Problem Solving vs. Problem Fixing
Utilizing Metrology for Root Cause Analysis

ZEISS Industrial Metrology

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Problem Solving as a Core Capability
The Root Causes

In business it's easy to become complacent. Manufacturers can fall prey to continually repeating the same mistakes, disrupting production and damaging profitability. It's time to recognize the root of this issue – it's a lack of problem solving.

Problem fixing vs. problem solving
A majority of OEMs and suppliers identify problem solving as important to the future of their businesses and see evidence it has a ripple effect throughout their organization. A lack of problem solving can impact:

1. An organization's ability to manage, monitor and respond to quality-related events
2. A manufacturer's ability to implement operational efficiencies
3. A company's brand reputation and customer relationships

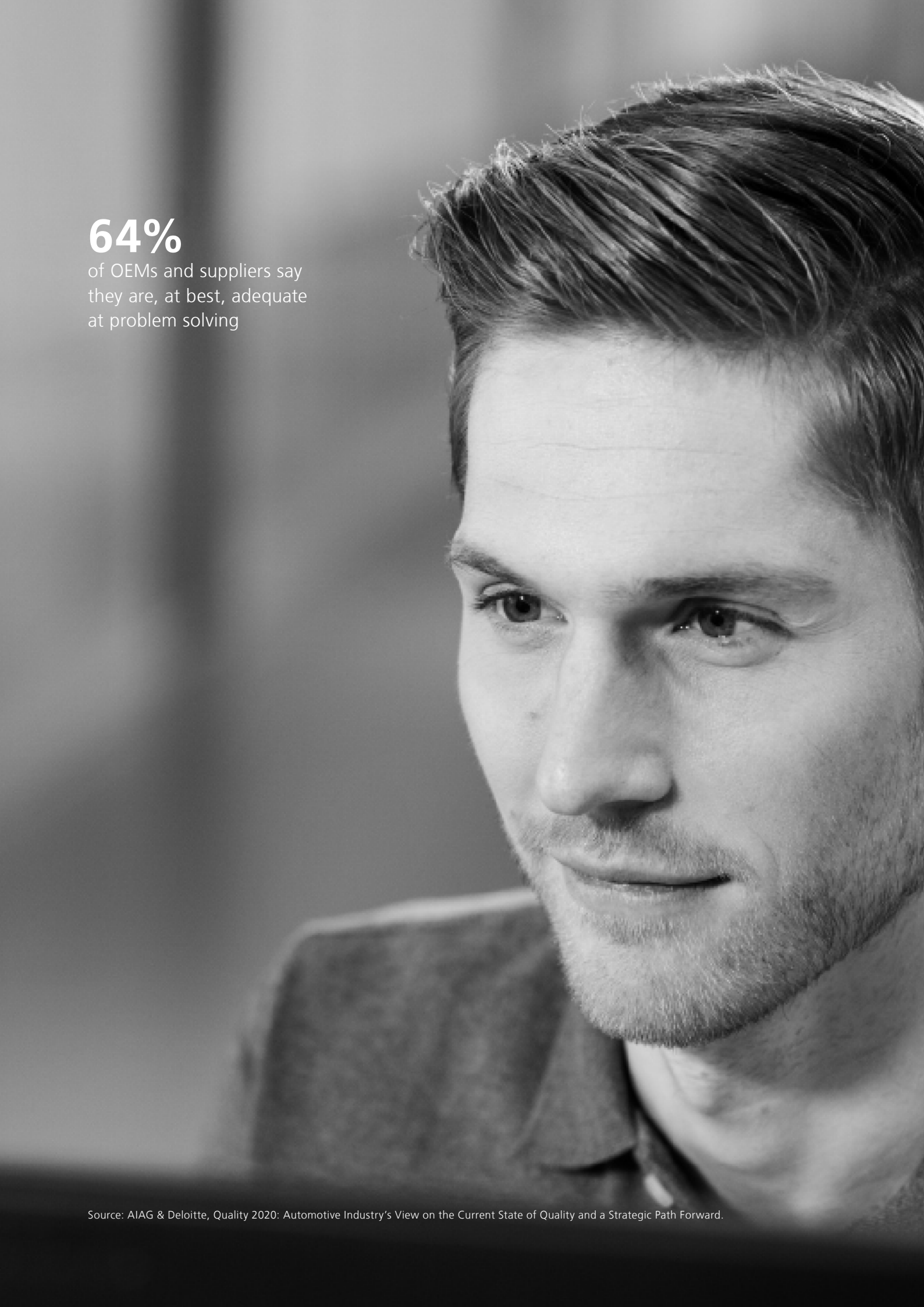
What can teams do to improve an organization's capabilities for problem solving? First, it's important to recognize the difference between true problem solving and surface-level problem fixing.

Critical core skill
Problem solving is a critical core skill that has lasting benefits for a company. Many companies, however, reward problem fixing behavior. Team members who rush to the rescue and generate a quick fix are applauded. The speed of correction is important for minimizing downtime, so management stresses urgency and incentivizes fast action.

However, making short-term fixes can doom a company to repeat the same mistakes or build in faulty processes that can impact quality dramatically on multiple product groups.

