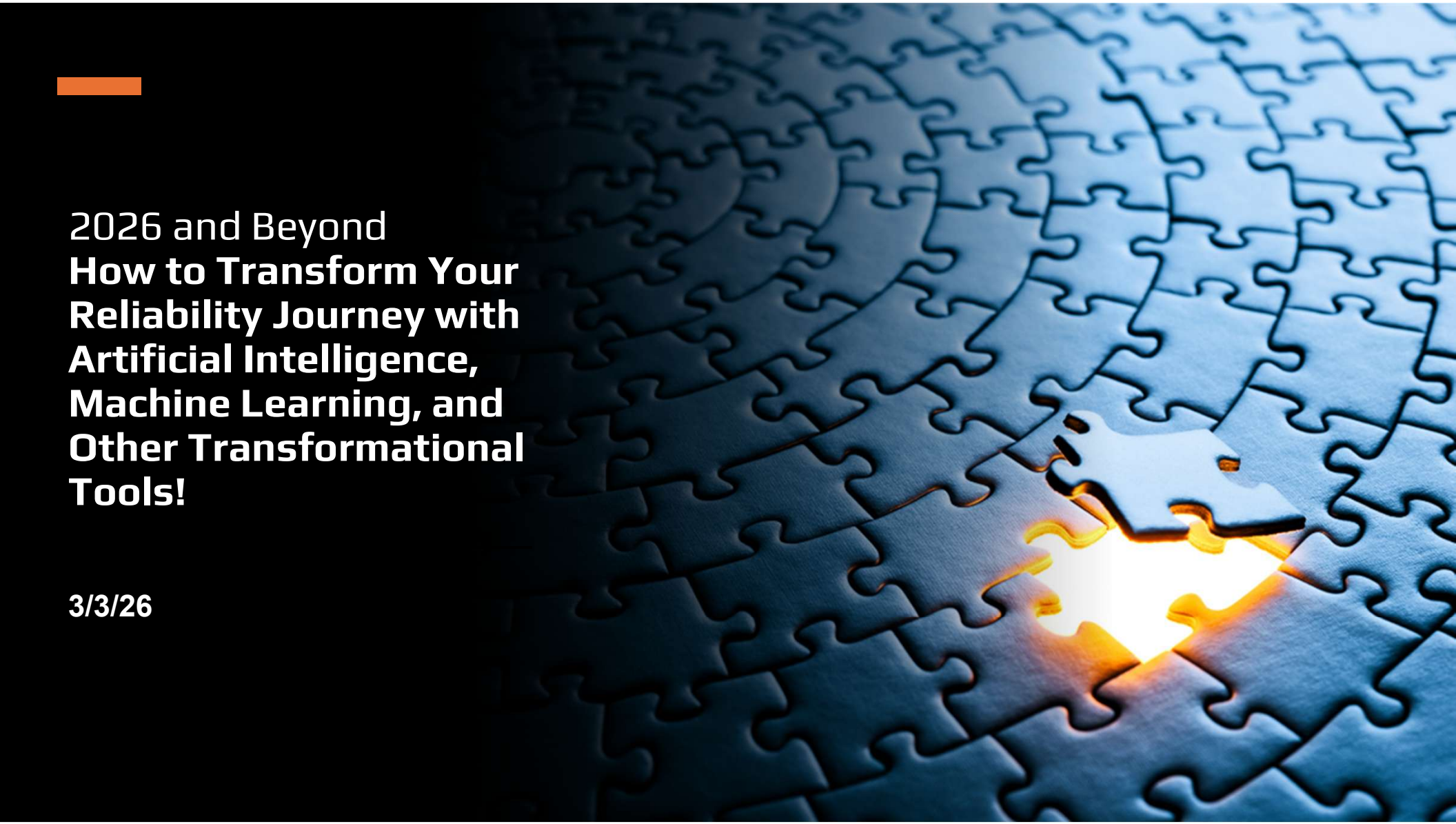
2026 and Beyond

How to Transform Your Reliability Journey with Artificial Intelligence, Machine Learning, and Other Transformational Tools!

3/3/26



Agenda

- Introduction
- Maintenance & Reliability Program Building Blocks
- AI Foundation and Fundamentals
- Tools & Resources
- Reliability/AI Journey
- The Case Study
- What's Next?
- Discussion/Q&A

Transition:
Introduction

The 9 Steps to a Fully Planned Work Order

Define Scope	Diagnosis	Technical Information	Work Scope
Manage Risks	Job Hazards & Risks	HSE & Quality Controls	Method Statements & Procedures
Resources & Costs	Materials & Parts	Trades & External Resources	Cost Estimate

Reliability Academy Graphic – Erik Huple

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LinkedIn: **Maven Asset Management: Overview | LinkedIn**

Course Description

- In this interactive workshop, participants will explore how Artificial Intelligence (AI), Machine Learning (ML), and other transformational tools can accelerate, strengthen, and enhance their organization's reliability journey.
- We'll begin by defining the essential components of an effective reliability program—its key building blocks, expected outcomes, and proven strategies for success. From there, we'll break down how to establish a solid foundation that enables the practical and impactful use of AI and ML tools to deliver measurable results.
- Whether your organization is just beginning its reliability journey, operating a mature program, or focused on near-term wins, we'll assess how AI and ML can be applied today and in the future. Participants will evaluate current capabilities, emerging enhancements, and innovative opportunities while considering technology timelines and organizational readiness.
- The session will also guide attendees through the planning process—clarifying starting points, desired outcomes, constraints, and required resources—to successfully integrate these technologies. We'll examine opportunities across three-time horizons:
- Immediate (6–12 months): Quick wins and foundational applications
- Short term (12–24 months): Scalable and continuous improvement solutions
- Long term (beyond 24 months): Sustainable capabilities
- Illustrative examples will demonstrate how AI/ML technologies can support reliability goals at each stage. Finally, we'll look ahead to how these advancements converge with other emerging areas—data science, automation, and virtual technologies—to sustain and elevate your organization's reliability journey.

Survey

Question	Response #1	Response #2	Response #3	Response #4	Response 5	Response 6	Answer
What is the definition of AI?	Systems that think rationally and like humans.	Systems that act rationally and like humans.	Technology that enables machines to simulate human learning, comprehension, problem solving, decision-making, and autonomy.	All the above			
What is the term for an AI mistake?	Miscalculation	Hiccup	Hallucination	Error			
Which of the following is not a weakness of AI?	Ethical issues surrounding AI usage.	Detailed prompt needed to generate a response	Stereotypes exist in AI responses.	There is bias built into AI responses.			
When did AI begin?	1950s	1980s	2010s	2020s			
What is the difference between deep learning and machine learning	Deep learning can create images and text, but machine learning only consists of rules that are given to a system to follow.	Machine learning is another term for the "neural network" that improves over time, while deep learning is a broader term that represents AI as a whole.	Machine learning can adapt as it analyzes data and locates patterns, and deep learning is a subset of machine learning that incorporates networks with extensive layers.	There is no difference between deep learning and machine learning.			
What is your level of knowledge in the area of AI?	Expert	Average	Low	None			
How do you currently use AI?	Create content	Asset Machine Learning	Prompt Engineering	Data Analysis	Other	Do not use AI	Select All That Apply
Have you done any training in AI?	Yes	No					
Do you currently plan on any AI projects in 2026?	Yes	No	I do not know				
Do you have an AI budget for 2026?	Yes	No	I do not know				
Do you have a long-term AI plan? This could be a stand alone plan, or a section of other plans. Examples include Digitalization, Technology, Innovation, etc. plans.	Yes	No	I do not know				

Survey Results

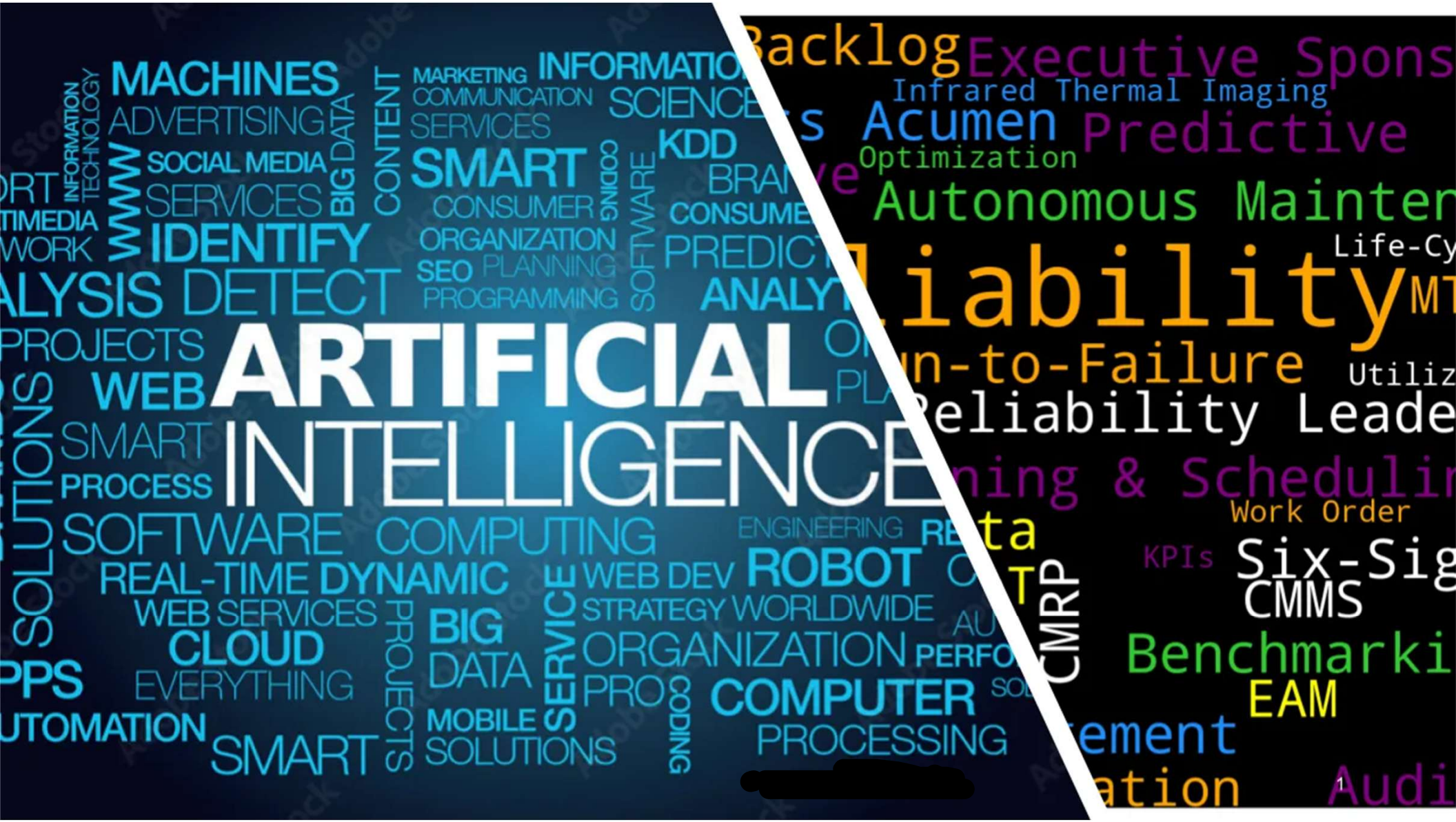
Number	Question	Response #1	Response #2	Response #3	Response #4	Response 5	Response 6	Results
5	What is the definition of AI?	Systems that think rationally and like humans.	Systems that act rationally and like humans.	Technology that enables machines to simulate human learning, comprehension, problem solving, decision-making, and autonomy.	All the above			29%
6	What is the term for an AI mistake?	Miscalculation	Hiccup	Hallucination	Error			55%
7	Which of the following is not a weakness of AI?	Ethical issues surrounding AI usage.	Detailed prompt needed to generate a response	Stereotypes exist in AI responses.	There is bias built into AI responses.			52%
8	When did AI begin?	1950s	1980s	2010s	2020s			68%
9	What is the difference between deep learning and machine learning	Deep learning can create images and text, but machine learning only consists of rules that are given to a system to follow.	Machine learning is another term for the "neural network" that improves over time, while deep learning is a broader term that represents AI as a whole.	Machine learning can adapt as it analyzes data and locates patterns, and deep learning is a subset of machine learning that incorporates networks with extensive layers.	There is no difference between deep learning and machine learning.			69%
10	What is your level of knowledge in the area of AI?	Expert	Average	Low	None			2.6
11	How do you currently use AI?	Create content 64.5%	Asset Machine Learning 25.8%	Prompt Engineering 41.9%	Data Analysis 61.3%	Other 29%	Do not use AI 12.9%	39%
12	Have you done any training in AI?	Yes	No					1.6
13	Do you currently plan on any AI projects in 2026?	Yes	No	I do not know				1.9
14	Do you have an AI budget for 2026?	Yes	No	I do not know				2.0
15	Do you have a long-term AI plan? This could be a stand alone plan, or a section of other plans. Examples include Digitalization, Technology, Innovation, etc. plans.	Yes	No	I do not know				1.8

Demographics

Account Executive	Engineering Intern	Maintenance Project Manager	Professor Emeritus	Senior Asser Reliability Manager
Asset Manager	Engineering Tech. Specialist	Maintenance Reliability Engineer	Regional Reliability Leader	Senior Director of Maintenance Reliability
Assistant Vice Presdient - Sales	Enterprise Account Executive	Maintenance Scheduler and Contractor Supervisior	Regional Reliability Manager	Senior Engineering Manager
Automation Engineer	Founder	Maintenance Supervisor	Reliability Engineer	Senior Manager
CBM Manager	Global Maintenance Lead	Manufacturing Excellence AI Lead	Reliability Improvement Group Supervisior	Senior Manager - Reliability and Engineering
Chief Executive Officer	Head of National Accounts Southeast	Mgr Maintenance Training	Reliability Director	Senior Reliability Engineer
Director - Machine Reliability	ID&C Engineer	NDT Supervisior	Reliability Manager	Sr Maintenance Training Sp
Director Innovation Georgia Pacific (Ret.)	Industry Principal	Operations and Maintenance Gatekeeper	Reliability Team Lead	Sr. Director of Eng & Maintenance
Director of Engineering and Maintenance	Instrument Engineer	PM Team Leader	Reliability Technician	Sr. Reliability Engineer
Director of Maintenance & Reliability	Lead Maintenance Planner	Principal Consultant	Reliability Technologist	System Engineer
Director of Maintenance and Reliability	Maintenance Manager	Process Coordinator 1st Unit Coking Maintenance	Research Engineer	Technical Support Specialist
Electrical Supervisor	Maintenance Planner	Professor	Risk Manager	Vice President

50 - Companies

21 - States


ARTIFICIAL
INTELLIGENCE
MACHINES
ADVERTISING
SOCIAL MEDIA
SERVICES
IDENTIFY
DETECT
PROJECTS
WEB
SMART
PROCESS
SOFTWARE
COMPUTING
REAL-TIME
DYNAMIC
WEB SERVICES
CLOUD
EVERYTHING
BIG
DATA
MOBILE
SOLUTIONS
SMART
ROBOT
COMPUTER
PROCESSING
ORGANIZATION
STRATEGY
WORLDWIDE
WEB DEV
ENGINEERING
SMART
CONSUMER
ORGANIZATION
SEO
PLANNING
PROGRAMMING
KDD
MARKETING
COMMUNICATION
SERVICES
CONTENT
DATA
WWW
INFORMATION TECHNOLOGY
SOLUTIONS
AUTOMATION
Backlog
Executive
Infrared Thermal Imaging
Acumen
Predictive
Optimization
Autonomous
Life-Cy
liability
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Reliability
Work Order
KPIs
Six-Sig
CMMS
CMRP
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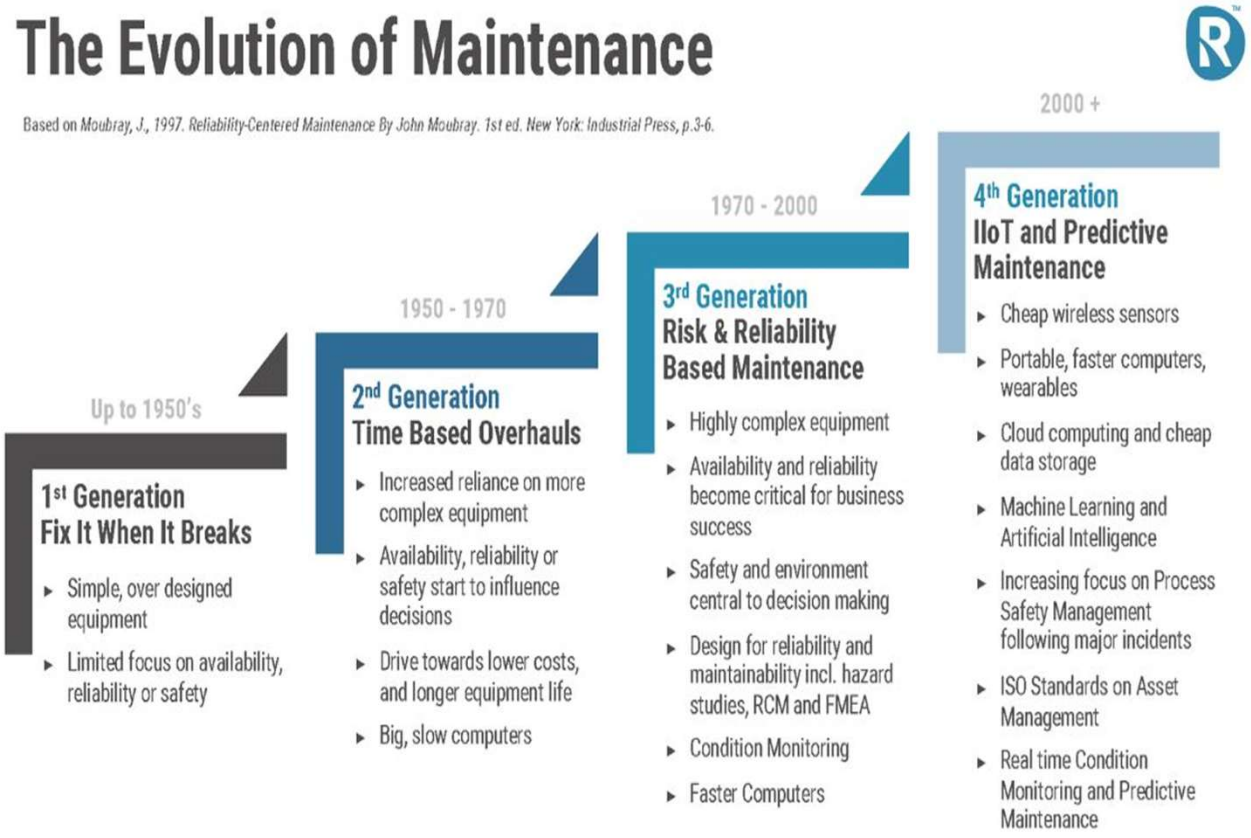
Transition: Maintenance & Reliability Building Blocks

