

COGNITIVE WORKFLOWS 101

A Complete Reference Guide to Structured
Thinking and Problem-Solving

107 Cognitive Workflows for Human Minds and AI Machines

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7

Core Chapters

100

Appendix Workflows

107

Total Workflows

10+

Domains Covered

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PART I

Core Cognitive Workflows — Chapters 1–7

CHAPTER 1

The Scientific Method

Unlocking Empirical Understanding

The scientific method is not just for scientists in labs — it is a powerful cognitive workflow for anyone seeking to understand the world through observation, experimentation, and logical reasoning. It provides a structured way to investigate phenomena, test ideas, and build reliable knowledge. By internalizing this method, you can approach everyday questions with greater rigor and clarity.

STEPS

1

Observation: Notice something interesting, a pattern, or a problem. This is the initial spark that ignites curiosity. Example: Your houseplants seem to grow faster when you talk to them.

2

Question: Formulate a specific, clear, focused question you want to answer based on your observation. Example: "Does talking to houseplants actually increase their growth rate?"

3

Hypothesis: Form an educated, testable explanation for your observation — often phrased as an "if-then" statement. Example: "If I talk to my houseplants daily, then they will grow taller than plants I don't talk to."

4

Experiment: Design and conduct a controlled test to see if your hypothesis holds true. Manipulate variables and collect data carefully. Example: Get 10 identical plants, talk to 5 of them, keep all other conditions identical.

5

Data Analysis: Organize and interpret the collected data. Look for patterns, trends, and relationships. Example: Compile weekly measurements into a table and calculate averages.

6

Conclusion: Based on your analysis, determine whether your hypothesis was supported or refuted. State findings clearly. Example: "The data shows no significant difference in growth between the two groups."

Real-World Applications: Personal finance (testing budget strategies), productivity research (does a lunchtime walk improve afternoon focus?), health behaviour tracking.

Source: Foundation: Popper, K. R. (1959). The Logic of Scientific Discovery. Hutchinson.

CHAPTER 2

General Problem-Solving

A Universal Approach

While the Scientific Method is excellent for empirical inquiry, many challenges in life are about navigating obstacles, making choices, and finding effective ways forward. The General Problem-Solving Framework is a versatile cognitive workflow that can be applied to virtually any dilemma — from a minor personal snag to a complex organisational issue.

STEPS

1

Define the Problem: Clearly and concisely articulate the problem. Avoid vague statements. Focus on symptoms and try to identify the core issue. Example: "Team task-completion rate dropped 15% this quarter."

2

Analyze the Problem: Gather all relevant information, data, and perspectives. Ask who, what, when, where, why, and how. Identify contributing factors, root causes, and constraints.

3

Generate Solutions: Brainstorm a wide range of potential solutions without judgment. Prioritise quantity over quality initially. Encourage diverse and unconventional ideas.

4

Evaluate Solutions: Systematically assess each solution against criteria such as feasibility, impact, cost, risks, and alignment with goals. Example: "Reduce meeting times" is low cost, quick, and high impact.

5

Implement the Best Solution: Put the chosen solution into action. Create a clear action plan, assign responsibilities, set timelines, and allocate necessary resources.

6

Review and Learn: After implementation, monitor effectiveness. Did it solve the problem? Did it create new ones? Extract lessons for future improvement cycles.

Real-World Applications: Managing a personal budget, improving customer satisfaction scores, resolving team communication breakdowns, optimising any multi-step process.

Source: Polya, G. (1945). How to Solve It. Princeton University Press.

CHAPTER 3

Critical Thinking

Evaluating Information with Precision

In today's information-saturated world, the ability to think critically is not just an academic skill — it is a survival tool. Without a systematic way to evaluate information, we risk making poor decisions, falling prey to misinformation, or simply being overwhelmed. Critical Thinking is a cognitive workflow that empowers you to analyse information objectively, assess arguments rigorously, and form well-reasoned judgments.

STEPS

1

Identify the Issue, Argument, or Claim: Clearly and precisely state the central question being addressed, the main argument being made, or the specific claim being presented.

2

Analyze the Information and Argument Structure: Break down the argument into its constituent parts. Identify the premises, the conclusion, and how they are logically connected.

3

Evaluate the Evidence and Sources: Assess the quality, relevance, and sufficiency of the evidence. Is the source credible? Is the study peer-reviewed? What was the sample size? Who funded it?

4

Identify Assumptions and Biases: Uncover unstated beliefs, values, or predispositions that might influence the argument. Does the claim assume correlation equals causation?

5

Consider Alternative Perspectives and Explanations: Actively seek other ways to interpret the information or other conclusions that could be drawn from the same data.