Problem Solving Comparison

Problem Fixing	Problem Solving
Puts out fires	Looks at complex situation
Makes quick fixes	Conducts a root cause analysis
Reaches conclusions with incomplete data	Collects comprehensive data
Performs an incomplete analysis	Seeks a total understanding of the process
Seeks to place blame	Includes appropriate team members
Focuses on performance metrics	Focuses on improving processes



64%
of OEMs and suppliers say they are, at best, adequate at problem solving

Source: AIAG & Deloitte, Quality 2020: Automotive Industry's View on the Current State of Quality and a Strategic Path Forward.

Root Cause Analysis
Approaches and Tools

World-class manufacturing operations employ root cause analysis (RCA) and corrective actions to address quality problems. This approach may be prompted by a crisis of quality, but its implementation has long-term effects on processes and ultimately the quality of products.

Variety of approaches

There are a variety of systematic approaches to root cause analysis, including the popular and well-known 8 Discipline (8D) process, 7-step process or 5-step DMAIC process. Several companies have modified or developed their own process, but they often have similar themes that include defining the problem, collecting data, performing an analysis, implementing a solution and evaluating the solution.

Data collection serve as foundation of RCA steps

1. Create a team and define the problem
2. Contain the symptom and isolate the effects
3. Measure and collect data and evidence about the problem
4. Choose and implement a corrective action
5. Measure and evaluate the effectiveness of the solution

Tools for analysis

Depending on the type of problem being investigated, RCA can often utilize a variety of tools, including diagrams, graphs and charts. The most common tools include:

- Brainstorming
- Pareto charts
- 5-why analysis
- Fishbone diagrams
- Scatter diagrams
- Run charts
- Histograms
- Control charts
- Flow charts
- Tree diagrams
- Experiments

52%

say a lack of problem solving is a significant risk to their business

Source: AIAG & Deloitte, Quality 2020: Automotive Industry's View on the Current State of Quality and a Strategic Path Forward.

While much of the discussion surrounding root cause analysis focuses on the processes and the tools, companies may overlook the role of data – and the quality measurement equipment that collects that data – in an effective and robust analysis.

Complex parts require complete measurements

All of the processes for RCA include a phase for the collection of measurements and data. To remain competitive with the increasingly complex components required in the industry, manufacturers must gather greater specificity in their measurements.

Customer-specific requirements (CSRs) make it even more challenging to meet the needs and expectations of customers. Advanced manufacturers are leveraging big data and predictive analytics to improve root cause analysis capabilities. The importance of data inputs to drive those sophisticated analyses continues to grow. Sophisticated industrial metrology equipment can offer the solution.

Capture data throughout the supply chain

- Incoming raw material and products from suppliers
- Machine set-ups and tooling
- Non-conforming component rejection before it hits the production line
- Finished product inspection

Precision, speed and sophistication

To gather data that is useful in RCA and problem solving – both in the data collection and in the evaluation phases – a team must have measurement equipment they can rely on and is capable of meeting the company's needs.

- CAD-based measuring software
- Multiple measurements in a single pass
- Reporting software for constant recording, monitoring and management
- Flexibility of measurement for a variety of parts and sizes
- Ease of use and reduced risk of operator error

Root cause (ru:t ko:z) noun. The fundamental reason for the occurrence of a problem. The breakdown or failure of a process. When resolved, it prevents the recurrence of the problem. Effective root cause analysis utilizes a systematic approach to identify the true problem that causes a non-conforming product.

Solutions Designed for Problem Solving
ZEISS Industrial Metrology

Quality technicians utilizing ZEISS Industrial Metrology indicate that the amount of data available and the precision, accuracy and repeatability of measurements enable the collection of data that can shorten the analysis and fact-gathering phases of RCA.

Industry-leading software assists in analysis and evaluation
With data at your fingertips, non-conforming processes and products are proactively identified. In addition, ZEISS' sophisticated CALYPSO software and PiWeb reporting software provide users with multiple analytics and views to process inspections, identify non-conformance and assist in determining the root cause.

Employ the tools you need for effective problem solving
The pressures on modern manufacturers are mounting. There are more opportunities every day for an error to occur when dealing with complex components, increasingly sophisticated systems and stringent customer requirements. The industry has identified problem solving as a critical skill for enhancing the capabilities of both OEMs and their suppliers.

Grow your problem-solving capabilities
Root cause analysis is one of the many tools in the manufacturer's toolbox for growing problem-solving capabilities within the business. But with any process or tool, the quality of the inputs can have a significant impact on its effectiveness. Accurate data and the sheer quantity of data points companies can measure, monitor and manage will have a positive impact on RCA.

Let's ZEISS it
ZEISS Industrial Metrology equipment holds up over time, and our reputation is synonymous with quality. When experts want answers, they say, "Let's ZEISS it." Is your metrology equipment also a verb? For decades, we've been providing manufacturers with the metrology solutions they need to become true problem solvers.

Talk to our ZEISS Industrial Metrology experts about applications for our equipment and the role that accurate data can play in your root cause analysis and problem solving.

"JUMPING TO THE SOLUTION IS CONSIDERED BY OEMS AS THE TOP REASON PROBLEM SOLVING IS INADEQUATE."

Source: AIAG & Deloitte, Quality 2020: Automotive Industry's View on the Current State of Quality and a Strategic Path Forward.

95%

believe that closing the gap in problem solving would have a moderate to extremely high impact on quality for their company.

For more information:
+1 800 327-9735
metrology@zeiss.com
www.zeiss.com/metrology