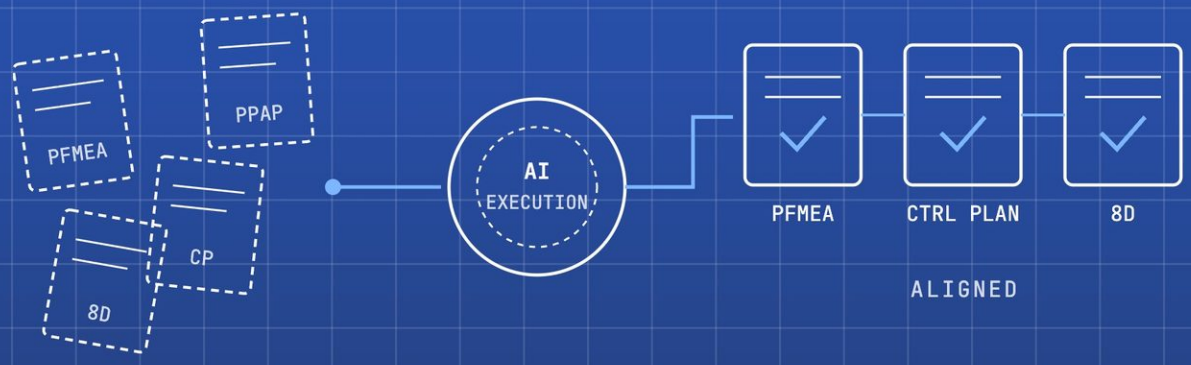
MAD-Ai

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EXECUTIVE BRIEF · AUTOMOTIVE SUPPLIERS

From PFMEA Chaos to Standardized Quality.

How an AI quality workforce helps automotive suppliers execute and standardize PFMEA, control plan, PPAP and corrective-action workflows across growing product families, with the same team.



ONE AI WORKFORCE. MORE CONSISTENT QUALITY EXECUTION ACROSS EVERY PROGRAM.

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SECTION 01 / 05

Quality under pressure.

Automotive suppliers are being pushed from every side. OEMs and auditors want tighter controls and cleaner documentation, programs and variants keep multiplying, and quality teams are asked to do more with no added headcount.

Leaders responsible for families of products, such as HVAC, interiors, washer tanks, overflow tanks and similar commodity groups, are juggling four streams of work at once:

01

8Ds and customer issues

Problem solving under OEM deadlines.

02

PFMEAs and control plans

Risk analysis that has to match the floor.

03

PPAPs and supplier quality

Submissions and supplier responses to grade.

04

Audits and internal reviews

Annual audits and constant readiness checks.

The result is constant firefighting, and quality processes that are manual, fragile and dependent on a handful of experienced people.

KEY TAKEAWAY

The work is not getting simpler and the team is not getting bigger. The only lever left is how the work itself gets done.

SECTION 02 / 05

Four places where the process breaks down.

01

DOCUMENT DRIFT

PFMEAs don’t stay in sync with 8Ds and control plans.

8Ds get completed under pressure, but PFMEAs are not fully updated with new failure modes and controls, and control plans drift away from the PFMEA. Decisions run on stale risk analysis while engineers reconcile documents by hand. The risk: recurring issues, hidden failure modes and audit findings.

02

NO STANDARD BASELINE

No foundation PFMEAs across product families.

Similar products, like several HVAC or tank variants, each get their own PFMEA built from scratch. Common steps like receiving, material handling, labeling and shipping are reinvented every program, and lessons learned on one never reach the others. The impact: duplicated effort, inconsistent controls and missed chances to scale what works. And when the engineers who built those PFMEAs move on, their knowledge leaves with them.

03

AUDIT AND SUPPLIER PRESSURE

Manual, inconsistent reviews.

Annual audits force last-minute cleanup of PFMEAs, control plans and PPAP records. Supplier 8Ds and PPAPs are graded by hand and subjectively, and PFMEAs often live in messy Excel files with merged cells and non-standard layouts. The consequence: more nonconformities, more rework and tenser customer conversations than the work deserves.

04

WORK INSTRUCTIONS

Turning real processes into clean instructions is painful.

The truth of the process lives in experienced operators’ heads and phone videos from the floor. Turning that into structured work instructions, with PPE, warnings and CTQ steps called out, is slow. The result: inconsistent training, uncontrolled variation and documents that lag the line.

SECTION 03 / 05

The missing piece: a purpose-built AI quality workforce.

Most AI tools available today are generic chatbots or copilots. They help with drafting, but they tend to agree rather than challenge, they can give different answers to the same input, and they aren't built around AIAG-VDA quality logic or formal automotive frameworks.

What quality leaders need is a purpose-built AI quality workforce. MAD-Ai's Manufacturing Quality Super-Intelligence System (MQSIS) is an agentic AI platform that executes structured workflows across PFMEA, control plans, PPAP, 8D and corrective action. It sits on top of your existing systems with no rip-and-replace, produces consistent and repeatable outputs for engineering review, and lets you standardize how quality work is done across product families, plants and teams.

Key capabilities.

01 / CROSS-WALK

PFMEA and control plan cross-walks

Normalize messy spreadsheets, highlight PFMEA and control plan mismatches, and recommend specific updates.

