Software Acquisition Pathway

AI Model Types

- Text Models: Great for drafting user stories, reviewing compliance documents, and summarizing sprint retrospectives.
- Image Models: Generate quick architecture or workflow diagrams from text prompts.
- Audio Models: Transcribe stakeholder interviews or daily stand-up meetings.
- Multimodal Models: Combine text, code snippets, and visuals (e.g., a user-flow diagram annotated with DevOps steps).

Prompt Engineering Fundamentals

- Zero-Shot: Directly request analyses or solutions with minimal setup—useful for quick tasks like "Check if code meets security standard X."
- Few-Shot: Provide short examples of user stories, acceptance criteria, or architecture diagrams so the model mimics your style.
- Chain-of-Thought: Ask the model to outline its reasoning for complex tasks (e.g., risk analysis across multiple software increments).
- Iterative: Start with a partial requirement, refine after seeing the AI's first draft, then finalize.

Prompt Structure Templates

Requirement Clarification
- "Here's our user requirement [text]. Identify possible gaps or ambiguities."

Agile Backlog
- "Generate user stories for a software release, each with acceptance criteria."

Compliance Focus
- "Summarize how DoDI 5000.87 guidelines apply to this software sprint plan."

Security Review
- "Check the provided code snippet for common cybersecurity vulnerabilities."

Documentation
- "Draft or update a Software Development Plan (SDP) section to reflect new features."

Architecture Visualization
- "Describe a high-level architecture for this microservice approach in bullet points."

Troubleshooting Flow
- "Outline a debugging process for a CI/CD pipeline failing at the integration test stage."

Do's and Don'ts

Do
- Provide relevant DoD regulations (e.g., references to DoDI 5000.87, DevSecOps guidelines).
- Use examples of well-formed code or standard documents to steer style.
- Iterate: refine early prompts to correct misunderstandings.

Don't
- Include classified or sensitive code details without sanitizing.
- Depend solely on AI for final technical or compliance sign-off—always have SMEs verify.

Use Case Examples

- Sprint Planning: Generate user stories and acceptance criteria aligned with warfighter needs.
- Automated Code Reviews: Ask for best practices or highlight potential security flaws.
- Compliance Summaries: Distill new DoD instructions or policy memos for the dev team.
- Risk Assessment: Identify schedule slips or integration challenges across multiple increments.

Evaluation Methods

- Technical SME Checks: Have experts confirm the correctness of AI-suggested solutions.
- Compliance Cross-Reference: Ensure outputs align with the Software Acquisition Pathway guidelines.
- Pilot Runs: Test AI recommendations on a smaller scale (e.g., a single module) before widespread adoption.
- Comparative Versions: Generate multiple drafts, then compare to choose the best fit.

Prompt Collection

Content Creation
1. "Draft a user story (with acceptance criteria) for implementing role-based access control in our new app."
2. "Summarize the key takeaways from this 20-page DoDI 5000.87 document in 150 words."
3. "Generate a one-page software architecture overview for our microservices approach."
4. "Create a sprint review summary that highlights completed features, known issues, and next steps."

Data Analysis/Summarization
5. "Compare these two sprint backlogs and identify major differences in scope or complexity."
6. "Analyze the test results from our last CI/CD pipeline run—list the top 3 failure causes."
7. "Summarize this DevSecOps guidance, focusing on code scanning and container security requirements."
8. "Review these system logs to spot recurring patterns or error codes over the past month."

Code Generation
9. "Generate a Python script to parse JSON logs for error codes and summarize them by frequency."
10. "Write a Dockerfile that sets up a secure environment for a basic Flask application."
11. "Provide a skeleton Java code snippet that checks user authentication against a DoD security standard."

Creative Ideation
12. "Propose 3 novel ways to incorporate user feedback loops during early software increments."
13. "Brainstorm potential DevSecOps pipeline improvements to reduce integration time by 20%."
14. "Suggest ways to gamify compliance tasks, keeping the dev team motivated."

Problem-Solving
15. "Outline a step-by-step plan to troubleshoot intermittent server crashes in the staging environment."
16. "Identify the biggest risks in migrating a legacy app to a containerized environment under tight deadlines."
17. "Propose a resolution path if the new code fails compliance scanning on repeated checks."

Educational Purposes
18. "Explain the Software Acquisition Pathway's iterative approach to someone new to DoD acquisitions."
19. "Design a short workshop agenda teaching the basics of agile software acquisition for government teams."
20. "Create 5 multiple-choice quiz questions on DoDI 5000.87 focusing on agile release cycles and DevSecOps."