



> Cost of Quality:
The Hidden Truth
About Your Ultimate
Quality Metric

EASE



Executive Summary

In industries from aerospace to medical devices to consumer packaged goods, companies can't afford to let defective products reach customers. The average cost of a significant recall is \$12 million, with large events costing far more.

While only a small percentage of recalls are typically related to production issues, scrap, rework and warranty related costs can total into the millions (or tens of millions) for an individual manufacturer with reputational risk being unquantifiable.

Customers today expect products with zero defects and 100% on-time performance, yet faster rates of production development cycles and more varied product mixes introduce opportunities for errors—and rising risks around cost of quality.

Cost of quality typically totals 15 to 40% of an organization's revenue, according to the American Society for Quality (ASQ). Even on the low end, that number that can easily erase a company's profit margin.

Many companies use operational metrics to manage risk and reduce the cost of defects, but they often fall short due to two critical errors:

1 Misunderstanding the difference between cost of poor quality (CoPQ) versus prevention and early detection

2 Investing in quality indiscriminately, even though investment in prevention and early detection delivers ROI by exponentially reducing future quality costs.

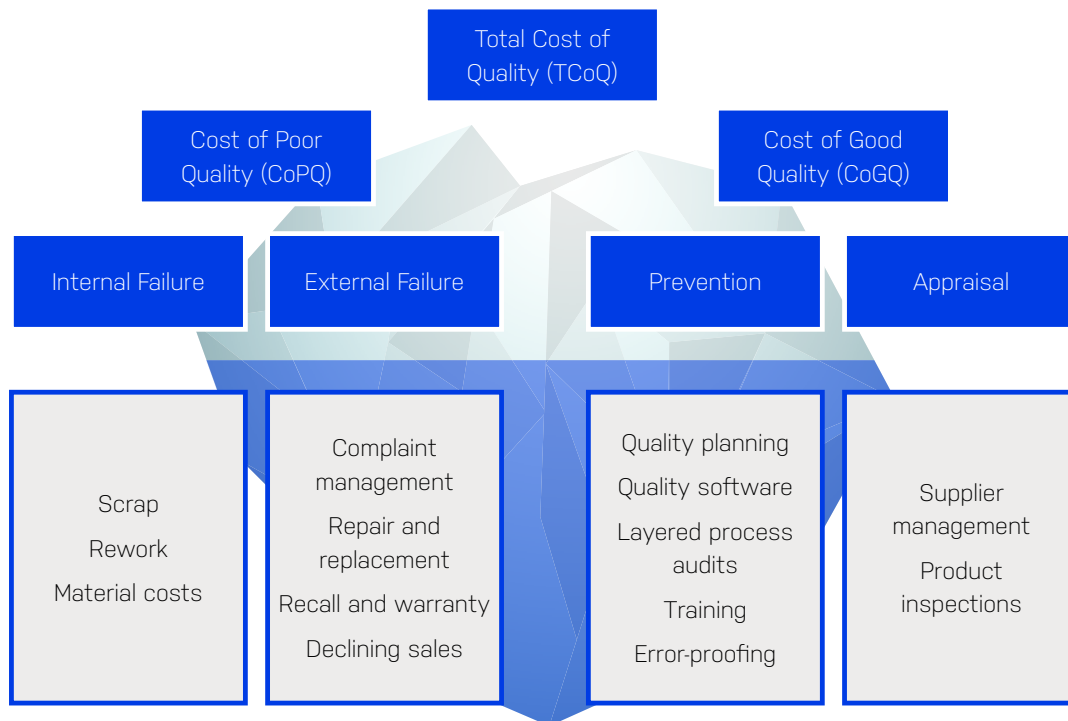
In this eBook, we look at common misconceptions around quality costs and how manufacturers can use the 1-10-100 rule to push down cost of quality. We also look at how layered process audits leverage the power of prevention and early detection to reduce costs—and how digital transformation is helping manufacturers defy traditional cost of quality trends.

