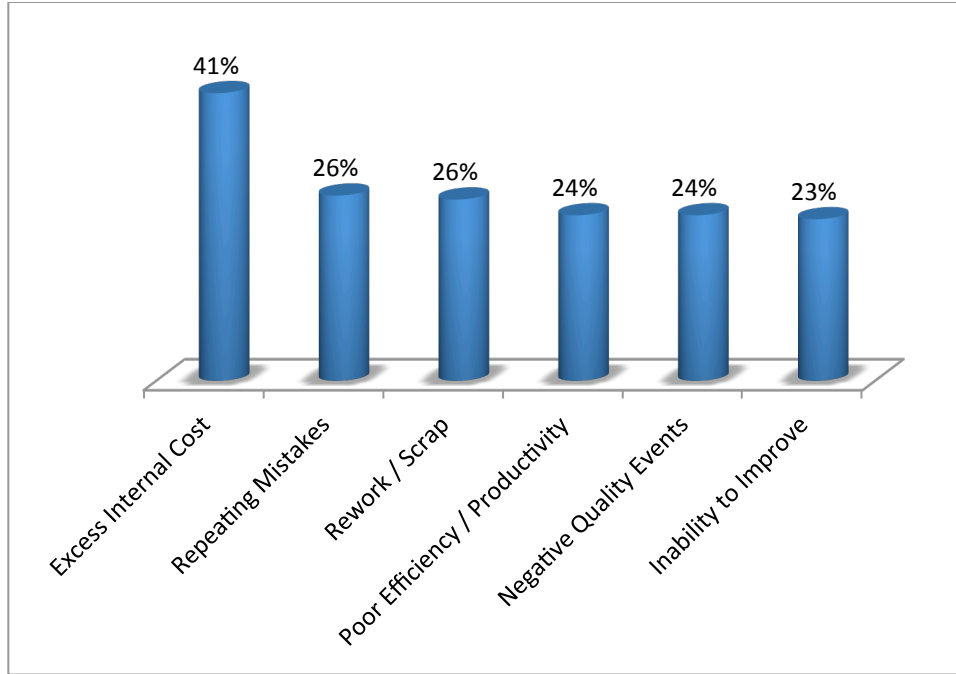


Figure 3: CPG Quality Management Business Impacts

Other impacts reported by survey participants include one of the most frustrating organizational issues, repeating quality mistakes. They also report a related inability to improve, one reason companies suffer from repeat errors. Many companies lack the ability to learn from the past and effectively apply those lessons to the future so they can “close the loop” on quality issues.

All of the issues contribute to the most commonly reported issue – excess cost.

Of course all of the issues contribute to the most commonly reported issue – excess cost. Quality management, although essential, places a significant burden on the business.

What Sets Apart Top Performers in Quality?

Our experience shows that some companies are able to achieve higher levels of quality without putting additional burden on their innovators. For example, examining the compliance aspect of quality in our prior research, including Product Environmental Compliance, we’ve seen that companies using better processes and systems don’t end up spending more to get better results.

We used Performance Banding to identify which companies are performing at a higher level. Then, we analyzed what these companies do differently that may contribute to their enhanced performance, and use this to make recommendations to other companies so

they can improve performance. In order to understand which of the responding CPG companies perform better in quality, we asked companies to self-report on their quality performance as compared to their competitors. We chose to use business-oriented metrics that primarily represent the outcome of quality and the impact on company performance, asking respondents to rank company performance on:

- Product quality / reliability / performance
- Cost of quality (quality processes, inspections, etc.)
- Cost of poor quality (rework, recalls, warranty claims, etc.)

We chose to use business-oriented metrics that primarily represent the outcome of quality and the impact on company performance.

We created an aggregate score across these metrics and separated respondents into Performance Bands. The top 29% of respondents were classified as “Top Performers,” while the rest were labeled as “Others.”

The top 29% of respondents were classified as “Top Performers.”

We also reviewed how effective companies are at important quality-oriented capabilities. This helps us quantify the performance advantage held by Top Performers and further validates the Performance Banding. The analysis shows that Top Performers are much more likely to report their company is “Extremely Effective” at most of the quality-related competencies. Specifically, Top Performers are:

- 58% more likely to be "Extremely Effective" at complying with regulations
- 2.5 times as likely to be "Extremely Effective" at responding to audit / information requests
- 32% more likely to be "Extremely Effective" at data accuracy, traceability, and integrity
- 2.5 times as likely to be "Extremely Effective" at managing quality data and documents
- Almost twice as likely to be "Extremely Effective" at generating quality metrics
- 2.4 times as likely to be "Extremely Effective" at process oversight

These capabilities provide insight into the means by which Top Performers achieve their better business results. The remainder of the report focuses on what these Top Performers do differently from Others to gain deeper insight into how they achieve these higher levels of capability and performance.



