2025 Pulse of Quality in Manufacturing

How manufacturers are navigating labor shortages, AI adoption and quality challenges

Introduction
About this report

In early 2025, ETQ conducted its second annual **Pulse of Quality in Manufacturing survey**, gathering insights from more than 750 senior quality, safety, operations and compliance professionals across the U.S., U.K. and Germany. These respondents oversee quality, compliance, digital transformation, regulatory affairs and supply chain management across industries such as electronics and appliances, heavy manufacturing, medical devices, pharmaceuticals and life sciences, automotive, general manufacturing and food and beverage.

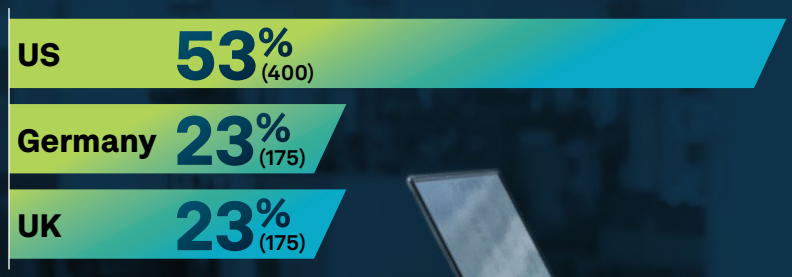
This report provides an in-depth analysis of the challenges manufacturers face — labor shortages and the workforce skills gap, product recalls and safety issues — alongside trends such as AI adoption and increased investment in quality tools, technologies and people.

A survey conducted by Censuswide on behalf of ETQ polled:

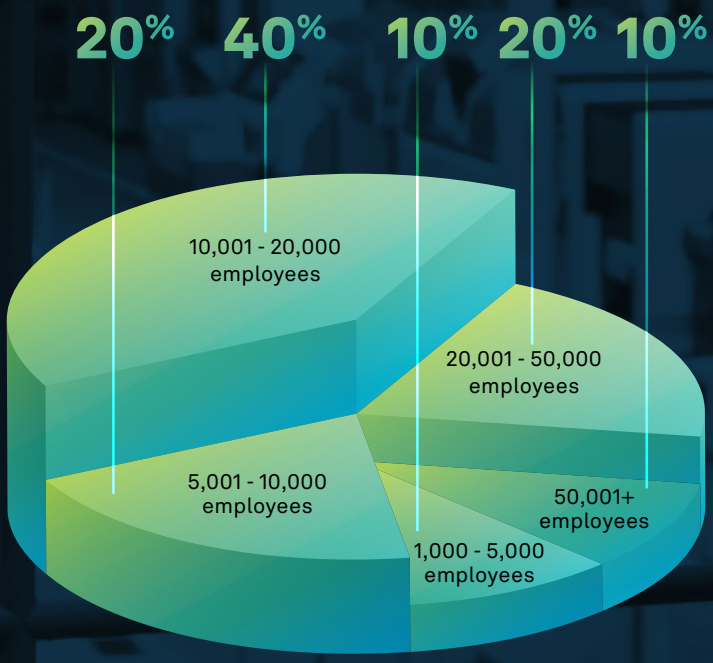
Respondents

750

Senior-level quality professionals & enterprise manufacturing firms



In terms of the size of the company surveyed, the sample distribution was:



Executive summary

The manufacturing industry is undergoing a significant shift, with quality playing an increasingly strategic role. Key insights from the **2025 Pulse of Quality in Manufacturing survey** include:

- **Labor shortages continue to impact quality**, affecting production efficiency and product integrity.
- **Product recalls are rising** despite manufacturers' efforts to improve quality management.
- **AI adoption is accelerating** as manufacturers seek automation to enhance efficiency and accuracy.
- **Investment in quality is expected to rise** as quality becomes a more important business driver.
- **Safety concerns remain prevalent**, highlighting the need for stronger compliance measures and technology-driven solutions.

This report provides actionable insights into how manufacturers can leverage technology, workforce strategies and data-driven approaches to enhance quality management in 2025 and beyond.