Just 17% of companies understand their total cost of quality (TCoQ)

What Manufacturers Get Wrong About CoPQ

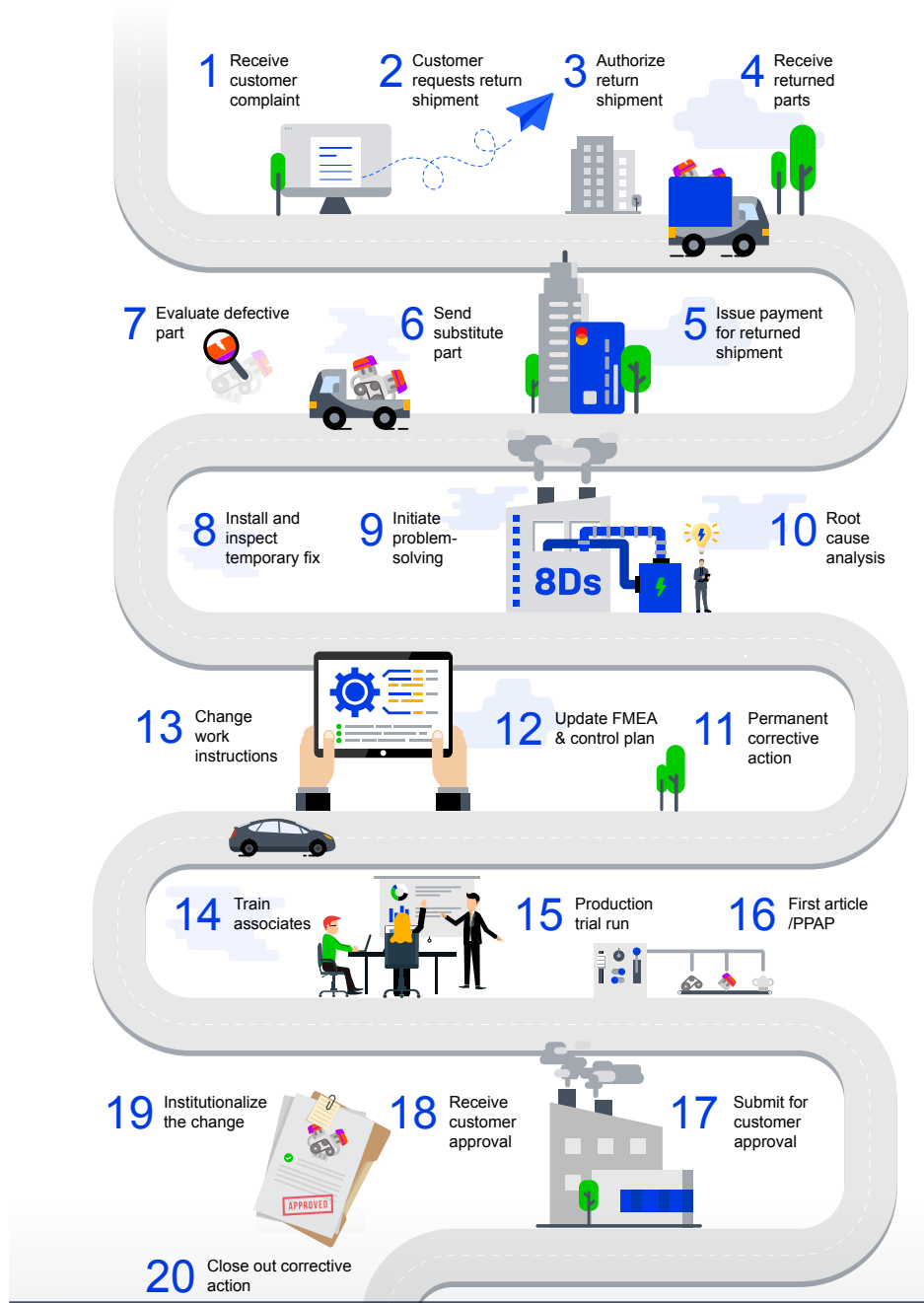
According to LNS Research, just 17% of companies understand their total cost of quality (TCoQ), widely considered the ultimate quality metric.