Top Performers Take a More Integrated Approach to Quality

The survey analyzed a number of different integration dimensions related to quality and found a consistent theme that Top Performers take a broader, more connected approach to Quality Management (Figure 4). Note that the order we chose to chart these is in order of what’s most *different* between Top Performers and Others, not what was most *common* for either. These are the most differentiating choices between performance bands, and can provide insight into what drives higher performance.

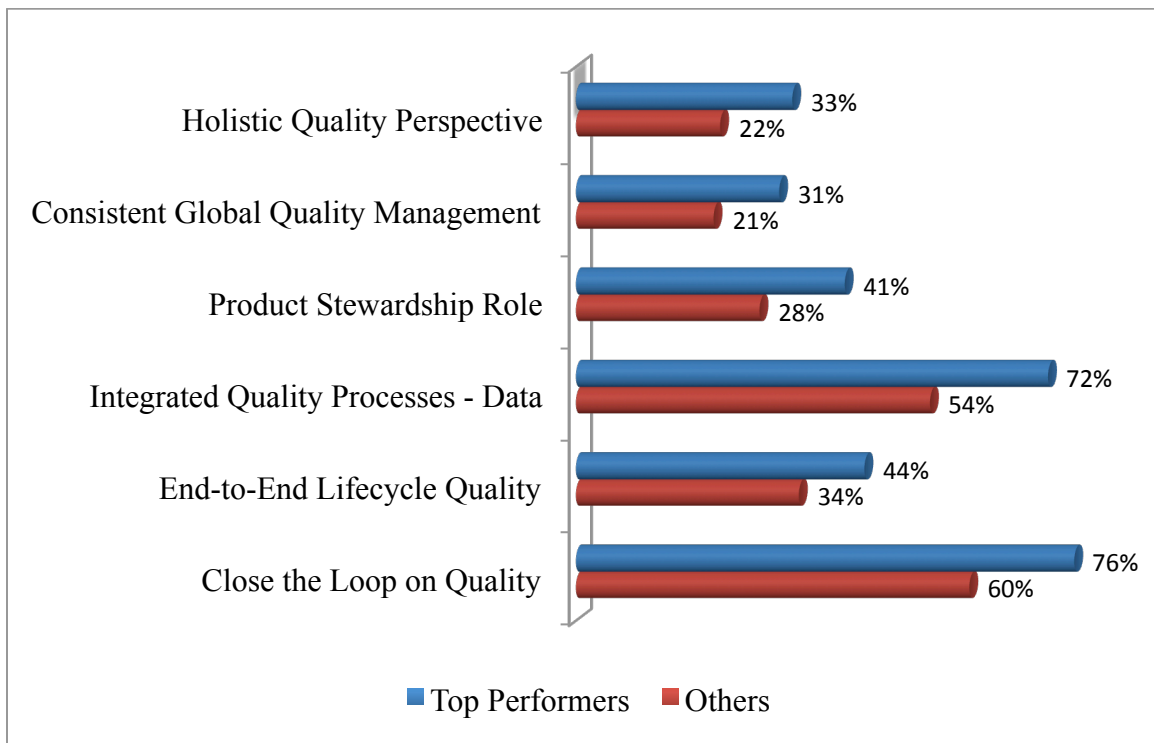


Figure 4: CPG Quality Practices by Performance

Results show that Top Performers are more integrated around quality from strategic, organizational, and process perspectives. Managing quality is inherently cross-functional and requires participation and coordination across many different departments.

Top Performers are more likely to manage quality across the product lifecycle in an integrated, end-to-end manner (end-to-end lifecycle quality).

For example, the most differentiating thing we found is that Top Performers take a holistic quality perspective. Top Performers are 50% more likely than Others to view product quality, process improvement, regulatory compliance, product safety, and sustainability as “one, integrated topic.” Top Performers are also 50% more likely to



manage quality consistently on a global basis and about one-third more likely to manage quality across the product lifecycle in an integrated, end-to-end manner (end-to-end lifecycle quality).

Top Performers are more organizationally integrated.