Key takeaways from the 2025 pulse of quality in manufacturing survey

The labor shortage continues to impact quality

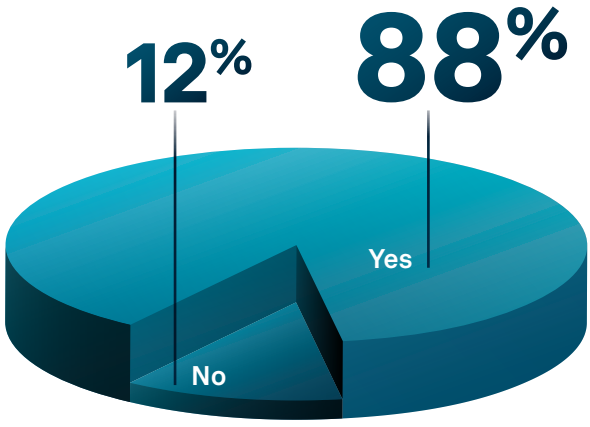
With the current global economic uncertainty sure to impact supply chains, labor force dynamics and a sudden need to more deeply consider where companies establish their manufacturing locations, companies are faced with new challenges in today's environment. As a result, the workforce shortage and skills gap, which are widespread issues in the manufacturing industry now, are set to become even more problematic in the future.

Survey insights

Seventy percent of manufacturers report that labor shortages are affecting their companies, and 88% say the shortage has negatively impacted product quality.

This highlights the urgent need for businesses to explore solutions to address the workforce shortage and skills gap to mitigate its effects.

Does this workforce shortage and skills gap have an impact on product or service quality?



The financial and reputational cost of recalls

What's driving the manufacturing labor shortage?

A variety of factors are driving the workforce shortage and skills gap. The **aging workforce** and skills shortages have created a gap in experienced talent, making it difficult for businesses to find skilled workers.

Meanwhile, rapid advances in technology have outpaced the supply of workers with the required skills to perform tasks. Similarly, a younger, digitally native workforce that has grown up with easy access to portable devices and screens of all sorts, is less likely to enter an industry that may be seen as less than cutting edge, technology-wise. This has put more pressure on businesses to offer more extensive training and development programs to employees.

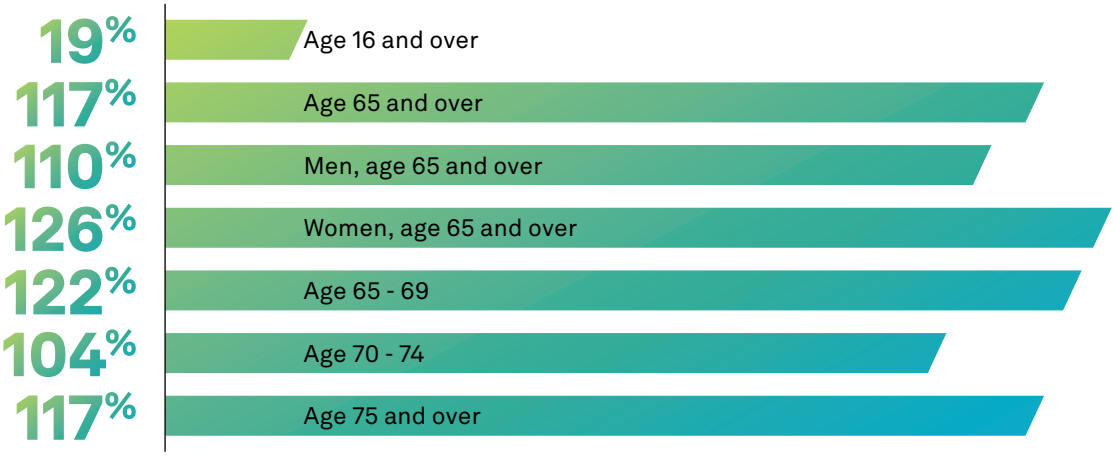
Increasingly, businesses are relying on connected worker technologies to help fill workforce gaps and scale operations without requiring a significant increase in staff. Strong connections between workers, processes and quality systems drive operational excellence. When frontline teams have seamless access to quality data and workflows, they can make real-time informed decisions. This reduces errors and accelerates continuous improvement, helping them maintain quality standards across the organization.

This also frees up human workers to focus on other important tasks that rely on skills that are more difficult to automate, such as creativity and strategic thinking.

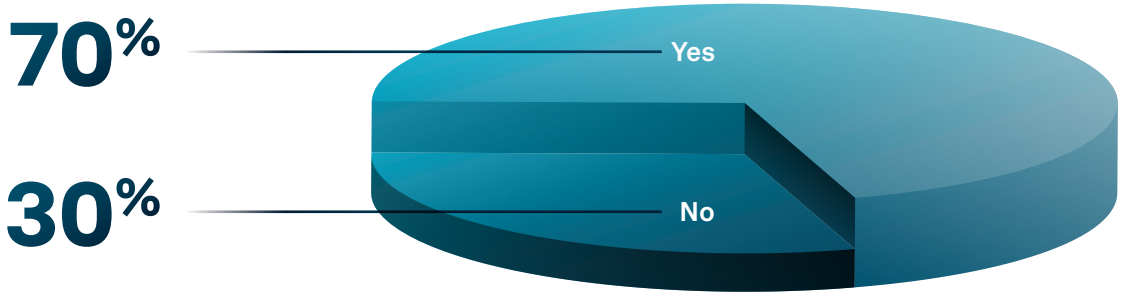
Businesses can streamline workflows and automate repetitive tasks using digital tools. Flexible online platforms foster collaboration, improving communication and decision-making across teams.