When calculating CoPQ, organizations often focus on obvious metrics like scrap, rework and returns. What they fail to realize is the full scope of the hidden costs, leading to underestimation of how failures impact the organization—and underinvestment in early detection and prevention.



The diagram above is helpful for understanding the different types of quality costs, but it doesn't show their relative proportion. The truth is that quality failures have far-reaching impacts on efficiency and productivity, considering the succession of events that takes place after a defective product leaks to the customer such as sorting, containment, complaints handling, parts replacement, repairs and more.

Succession of Events Following a Quality Escape



There's no question that it's far cheaper to detect issues early or avoid making bad products in the first place—a central tenet of management approaches like Lean and Six Sigma.

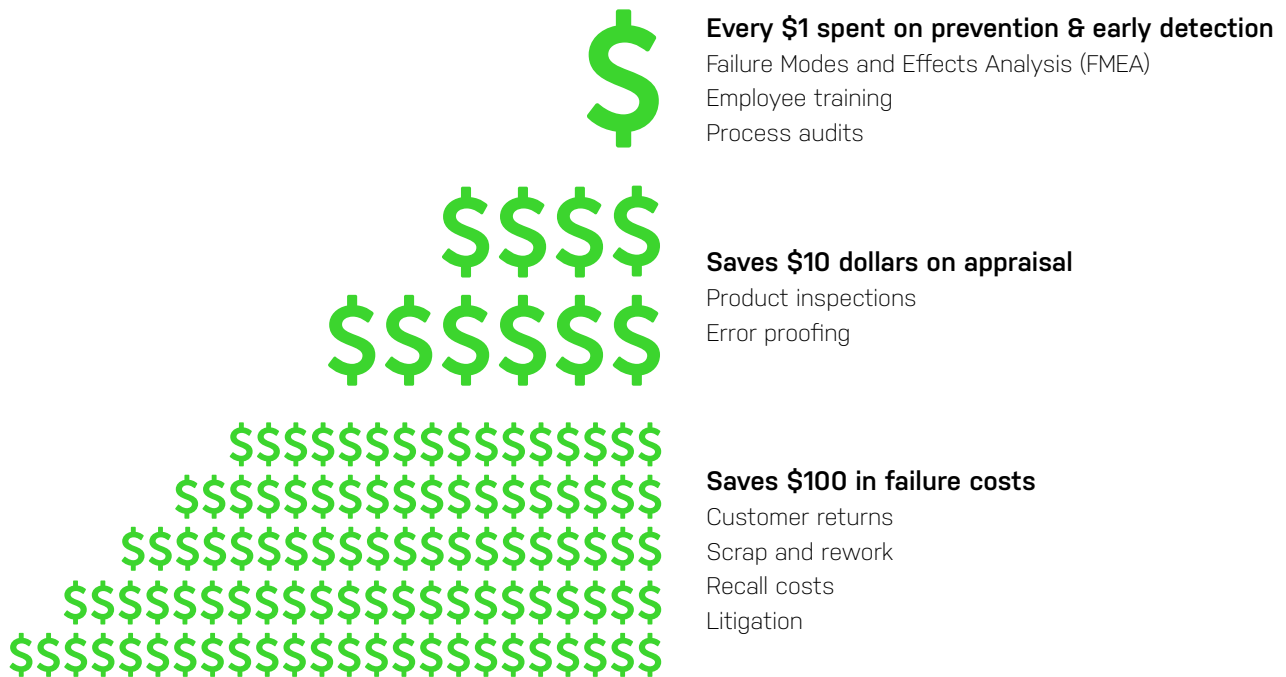
Leveraging Prevention and Early Detection to Reduce CoPQ

The 1-10-100 Rule

The cost of resolving non-conformances increases exponentially as products move from planning to manufacturing to distribution.

The Total Quality Management approach describes this relationship with the 1-10-100 Rule, which says that every \$1 spent on prevention and early detection saves \$10 dollars on appraisal and \$100 in failure costs.

