

# AI-Enhanced Problem Solving

## AI Model Types

- Text Models: Brainstorm solutions, analyze risk scenarios, detail step-by-step action plans.
- Image Models: Visualize cause-and-effect diagrams or risk matrices.
- Audio Models: Summarize recorded brainstorming sessions.
- Multimodal: Combine text + diagrams to clarify complex problems.

## Prompt Engineering Fundamentals

- Zero-Shot: "Give me potential solutions to X" for quick idea generation.
- Few-Shot: Provide examples of successful mitigations for similar problems.
- Chain-of-Thought: Ask the model to logically show how it arrives at each solution.
- Role-Playing: "Act as a risk manager..." to get domain-specific framing.

## Prompt Structure Templates

- Challenge + Constraints: "Given these constraints [X], propose solutions to [Y]."
- Stepwise: "Outline steps to solve [specific problem], from immediate fixes to long-term."
- Pros/Cons: "List benefits and drawbacks for each potential solution."
- SWOT Analysis: "Provide strengths, weaknesses, opportunities, threats for [scenario]."
- Scenario Variation: "If budget is cut by 20%, how does your solution change?"
- Root Cause: "Analyze the root causes behind repeated schedule slips."
- Risk Impact: "For each identified risk, propose a mitigation strategy."

## Do's and Don'ts

- Do:
- Include context about mission requirements, regulations, or environment.
  - Compare multiple solutions to weigh risk, cost, and benefit.
- Don't:
- Accept AI's solutions blindly—validate feasibility.
  - Overlook intangible factors like stakeholder buy-in or cultural shifts.

## Use Case Examples

- Risk Mitigation: Quick scanning of project docs to suggest 2–3 risk responses.
- Scenario Planning: "What if X fails? Propose fallback strategies."
- Conflict Resolution: Offer neutral steps to reconcile differing stakeholder priorities.

## Evaluation Methods

- Feasibility Check: Are solutions realistic given your environment?
- Scenario Testing: Ask for variations to test solutions against changes.
- Expert Validation: Confirm logic with real-world SMEs.

## Prompt Collection

### Content Creation

1. "Draft a one-page problem statement for the recurring supply chain bottleneck."
2. "Summarize potential solutions from a brainstorming meeting about contractor compliance issues."
3. "Write a short executive briefing that frames our top 3 challenges and recommended solutions."
4. "Compose a 200-word background paper on recurring budget shortfalls for a leadership roundtable."

### Data Analysis/Summarization

5. "Summarize these risk logs from the past 6 months; highlight the most frequent issues."
6. "Analyze a set of contract modifications and identify the top 5 triggers for changes in scope."
7. "Create a bullet list of potential cost overruns identified in these spending reports."
8. "Compare schedule data from the last two project phases to see if issues persist."

### Code Generation

9. "Generate Python code to identify outliers in project cost data and flag them."
10. "Write a script that reads an Excel risk register and outputs items with high severity."
11. "Create a pseudo-code routine for simulating resource allocation under shifting budgets."

### Creative Ideation

12. "Propose 3 ways to handle contractor disputes without formal legal escalation."
13. "Suggest unusual but feasible solutions for bridging a sudden skills gap in the project team."
14. "Brainstorm contingency plans for catastrophic vendor failure mid-project."

### Problem-Solving

15. "Step by step, propose a solution to reduce timeline overruns when deliveries are delayed."
16. "Identify conflicting user requirements in this scenario and propose ways to reconcile them."
17. "Give a chain-of-thought explanation for how to handle conflicting feedback from multiple stakeholders."

### Educational Purposes

18. "Explain the concept of root-cause analysis for novices in project management."
19. "Design a short workshop plan introducing risk matrices and their usage."
20. "Create a 5-question quiz on scenario-based planning for advanced learners."