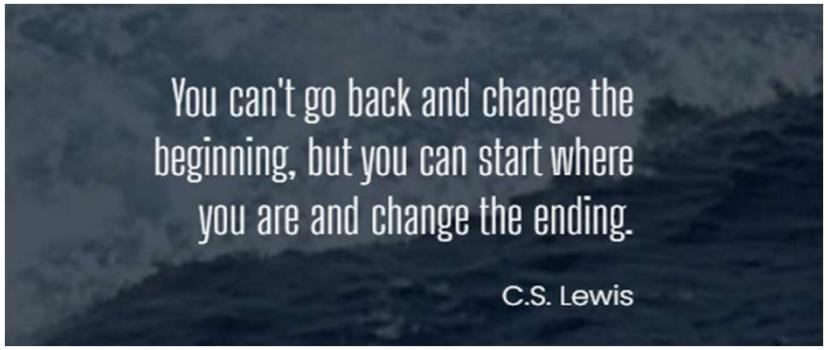


Reliability Academy Graphic – Erik Huple

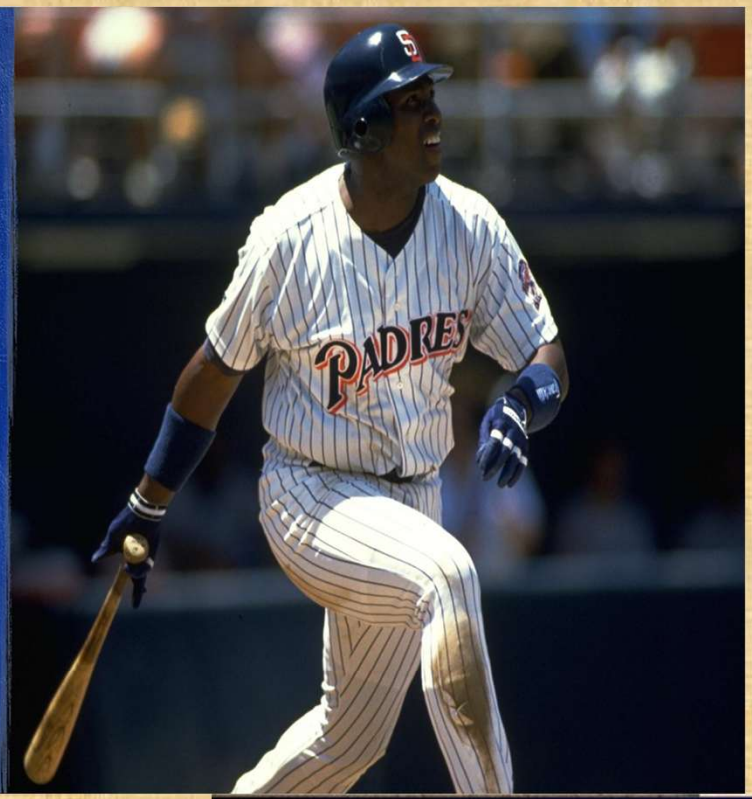
Maintenance/Reliability/AI – Where are You on the Journey?

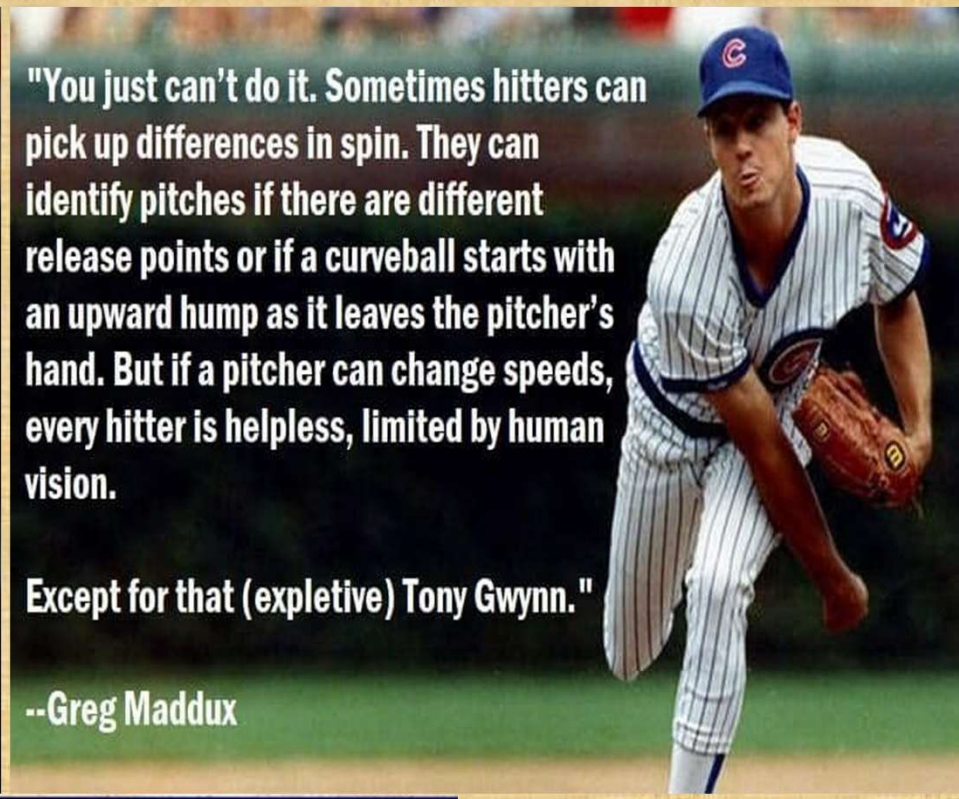
The question for every maintenance leader is:

Are you building the operating system that will let you win?



Perspective – What is Success?





GREG MADDUX VS. TONY GWYNN STATS

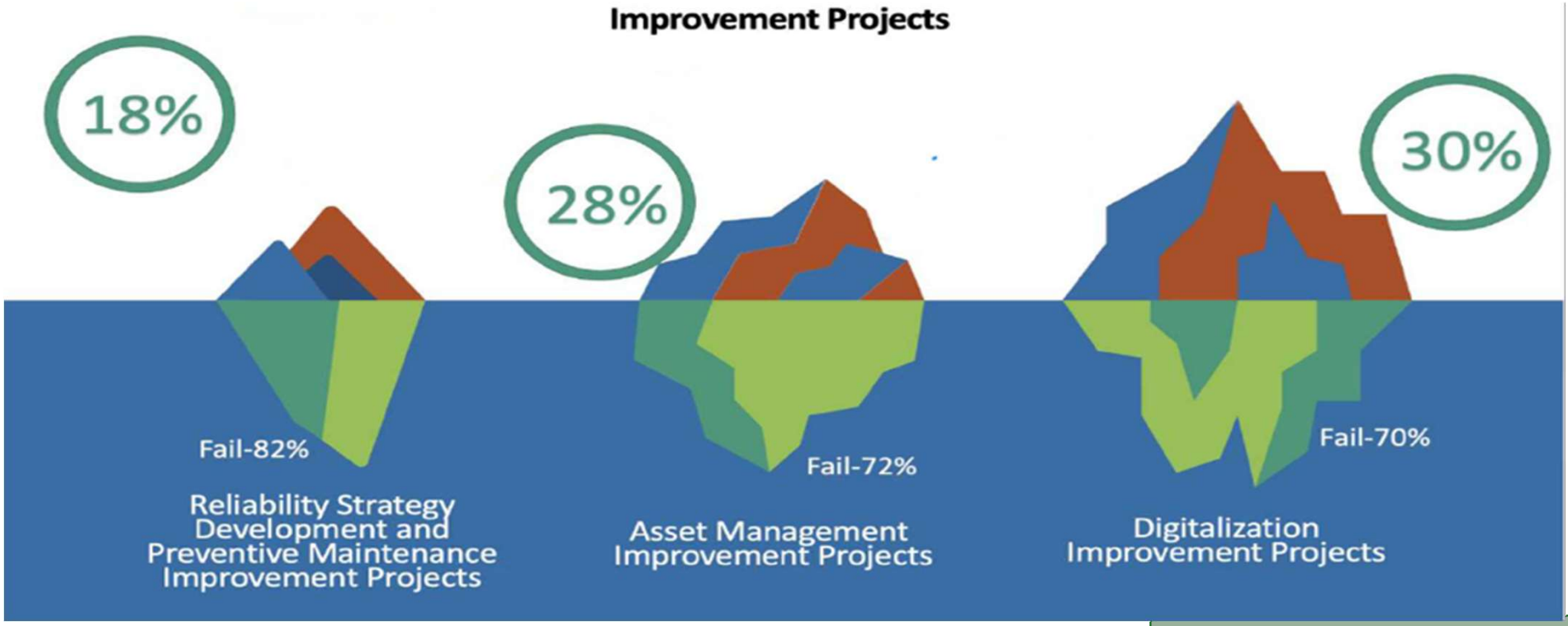
PLATE APPEARANCES	LIFETIME BATTING AVERAGE	STRIKEOUTS
107	.415	0

Why Not to Proceed

"We've already tried that"

"Those never work"

"Our systems work just fine"



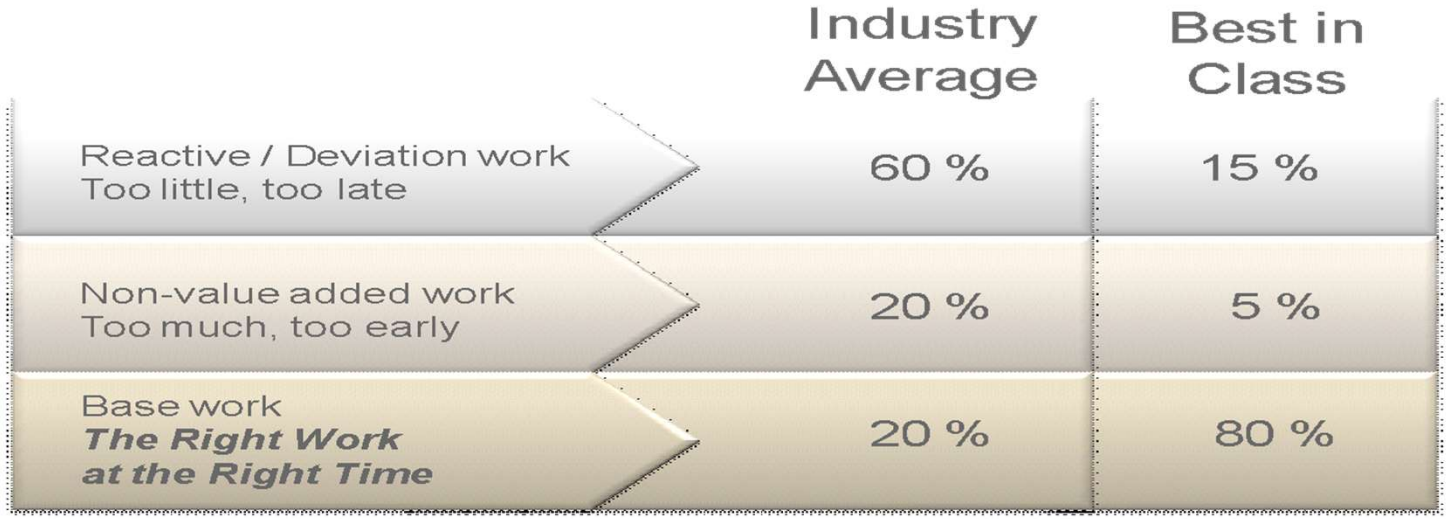
"We will have to hire"

"It is too expensive"

"We are too busy putting out fires ……"

Why Proceed?

**Right Work, Right Time, Right Cost, Appropriate Risk*



Reactive work can take up to 3X longer and can cost 4-10X

* Information from SMRP Benchmarking

Organizational Items to Consider

01 Reliability Engineering

Reliability Centered Maintenance (RCM)
- What is critical?
- What are the risks?
- What can we mitigate?

02 Operational Excellence

Maintenance Strategy
- What tool?
- What time?
- What person?

03 Planning & Scheduling

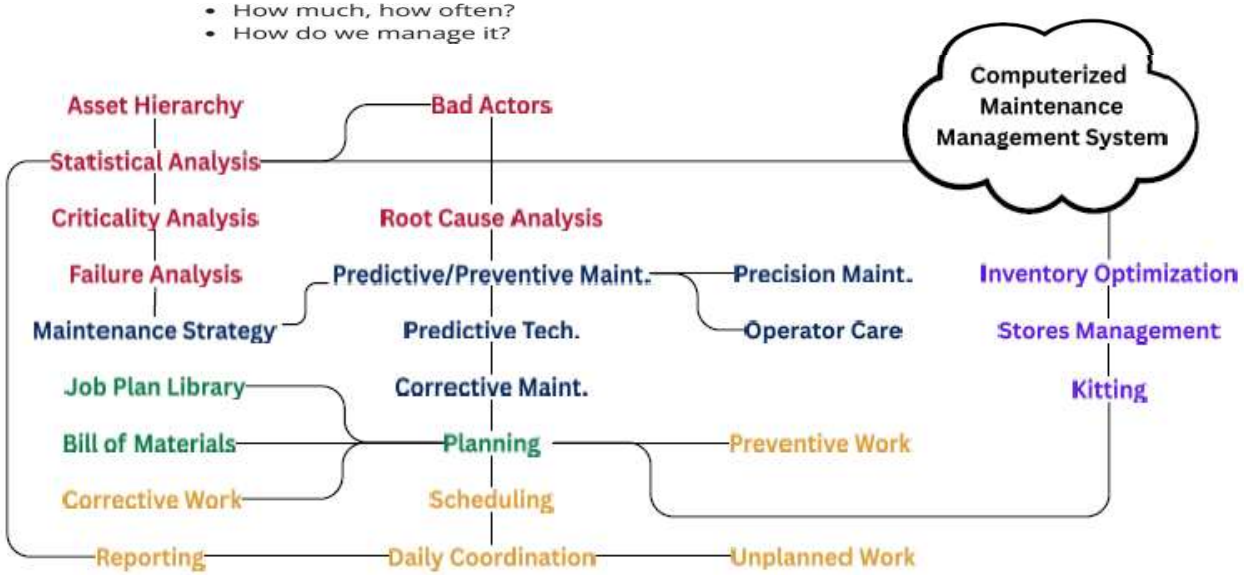
Comprehensive Work Planning
- What needs doing?
- What comes first?
- What is the best way?

04 Manufacturing Leadership

Continuous Improvement
- How do we make it happen?
- How did it go?
- How do we improve?

05 Storeroom Operations

Right Parts at the Right Time
- What do we need?
- How much, how often?
- How do we manage it?



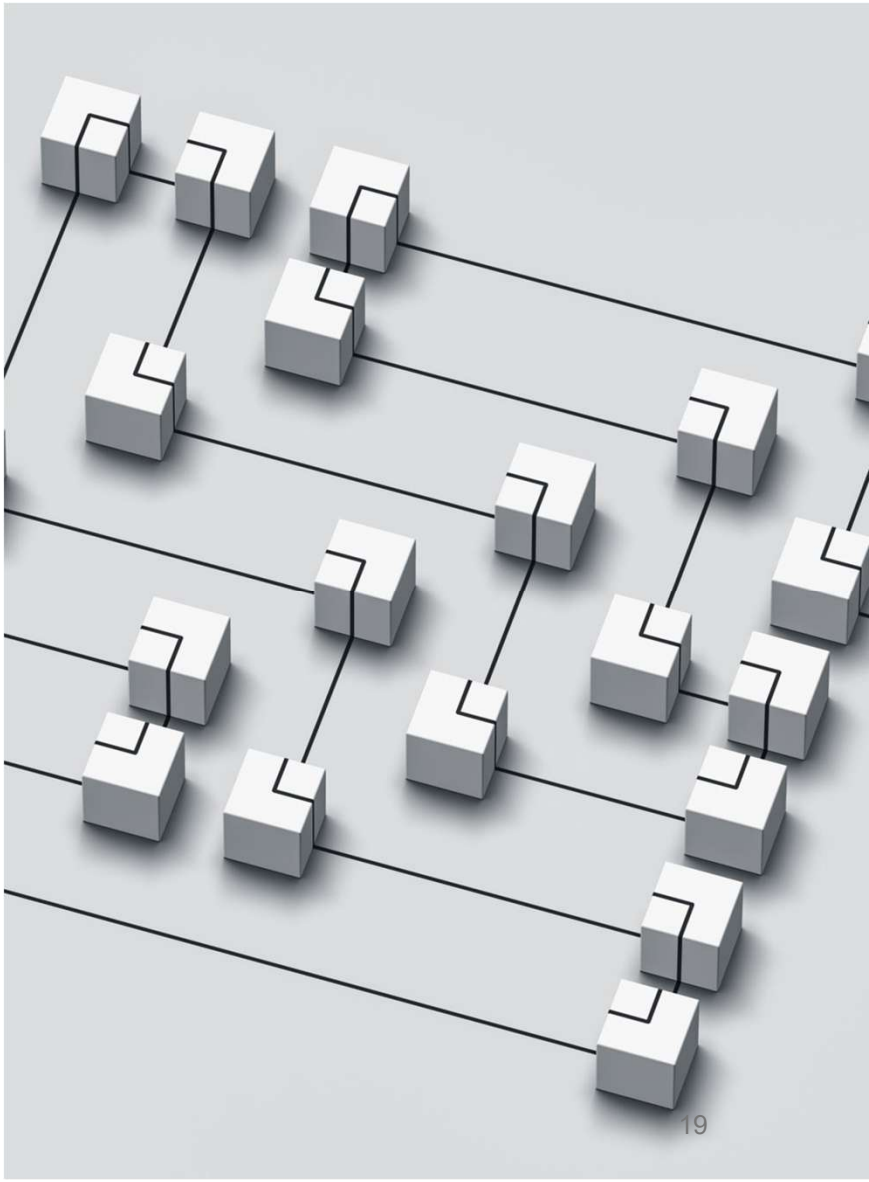
Graphic provided by Bill Leahy from *Unturning Steel, The MADE IN AMERICA Community*

Organizational Items to Consider

- Maintenance/Reliability/ Maintenance/Operations
  - Organizational Ownership
  - Process/Procedures/Checklists
  - Governance
- Leadership
  - Executive Sponsor
- Human Resources
  - New Skills Required
  - Organizational Changes
  - Job Descriptions and Hiring Requirements
- Accounting and Finance
  - Budget/Cost
- Purchasing & Procurement
  - Purchasing Specifications & Contracts
- IT
  - Technical Requirements
  - Security
  - Data Location
- Legal
  - Disclaimer
  - Liability for Hallucinations
  - Overall Contract Language
- And More