Top Performers are also more organizationally integrated. While only about one-third of companies have a central person responsible across quality disciplines, such as a product steward, Top Performers are 44% more likely to have a person in that role. In the next section, we'll also see that they are more likely to integrate with other departmental functions (see next section).

Top Performers are also more likely to be able to feed quality issues back into design / R&D for long-term resolution and improvement, with about two-thirds of these higher performance companies able to "close the loop" on Quality. In fact, Top Performers are 26% more likely to be able to close the loop, and 34% more likely to be able to do it efficiently, while Others are more likely to find it "cumbersome."

The integration employed by the higher performing companies also extends to their systems.

The integration employed by the higher performing companies also extends to their systems. Top Performers are about one-third more likely than Others to integrate quality processes like CAPA with product data (Recipes, Formulas, Bills of Material, Change Orders, etc.). We'll also see later in this report that the holistic, integrated approach is also evident in how integrated quality systems are across the enterprise.

Top Performers Extend Data and Processes to More Functions

Consistent with more integrated approaches, Top Performers integrate Quality Management data and processes with more functions within the business (Figure 5). At the highest level, Top Performers integrate to more organizational functions— an average of 3.7 functions of those investigated as compared to 2.9 for Others.

Top Performers are more likely to extend quality data across the enterprise.

The analysis also turned up some interesting functional areas that are more integrated with quality. Top Performers are much more likely to integrate process / production engineering (68% more) with quality data and processes. They were also more likely to integrate processes and data with materials and packaging (about 50% more likely for each), and others including requirements, production, and the lab. The takeaway from this



is that Top Performers are more likely to extend quality data across the enterprise, treating Quality Management like the enterprise initiative it needs to be.

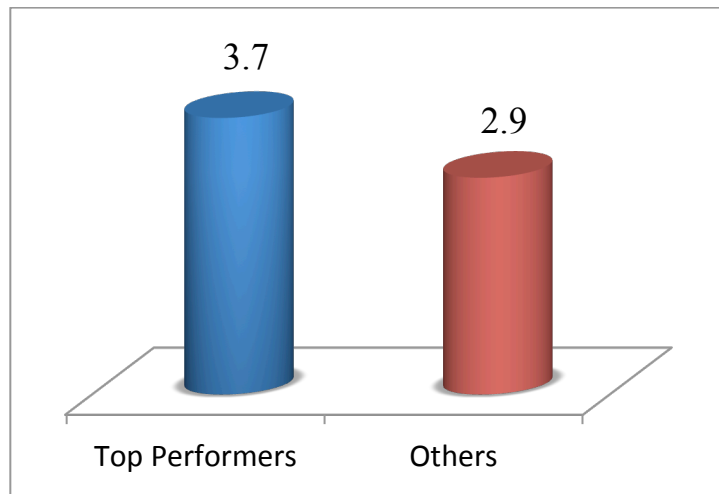


Figure 5: Number of Functions Integrated with Quality Processes and Data

Top Performers Use More Automation, Advanced Technology

Analysts also reviewed the technology that companies use to support Quality Management (Figure 6) and discovered some interesting differences. The most differentiating statistic was that Top Performers are 21% more likely to be able to easily use analytics to improve quality. Others that use analytics are more likely to find it difficult and cumbersome.

Top Performers are more likely to have fully automated data collection for quality.

Other areas displaying significant differences in technology use relate to automation. The majority of companies across performance bands have partially automated collecting data. Top Performers, however, are 26% more likely to have fully automated data collection for quality. They are also 44% more likely to automate creation of product documentation / dossiers.

Tools like analytics and automating product documentation rely on a foundation of integrated data.

These findings represent differences in some of the individual tools they use. We'll see that there's more to the story. Tools like analytics and automating product documentation also rely on a foundation of integrated data, which we'll discuss later in the report.