6

Formulate a Reasoned Conclusion: Based on your thorough evaluation, draw your own conclusion. Explain why you arrived at your judgment, citing the strengths and weaknesses you identified.

Real-World Applications: Evaluating news and media claims, making hiring decisions, auditing personal beliefs and cognitive biases, assessing research and marketing claims.

Source: Paul, R., & Elder, L. (2006). *Critical Thinking: Tools for Taking Charge of Your Learning and Your Life*. Pearson.

CHAPTER 4

The Design Thinking Process

Innovating with Empathy

Innovation often requires a different kind of thinking — one that starts not with a problem, but with a deep understanding of people. The Design Thinking Process is a human-centred, iterative cognitive workflow for creative problem-solving and innovation. It is particularly effective for tackling ill-defined or unknown problems, as it prioritises empathy for the user and continuous experimentation. Used by Apple, Google, IDEO, and healthcare systems worldwide.

STEPS

1

Empathize: Gain a deep understanding of the people you are designing for. Observe, engage, and immerse yourself in their experiences to uncover needs, desires, pain points, and motivations.

2

Define: Synthesise the insights from the Empathise stage into a clear, human-centred problem statement that is actionable and inspiring. Frame it as a "How Might We..." question.

3

Ideate: With a clear problem definition, brainstorm a wide range of creative solutions. The goal is to generate as many ideas as possible — no matter how wild or impractical they initially seem.

4

Prototype: Transform your ideas into tangible forms that can be tested. A prototype can be anything from a simple sketch, paper model, basic wireframe, or clickable digital mock-up.

5

Test: Put prototypes in front of real users and gather feedback. Observe how they interact, listen to their comments, and ask probing questions to learn what works and what doesn't.

6

Iterate: Based on test results, go back to any previous step to refine the problem, generate new ideas, or improve the prototype. Design Thinking is non-linear and cyclical.

Real-World Applications: Product development, healthcare patient experience, education curriculum design, social innovation for community challenges like food insecurity or housing.

Source: Brown, T. (2009). *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*. HarperBusiness.

CHAPTER 5

The Strategic Planning Cycle

Charting Your Course

Whether you are leading a multinational corporation, managing a small business, or navigating your personal career path, the ability to think strategically is paramount. The Strategic Planning Cycle is a robust cognitive workflow that provides a structured approach to setting long-term goals, making informed decisions, and allocating resources effectively to achieve a desired future state. It moves beyond day-to-day tactical thinking to focus on the bigger picture.

STEPS

1

Define Vision, Mission, and Values: Establish the "why" and "what" of your existence. Vision: What does success look like in the future? Mission: What do you do, for whom, and why? Values: What core beliefs guide your actions?

2

Conduct Situational Analysis: Comprehensive assessment of internal capabilities and external environment using SWOT Analysis (Strengths, Weaknesses, Opportunities, Threats), PESTEL Analysis, and Porter's Five Forces.

3

Set Strategic Goals: Translate vision and mission into SMART objectives — Specific, Measurable, Achievable, Relevant, and Time-bound. Example: "Increase market share by 5% in 18 months."

4

Formulate Strategies: Develop broad action plans to achieve your strategic goals. Decide how to leverage strengths, address weaknesses, capitalise on opportunities, and mitigate threats.

5

Develop Action Plans: Break down broad strategies into specific, detailed, actionable steps (tactics). Define who will do what, by when, and with what resources.

6

Implement Plan: Put the action plans into motion. This requires effective leadership, resource allocation, communication, and coordination across teams or individuals.

7

Monitor, Evaluate, and Adjust: Continuously track progress against strategic goals. Measure KPIs. Evaluate what's working, what's not, and why. Adapt as circumstances change.

Real-World Applications: Business growth planning, personal career development, academic research programme direction, policy and governance frameworks.

Source: Mintzberg, H., Ahlstrand, B., & Lampel, J. (1998). *Strategy Safari: A Guided Tour Through the Wilds of Strategic Management*. Free Press.

CHAPTER 6

Troubleshooting / Debugging

Diagnosing and Resolving Issues

Problems are an inevitable part of any system — whether it is a complex software application, a malfunctioning household appliance, a breakdown in team communication, or a personal habit causing issues. The Troubleshooting/Debugging Process is a systematic cognitive workflow designed to identify the root cause of a problem and implement an effective solution. It moves beyond guesswork to a methodical approach that saves time, reduces stress, and ensures lasting fixes.

STEPS

1

Observe and Identify the Problem: Clearly and precisely describe what is happening (the symptoms) or what is not happening that should be. Avoid assumptions about the cause — just focus on observable facts.