The lesson: Prevention and early detection is affordable and the most effective investment in quality an organization can make.



Proactive Investments in Prevention Deliver Large ROI

When companies compare prevention costs to CoPQ, they typically find modest investments in prevention can deliver surprisingly large reductions in CoPQ. One example is implementing a layered process audit (LPA) system, which focuses investment in production defect prevention to leverage larger savings.

Using Layered Process Audits to Prevent Defects and Reduce Quality Costs

Layered process audits (LPAs) are quick, high-frequency checks to reduce variation from work standards, a top cause of production defects. LPAs promote a culture of quality by engaging all levels of the organization in short process audits that anyone can complete.

Long used in automotive and aerospace, LPAs have spread to multiple industries where quality is mission-critical, including medical devices, electronics and consumer packaged goods.

LPA programs help control processes to minimize defects at their source, allowing organizations to:

Reduce defects, scrap and complaints

Minimize external audit findings

Improve customer satisfaction ratings

LPA Automation Accelerates Quality Improvement

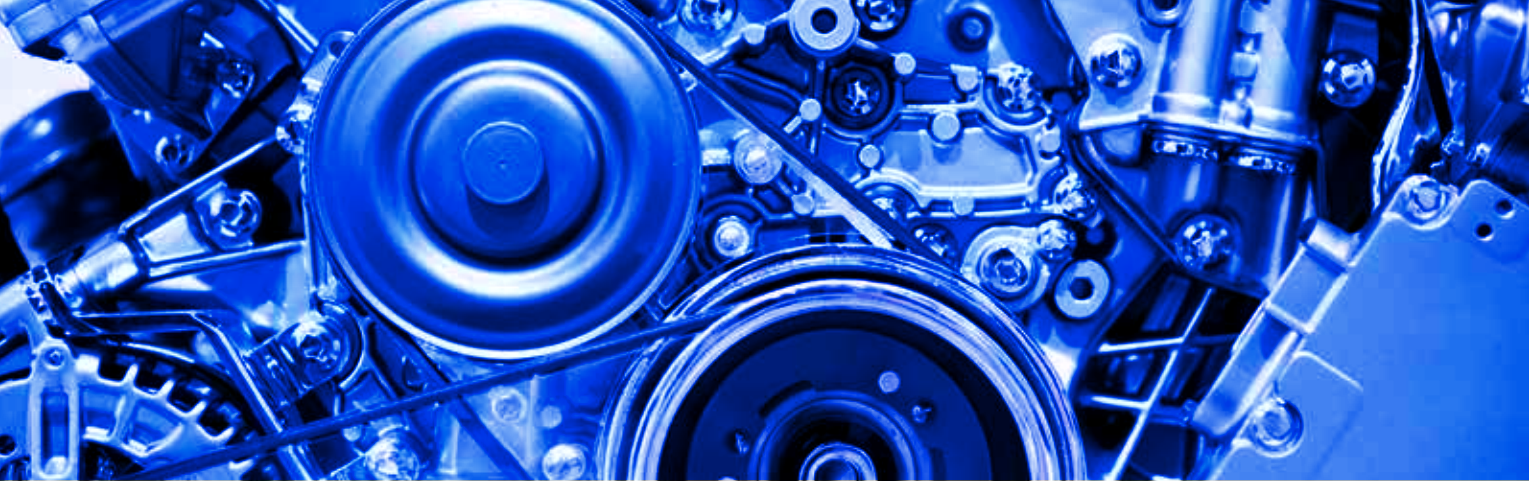
While LPAs can help detect and prevent quality problems early, the difficulty of managing audits with paper checklists and spreadsheets can get in the way of results. An automated LPA platform such as EASE eliminates this administrative burden while providing insights that drive real audit value, including:

- Real-time reporting for more effective decision-making
- Question rotation and randomization to improve audit quality
- Automated scheduling and notifications to increase audit completion rates
- Mobile app to simplify audits and engage team members
- Mitigations and issue tracking to reduce the corrective action backlog



Automation solves the main challenges of this highly effective quality strategy, helping prevent quality escapes and their associated downstream costs.