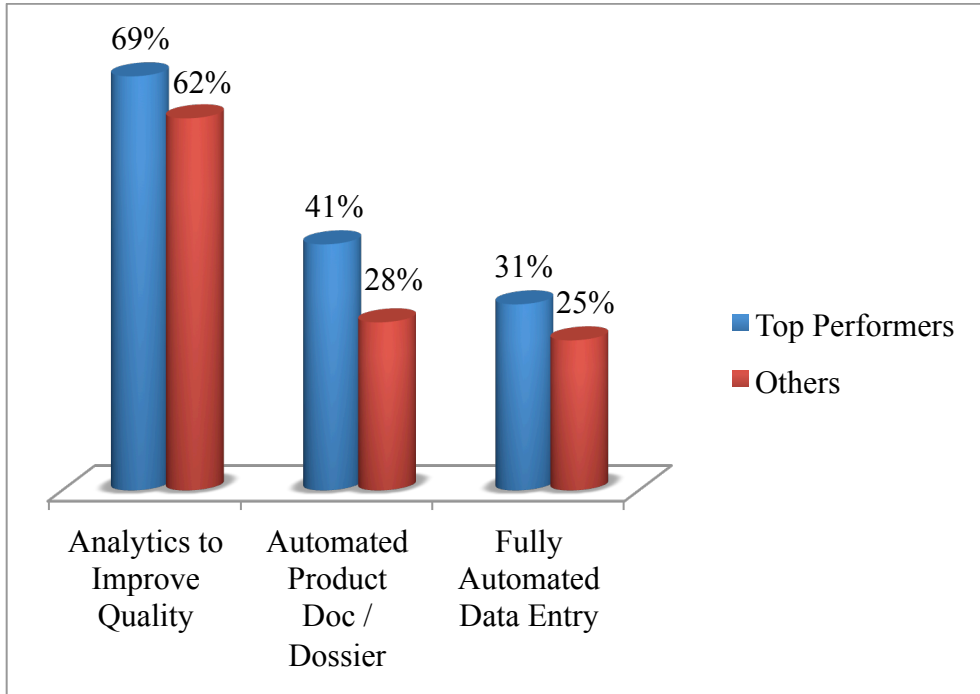


Figure 6: CPG Quality Management Enablers by Performance

Perhaps the most important findings were not the individual technologies used, but that Top Performers use *more integrated* technology, automate more, and extend it to more functions. It’s also interesting to analyze what they used *less* of. Top Performers are less likely to rely on text documents, spreadsheets, and standalone workflow as a primary quality system. This shows that Top Performers are more likely to use enterprise-class technologies to manage quality.

Top Performers use more integrated technology, automate more, and extend it to more functions.

Top Performers Enable Quality Digitally

The technology enablers used by Top Performing CPG companies are not just individual tools. The CPG industry is making the transition to the digital enterprise, although many still use paper-based processes or computer-based processes that are based on document-centric approaches developed for paper, sometimes called “paper on glass”. As reported earlier, however, Top Performers use less of these ad-hoc tools.

The CPG industry is making the transition to the digital enterprise.

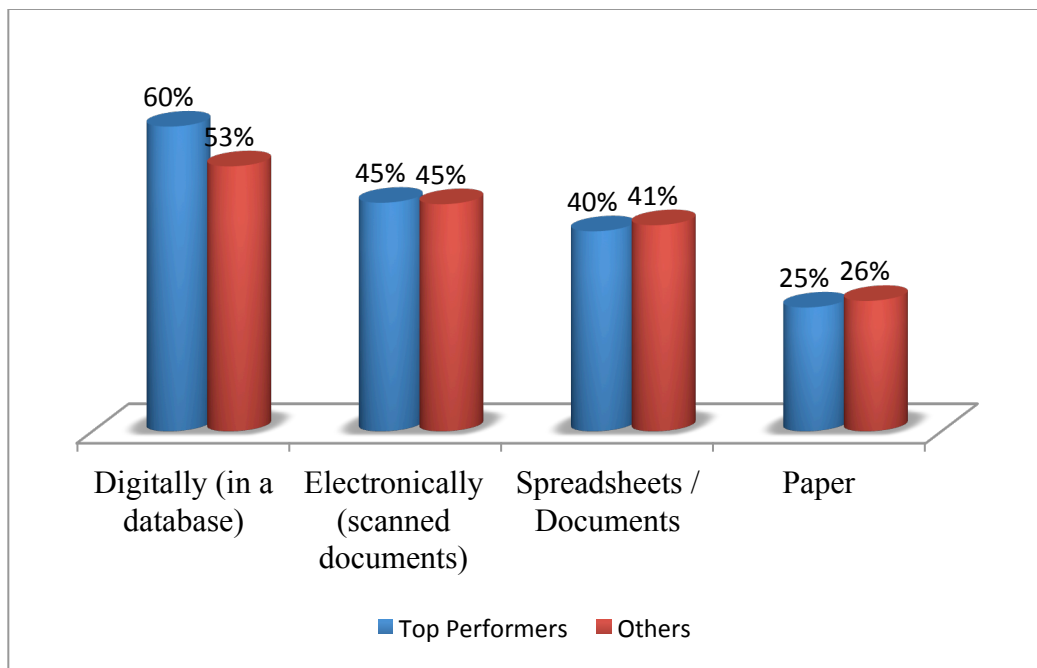


Figure 7: CPG Quality Management Approach by Performance Class

When asked about their primary approach to managing quality, just over one-half of companies say they manage quality digitally (Figure 7). But it appears that's not the *only* way they manage it. They're not managing quality *fully* digitally. Instead, almost one-half use scanned documents and 40% use spreadsheets. These tools are suboptimal because they are prone to errors, frequently end up with conflicting versions, and they're hard to share and collaborate on effectively.