Companies investing in digitizing worker experiences often see enhanced quality outcomes due to higher employee engagement, increased productivity and greater job satisfaction overall.

The percentage of older workers employed has grown



Is your firm impacted by the current workforce skill shortage/skills gap?



Product recalls are increasing despite quality efforts

Despite manufacturers' ongoing efforts to improve quality control, product recalls have been on the rise, raising concerns and costs among manufacturers, businesses and customers.

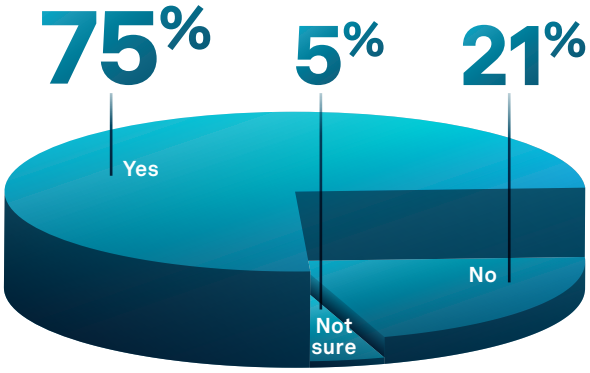
Survey insights

Product recalls are still steadily climbing. Seventy-five percent of manufacturers have experienced a product recall in the past five years, according to the **ETQ 2025 Pulse of Quality in Manufacturing survey**, a slight increase from 73% in 2024.

The cost of these recalls is significant, with 48% of manufacturers reporting that rectifying recalls costs between $10M and $49.99M. Supply chain performance appears to play an important role in these issues, with 47% of manufacturers attributing these recalls to supply chain issues.

This highlights the critical need for stronger supply chain oversight and more stringent quality management measures to help businesses catch potential issues as early as possible before they escalate into recalls that hurt the bottom line and imperil brand reputation.

Did your organization experience a product recall in the last 5 years?



48% of manufacturers reporting that rectifying recalls costs between **$10M** and **$49.99M**

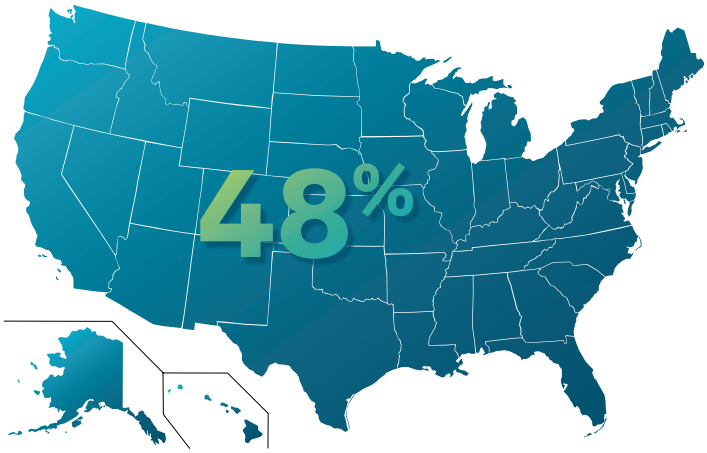
Thinking of your most recent recalls, how much can you attribute to supplier issues vs. internal actions?

The direct financial impact of these recalls is just the tip of the iceberg: they can also have significant long-term reputational costs for manufacturers. Product recalls can erode customer trust, reducing long-term profitability and brand value. They can also increase operational costs, create legal liabilities and potentially damage relationships with suppliers and distributors.

As a result, businesses are under increasing pressure to strengthen their quality control processes to reduce the risk of recalls. One key way to do this is to implement a robust Quality Management System (QMS) within the business, as companies with a QMS report fewer recall incidents.

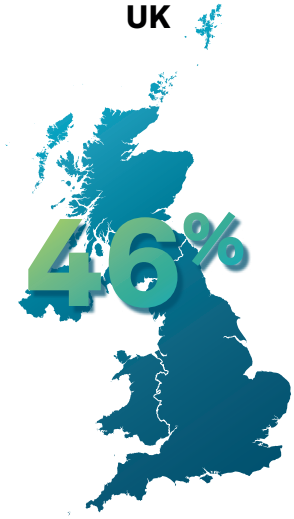
What was the cost to rectify the most recent product recall?