The opportunity cost of this type of investment in prevention and early detection is also important to consider. In the example above, not implementing an LPA system could mean higher quality costs and an increased risk of losing customers—which leads to fewer dollars for other strategic initiatives. Without effective corrective action processes, it would also take longer to address failures whose costs are continually increasing over time.



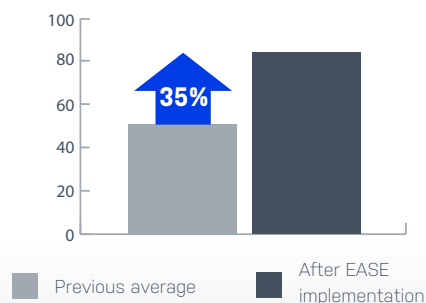
LPA Automation Success Story: Fortune 500 Automotive Manufacturer

A leading automotive supplier used the EASE platform to replace its paper-based LPA process. A successful pilot led to a rollout across more than 12 North American and 20 European sites, helping one plant achieve:

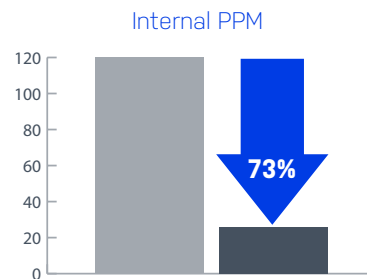
- 73% lower internal PPM
- 94% reduction in corrective action requests >45 days overdue
- Audit completion rates of 85% or higher at all plants
- Reduced scrap costs

"Customer ratings are as high as I've ever seen them. The software more than pays for itself."
—Head of Quality for North America

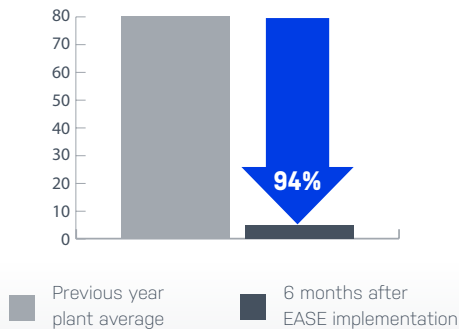
Division-Wide Improvement in Audit Completion Rate



Reduction in PPM and ISCARs past due >45 days



Corrective action requests past due over 45 days



Digital Transformation: Unlocking a Competitive Advantage in Cost of Quality

Data from LNS Research on nearly 1200 manufacturers highlights the clear connection between higher levels of quality maturity and lower cost of quality.



What was most interesting to LNS is that early adopters of Quality 4.0 don't see the uptick in Cost of Good Quality (CoGQ) shown in the overall data, which mirrors the traditional cost curve. Instead, they use technology, specifically analytics, to continuously reduce CoGQ and CoPQ—essentially defying the curve.

The Key Mindset Shift

Underestimation of quality costs often leads to underinvestment in prevention and early detection. To reduce cost of quality, manufacturers must first acknowledge the full impact of quality failures. They must also recognize that in manufacturing, the old saying holds true: an ounce of prevention is worth a pound of cure.

Meeting today's growing customer expectations requires a higher level of reliability, with systems in place to proactively prevent rather than just react to defects. Automated LPA platforms like EASE help manufacturers achieve this vision, minimizing variation to reduce costs while fostering a culture of quality.



About EASE

EASE is the innovative mobile platform that helps manufacturers simplify how they administer, conduct and respond to plant floor audits. With best-in-class support for layered process audits, safety, 5S and more – EASE drastically reduces labor costs and delivers insights that ensure audit programs drive real business value.

Leading automotive, aerospace and manufacturing organizations around the globe depend on EASE's enterprise scale, expertise and customer-centricity. EASE is a privately held company based in Mission Viejo, California.

EASE – Insights that Drive Performance™

To learn more, please visit ease.io