2

Define the Scope and Gather Information: Determine who or what is affected, when the problem started, and under what specific conditions it occurs. Collect relevant data, error messages, logs, or user reports.

3

Formulate Hypotheses: Based on observations and gathered information, brainstorm a list of potential reasons why the problem might be occurring. Start with the most common or simplest explanations.

4

Test Hypotheses: Systematically test each hypothesis, one at a time, to confirm or rule it out. The goal is to isolate the single root cause. Example: "If the battery is dead, jump-starting should work."

5

Implement Solution: Once you have identified the root cause, apply the fix. This might involve repairing, replacing, configuring, or educating. Example: Replace the old car battery.

6

Verify Solution: After implementing the fix, confirm that the problem is truly resolved and that no new issues have been introduced. Test under the conditions that previously caused the problem.

7

Document and Learn: Record the problem, the steps taken to diagnose it, the solution implemented, and lessons learned. This prevents recurrence and builds organisational knowledge.

Real-World Applications: Software debugging (isolating browser-specific JavaScript errors), team communication breakdowns, mechanical failures, process inefficiencies.

Source: Kepner, C. H., & Tregoe, B. B. (1981). The New Rational Manager. Princeton Research Press.

CHAPTER 7

The PQRS Method

Mastering Active Learning

In an age of information overload, simply reading or listening is often not enough to truly learn and retain knowledge. Passive consumption leads to shallow understanding and rapid forgetting. The PQRS Method is a classic, yet incredibly effective, cognitive workflow designed to transform passive learning into an active, engaging, and highly retentive process. It is a systematic approach to reading and studying that ensures deeper comprehension and better recall — applicable to both human learners and AI-assisted study workflows.

STEPS

1

Preview (Survey): Before diving into details, get a quick overview of the material. Skim the chapter, look at headings, subheadings, bolded terms, images, charts, and the introduction and conclusion. This activates prior knowledge and gives you a mental map.

2

Question: Based on your preview, formulate questions about the material. Turn headings into questions (e.g., "What is supply and demand?"). Questions create a purpose for reading — your brain becomes an active seeker of answers.

3

Read: Read the material actively, section by section. Actively search for the answers to the questions you formulated. Highlight key points, make marginal notes, or underline important concepts. Reading with purpose creates deeper engagement.

4

Summarize / Recite: After reading a section, put the information into your own words without looking at the text. Recite aloud, write a summary, or explain it to an imaginary audience. This is the most powerful step for long-term retention.

5

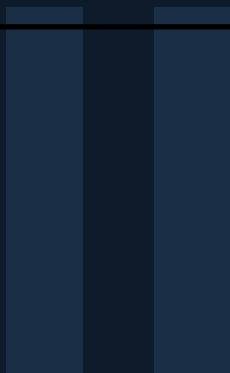
Test (Review): After completing the chapter or a major section, test yourself on the material. Answer your generated questions, try practice problems, create flashcards, or explain the entire topic to someone else. Testing is a learning tool, not just assessment.

Real-World Applications: Learning new software features, preparing presentations, understanding complex policy documents, academic study, professional certification preparation.

Source: Thomas, E. L., & Robinson, H. A. (1972). *Improving Reading in Every Class: A Sourcebook for Teachers*. Allyn & Bacon.

APPENDIX A

100 Additional Cognitive Workflows



WORKFLOW A-1

Pros and Cons List

A fundamental decision-making tool that involves listing the advantages and disadvantages of a particular option. Helps visualise and weigh positive and negative aspects to arrive at a reasoned choice. Best for simple, binary decisions.

STEPS

- 1 Define the Decision: Clearly state the decision or option you are evaluating.
- 2 Draw Two Columns: Label one "Pros" (Advantages) and the other "Cons" (Disadvantages).
- 3 Brainstorm Pros: List all positive aspects, benefits, and advantages associated with the decision.
- 4 Brainstorm Cons: List all negative aspects, drawbacks, and disadvantages.
- 5 Evaluate and Decide: Review both lists holistically to inform your final decision.

Source: Mind Tools — Pros and Cons Analysis

WORKFLOW A-2

Cost-Benefit Analysis (CBA)

A systematic process for analysing decisions by weighing total expected costs against total expected benefits. Aims to identify the best or most profitable option, particularly useful for complex projects or policies with significant financial implications.