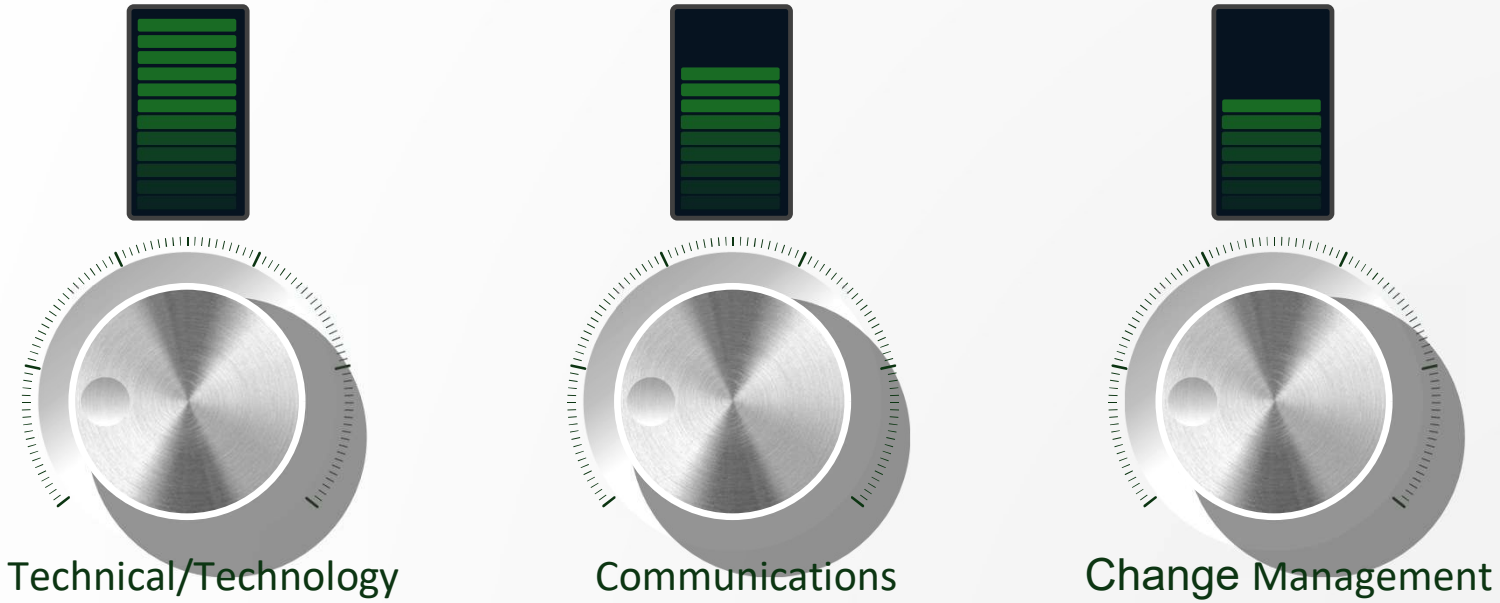
Building Blocks

- **Standard** – Minimum expectable level of performance.
- **Framework** – Structure and guidance for organizing, managing, and improving specific aspects of an organization's operation.
- **Management System** – A framework for gathering and analyzing information and data to help an organization:
  - Make informed decisions
  - Set Strategic goals
  - Track progress
- **Benchmarking -** is **outward-looking** and inherently **comparative**. It involves **looking beyond the organization** to compare with external standards, peers, or industry leaders. The **aim is to identify gaps** in performance or processes and to uncover **actionable insights** that can drive **improvements** based on best practices from outside the organization.
- **Assessment** - is primarily **inward-looking**, focusing on the internal attributes or performance of an individual, group, or organization. It seeks to understand the **current state or effectiveness** of the subject being assessed, **without** necessarily **comparing it to external standards or entities**. Assessments can take various forms:
  - Tests
  - Surveys
  - Observations
  - Reviews



Graphic courtesy of Allison Field

Technology Programs



Projects are technical, communication, & change management activities

Importance of Data for Maintenance, Reliability, and AI

Do You Trust Your Asset Management Data? Answer < 60%

> *Business assets (humans, machines, everything) now generate massive amounts of data that needs to be captured, processed, analyzed, and transmitted in real-time if enterprise systems are to be productive, efficient, and robust.*
>
> *Forbes*

> *A transformative shift from reactive to proactive asset management, powered by data and analytics, heralds a future-ready approach to pre-empt asset failures.*
>
> *AI and Emerging Technologies for EAM Systems*
> *Ernst & Young*

Connected Devices

- 2019 – 8.6B
- 2025 – 25B (180 ZB)
- 2030 – 50B

ZB=1,180,591,620,717,411,303,424 bytes

History to AI Driven Reliability

Graphic provided by AI, Deep Learning, and Machine Learning Group LinkedIn page

Poor Data

Poor Data Leads to:

- Delayed or incorrect maintenance actions
- Inefficient use of labor and materials
- Missed warranty claims
- Weak reporting and audit risk
- Poor decision-making capabilities
- Incidents/breakdowns/injuries

Align Data Cleanup and Cloud Readiness:

- Minimize unnecessary historical data unless it's tied to compliance
- Enforce relationships between parent and child assets
- Standardize values used in filters, KPIs, and mobile apps
- Reduce “data noise” that can pollute dashboards
- Maintain full auditability of transformations for future traceability
- Implement and adhere to a data governance process

Information provided by Erin Pierce, *Don’t Move the Mess: Cleaning Legacy Data Before Your Move to MAS*, 10/8/25

Data Reality Check

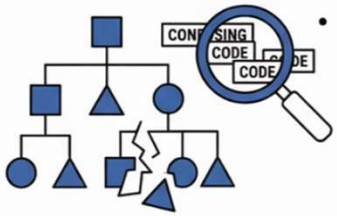
Your CMMS data is not AI-ready by default

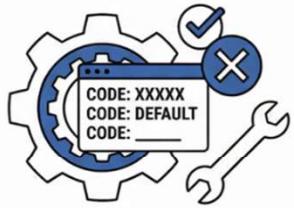
Most organizations think they have good data because their CMMS is full. But volume isn't quality. AI models learn from patterns—and if those patterns are chaos, you get garbage predictions. Here are the four landmines hiding in your data right now.

Reality Check: If your closeout notes are weak, your model learns nonsense. Period. AI can't fix what humans won't document properly.

Free-text fields with no standards:
Inconsistent descriptions.

Asset hierarchy missing or inconsistent:
Multiple naming conventions.





Failure codes unused or misapplied:
Blank or default codes.

Bad timestamps and incomplete records:
Estimated dates, missing labor hours.

Data Quality Sprint: The 30-Day Blitz

Data quality isn't a one-time project—it's a discipline. But you need a forcing function to start. This 30-day sprint gets you from chaos to usable in one month.

Week 1: Audit & Baseline

Extract last 12 months of work order data for critical assets.

- Run data quality checks for blank Asset IDs and Failure Codes.
- Assess WOs with zero labor hours or short descriptions.
- Identify assets without criticality ratings.

Present findings to leadership, quantifying the impact of data gaps.

Deliverable: Data quality scorecard with baseline metrics

Week 2: Standardize & Enforce

Define mandatory closeout fields in CMMS, working with IT to enforce:

1. Asset ID (must match asset master)
2. Failure Code (from approved list)
3. Labor Hours (actual, not estimated)
4. Failure Cause (dropdown or text)
5. Corrective Action Taken (dropdown or text)

Create and distribute visual job aids for failure codes.

Train supervisors on new closeout requirements and their importance.

Deliverable: Mandatory field enforcement live in CMMS. Training completed.

Week 3: Clean Historical Data (Top Assets Only)

Identify top 50 critical assets; pull all work orders for these from last 6 months.

- Backfill missing data like failure codes and asset IDs.
- Standardize asset IDs (fix duplicates, typos).
- Fill in labor hours from crew timesheets where possible.

Validate cleaned data by spot-checking 20 work orders for accuracy.

Deliverable: 6 months of clean data for top 50 assets

Week 4: Monitor & Reinforce

Set up a weekly data quality dashboard to track:

- % WOs closed with all 5 mandatory fields complete.
- % failure codes used vs. blank/default.
- Top 10 assets with most data quality issues.

Review new data weekly, identify low compliance, and coach individually.

Celebrate wins and recognize crews with 100% compliance.

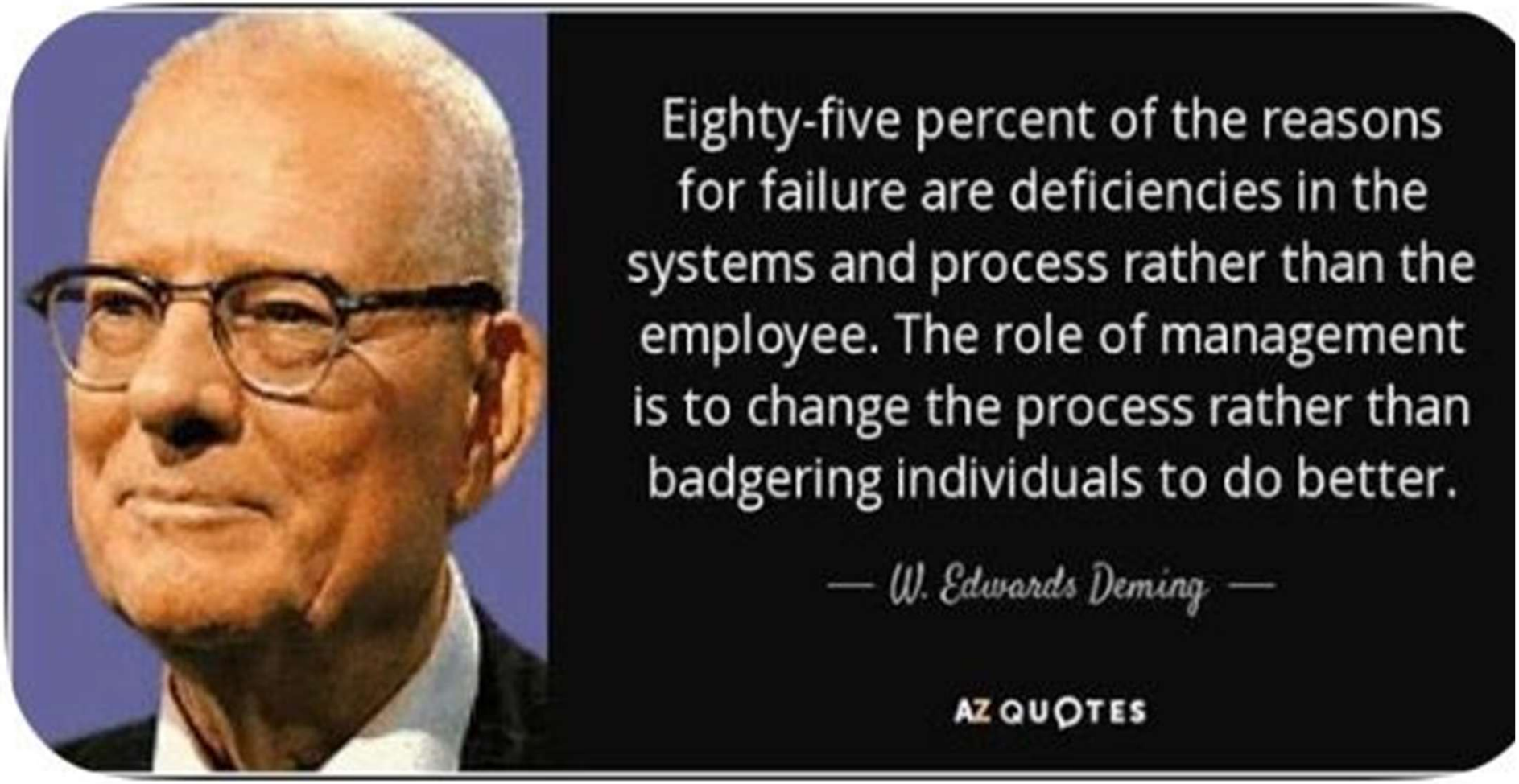
Deliverable: Weekly data quality monitoring process established

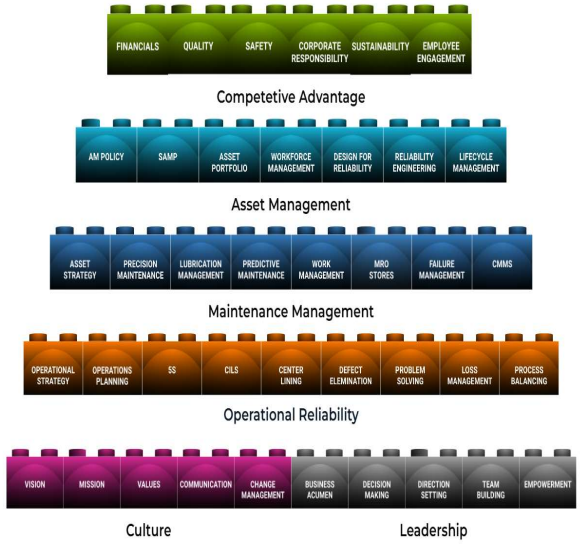
The Hard Truth: Expect pushback; hold the line by explaining why data quality matters. Discipline beats convenience every time

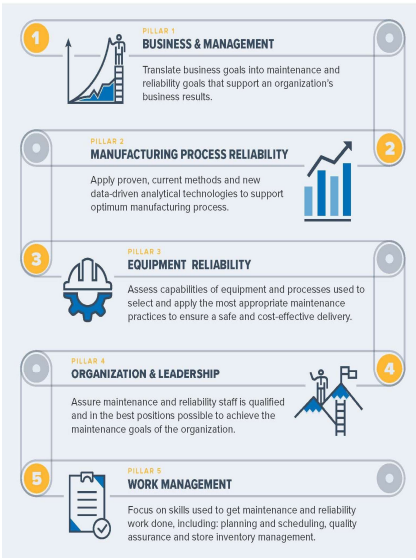
Graphic provided by Charles Menke

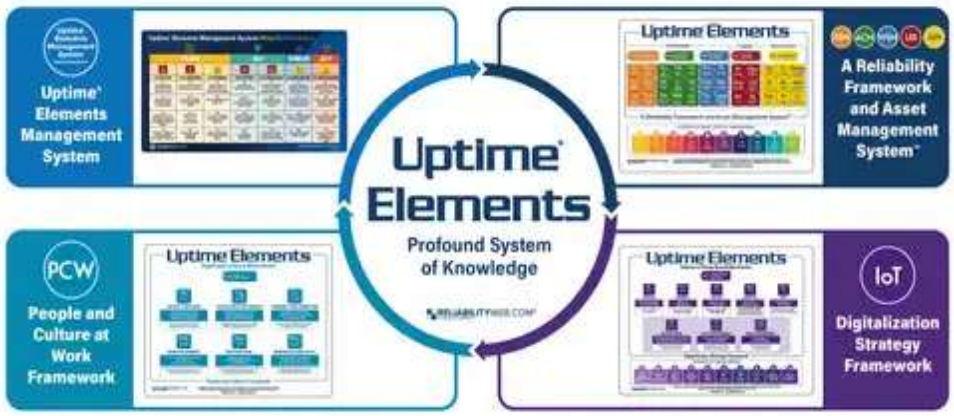
Process, Procedures, and Checklist:

- **Must Have – Set Expectation**
- **Train**
- **Governance**
- **Continuous improvement**


Eighty-five percent of the reasons for failure are deficiencies in the systems and process rather than the employee. The role of management is to change the process rather than badgering individuals to do better.
— W. Edwards Deming —
AZ QUOTES



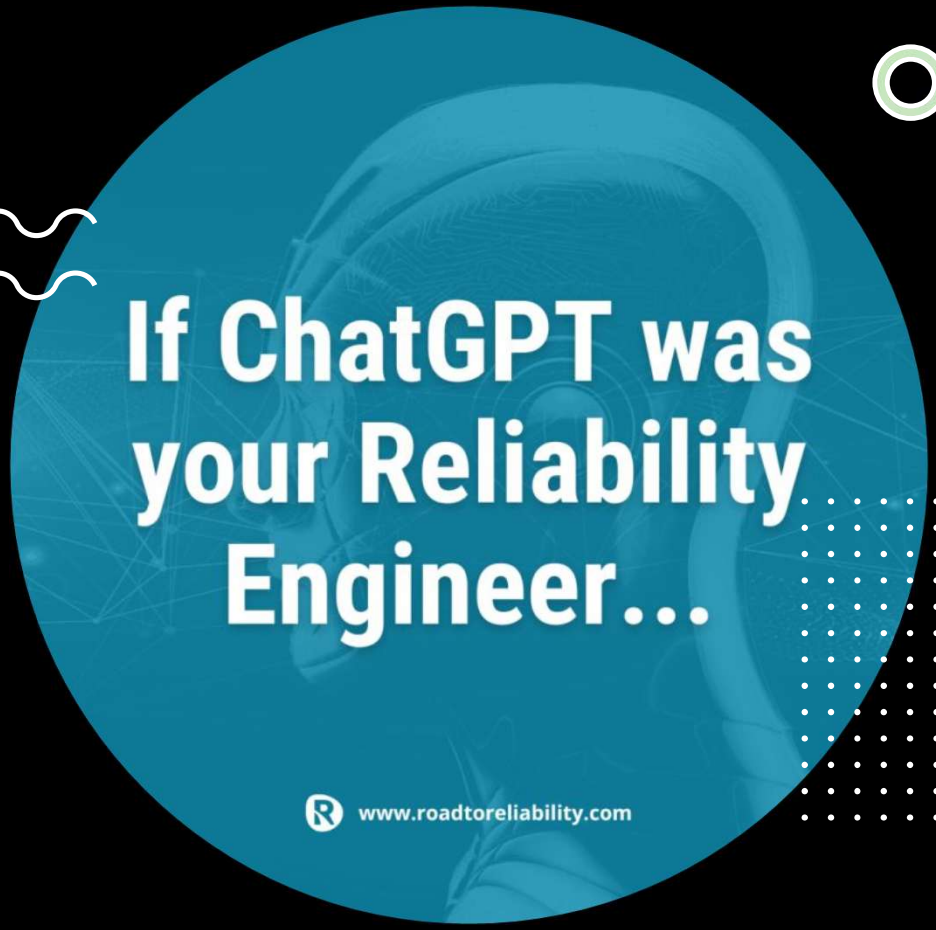




Reliability Frameworks

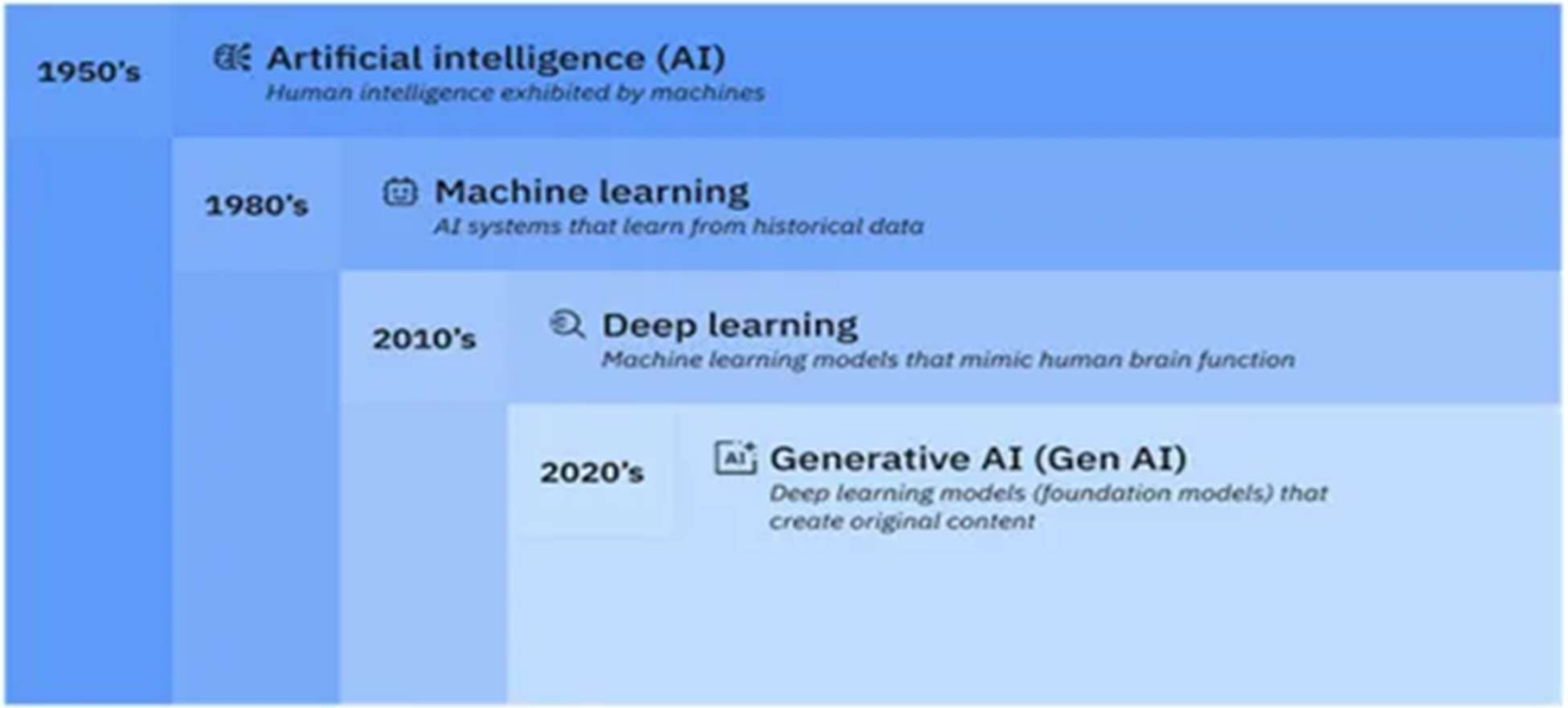
- LCE
- Reliability Academy
- ReliabilityWeb
- ReliabilityX
- SMRP