US



$ 10 - 49.99 M
(USD)

UK



£ 4 - 7.99 M
(GBP)

Germany

€ 10 - 49.99 M
(EUR)

What has been the biggest impact of poor quality to your organization?

Proactive quality management strategies can help minimize recall risks. Some examples of proactive control strategies that can be enhanced by QMS implementation include:

Document control

Document control ensures that documents are accessible, compliant and up to date. A robust document control process is important in manufacturing, where precision and consistency are critical.

A QMS ensures a standardized process for creating, reviewing and archiving documents. This reduces the risk of errors by ensuring that everyone follows the same guidelines and preventing the use of outdated documentation. It also allows business leaders to define who can access or approve documents, which improves confidentiality and control across the organization. In addition, as processes are updated, the QMS can ensure compliance, tracking that the appropriate employees are trained on the new process.

Supplier management

A robust supplier management process ensures that an organization consistently receives high-quality products and services from its suppliers.

A QMS typically sets out criteria for evaluating and selecting appropriate suppliers and establishes regular monitoring and assessment of supplier performance. This ensures that suppliers meet the standards and helps identify potential issues early. It also makes it easier to track supplier performance over time, which allows organizations to maintain reliable supply chains and optimize their supplier relationships.

Data collection and analysis

Continuously collecting data over time provides valuable historical insights, which businesses can analyze to adjust and improve their processes. Since the data is stored in a centralized system, it can be accessed by quality, production and management teams.

This continuous flow of data helps organizations drive real-time corrections and constant improvement. Teams can detect potential quality issues and bottlenecks as soon as they occur and rectify them immediately before they escalate. It also provides opportunities to analyze the data to identify trends, patterns and areas for improvement and to avoid problems before they occur.

Audit readiness

Audits assess whether the organization's regulations, processes and standards are being maintained. Regular audits help businesses to identify inefficiencies and compliance gaps, reducing recall risks proactively. In addition to internal audits, many organizations are subject to customer and regulatory audits, which requires that companies must always be audit-ready to ensure successful outcomes.

A QMS provides a clear structure for audits and securely stores critical audit data, ensuring that auditors can easily access the information they need for a thorough review. It can also automatically generate audit reports, saving time and reducing the risk of human error.

By centralizing audit trails, the QMS makes it easier for departments to track and document compliance over time, which is especially useful when preparing for regulatory inspections. This centralization ensures that all audit data is readily accessible, enhancing accountability, easing compliance demands and boosting transparency across the organization.

This proactive approach reduces the likelihood of unexpected issues arising during external audits, helping to minimize the risk of non-compliance.

AI adoption in manufacturing is accelerating

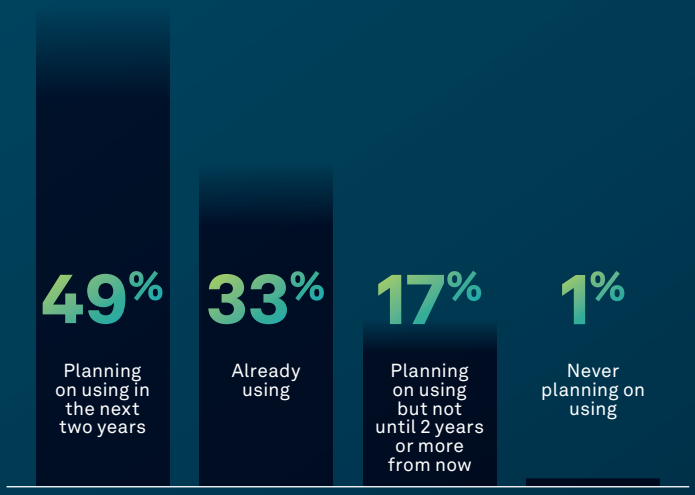
As more manufacturers seek to improve efficiency while maintaining quality standards, AI adoption is accelerating.

Survey insights

Today, AI adoption is overwhelmingly viewed as inevitable, given that only 1% of respondents said they would never use AI. This reflects a growing acceptance of the technology among manufacturers. This survey found that AI adoption has risen sharply in recent years with 49% percent of manufacturers saying they plan to deploy AI within two years, an increase from 2024.

Forty-seven percent believe AI's most valuable function is automating core processes, such as defect detection and document processing. This shows increasing confidence in AI's ability to drive efficiency on a day-to-day basis while also helping to address the labor shortage where AI can handle repetitive analysis while humans fill higher value roles.

Which of the following best describes your organization with regards to using or planning on investing in AI for manufacturing?