Top Performers are 15% more likely to manage quality digitally (in a database).

Beyond that, a significant number (25%) still use paper either alone or in combination with other methods. Top Performers are about as likely to use paper or electronic methods, but set themselves apart because they are 15% more likely to manage quality digitally (in a database).

Top Performers Enable Quality with a Platform Approach

Following the theme of integration and enterprise-class tools, the research looked at how integrated quality systems are across the enterprise (Figure 8). Consistent with other findings, the leaders have more integrated practices. Top Performers are 69% more likely to have a single platform for quality with common data integrated across the enterprise. At this time, only about one-quarter of Top Performers take a single platform approach, but another one-quarter have a single system. We believe that the platform approach will



grow in popularity and provide further performance advantages in the future as companies recognize the value of integration.

Top Performers are 69% more likely to have a single platform for quality with common data integrated across the enterprise.

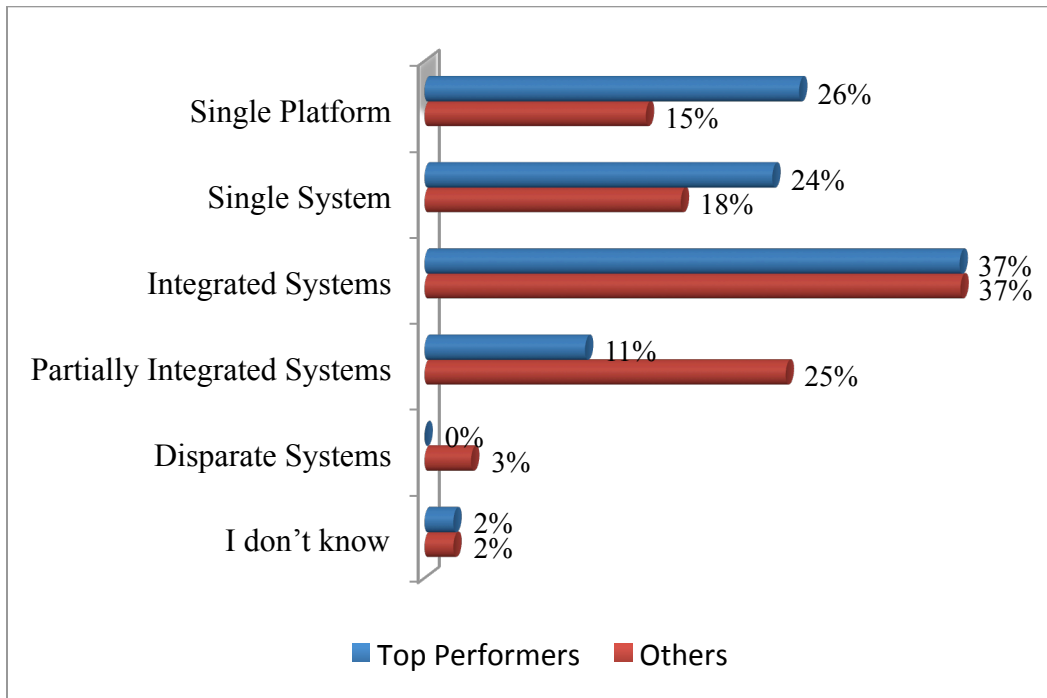


Figure 8: CPG Quality Management Systems Integration by Performance Class

A common platform provides consistent data across functional areas and enables more integrated approaches. As data from [How Top Performers Implement, Operate, and Maintain PLM Integration](#) report finds, integration prevents duplication of data, the need to reenter data, the need to look across systems, and data inconsistencies across systems. PLM often forms the core of this integrated quality platform and is another important technology leveraged by Top Performers. As the [PLM Beyond Managing CAD](#) research reports, Top Performers are 2.7 times as likely to manage quality in PLM. The clear message is that Top Performers leverage integrated, enterprise-class solutions.

Top Performers leverage integrated, enterprise-class solutions.