Transition:
AI Foundation
&
Fundamentals

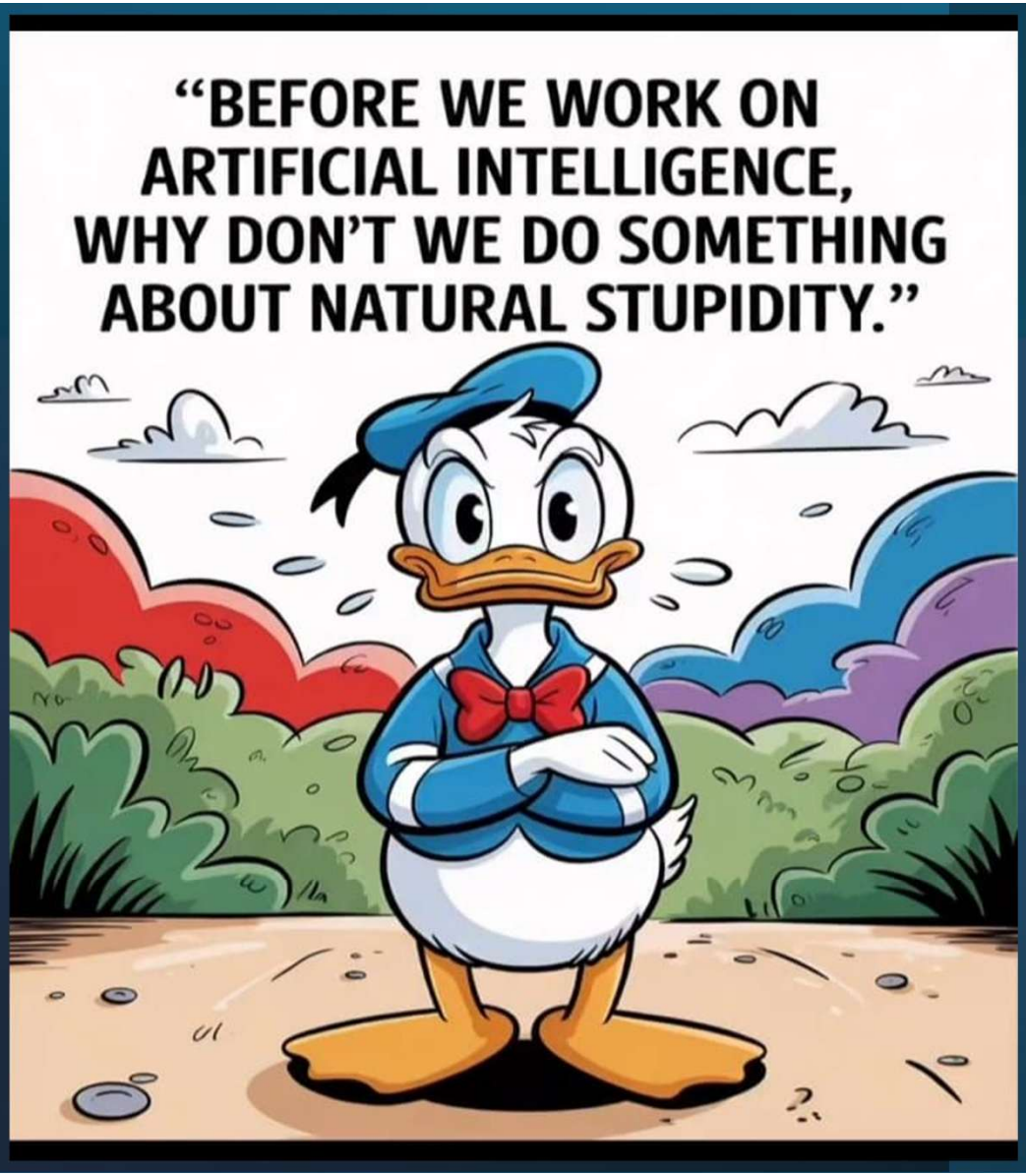


Reliability Academy Graphic – Erik Huple

Age of AI

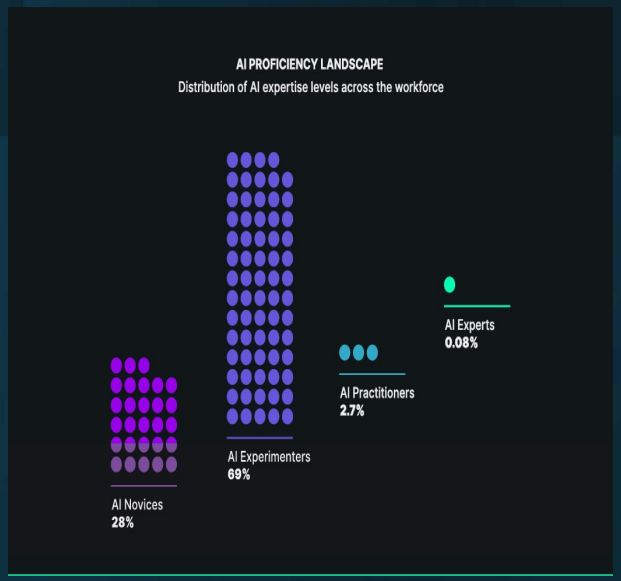


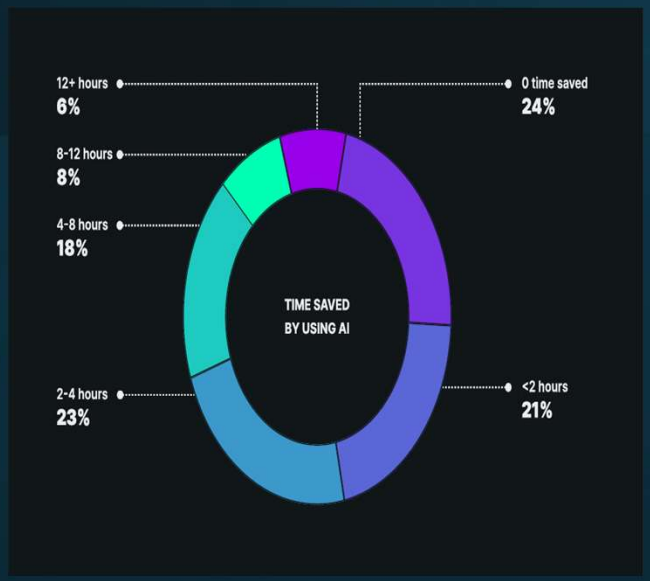
Graphic from Stryker & Kavlakoglu, 2024

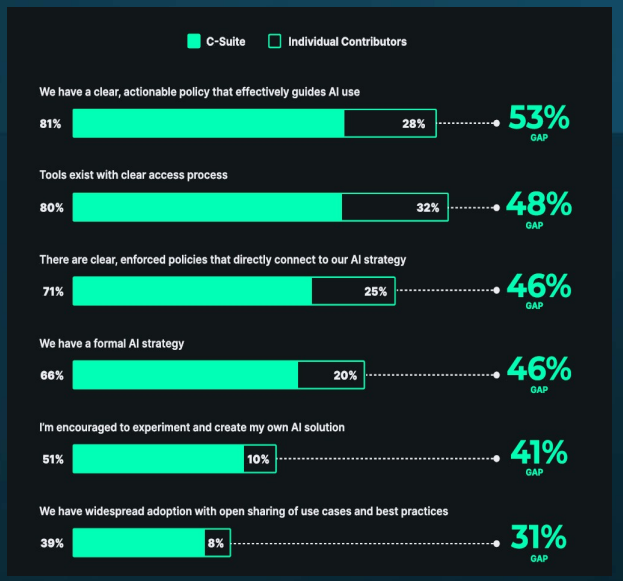


Graphic provided by Pretap Kambley

AI Proficiency

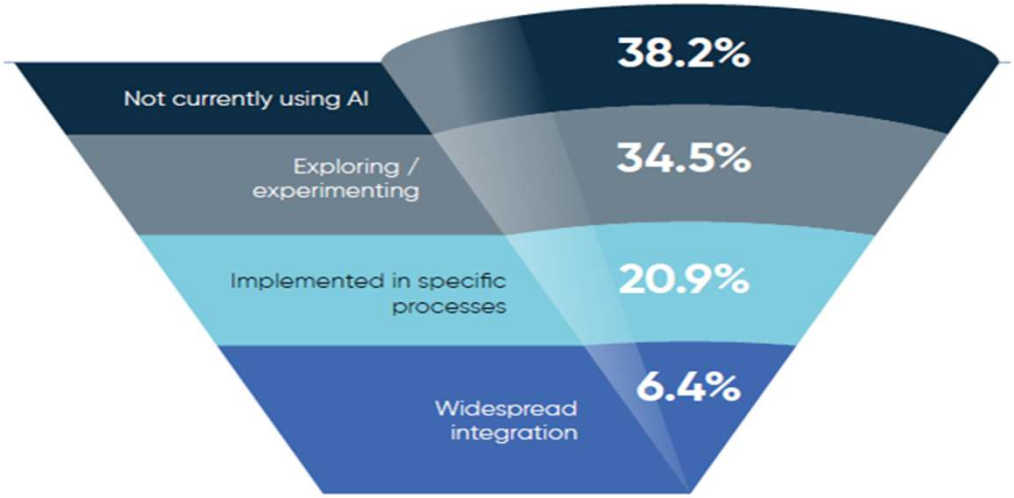


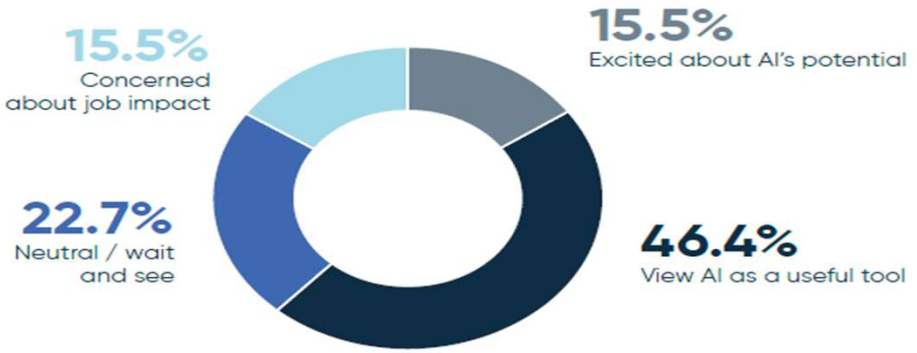


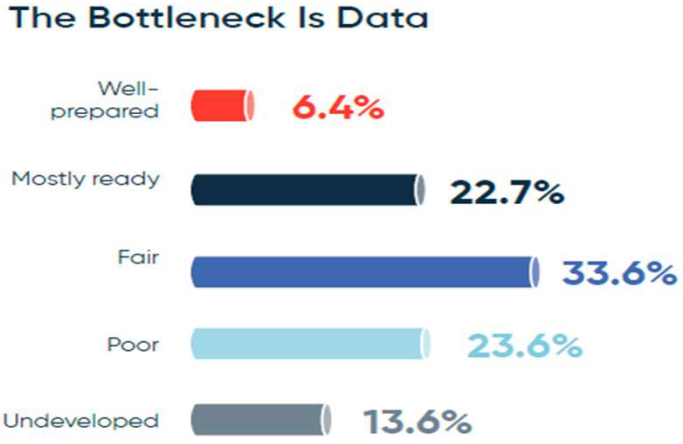


Graphics provide by *Section 2026 AI Proficiency Report*

The State of AI and Maintenance in 2026 Survey





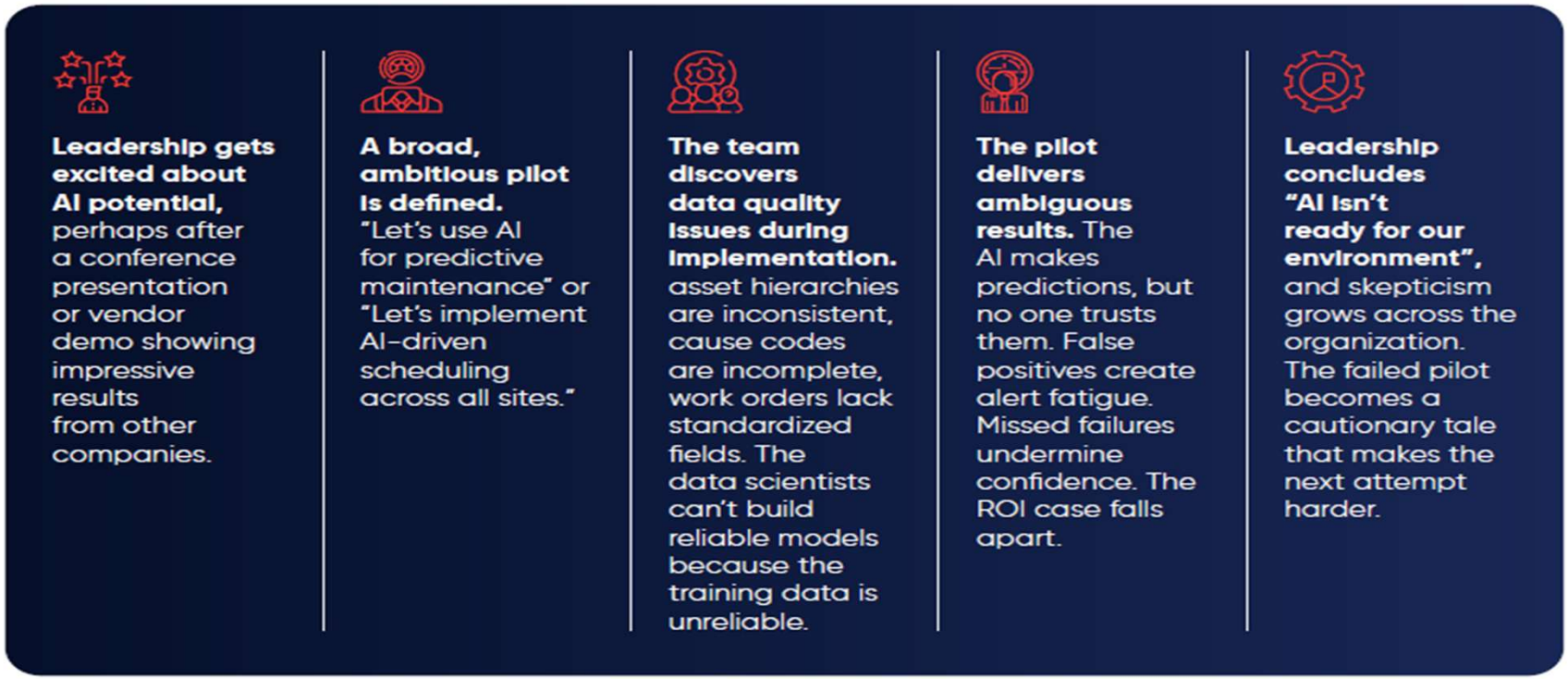


Graphic from Upkeep's *State of Maintenance 2026 Report*

The State of AI and Maintenance in 2026 Survey

Why Most AI Pilots Stall

Most AI pilots in maintenance follow a predictable pattern:



Graphic from Upkeep's *State of Maintenance 2026 Report*

What This Means for AI

The Current State

The data is clear about where the industry stands:

72.7%
are not using AI or only experimenting

70.9%
rate data readiness as fair, poor, or undeveloped

61.9%
are excited about AI or view it as a useful tool

A Better Approach

The strategy is not "go deploy AI." The strategy is "make one workflow AI-ready, prove value and scale."

Step 1: Pick one workflow where success is measurable. Don't try to make "make maintenance AI-ready." Pick a specific process (e.g. work order triage, PM scheduling, parts forecasting) where you can define and measure success.

Step 2: Fix the inputs. Before deploying AI, fix the data quality issues in that specific workflow. Standardize the taxonomy. Clarify the cause codes. Clean up the asset hierarchy for assets involved in this workflow.

Step 3: Define what "better" means. Set measurable outcomes: time-to-assignment reduced by X%, first-time fix rate improved by Y%, schedule adherence improved by Z%. These become your success criteria.

Step 4: Deploy and measure. Implement AI in the specific workflow. Measure against defined success criteria. Give it time to generate meaningful data, typically 3-6 months.