How AI is improving manufacturing quality

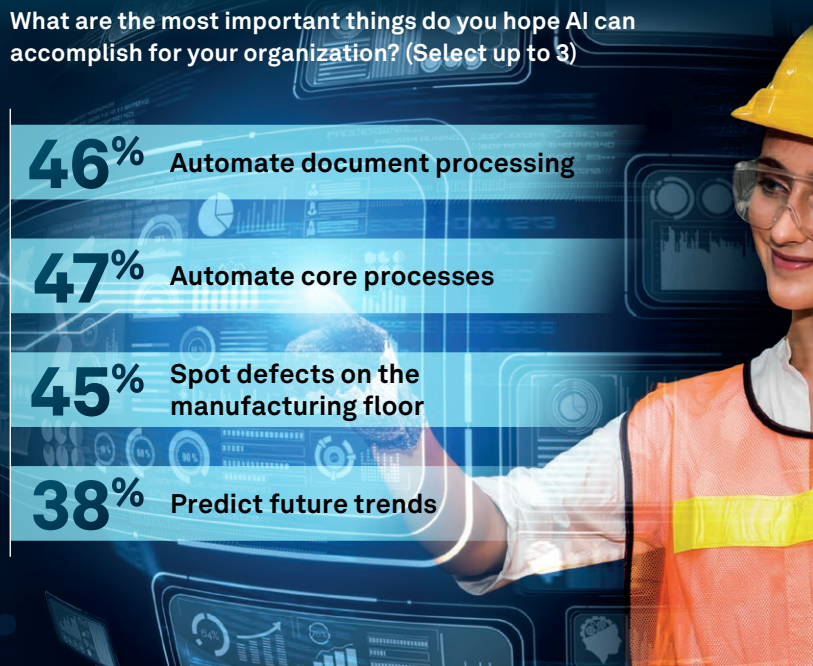
AI-driven predictive analytics and automation improve efficiency across businesses by helping them forecast trends, demand and potential risks. Predictive quality analytics allow manufacturers to minimize defects before they reach the market, which boosts efficiency and minimizes the cost of poor quality.

Another key benefit of AI in improving manufacturing quality is that it helps streamline production processes by identifying inefficiencies and recommending adjustments in real time. This leads to higher operational productivity across the business. The ability to analyze vast amounts of data coming from equipment sensors and other sources quickly allows companies to detect and address potential issues before they escalate, improving product quality and minimizing downtime.

A third benefit of AI technologies like machine learning is that they can continuously learn from historical data to improve forecasting accuracy over time. This leads to better, more informed decision-making and more optimal resource allocation. It can also reduce costs associated with scrap and rework and ensures that businesses respond quickly to market changes.

Using AI across the business can also enhance transparency. Real-time monitoring and data visualization make it easier to track performance metrics and share information across teams. This improves risk management and paves the way for long-term efficiency.

What are the most important things do you hope AI can accomplish for your organization? (Select up to 3)



Investment in quality tools and processes will increase in 2025

Quality has become a key priority for manufacturers, and investments in quality tools and processes are set to increase this year.

Survey insights

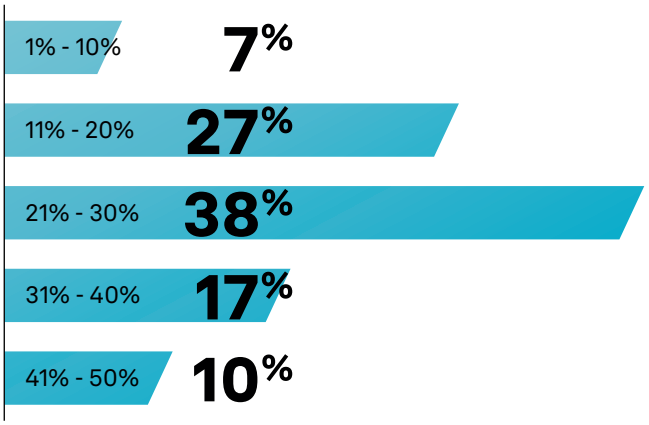
A significant proportion of manufacturers are making substantial investments in quality programs and prioritizing quality as a marker of success: 39% spend $10M – $49.99M on quality programs per year, while 24% spend $50M – $99.9M per year.

Manufacturers are demonstrating their commitment to quality through their budgets — sixty percent plan to increase their quality spending this year. 7% of survey respondents anticipate that their organization's total spending on quality programs and people will increase by up to 10% in 2025. Meanwhile, 38% of respondents believe the increase will range from 21% to 38% and 10% expect an increase between 41% and 50%.

Additionally, respondents recognize the importance of using structured systems to promote and maintain quality across the organization. In fact, 55% are now using a quality management system (QMS) to manage quality processes.