02 / GRADE

8D grading and guidance

Grade 8Ds against a clear rubric of basic versus complete steps, with scorecards, gaps and recommendations.

03 / REVIEW

PPAP review and scorecards

Check PPAP packages for missing or weak elements against submission readiness, for reviewer sign-off.

04 / STANDARDIZE

Foundation PFMEA support

Consolidate related PFMEAs into commodity-level baselines so common steps and risks are handled the same way.

05 / CAPTURE

Video to work instruction

Turn a simple process video into a structured, editable work instruction for tablets or the shop floor.

06 / DECIDE

Your engineers make the call

Every finding comes with its evidence. The engineer reviews, decides and signs off.

SECTION 04 / 05

What customers can expect.

10–15×
efficiency gain in day-to-day quality documentation and review

15×
faster problem solving and root cause work

32×
faster PFMEA and risk analysis

$3–7
return for every $1 spent

Efficiency figures from MAD-Ai testing trials against manual process. Return estimated from conservative time savings. Results vary.

Efficiency and ROI.

The return comes from less rework and scrap, faster PPAP and 8D cycles, fewer audit findings and corrective costs, and more productive engineering time.

People and process benefits.

Senior engineers spend more time solving problems and less time formatting Excel and Word files. Teams can hand off the heavy analytical lifting, dropping in a full 8D, PFMEA, control plan and process video as one package, and let the system do the first-pass structuring.

→ **Knowledge and standards live in the system itself, not with whichever expert happens to be available that day.**

SECTION 05 / 05

A practical way to start.

Instead of a big-bang rollout, suppliers usually start with a focused pilot:

THE PILOT IN THREE STEPS

01 **Pick one real issue** → 02 **Run the analysis** → 03 **Measure the results**

01 **Choose one real issue.** A strong 8D with its PFMEA and control plan, plus an optional short video of one key process step.

02 **Run it through the platform.** Over a short, defined window, MAD-Ai normalizes and analyzes the documents, runs 8D grading, PFMEA and control plan cross-walks and optional PPAP checks, and produces reports, heat maps and concrete recommendations that your engineers validate before anything changes.

03 **Measure the results.** Time saved per case, the number and type of findings flagged automatically, and gains in audit readiness and documentation quality.

From there, organizations typically build foundation PFMEAs for each commodity family, standardize supplier scorecards and roll out video-based work instructions across more plants.

Standardize quality without adding headcount.

For automotive suppliers, manual spreadsheets, tribal knowledge and last-minute audit prep are no longer sustainable. Quality leaders need to keep PFMEAs, control plans and 8Ds aligned, standardize practice across product families and plants, reduce audit and supplier friction, and free engineers for real problem solving.

KEY TAKEAWAY

A purpose-built AI quality workforce is a fast, pragmatic way to standardize quality, protect margins and scale without constantly adding headcount.

ABOUT THE AUTHOR

About the author and founder.



Rick Heilshorn

FOUNDER & CEO · MBA · MSENG · LSS MASTER BLACK BELT

Rick earned his Lean Six Sigma Master Black Belt at Honda, where he led quality initiatives across North America. After decades of manufacturing turnarounds and quality leadership, he built the methodology and domain expertise that became the foundation for MAD-Ai.

→ **His mission: bridge the gap between human expertise and the AI revolution. Not to replace skilled quality professionals, but to give them superpowers.**

This brief reflects MAD-Ai's applied experience helping automotive suppliers keep PFMEAs, control plans and 8Ds aligned across growing product families.

CREDENTIALS

- **MBA and Master of Science, Engineering**
- **Lean Six Sigma Master Black Belt, earned at Honda**
- **Led quality initiatives across North America**
- **Specialist in manufacturing turnarounds**
- **Tier 1 automotive supplier leadership**
- **AIAG Quality Summit speaker**

ABOUT MAD-AI

MAD-Ai, LLC, based in Madison, Mississippi, delivers a purpose-built, agentic AI platform for manufacturing quality. Its Manufacturing Quality Super-Intelligence System (MQSIS) deploys a specialized AI workforce that executes structured workflows across 8D, PFMEA, PPAP, corrective action and supplier quality, helping teams work faster, reduce variation, retain institutional knowledge and scale without proportionally adding headcount. MAD-Ai supports automotive, aerospace, defense and advanced manufacturing organizations.

SEE WHAT MAD-AI CAN DO FOR YOUR QUALITY TEAM

Standardize every PFMEA, control plan and 8D.

See how MAD-Ai's Manufacturing Quality Super-Intelligence System (MQSIS) works through a real issue in your own documents, flags gaps and produces structured outputs for your team to review.

01 / DISCOVER

Talk to an Expert

Discuss your quality challenges, engineering workload, and opportunities to improve efficiency.

02 / DEMONSTRATE

See MAD-Ai in Action

See how MAD-Ai supports real manufacturing quality workflows, including 8D, PFMEA, and PPAP.

03 / VALIDATE

Start a Pilot

Evaluate MAD-Ai using your own quality workflows and measure the impact on engineering time.

LET'S TALK ABOUT YOUR QUALITY OPERATION

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