Step 5: Scale to the next workflow. Once one workflow is demonstrably improved, apply the same approach to the next. Build momentum through demonstrated wins.

Graphic from Upkeep's *State of Maintenance 2026 Report*

AI Fundamentals in 4 Buckets

Forget the hype. AI for reliability breaks down into four practical categories. Each one solves different problems. Each one needs different data. Understanding which bucket fits your use-case is half the battle.

Classification

What it does: Sorts things into categories

Reliability example: Auto-assign failure codes from work order descriptions

Data needed: Historical coded failures

Forecasting/Regression

What it does: Predicts numeric outcomes

Reliability example: Forecast parts demand or predict remaining useful life

Data needed: Time-series metrics, usage patterns

Anomaly Detection

What it does: Flags unusual patterns

Reliability example: Identify condition monitoring outliers in vibration or temperature data

Data needed: Sensor streams, baseline "normal" behavior

Natural Language Prompting (NLP)/GenAI

What it does: Understands and generates text

Reliability example: Draft job plans, summarize failure trends, assist with root cause analysis

Data needed: Quality text descriptions, structured prompts

Where AI Wins Early

Based on current technology and adoption patterns, these applications are delivering value:

Application	What It Does	Why It Works
Work request triage	Automatically categorizes and routes incoming requests	Reduces dispatcher workload; improves consistency
Work order structuring	Turns unstructured technician input into standardized data	Improves data quality as byproduct of normal work
Suggested troubleshooting	Surfaces relevant history and likely causes based on symptoms	Helps less experienced technicians perform like veterans
Schedule optimization	Adjusts PM schedules based on actual conditions and constraints	Prevents both over-maintenance and under-maintenance
Parts forecasting	Predicts demand to optimize inventory levels	Reduces stockouts and excess inventory
Documentation prompts	Nudges technicians for missing information at closeout	Improves completeness without adding friction

Graphic from UpKeep's *State of Maintenance 2026 Report*

AI -101

Feature	Traditional AI	Predictive AI	Generative AI	Agentic AI
Primary Function	Classification or prediction	Forcast Outcomes/Trends based on histoical patterns	Content creation (text, images)	Goal-driven action and execution
Initiative	Reactive: Waits for input	Proactive: When/what can Occur	Reactive: Responds to prompts	Proactive: Initiates workflows
Output	A single result or label	Numbers, categories, & probaility	Content based on a prompt	Completed multi-step tasks
Storage Size	KB to MB	KB to MB	GB-TB	GB-TB
Typical Parameters	Dozens to Millions	Dozens to Millions	1 Billion to 1Trillion	Billions, Typically LLMs
Hardware	CPU	CPU	High-end GPU/data center	High-end GPU with significant VRAM

Various Instructors (2025), University of South Florida, *Gen AI in Action: Impact and Possibilities Course*. Taken November 2025 – December 2025

Additional Terms

- Additional Terms/Information:
  - Machine Learning (ML) - The use of data to improve performance of associated, targeted and AI systems over time. It is a system that learns from historical data.
  - Deep Learning (DL) – ML with deep neural networks. These are ML models that mimic human brain function.
  - Neural Networks – Artificial networks that are modeled after the human brain's structure and function. These networks consist of interconnected layers of nodes that work together to process and analyze complex data.
  - Natural Language Processing (NLP) – Language modeling that correlates probability distribution or a collection of rules to capture properties of human language models.
    - ✓The most common of these is the Large Language Model (LLM), which is the foundation of products like Chat GPT.
    - ✓LLM's are a type of DL architecture used for language processing (USF, 2025).

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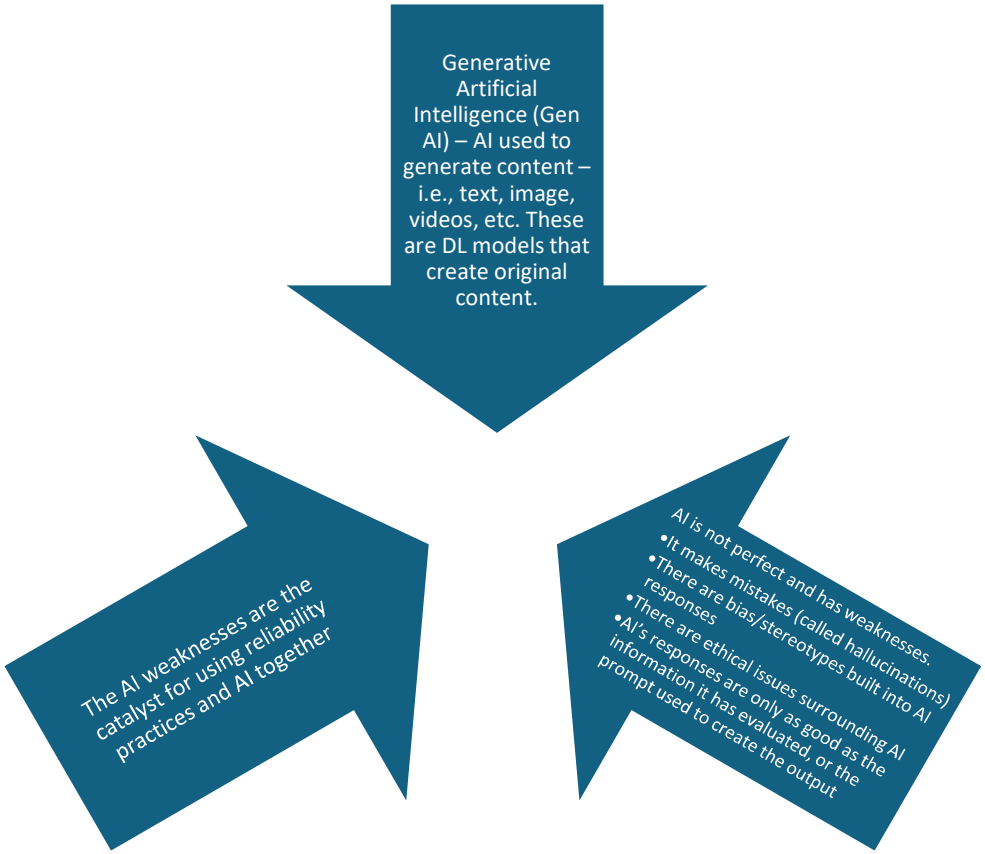
Generative AI



Various Instructors (2025), University of South Florida, *Gen AI in Action: Impact and Possibilities Course*. Taken November 2025 – December 2025

Prompting = Requirements for GenAI

Writing a prompt is like writing requirements for a junior planner. Vague input gets vague output. Specific, structured prompts get useful work. This is the skill that separates GenAI users from GenAI complainers.

Bad Prompt

```
Write a job plan for pump maintenance.
```

Result: Generic, unusable boilerplate that wastes everyone's time.

Good Prompt

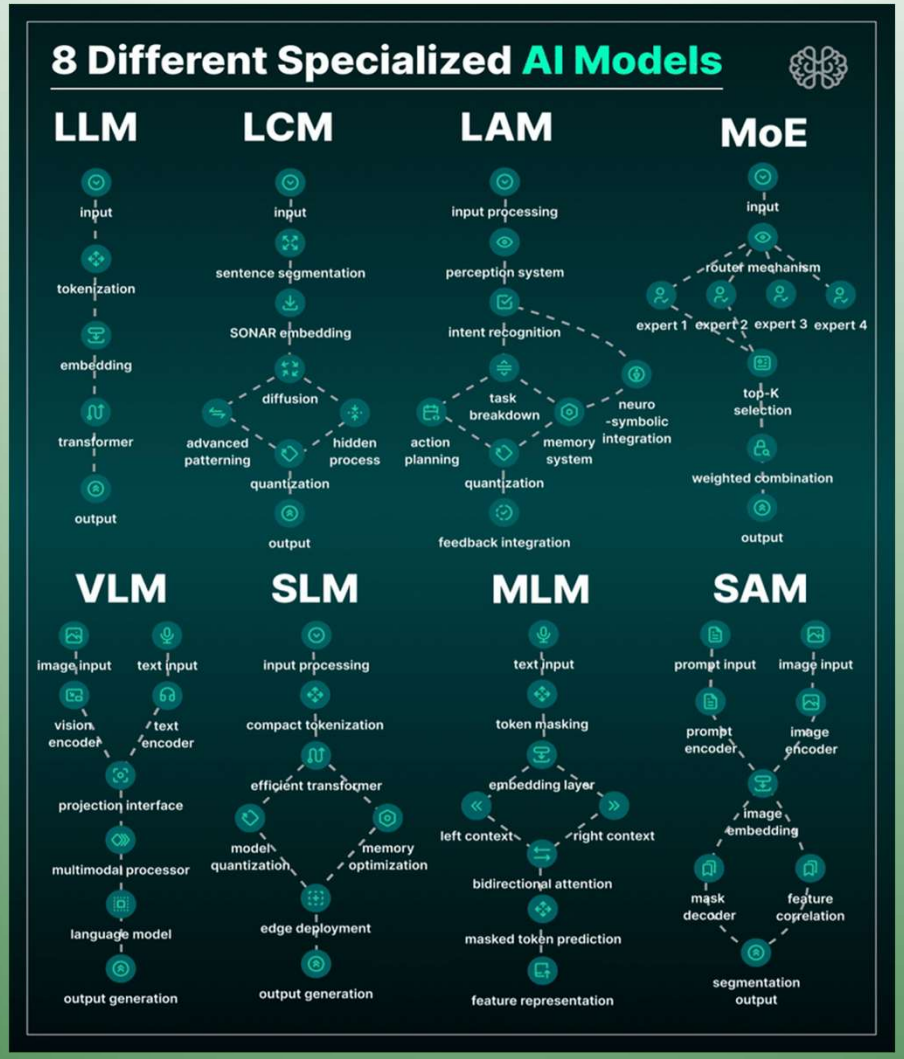
```
You are a maintenance planner for a refinery. Write a job
plan for quarterly PM on a centrifugal pump (model XYZ-
500, criticality A). Include safety permits, lockout
steps, torque specs for impeller bolts, alignment
tolerances, and estimated labor hours. Format as: Safety
→ Lockout → Disassembly → Inspection → Reassembly →
Testing. Verify all torque values against OEM manual.
```

Result: Actionable, specific, ready for tech review.

Role: Define who the AI is (planner, analyst, technician)
Context: Asset type, criticality, operating conditions
Constraints: Safety requirements, regulatory standards, limits
Format: Specify output structure (checklist, narrative, table)
Examples: Show what good looks like when possible
Verification: Ask AI to check its work against standards

Interactive Exercise: Take 30 seconds—rewrite this prompt: "Help me with backlog." Make it specific, contextual, and actionable.

AI Models



Graphic Provided by Charafeddine Mouzouni

Agentic AI

- Agentic AI – Autonomous AI systems that can independently set goals, plan, reason, and execute complex, multi-step tasks with minimum human oversight, acting proactively to achieve objectives.
- AI Agents - Synonymous term for Agentic AI but is setup to accomplish desired outcomes.
    - Uses LLMs for understanding but add planning, memory, and tool integration for more sophisticated goal –oriented behavior.
- Unlike traditional AI that follows strict commands, agentic AI adapts to dynamic environments, uses external tools, and learns from real-time data to make decisions and improve performance, functioning more like a human employee with initiative.
- Key Characteristics
    - Autonomy: Operates independently, making decisions without constant human input.
    - Goal-Oriented: Focused on achieving specific goals, outcomes, or objectives.
    - Planning & Reasoning: Breaks down complex goals into actionable steps and decides the best path forward.
    - Learning & Adaptability: Learn from new data and experiences, adjusting in **real-time.**
    - Tool Use: Can interact with and utilize external tools and other AI systems
    - Environmental Understanding: Process multimodal data (text, audio, video) to get a complete picture.

Various Instructors (2025), University of South Florida, *Gen AI in Action: Impact and Possibilities Course*. Taken November 2025 – December 2025

Agentic AI

Key Components

- Perception: Gathering real-time data from diverse sources like sensors, logs, and APIs.
- Memory: Retaining context from past interactions (short-term) and learned experiences (long-term) to ensure consistency.
- Orchestration: Managing multiple specialized agents to collaborate on complex, cross-departmental problems.
- Reflection: Self-evaluating results to improve future performance through reinforcement learning

How Agentic AI differs from traditional AI?

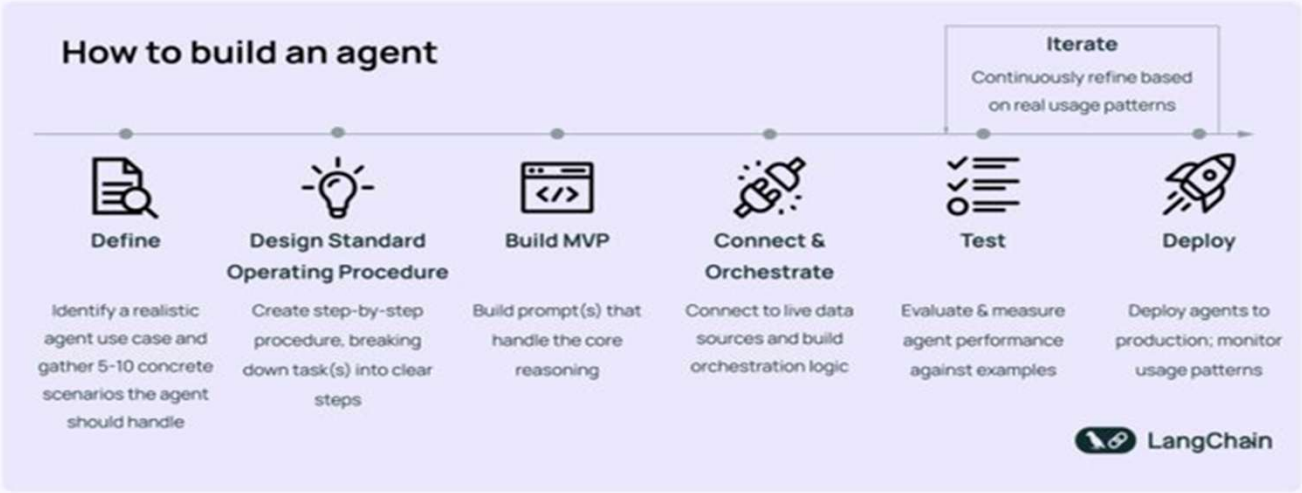
- Traditional AI: **Reactive**, follows predefined rules or script, requires explicit commands
- Agentic AI: **Proactive**, reasons through problems, and takes initiative to solve complex, end-to-end processes.

Industry Outlook for 2026 and Beyond

- By 2026, agentic AI is expected to be a mainstay in enterprise operations. Salesforce forecasts **1 billion AI agents** in service by this year. Gartner predicts that by 2028, one-third of enterprise software will include agentic AI, with **15% of daily work decisions** being made autonomously. Organizations are increasingly moving toward "multi-agent ecosystems" where specialized agents for IT, HR, and Finance collaborate seamlessly.

Various Instructors (2025), University of South Florida, *Gen AI in Action: Impact and Possibilities Course*. Taken November 2025 – December 2025

Agents

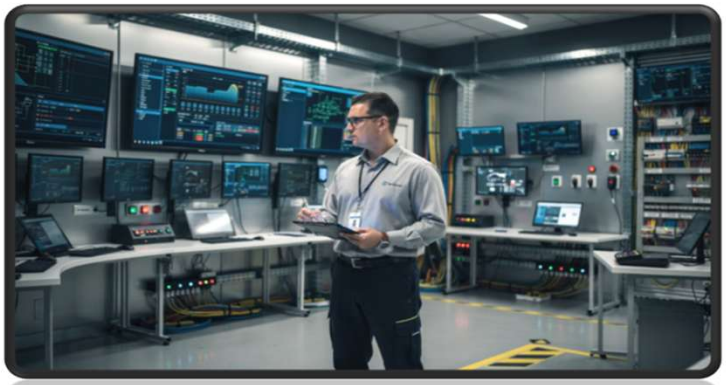


LangChain

Stage	Define	Design Standard Operating Procedure	Build MVP for Core Prompts	Connect & Orchestrate	Test & Iterate	Deploy, Scale & Refin
Description	*Identify a realistic agent use case and gather 5-10 concrete scenarios the agent should handle*	*Create a step-by-step procedure, breaking down the task(s) into clear steps a human would follow*	*Design agent architecture; Build prompt(s) that handle the core reasoning*	*Connect to live data sources and build orchestration logic*	*Evaluate agent against examples; Identify failures & iterate to improve reliability & performance*	*Deploy agent & monito how users interact; continuously refine bas on real usage patterns*
Duration	~1-2 week(s)	~1-2 week(s)	~1-2 week(s)	~2-3 week(s)	~1-2 month(s)	Ongoing
Output	Clear agent task scope & concrete use cases	Clear Standard Operating Procedure of step-by-step workflow, incorporating identified scenarios	Agent architecture and core prompt(s) that works with static data	End-to-end agent with live data	Agent with systematically tested performance	Improved agent with expanded capabilities
Stakeholders	Product Owner, Subject Matter Expert	Product Manager, Subject Matter Expert	Product Manager, AI & Prompt Engineer	Engineers	Product Manager, QA Engineer	PM, Engineers, Suppor
Example: Building an Email Agent	Example tasks: • Categorize email by priority • Schedules meetings • Answer product questions	Step-by-step procedure: • With incoming emails, label with email category & response priority • Checks calendar availability & schedule meeting • Draft response & queue for human review	Email agent architecture design with core prompts, incl. email routing & response generation; Test with manually provided context and sample data	Example integrations: • Gmail & Outlook for email access • Google & Outlook Calendar • CRM database for sender context	Evaluate email responses over success criteria: response quality, accuracy, and professional tone	Monitor traffic, use case and feedback. Iterate to improve performance an add additional features

Graphic provided by AI, Deep Learning, and Machine Learning Group LinkedIn page

Learning Types Mapped to Reliability



Not all AI learns the same way. The learning type determines what data you need and how much human input is required. Here's the breakdown that matters for asset management professionals.

Supervised Learning	Reliability Use-Case	Data Needed
Train on labeled examples	Predict failure modes from symptoms	Coded historical failures
Unsupervised Learning	**Reliability Use-Case**	**Data Needed**
Find hidden patterns	Cluster similar repeat failures	Unstructured WO text
Reinforcement Learning	**Reliability Use-Case**	**Data Needed**
Learn from trial/reward	Optimize PM intervals dynamically	Feedback on outcomes

Most reliability applications start with supervised learning—it's the most practical path when you have labeled failure history.