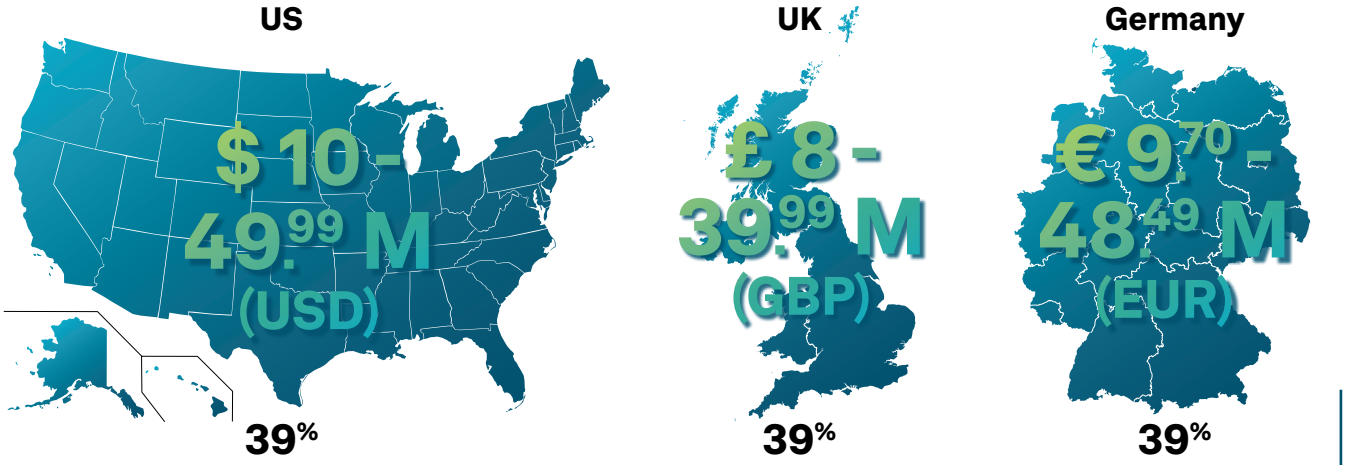
However, there is still some way to go to ensure that every business has access to the systems it needs. According to the survey, 27% of manufacturers cite inadequate technology as the biggest barrier to achieving quality objectives.

By what percent do you think your organization's total spending on quality programs and people will increase in 2025?



55% of respondents are now using a quality management system (QMS) to manage quality processes

Approximately, how much does your organization currently spend per year on quality programs and people?



Why companies are prioritizing quality investments

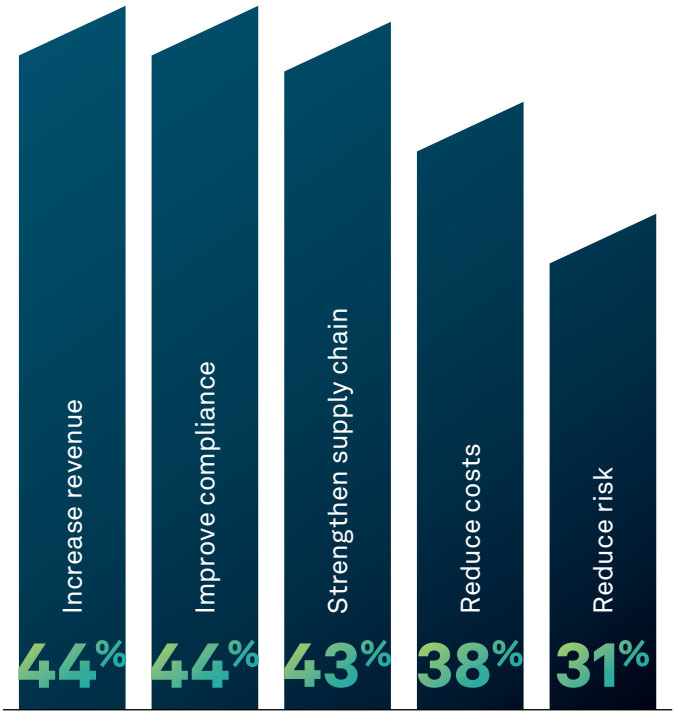
Businesses have reported that quality investments result in increased revenue (44%), improved compliance (44%) and supply chain resilience (43%). This shows that quality is increasingly viewed as a key to long-term success.

One of the most well-known advantages of a QMS is its ability to help organizations achieve compliance. This is because it automates many quality management processes, reducing errors and inconsistencies. For example, a QMS allows businesses to monitor quality metrics in real time, enabling quicker, more effective actions while ensuring compliance documentation is always up to date.