The word cloud below (Figure 9) represents the value companies report from a platform approach to Quality Management, derived from responses to an open-ended question. The most commonly reported benefit of a platform approach is “efficiency,” showing that



CPG companies can leverage more integrated systems to move away from “brute force” and reduce the internal cost of managing quality.



Figure 9: Benefits of a Platform Approach to Quality Management in CPG

Conclusion

Quality Management is crucial for CPG companies, but they face significant challenges. Although CPG companies report they are relatively effective at preventing significant issues, they face excess Quality Management related costs.

Top Performers, on the other hand, are able to achieve better quality results from both quality and cost perspectives. They appear to have broken out of the paradigm of “better quality or lower cost, choose one.” They do this by taking a more holistic approach to quality, using more advanced tools like analytics, and leveraging more automation.

Top Performers take a much more holistic, integrated approach to organization, processes, and systems.

Beyond the individual tools they use to manage quality, Top Performers take a much more integrated approach to organization, processes, and systems. They are more likely to have integrated data and processes, integrated systems, and pursue a platform approach for Quality Management. Our conclusion is that an integrated, digital approach to Quality Management in the CPG industry drives better business results from both quality and cost perspectives.

An integrated, digital approach to Quality Management in the CPG industry drives better business results from both quality and cost perspectives



Recommendations

Based on industry experience and research for this report, Tech-Clarity offers the following recommendations:

- Take a holistic view and approach to quality
- Move away from brute force Quality Management practices
- Adopt automation for more current, trusted data
- Adopt advanced tools like analytics to improve quality
- Move to a digital approach
- Integrate quality systems
- Leverage a platform of solutions to enable more holistic, integrated quality to improve quality without increasing cost, or reduce cost and maintain quality

About the Author

Jim Brown is the President of Tech-Clarity, an independent research and consulting firm that specializes in analyzing the business value of software technology and services. Jim has over 25 years of experience in software for the manufacturing industries. He has a broad background including roles in industry, management consulting, the software industry, and research. His experience spans enterprise applications including PLM, ERP, quality management (QMS), service lifecycle management, manufacturing, supply chain management, and more. Jim is passionate about improving product innovation, product development, and engineering performance through digitalization and the use of software technology.

Jim is an experienced researcher, author, and public speaker and enjoys the opportunity to speak at conferences or anywhere he can engage with people with a passion to improve business performance through digitalization and software technology.

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About the Research

Tech-Clarity gathered and analyzed over 175 responses to a web-based survey on Quality Management. Survey responses were gathered by direct e-mail, social media, and online postings by Tech-Clarity and Dassault Systemes.

The responding companies were a good representation of the CPG industry, including Food (39%), Water (20%), Non-alcoholic Beverages (19%), Materials / Ingredients (18%), Alcohol / Alcoholic Beverages (17%), Cleaning Products (17%), Nutrition / Nutraceuticals (15%), Specialty Chemicals (14%), Beauty / Personal Care (13%), Flavors / Fragrances (13%), Paper Products (12%), Paints / Pigments / Inks / Coatings (11%), Over the Counter Drugs (8%), Footwear / Apparel (7%), Tobacco Products (7%), and Others (2%). Note that these numbers add up to greater than 100% because some companies indicated that they are active in more than one industry.

The respondents represented a mix of company sizes, including 7% greater than \$5 billion (US Dollars or equivalent), 13% between \$1 - \$5 billion, about a quarter (24%) between \$250 million to \$1 billion, 17% between \$100 and \$250 million, and about one-third (34%) below \$100 million. The rest did not know or chose not to share (5%).

The respondents reported doing business globally, with about two-thirds doing business in Western Europe (65%), one-half of companies doing business in the North America (50%), about one-third doing business in the Eastern Europe, and others from the Asia-Pacific regions (13%) and Latin America (12%). Note that these numbers add up to greater than 100% because many companies indicated that they are active in more than one geography.

The respondents were comprised of one-half (49%) who were manager level and 20% director level. Another 16% were Vice-President level and 13% were in executive, "C-level" roles. There was very little representation from individual contributors.

The responding companies performed a variety of functions in the CPG industry, including Production (60%), Marketing (42%), R&D (28%), Distributor (28%), Retailer (25%), Testing (22%), and Other (2%). Again, these numbers add up to greater than 100% because many companies indicated that they perform multiple roles in the industry, as expected.

About the Sponsor

This paper is sponsored by Dassault Systèmes BIOVIA, www.3DS.com/BIOVIA