Transition:
Tools & Resources

Reliability Academy Graphic – Erik Huple

Resources

Company	website	LinkedIn Site	Consulting	Certification	Intellectual Property	Conferences	Training	Framework	Technology	Podcast	Newsletter / Blog	Other
Asset Analytix	http://www.assetanalytix.com/	https://www.linkedin.com/company/assetanalytix-the-official-page/	X		X		X		X		X	Assessment Optimization
Association of Asset Management Professionals (AMP)	https://assetmanagementprofessionals.org/	https://www.linkedin.com/company/association-of-asset-management-professionals/		X	X		X			X		Women in Reliability and Maintenance (WIRAM)
CMMSradio	https://cmmsradio.com/	https://www.linkedin.com/company/cmmsradio/	X		X					X	X	
efacility	https://efacility.app/	https://www.linkedin.com/company/efacility-app/							X			Information Management
Forum Reliability	https://www.forumreliability.com/	https://www.linkedin.com/company/forumreliability	X		X		X					
IFM Consulting LLC	https://www.ifmconsultingllc.com/	https://www.linkedin.com/company/ifm-consulting-llc/	X				X					IFM Services
Life Cycle Engineering (LCE)	https://www.lce.com/	https://www.linkedin.com/company/life-cycle-engineering/	X	X	X	X	X	X			X	
Noria	http://www.noria.com/	https://www.linkedin.com/company/noria-corporation/	X	X	X	X	X	X			X	Lubrication Specialty
Reliability Academy	https://www.reliabilityacademy.com/	https://www.linkedin.com/company/reliabilityacademy			X		X				X	Great Information
Reliability X	http://www.reliabilityx.com/	https://www.linkedin.com/company/reliabilityx/	X		X		X	X		X	X	
Reliabilityweb.com (RW)	http://www.reliabilityweb.com/	https://www.linkedin.com/company/reliabilityweb.com			X	X	X	X		X	X	Reliability Leadership Institute (RLI)
Reliable ∞	https://www.reliamag.com/	https://www.linkedin.com/company/reliamag/			X		X				X	
Society of Maintenance & Reliability Professionals (SMRP)	Society for Maintenance & Reliability Professionals | SMRP	https://www.linkedin.com/groups/1405447/		X	X	X	X	X		X	X	
Squint AI	https://www.squint.ai/	https://www.linkedin.com/company/squintai/	X		X				X			Artificial Intelligence
Tractian	https://tractian.com/en	https://www.linkedin.com/company/get-tractian/	X		X				X			Artificial Intelligence
UpKeep	http://www.upkeep.com/	https://www.linkedin.com/company/on-upkeep/	X		X	X	X	X		X	X	
World Class Maintenance	http://worldclassmaintenance.org/	https://www.linkedin.com/company/world-class-maintenance	X		X							Best Practices

Resources

STRATOSPHERE

RMC

MAVEN

Reliability Academy

nexus global

People and Processes

AssetAnalytix

eFACILITY

Squint AI

UpKeep

MetaExperts

Reliability ∞

LCE

ReliabilityX

UNIVERSITY of SOUTH FLORIDA

TRACTIAN

RELIABILITYWEB.COM®
A Culture of Reliability®

Tools

Loss Calculator

Description *

Details

Designed Run Rate in Unites Per Minute *

Average Daily Hrs of Run Time *

Avg Shifts Per Day of Runtime *

Avg Days per Week Line Runs *

Weeks Per Year of Run Time *

Times per shift issue occurs *

Avg length of occurrence in minutes *

Cost to produce per unit *

Sales price per unit *

Annual Contribution Margin Loss

$0.00

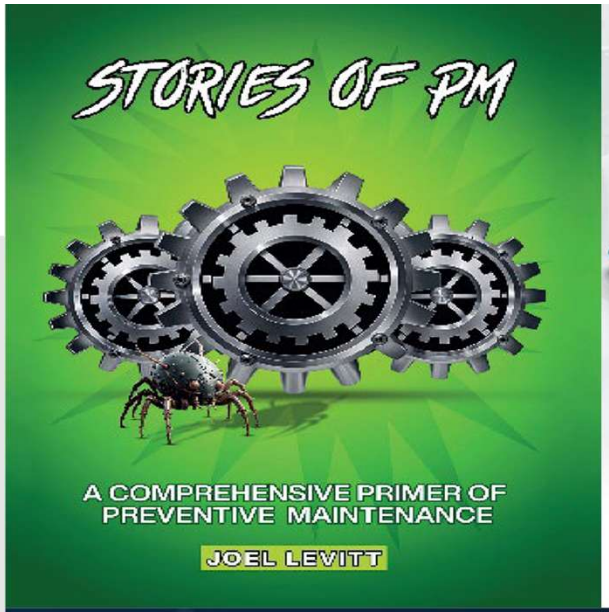
Annual Revenue Loss

$0.00

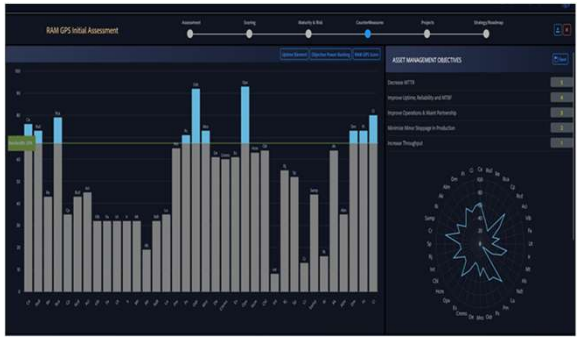
Email *

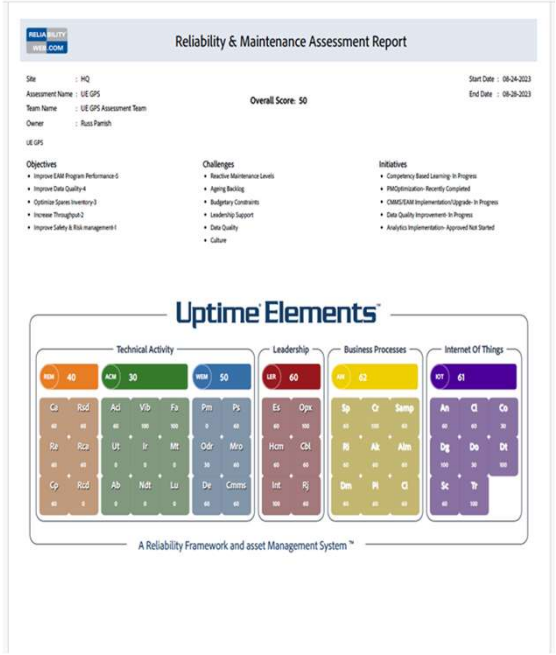
ReliabilityX

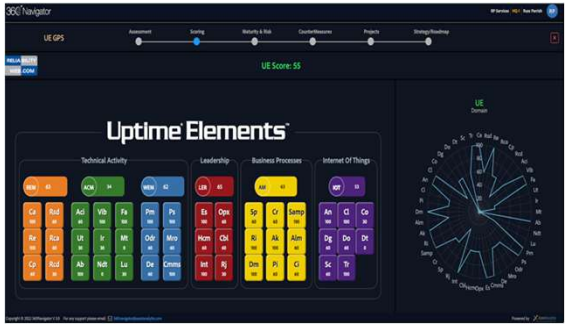
Print



Assessment Examples



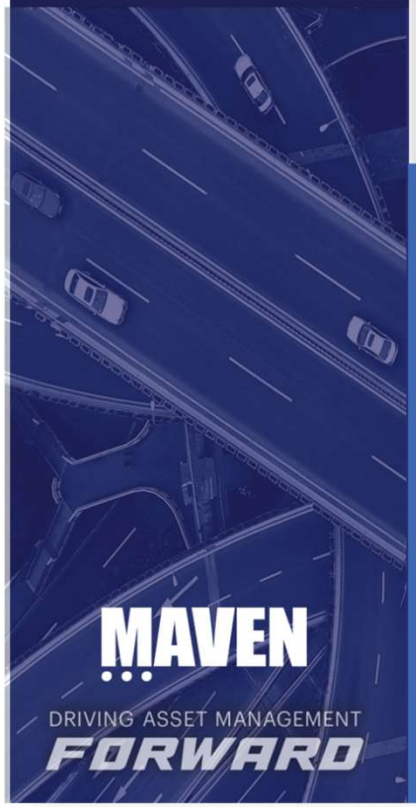




UE GPS™

RAM GPS™

Our Background



Qualified

16 YEARS OF *SUPERIOR* MAXIMO SERVICES

- 100s+ of Years of Maximo Experience
- Commitment to Maximo Community

Certified

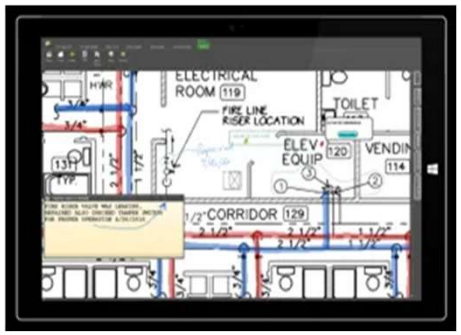
- Distinguished IBM Business Partner
- Certified IBM Maximo consultants
- Awarded ISO 9001:2015 Certification

Trusted

- High Customer Satisfaction
- Long-standing Relationships Based on Trust
- Teaming Partnerships with Clients

eFACILITY

- Company Synopsis: eFacility provides an easy-to-use software application that makes facility information management simple, efficient, and accessible.
  - This innovative platform provides real-time access to critical facility data, helping teams work smarter, reduce downtime, and improve operational and maintenance efficiency.
  - This allows teams to gain visibility and control while reducing costs.
- Core Services, Products, & Resources:
  - eFacility Software
    - Provides complete information regarding the facility or project by organizing 2D drawings, in a 3D grid, and using patented navigation to move between trade drawings on a mobile tablet. Combine this with the ability to view and record information at any location, ensuring that information gets to the person who needs it, when they need it, and where they need it.
    - Facility Intelligence Platform – Provides document management as a service.
  - Features
    - Organize drawings
    - Store almost any document you can and link directly to a specific location on a drawing.
      - ✓ PDF, Excel, Word, MP4, JPEG, etc.
    - Easily view drawings from a centralized server, in an organized manner, on any device
    - Design Grid, Shop Grid, Design Details, Shop Details, all organized by drawing sticks.
    - Add markups and notes
    - Grid view by floor and trade



Born from Tragedy, Built with Purpose

One Veteran, One Opportunity, One Community at a Time

Dual Mission: At UTS, they tackle two national challenges at once:

- Veteran Suicide and Transition Stress: UTS supports service members during the most vulnerable phase of their journey—the transition to civilian life—by providing community, certainty, and purpose.
- Manufacturing Workforce Crisis: UTS delivers reliable, trained, and mission-ready talent to American manufacturing, reducing costly workforce gaps and supporting long-term operational excellence.

UTS Website: https://www.unturningsteel.org/
UTS Donation Site:
https://argentasoftware.com/interfaces/50275/frmDonationForm.aspx
UTS Volunteer Site:
https://argentasoftware.com/interfaces/50275/frmVolunteerForm.aspx
UTS LinkedIn Site: https://www.linkedin.com/company/unturningsteel/

What: Through the DoD SkillBridge program, veterans are matched with U.S. manufacturers to fill essential roles in operations, maintenance, and engineering. The partnership between SkillBridge and UTS offers active-duty service members:

- Education and training in reliability and operations best practices
- Professional certifications through academic and professional partners like SMRP
- Career opportunities with American manufacturers
- 3–6 months of real-world experience embedded at host companies
- One-on-one coaching and mentorship from expert reliability professionals
- These participants fill vital roles in operations, maintenance, engineering, and leadership—at no cost to the veteran or the host company.
- They also complete a reliability project as part of their curriculum, contributing directly to their host's bottom line.

Information provided by Bill Leahy from *Unturning Steel, The MADE IN AMERICA Community*

Stratosphere accelerates digital transformation with enterprise grade solutions that streamline ERP data migrations, implement digital twins, and optimize operations.

They are your Industry 4.0 marketplace for manufacturing. Stratosphere Business Solutions specializes in connecting manufacturers to cutting-edge technologies, offering FedRamp-certified solutions powered by Palantir Technology, the largest, most advanced, and secure software development platform in the world.

https://**stratospheresolutions**.biz/

Certifications

Certification	Link	Organization
Certified Reliability Engineer (CRE)	https://www.asq.org/cert/reliability-engineer	ASQ
Certified Maintenance & Reliability Professional (CMRP)	https://smrp.org/Certification	SMRP
Certified Maintenance & Reliability Technician (CMRT)	https://smrp.org/Certification	SMRP
Asset Reliability Practitioner (ARP)	https://www.mobiusinstitute.com	Mobius Institute
Certified Reliability Leader (CRL)	https://assetmanagementprofessionals.org/certified-reliability-leader-overview/	AMP
Reliability Engineering Certification (REC)	https://lcemarketplace.com/rec	LCE University Partners
Certified Asset Management Assessor (CAMA)	https://www.wpiam.com	WPiAM
Certified Professional Reliability Engineer (CPRE)	https://cpre.ireb.org	IREB
Reliability & Maintainability Implementation Certification (RMIC®). People and Process supports prepatory Training for this certification.	https://rmc.utk.edu/professional-development	Univ of Tenn RMC People and Process
Graduate Certificate in Reliability and Maintainability Engineering (RME)	https://rmc.utk.edu/professional-development	Univ of Tenn RMC
RMIC® Planning and Scheduling Practitioner. People and Process supports prepatory Training for this certification.	https://rmc.utk.edu/professional-development	Univ of Tenn RMC People and Process
Reliability Centered Maintenance (RCM™). People and Process supports prepatory Training for this certification.	https://www.aladon.com/training/rcm-certificatio	Aladon Network People and Process
Maintenance Management Professional (MMP)	https://www.pemac.org/certification/mmp	PEMAC
Certified Asset Management Professional (CAMP)	https://www.cybiant.com/product/certified-asset-management-professional/	IAITAM
RAMS Certificate	https://rams.org/rams-tutorial-certificate-program/	RAMS®
TÜV SÜD Reliability & Functional Safety	https://www.tuvsud.com/en-us/industries/mobility-and-automotive/automotive-and-oem/iso-26262-functional-safety/iso-26262-functional-safety-certification-programme	TÜV SÜD
IEEE Reliability Society Credentials	https://credentials.ieee.org/application/certificates/	IEEE
Reliability & Risk Engineering (DNV)	https://www.dnv.us/assurance/Management-Systems/	DNV
Machinery Lubrication Tech (MLT) and othe lubrication related certifications. The are other oranizations who support certification training and administer exam at events.	https://www.icmlonline.com/ https://www.reliableplant.com/ https://www.noria.com/	ICML Noria Reliable Plant
Reliability Engineering Training (SAE)	https://www.sae.org/professional-development/certificate-programs	SAE International
Certified Professional for Requirements Engineering (CPRE)	https://cpre.ireb.org/en	IREB
Certified SRE Practitioner (GSDC)	https://www.gsdcouncil.org/certified-site-reliability-engineer-practitioner	GSGC

Certification	Link	Organization
Professional Certificate of Competency in Advanced Plant Maintenance & AI-Driven Predictive Technologies	https://www.eit.edu.au/courses/professional-certificate-of-competency-in-advanced-plant-maintenance-and-ai-driven-predictive-	EIT
AI for Predictive Machine Maintenance	https://www.enoinstitute.com/training-tutorials-courses/applications-of-ai-for-predictive-maintenance-training/	ENO Institute
AI Driven Predictive Maintenance and Asset Management	https://www.databricks.com/training/catalog/ai-industry-training-predictive-prescriptive-maintenance-4594	Databricks
AI Industry Training: Predictive & Prescriptive Maintenance	https://niccs.cisa.gov/training/catalog/tonex/certified-ai-reliability-engineer-care	Tonex (via NICCS)
Certified AI Reliability Engineer (CARE)	https://www.tonex.com/training-courses/certified-ai-reliability-safety-engineer-cairse/	Tonex
Certified AI Reliability & Safety Engineer (CAIRSE)	https://www.tuvsud.com/en-us/themes/artificial-intelligence/training/aiqcp	TÜV SÜD
AI Quality Certification Program (AIQCP)	https://gaqm.org/certifications/artifical_intellegence/caitp	GAQM/GSDC
Certified AI Testing Professional (CAITP)	https://www.gsdcouncil.org/certified-site-reliability-engineer-practitioner	GSDC
University of South Florida (USF) Microcredentials in AI	https://www.usf.edu/innovative-education/usf-microcredentials/usf-microcredential-programs.aspx	USF

2026 Industry Trends

For 2026, there is a significant surge in Industry 4.0 and Sustainability certifications (such as ESG or ISO 14001) as reliability engineering increasingly integrates with digital factory transformations and corporate climate goals.

Gartner Webinars

7 Forces That Will Drive the Future Beyond Technology

Presented by: Marty Resnick

Watch Now

How Today's AI Decisions Will Shape Human Success

Presented by: Tori Paulman

Watch Now

The Gartner Top 10 Strategic Predictions for 2026 and Beyond

Presented by: Daryl Plummer

Watch Now

Impactful Storytelling for Executives: Using GenAI to Inspire Your Stories

Presented by: Bruce Robertson

Watch Now

The AI Future of CIO Leadership and Management

Presented by: Kristin Moyer

Graphic from Gartner Presentations (Various).

Transition: Reliability/ AI Journey

Reliability Academy Graphic – Erik Huple

Common Sense Reliability ™

RPC Common Sense Process

- Listen to client's wants/needs
- Evaluate available info
- Perception vs. Reality
- Identify opportunities
- Create an achievable & sustainable plan
- Stress technical, communication & change
- Instill discipline to achieve desired results
- Put tools in place to sustain success

Customer Requirements

- Do basic foundational maintenance & reliability requirements well
- Operate in a data driven and proactive decision-making manner
- Embrace innovation and technology
- Invest in employees

*** 8 Pillars of Asset Operations Management**

- Maintenance, reliability, and operations must operate together and be aligned on achieving a common goal.
- Data must into flow into a single repository.
- Measure teams based on why they do something rather than what they do.
- Collect the right data, display the best insights, and provide actionable feedback through a centralized command center.
- Continuous Improvement as an abundant lifecycle, not just a point in time.
- Everything measured can be improved.
- Data accessible from wherever you are.
- Maintenance, reliability, and operations are revenue driver, not a cost center.

* From *Asset Operations – Maintenance, Reliability, and Operations in the Era of AI* by Ryan Chan @ UpKeep

Understanding the research that underpins the Road to Reliability

When industrial plants with a reactive maintenance culture implemented only Planning their uptime improved on average by 0.5% (to 84.0% from 83.5%)

When industrial plants with a reactive maintenance culture implemented only Scheduling their uptime improved on average by 0.8% (to 84.3% from 83.5%)

When industrial plants with a reactive maintenance culture implemented Preventive Maintenance only their uptime decreased on average by 2.4% (to 81.1% from 83.5%) due to the additional downtime to conduct preventive maintenance work.

Tactic	Uptime % change	Uptime	Downtime reduction
Reactive plants		83.5%	
Planning only	+0.5%		
Scheduling only	+0.8%		
Preventive / predictive Maintenance only	-2.4%		
All Three Tactics	**+5.1%**	**88.6%**	**30.9%**
Plus Defect Elimination	**+14.8%**	**98.3%**	**89.7%**

Industrial plants with a reactive maintenance culture were found to have on average an uptime of 83.5%

Industrial plants that practiced Planning, Scheduling and had a Preventive Maintenance Program, but no Defect Elimination had on average an uptime of 88.6%

Industrial plants that practiced Planning, Scheduling and had a Preventive Maintenance Program experienced 30.9% less downtime compared to reactive plants.