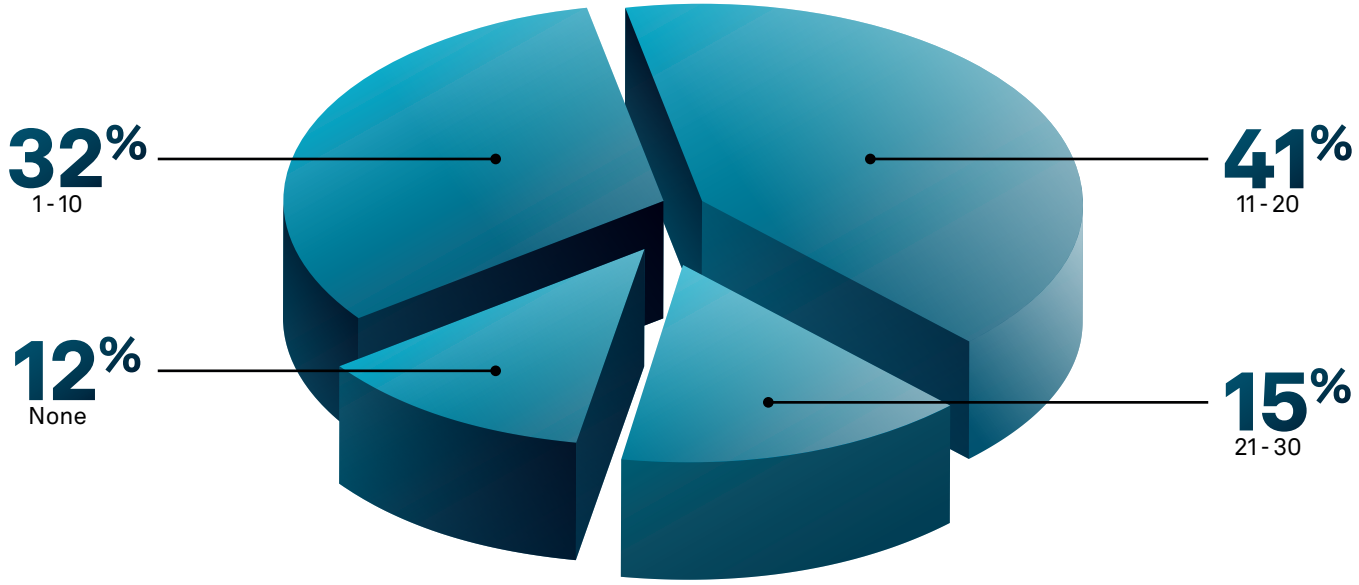
However, the benefits of a robust quality management process extend far beyond compliance. Investing in quality and bringing suppliers into quality processes can significantly boost revenue by reducing defects, returns and customer complaints while driving more sales. This can reduce lead time, resulting in faster time to market and more opportunities to respond effectively to customer demand.

Providing customers with reliable, high-quality products is crucial for securing and maintaining a positive reputation in today's competitive marketplace.

In 2025, what are your top 3 business drivers for investing in quality initiatives, if any? (Select up to 3)



How many safety issues, if any, occur across your organization in an average year?



Safety issues in the plant remain a challenge

Despite long-term efforts to improve workplace safety, many manufacturing businesses are still struggling to maintain a safe working environment.

Survey insights

Workplace safety incidents are still a significant problem, and 41% of manufacturers report 11 to 20 safety incidents per year. These incidents can significantly impact worker well-being, harm productivity across the business and result in lasting financial and reputational damage.

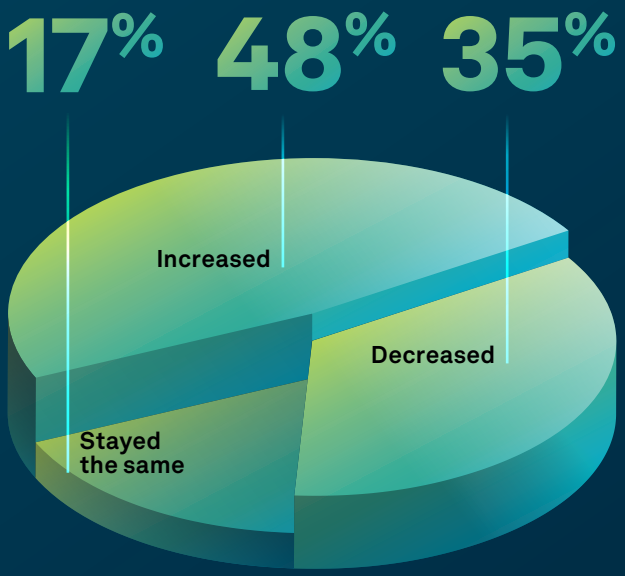
Furthermore, 48% of manufacturers say safety incidents have actually increased over the past five years. This may indicate that current safety protocols and training efforts are not sufficient to protect workers in modern workplaces and that they need to be adapted. Additionally, this could be a result of simply having too few well-trained workers to create a work environment that maximizes safety.