Industrial plants that practiced Planning, Scheduling, had a Preventive Maintenance Program and had implemented Defect Elimination experienced almost 90% less downtime compared to reactive plants.

When industrial plants with a reactive maintenance culture implemented all three tactics of Planning, Scheduling and Preventive Maintenance their uptime increased on average by 5.1% (from 83.5% to 88.6%)

Industrial plants that practiced Planning, Scheduling, had a Preventive Maintenance Program and had implemented Defect Elimination increased uptime by 14.8% (from 83.5% to 98.3%)

Industrial plants that practiced Planning, Scheduling and had a Preventive Maintenance Program and also had implemented Defect Elimination had on average an uptime of 98.3%

Reliability Academy Graphic – Erik Huple

Top 10 CMMS Best Practices

1. Try
2. Define & document your processes
3. Put laser focus on data integrity
4. Put effort into culture change
5. Feed your CMMS
6. Use the plan-do-check-act method
7. Plan to train, train to plan
8. Build a long-term plan
9. Designate a database administrator
10. Designate an owner/champion

Example Roadmap to Excellence

	2025	2026	2027	2028
Operations & Process	• Determine initial baselines • Setup, configure, & deploy CMMS services – see "Optimization" below • Review and update all maintenance, work request, and financial processes. • Understand impact of GAAP on capitalization and budget/spend. • Evaluate CMMS functionality for implementation – see proposal	• Continue adding CMMS functionality and services – see "Optimization" below • Update to new model baselines • Customer sat and auditing • Roll out core process improvements: o No work without a work order o All possible work signed off onsite and quality verified o Check-in/check-out and proper time capture required to approve invoice o NTEs required, with approval process to exceed o Time/cost by cost buckets – labor, services, travel charge, supply/parts, etc. o Bulk invoice approval rules/controls o Disputed invoice plan	• Continue adding CMMS functionality and services – see "Optimization" • Advanced customer feedback and process improvement • Continuous process improvements: o Leverage data to refine PM program, reduce reactive & emergency work o Optimize vendor selection, controls over quality and cost o Create more value with internal FM team, exchange repetitive admin tasks for proactive coordination of work	• Continue adding CMMS functionality and services – see "Optimization" • Advanced customer feedback and process improvement • Reassess program for more incremental upside • Continuous process improvements: o Increase the number and quality of XXXX day-to-day maintenance decisions
Technology	• Data Cleanup - remove out-of-date locations, users, vendors, assets, other • Enter as-clean-as-possible data into CMMS • Move License tracking to CMMS • Deploy	• Verify assets in-person, update Master Data • Data Cleanup continued • Rollout Vendor Mobile App • Evaluate/update PMs • Monitor adoption	• Monitor adoption • Maintain service and asset Warranties • Optimize Procedures, Incident Management • Implement new features, services, integrations	• Monitor adoption • Optimize system configuration to align with process evolution • Implement new features, services, integrations
Optimization	• Begin communication, change, management, & train all vendors • Rate Cards, COI compliance – implement for all vendors	• GPS check-in and check-out – Rollout to all vendors • Setup Business Intelligence (BI) & track changes made using the data • Vendor to invoice actual work time in correct buckets • Setup NTE controls • Monitor callback events • Metric baseline and tracking	• Automate, enforce service and asset warranties • Use BI information to adjust maintenance practices • Use Intelligent Sourcing tools to optimize vendor selection, refine cost controls • Metric tracking & analysis • Reliability training	• Continuous improvement of processes • Evaluate the use of Planning & Scheduling • Evaluate for Reliability Based Maintenance (RBM) practices o Implement applicable practices • Determine if self performance is applicable • Reliability certification
Organization	• Existing organization • Add System Admin/Business Analyst	• Transition to 100% direct vendors, revised roles of IFM vendors • Adjust contract T&Cs for new vendors • Implement MyFM support services	• Align organization with revised location footprint • Evaluate the use of Mobile technicians • Update vendor contracts at renewal	• Align to new initiatives • Update vendor contracts at renewal • Adapt to new transformations
Roadmap	Setup	Foundation/Optimize	Optimize/Transformation	Transformation/Mastery

2029

Mastery – Path to World Class

The Outcomes

Improved Deliverables & Decision-Making Capability

- Safety Performance
- Financial Results
- Asset Performance
- Increased Proactivity
- Sustainability/Energy Savings
- Improved Reputation/ Brand Enhancement
- Data Integrity
- Workforce Engagement/Retention/ Recruitment/ Diverse & Inclusive
- Risk Reduction
- Certification/Knowledge
- Operational Delivery/Productivity
- Decision Making
- Continuous Improvement
- Dashboarding/KPI Accuracy
- And More!

Reactive work can take up to 3X longer and can cost 4-10X

Transition:
The Case Study

Reliability Academy Graphic – Erik Huple

Building Your Roadmap: Governance & Accountability

Governance Isn't Bureaucracy—It's Discipline

Without structure, AI initiatives become science projects that never scale. Governance ensures:

- Clear ownership and accountability
- Regular progress reviews and course corrections
- Transparent communication with stakeholders
- Sustainable capability that outlasts individuals

Keep it simple. Meet regularly. Track what matters. Adjust based on results.

Complete RACI matrix, progress tracking dashboard, and risk register templates available in workshop materials.

AI Governance & Accountability RACI Matrix

Responsibility	Exec Sponsor	AI Gov Lead	Reliability / AM Owner	EAM Product Owner	Data & Analytics	IT & Cybersecurity	Risk / Legal	Change Mgmt
AI Governance Charter	A	R	C	C	C	C	C	C
Define AI Principles	A	R	C	C	C	C	C	C
Use-Case Intake & Prioritization	A	R	R	C	C	C	C	C
Data Ownership & Quality	A	R	R	C	C	C	C	C
Model Selection & Validation	I	R	R	C	C	R	I	C
Cybersecurity Review	I	I	I	C	C	R	A	C
Deployment Approval	A	R	R	C	R	C	R	C
Monitoring & Drift Detection	C	R	R	C	R	C	C	C
Incident Response Plan	C	R	R	R	R	R	C	C
Training & Adoption	A	R	R	C	C	C	C	A

R = Responsible A = Accountable C = Consulted I = Informed

Your Next Steps: From Workshop to Work

The difference between this being useful and this being forgotten is what you do in the next 72 hours. Here's your action plan.

01

Audit Your Foundation (This Week)

Score yourself 1-5 on each foundation block: Work Management Discipline, Asset Hierarchy, Failure Coding, Job Plans, KPI Feedback. Be honest. Anything below a 3 is a blocker for AI. Fix those first.

02

Pick Your First Use-Case (Next 2 Weeks)

Review the Use-Case Menu. Pick ONE that solves a real pain point and has executive visibility. Get stakeholder buy-in. Define success metrics before you start.

03

Run a Data Quality Sprint (30 Days)

Enforce mandatory closeout fields. Standardize asset naming. Train your team on failure codes. Clean up the last 6 months of work orders. This is unglamorous work that unlocks everything else.

04

Pilot with GenAI (60 Days)

Start with job plan drafting or failure analysis summaries. Use structured prompts. Have humans review every output. Measure time saved and quality improvement. Build trust through transparency.

05

Build Your 3-Horizon Roadmap (90 Days)

Map quick wins, scaling initiatives, and long-term capabilities. Tie each initiative to a KPI. Get executive sponsorship. Assign owners. Review quarterly and adjust based on what you learn.

Resources to Take Home: Prompt templates for job plans and failure analysis, Data quality checklist for CMMS readiness, 3-Horizon roadmap template with KPI targets. Contact Maven Asset Management for workshop materials and consulting support.

Foundation Audit: Score Your Readiness

Before you chase AI, audit what you have. This self-assessment takes 30 minutes and tells you exactly where to focus. Be brutally honest—this is for you, not your boss.

★★★☆☆ 3

Work Management Discipline

Signs You're Ready:

- >95% work orders follow standard workflow.
- Planned work >85%, emergency work <5%.
- Backlog reviewed weekly with clear prioritization.

Signs You Need Work:

- Reactive firefighting dominates, no standard process.
- Backlog is a dumping ground, emergency work >30%.

★★★☆☆ 3

Asset Hierarchy & Criticality

Signs You're Ready:

- Every asset has unique ID tied to functional location.
- Criticality ratings (A/B/C) assigned using risk matrix.
- Hierarchy matches physical plant layout.

Signs You Need Work:

- Inconsistent naming, same equipment has multiple IDs.
- No criticality ratings or everyone is "critical".

★★★☆☆ 3

Failure Coding Discipline

Signs You're Ready:

- >80% corrective WOs have failure codes, standard taxonomy.
- Technicians trained on proper coding.
- Quarterly failure trend reports.

Signs You Need Work:

- Failure codes blank or defaulted, no standard taxonomy.
- Techs don't know codes exist, can't answer "why did this fail?".

★★★☆☆ 3

Job Plans & Materials

Signs You're Ready:

- Routine PMs have detailed job plans with labor estimates & parts.
- Plans reviewed annually, material availability >90%.

Signs You Need Work:

- Job plans are one-line descriptions, no parts lists.
- Material stockouts delay 30%+ of jobs.

★★★☆☆ 3

KPI Feedback Loop

Signs You're Ready:

- Reliability KPIs tracked monthly (MTBF, MTTR, PM compliance).
- Trends reviewed in leadership meetings, corrective actions tracked.

Signs You Need Work:

- No reliability metrics tracked, or metrics exist but no one acts on them.
- Data lives in spreadsheets, not decisions.

This audit isn't about shame. It's about clarity. Most organizations score 2-3 on average. That's fixable. But you can't fix what you won't measure.

Scoring Guide: 4-5 = Ready for AI pilots | 3 = Fix gaps first, then pilot | 1-2 = AI will fail here—focus on fundamentals for 6 months

Foundation Audit: Your Action Matrix

You've scored yourself. Now prioritize. This matrix maps your scores to immediate actions. Focus on the biggest gaps that unlock the most value.

Your 30-Day Plan: Pick 3 Quick Wins. Assign owners. Set dates. Review weekly. Build momentum before tackling Strategic Investments.

QUICK WINS - DO THESE FIRST

- **Enforce 5 mandatory closeout fields (Asset ID, Failure Code, Labor Hours, Cause, Corrective Action)**
- **Create visual job aid for failure codes—laminate and post at supervisor desks**
- **Establish weekly 30-minute backlog review with planner + supervisor**
- **Assign criticality ratings to top 20 assets using simple risk matrix**

STRATEGIC INVESTMENTS - PLAN & RESOURCE

- **Full asset hierarchy cleanup and standardization across all sites**
- **Build comprehensive job plan library for all routine PMs (100+ plans)**
- **Implement automated KPI dashboards with real-time CMMS integration**
- **Develop formal reliability engineering capability with dedicated headcount**

EASY IMPROVEMENTS - FILL GAPS

- **Train technicians on proper work order closeout (1-hour session)**
- **Create standard PM checklists for top 10 equipment types**
- **Document current work management process (even if imperfect)**
- **Set up monthly reliability metrics review meeting**

AVOID - NOT WORTH IT NOW

- **Custom CMMS development or major system replacement**
- **Enterprise-wide digital transformation initiatives**
- **Advanced AI models before data quality is fixed**
- **Perfecting every job plan before starting any AI pilot**

Most organizations jump to Strategic Investments before doing Quick Wins. Result? Expensive failures. Do the Quick Wins first

Building Your Business Case: Define the Problem

You've picked a use-case. Now sell it. Start by defining the problem in business terms.

A well-defined problem statement is crucial for gaining executive buy-in. It clearly articulates the current challenge, its measurable consequences, who or what it affects, and the underlying reason it exists.

This structured approach ensures everyone understands the magnitude and nature of the issue before proposing solutions.

Example Problem Statement:

"Currently, repeat failures on critical pumps are costing us 120 hours of unplanned downtime per quarter. This problem affects 15 A-criticality centrifugal pumps in the refinery and has persisted for 18+ months. Root cause: We can't identify failure patterns because work order descriptions are inconsistent and failure codes are rarely used."

Bottom Note: A clear problem statement is half the battle. Quantify the pain. Make it real.

Use-Case Menu: Pick One

Don't try to boil the ocean. Start with one high-value use-case that solves a real pain point. These six options are proven in industrial environments. Pick the one that hurts most right now—that's your first 90-day play.

1	**Auto-code failure class from WO text** Stop relying on techs to remember codes. Train a classifier on historical data to suggest failure modes automatically. Improves data quality and speeds closeout.
2	**Detect repeat failure patterns** Cluster similar work orders to surface chronic issues. Find equipment that fails the same way every quarter—then fix the root cause instead of treating symptoms.
3	**Predict parts stockout risk** Forecast demand for critical spares based on PM schedules, failure trends, and lead times. Prevent emergency expedites and unplanned downtime from parts shortages.
4	**PM optimization (prevent vs waste)** Balance prevention against over-maintenance. Use failure data to adjust PM intervals—extend when safe, tighten when risk increases. Reduce unnecessary work.
5	**Condition anomalies from sensors/SCADA/IoT** Flag abnormal vibration, temperature, or pressure before failure. Convert condition monitoring alerts into triggered work orders with context.
6	**Backlog prioritization assistant** Score and rank backlog items using criticality, risk, resource availability, and business impact. Help planners focus on what matters most.

Interactive Poll: Hands up—which one is your first 90-day play? Show me stockout risk... repeat failures... PM optimization...

Use-Case Selection: The Decision Framework

You've seen six use-cases. Now pick one. This framework helps you choose based on pain, data readiness, and organizational readiness. Don't pick what sounds cool—pick what solves a real problem.

Use-Case	Best For	Time to Value
Auto-code failure class from WO text	You have some coded history, but compliance is inconsistent. You want to improve data quality without adding tech burden.	60-90 days
Detect repeat failure patterns	You're drowning in repeat failures but can't see the patterns. You need visibility to drive defect elimination.	30-60 days
Predict parts stockout risk	Parts availability is your #1 constraint. You have materials data in CMMS. Procurement is a partner, not a blocker.	90-120 days
PM optimization (prevent vs waste)	PM compliance is high, but you suspect waste. You have mature data. You're ready for evidence-based changes.	120-180 days
Condition anomalies from sensors/SCADA/IoT	You have sensors but poor signal-to-noise ratio. You want predictive maintenance, not just monitoring.	90-120 days
Backlog prioritization assistant	Backlog chaos is killing productivity. You need a rational way to rank work. You have basic asset criticality data.	30-60 days

Decision Rule: Pick the use-case where you score 4+ on data prerequisites AND organizational readiness. If you score <3 on either, fix those gaps first or pick a different use-case.

Building Your Business Case: Measure Success

Define clear, measurable outcomes. Show executives exactly what success looks like.

Create a visual dashboard or metrics display showing:

Metric 1: Repeat Failure Rate

Visual: Gauge or chart showing

- Baseline: 35% of corrective WOs are repeats
- Target: <20% repeat failures
- Measurement: CMMS query tracking same asset + similar failure within 90 days

Metric 2: Time to Identify Issues

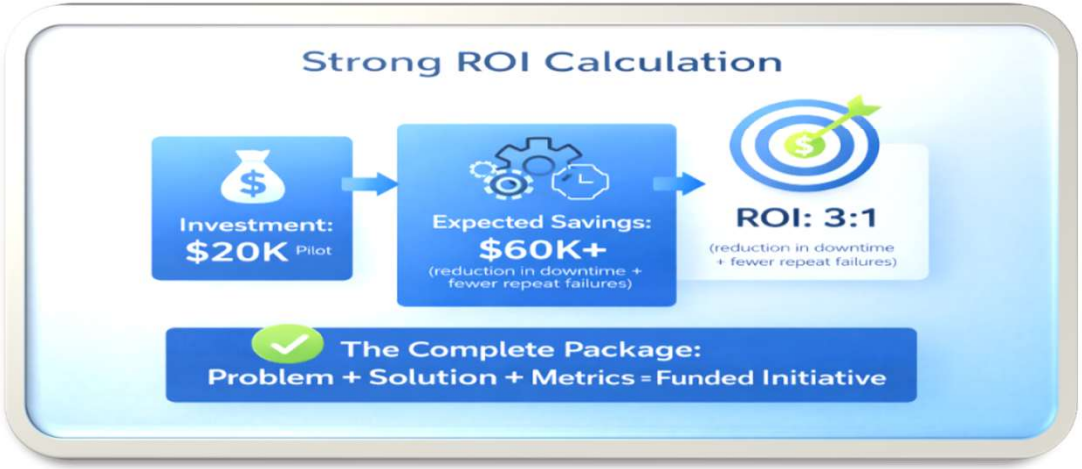
Visual: Timeline or speedometer showing

- Baseline: Manual process—weeks to never
- Target: Automated weekly reports
- Measurement: Time from failure to RCA work order creation

Metric 3: Root Cause Investigations

Visual: Bar chart or counter showing

- Baseline: 5 per quarter
- Target: 15 per quarter
- Measurement: Count of RCA work orders with documented corrective actions



Note: Full business case template includes resource requirements, timeline, and risk mitigation. Available from Maven.

Building Your Business Case: Propose the Solution

Now that you've defined the problem, present your solution clearly and concisely.

Step 1: What (the AI use-case)
Implement AI-powered repeat failure detection

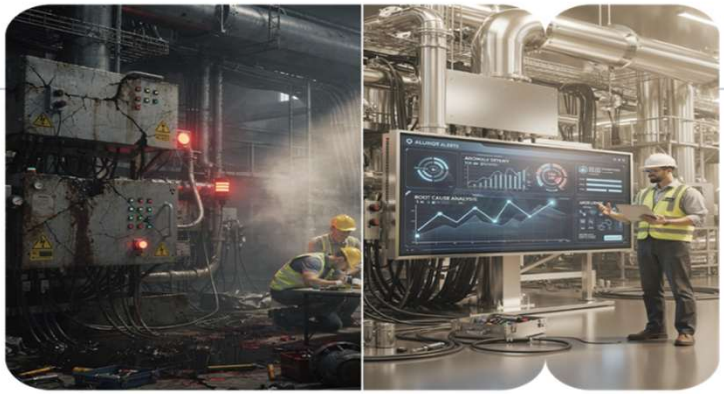
Step 2: How (the approach/technology)
Using NLP to cluster similar work orders

Step 3: Why (the capability it unlocks)
To enable proactive root cause investigations instead of reactive repairs

Example in a highlighted box:
"Implement AI-powered repeat failure detection → Using NLP to cluster similar work orders → To enable proactive root cause investigations instead of reactive repairs"

Before

Reactive repairs, no pattern visibility



After

Proactive investigations and root-cause fixes

Connect the solution to the problem. Show how the AI capability directly addresses the pain point you defined.

GenAI Pilot: The 4-Step Workflow

Here's how to turn work order history into root cause insights using GenAI.

Step 1: Data Extraction & Preparation

- Pull 12-24 months of work order history from CMMS
- Include: WO number, date, description, failure code, labor, parts, corrective action
- Export to CSV; remove sensitive info

Step 2: Pattern Recognition

- Upload work order data to GenAI
- Ask about common failure modes, frequency, patterns (seasonal/operational)
- GenAI surfaces patterns humans miss in large, inconsistent datasets

Step 3: Root Cause Hypothesis Generation

- Use GenAI to develop 5 potential root causes via 5 Whys method
- For each cause: evidence needed, tests to run, corrective actions
- Review with team; prioritize by likelihood and impact

Step 4: Investigation & Validation

- Take top hypotheses into the field for inspection and testing
- Document findings and implement corrective actions
- Track results: Did failure recur? Time until next failure?

The AI doesn't replace your expertise—it amplifies it. You still validate, decide, and act

GenAI Pilot: Tracking Results & ROI

Measure everything. Show the value. Build the case for scaling.

Metrics to Track:

Asset ID	Failure Mode	Failures (Last 12 Mo)	Root Cause Identified	Corrective Action	Cost	Failures (Next 6 Mo)	ROI
P-101 Pump	Seal Failure	6 failures	Inadequate cooling flow	Install flow meter + alarm	$8K	0 failures	$45K saved

Success Indicators

100x

Pattern Detection Speed

Before: Weeks of manual analysis
After: Minutes with GenAI
Improvement: 100x faster

3x

Root Cause Identification

Before: 5 RCAs per quarter
After: 15 RCAs per quarter
Improvement: 3x more investigations

40%

Repeat Failure Reduction

Before: 35% repeat failure rate
After: <20% repeat failure rate
Improvement: 40% reduction

ROI Calculation:

Investment
$15K (AI tool + 60 days of team time)

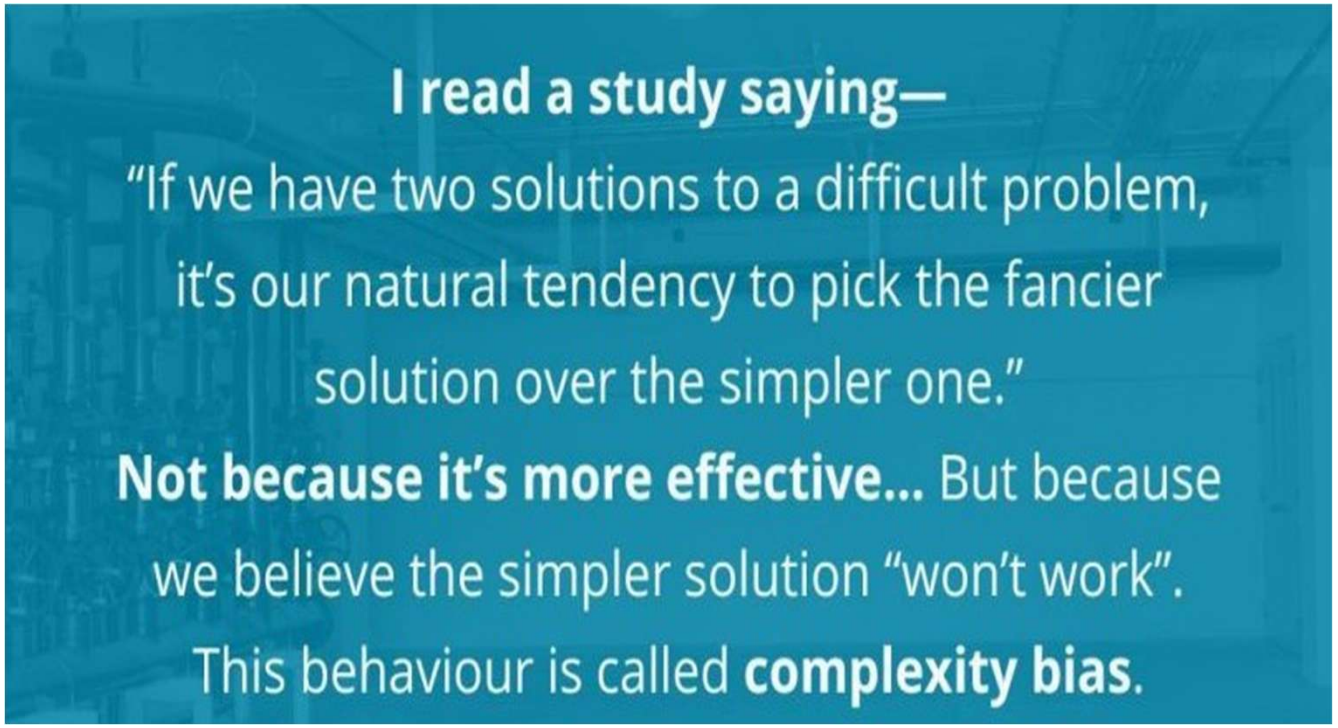
Savings
$45K+ per chronic issue resolved

Payback
<4 months on first success

What Makes This Work:

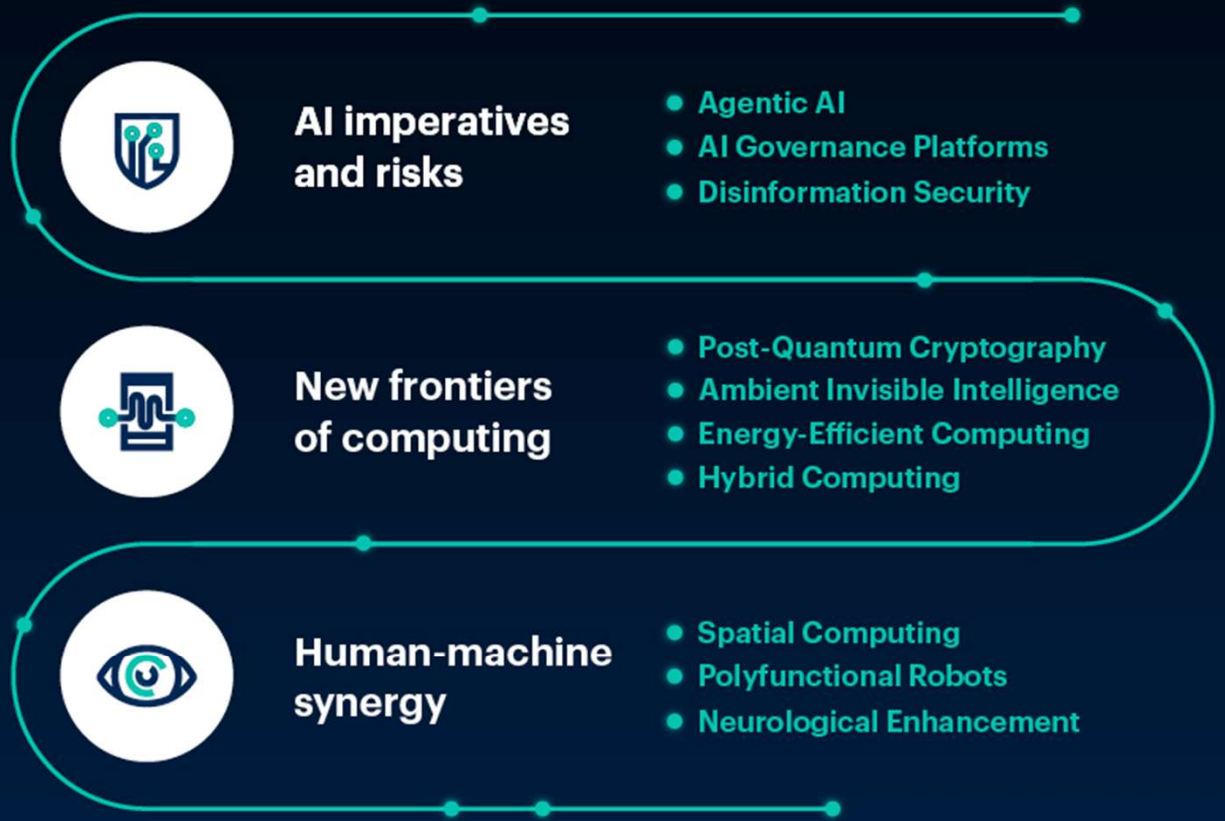
- GenAI processes hundreds of work orders that humans can't manually review
- It generates hypotheses you might not consider
- It's faster than starting from scratch
- But YOU still validate, investigate, and make decisions

Transition: What's Next?



Reliability Academy Graphic – Erik Huple

2025 Top 10 Strategic Technology Trends



Source: Gartner

Gartner

Graphic from Gartner Presentations (Various).

Gartner Top Strategic Technology Trends for 2026

Gartner carefully selected these 10 trends based on their potential to drive innovation, strengthen resilience and elevate trust in an AI-powered, hyperconnected world.

They represent strategic imperatives that require thoughtful consideration and decisive action from technology leaders.

The Architect

1. AI-native development platforms
2. AI supercomputing platforms
3. Confidential computing

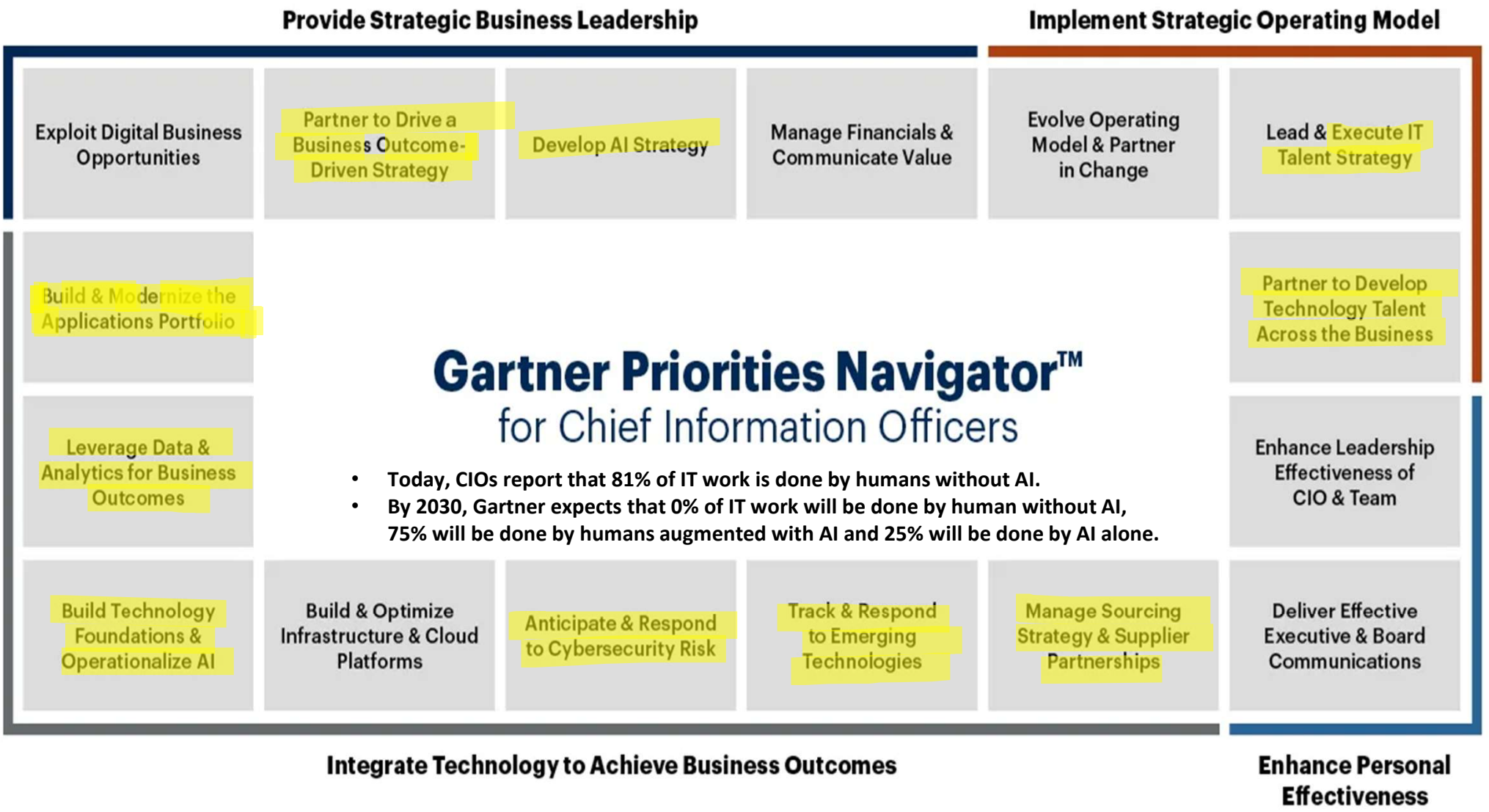
The Synthesist

4. Multiagent systems
5. Domain-specific language models
6. Physical AI

The Vanguard

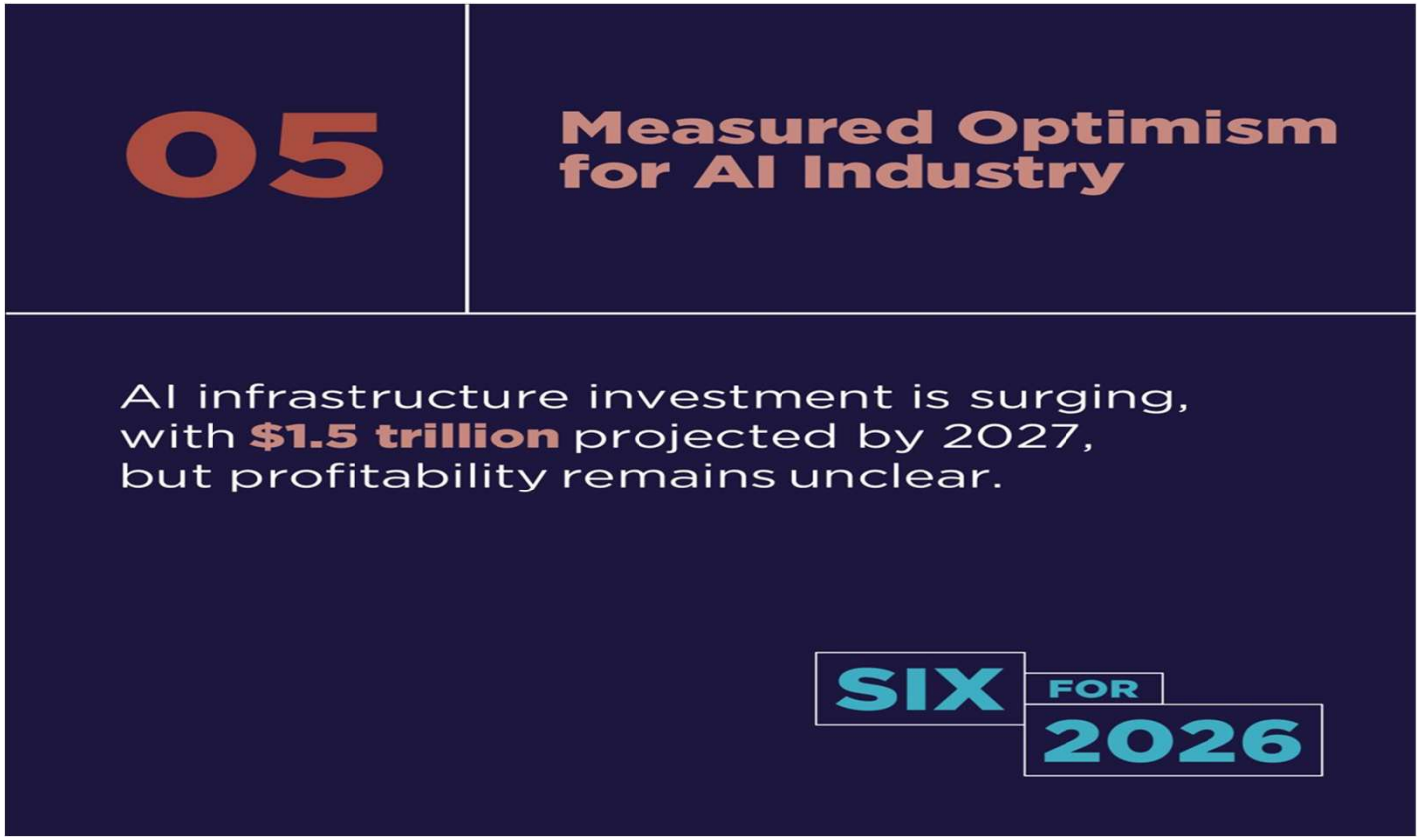
7. Preemptive cybersecurity
8. Digital provenance
9. AI security platforms
10. Geopatriation

Graphic from Gartner Presentations (Various).



Graphic from Gartner Presentations (Various).

AI Growth by 2027



This surge is reshaping data centers, power, and fiber, with operational capacity in the Americas expected to rise by nearly 50% in the next 3-5 years.

Cushman & Wakefield video by Kevin Thorpe – Six for 2026 – Real Estate Trends to Watch

What's Coming in 2027 and 2028

The data in this report points toward several shifts that will accelerate over the next two years.

Shift 1: Maintenance Will Be Judged on Financial Outcomes, Not Activity

The measurement gap (62.2% rate capability as fair or worse) is a pressure signal. Leadership will increasingly demand clarity about what maintenance spending is actually delivering. Activity metrics (e.g. PM completion %, work orders closed) will no longer be sufficient. Organizations that can articulate ROI in business terms will maintain investment. Those that can only report activity will face budget pressure.

Shift 2: Technician Experience Will Become a Retention Weapon

With 37.3% reporting strained morale and 63.6% finding hiring difficult, retention is increasingly critical. Technician experience, how the daily work actually feels, will become a competitive factor. Organizations that reduce chaos, simplify workflows, invest in tools technicians like, and create manageable workloads will retain better. Word gets around about which employers respect their technicians.

Shift 3: Multi-Site Standardization Becomes Mandatory

With 50%+ managing multiple locations, multi-site governance will move from "nice to have" to required. Leadership will demand benchmarking capability, the ability to compare sites, identify top performers, and transfer best practices. This requires standardization that many multi-site organizations currently lack. Systems that allow variability in data structure will be replaced with systems that enforce consistency.

Shift 4: AI Shifts from Insight to Execution

The first wave of AI in maintenance focused on insight, dashboards, predictions, alerts. The next wave will focus on execution, actually making work happen differently. This means AI that routes, schedules, prompts, and follows up. AI is embedded in the workflow rather than sitting alongside it. The winners won't be organizations that "use AI," they'll be organizations that operationalize AI inside workflows where it drives measurable improvements.

Graphic from UpKeep's *State of Maintenance 2026 Report*

Transition: Discussion/ Q&A

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RELIABILITY INSIGHTS
Less Maintenance
= Better Reliability

What are some practical ways for Maintenance Teams to use AI today?

Questions

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