Safety issues are quality issues

The steady rise in safety incidents suggests that manufacturers need to improve their risk management strategies to protect workers more effectively. Because the health and safety workflows in many organizations mirror quality management and compliance workflows and protocols, an automated QMS with expanded health and safety functionality is an excellent hub for improving both. This includes creating and managing appropriate and ongoing employee training, continuous monitoring of safety risks and automating safety event reporting.

In the long term, AI systems become more intelligent as they gather and analyze huge amounts of data over time. In doing so, they become better at using data gathered across an organization to identify recurrent safety issues, which allows plant managers and others to implement safety remedies and processes sooner. In this way, businesses understand when, where and why accidents occur so they can take measures to prevent them from recurring and improve safety.

Has the number of safety issue, increased, decreased or stayed the same over the last 5 years?



Integrating quality and safety initiatives helps businesses streamline their risk management processes by proactively identifying and addressing workplace issues. For example, a strong focus on quality ensures that processes, materials and equipment meet high standards. This reduces the risk of accidents and enhances overall safety across the organization. As a result, businesses with integrated quality and safety initiatives report lower incident rates.

How many safety issues, if any, occur across your organization in an average year?

The future of quality in manufacturing

The role of quality in manufacturing is becoming more important, and organizations must work hard to ensure that they don't fall behind.

To stay ahead, businesses should ensure they are taking advantage of opportunities to leverage AI and automation wherever possible. **The ETQ Predictive Quality Analytics Solution** can significantly improve precision and efficiency across the company by reducing human error while also freeing human workers to focus on more creative, strategic and impactful tasks. As we have seen earlier, AI solutions will also help to resolve issues caused by the workforce shortage and skills gap.

Technology can also be used to empower organizations where frontline workers are still grappling with paper-based processes, navigating the balance between production and quality pressures and dealing with workforce shortages. **The ETQ Reliance Connected Worker Solution** promotes quality control on the shop floor by breaking down silos and closing the skills gap by empowering frontline manufacturing workers to act on opportunities for improvement that they notice. This, in turn, drives high quality on the top floor when the product reaches the customer.

Organizations can further enhance oversight and traceability across the supply chain by investing in a QMS. This provides business leaders with a transparent window into every step of the supply chain and ensures they can identify compliance gaps — whether related to quality, safety or the environment — and address them in time to ensure they meet industry regulations.

QMS platforms also provide businesses with a robust audit trail that clearly demonstrates effective root cause analysis and the corrective actions taken to mitigate risks. This makes it easier to track and verify compliance over time, which can be crucial for meeting regulatory requirements, passing inspections and maintaining transparency with stakeholders.

Finally, businesses can improve workplace safety by prioritizing real-time monitoring and advanced training programs. This helps optimize operations and reduce risks across the organization, which is essential for maintaining a strong position in a competitive market.

Ultimately, investing heavily in quality empowers manufacturers to drive sustainable growth, improve product quality and build a strong, resilient reputation. By prioritizing quality at every step of the product lifecycle, businesses can build a competitive advantage and establish themselves as leaders in a crowded marketplace.

ETQ Reliance

ETQ Reliance® is a leading Quality Management Software (QMS) designed to empower organizations with comprehensive quality and safety management capabilities. ETQ Reliance leverages over 30 years of experience in the industry to deliver a robust and scalable cloud-native platform. This next-generation QMS is specifically engineered to meet the dynamic needs of businesses. It ensures compliance, enhances operational efficiency and fosters a culture of continuous improvement.

Key features of ETQ Reliance include:

Agile platform

Built for flexibility and scalability, allowing businesses to adapt to changing conditions and expand as needed.

Cloud-native SaaS

Ensures high performance, security and accessibility from any location, supporting remote and mobile workforces.

Core applications

This area covers essential quality processes such as document control, training management, audits, change management and corrective actions.

Advanced analytics

Provides actionable insights through powerful data analytics tools, facilitating informed decision-making and risk management.

Expanded quality capabilities

Beyond core QMS applications, ETQ Reliance offers the most comprehensive portfolio of quality and safety management applications to cover areas such as supply chain quality, nonconformance handling, new product introduction, safety management and life sciences compliance.

ETQ Reliance supports organizations in their digital transformation journey, enabling them to maintain high standards of quality and compliance across their operations.

Learn more about
Advanced Quality Management
at **ETQ.com**

ETQ, part of Hexagon, is a global leader in integrated quality management, health, safety, and environmental solutions for manufacturers. Learn more at etq.com.

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