STEPS

- 1** Define the Project/Decision: Clearly articulate the project, policy, or decision to be analysed.
- 2** Identify All Costs: List all potential costs — direct, indirect, intangible, and opportunity costs.
- 3** Identify All Benefits: List all potential benefits — direct, indirect, and intangible.
- 4** Assign Monetary Values: Quantify both costs and benefits in monetary terms where possible.
- 5** Calculate Totals: Sum up all identified and quantified costs and benefits.
- 6** Compare and Decide: If benefits outweigh costs, the project is considered viable. Proceed if the net benefit is positive.

Source: Investopedia — Cost-Benefit Analysis (CBA)

WORKFLOW A-3

Decision Matrix (Pugh Matrix)

A quantitative analytical tool used for systematically evaluating and comparing multiple options against a set of weighted criteria. Particularly useful when several alternatives require an objective selection process.

STEPS

- 1** Identify Alternatives: List all possible options or alternatives to be evaluated.
- 2** Define Evaluation Criteria: Determine the key criteria or factors important for the decision.
- 3** Assign Weights to Criteria: Assign a numerical weight to each criterion based on its importance.
- 4** Create the Matrix: Set up a table with alternatives as rows and criteria as columns.
- 5** Rate Each Alternative: For each alternative, rate its performance against each criterion on a consistent scale.
- 6** Calculate Weighted Scores: Multiply each rating by the criterion's weight.
- 7** Sum Totals and Rank: The alternative with the highest total score is typically most favourable.

Source: ASQ — Decision Matrix

WORKFLOW A-4

Pareto Analysis (80/20 Rule)

Based on the 80/20 Rule — roughly 80% of consequences come from 20% of causes. This workflow helps identify the vital few factors responsible for the majority of problems, allowing efforts to be focused on the most impactful areas.

STEPS

- 1 Identify the Problem/Effect: Clearly define the specific problem you want to analyse.
- 2 Identify the Causes: List all potential causes or contributors to the problem.
- 3 Quantify the Causes: Measure the frequency or impact of each cause.
- 4 Order Causes by Impact: Rank the causes from most to least significant.
- 5 Calculate Cumulative Percentage: Calculate cumulative percentages for both impact and causes.
- 6 Create a Pareto Chart: Plot a bar chart and overlay a cumulative percentage line graph.
- 7 Identify the "Vital Few": Locate causes responsible for approximately 80% of the impact.
- 8 Prioritise and Act: Focus efforts and resources on addressing the vital few causes.

Source: Investopedia — Pareto Analysis

WORKFLOW A-5

SWOT Analysis

A strategic planning tool used to evaluate the Strengths, Weaknesses, Opportunities, and Threats involved in a project or business venture. Provides a structured framework for assessing internal capabilities and external factors.

STEPS

- 1 Define the Objective: Clearly state the objective for the SWOT analysis.
- 2 Identify Strengths (Internal): List internal positive attributes and resources.
- 3 Identify Weaknesses (Internal): List internal negative factors hindering performance.
- 4 Identify Opportunities (External): List external factors that could be leveraged.
- 5 Identify Threats (External): List external factors posing challenges or risks.
- 6 Analyse and Strategise: Review the matrix for connections and implications (SO, WO, ST, WT strategies).
- 7 Formulate Actionable Insights: Develop strategies and action plans based on the analysis.

Source: Investopedia — SWOT Analysis

WORKFLOW A-6

Multi-Voting

A decision-making technique used to narrow down a large list of options or ideas to a smaller, more manageable set. Particularly useful in group settings where prioritisation is needed across many choices.

STEPS

- 1** Generate a List: Begin with a brainstormed list of ideas or options.
- 2** Clarify the List: Ensure everyone understands each item before voting.
- 3** First Round of Voting: Each participant chooses a predetermined number of items (typically N/3).
- 4** Tally Votes (Round 1): Collect and publicly tally all votes for transparency.
- 5** Eliminate Low-Scoring Items: Cross off items with very few or no votes.
- 6** Second Round (Optional): Repeat voting with fewer choices if needed.
- 7** Identify Top Items: Items with the highest votes are prioritised.
- 8** Discuss and Finalise: Discuss top-ranked items for group understanding and agreement.

Source: ASQ — Multi-Voting

WORKFLOW A-7

Impact/Effort Matrix

A prioritisation tool used to decide which initiatives to pursue based on their potential impact and the effort required. Helps identify quick wins, major projects, fills, and time sinks.

STEPS

- 1** List Initiatives/Tasks: Gather all initiatives to prioritise.
- 2** Define "Impact": Determine what constitutes impact and define a clear measurement scale.
- 3** Define "Effort": Determine what constitutes effort and define a measurement scale.
- 4** Create the Matrix: Draw a 2×2 matrix with "Effort" on one axis and "Impact" on the other.
- 5** Plot Each Initiative: Place each initiative into the appropriate quadrant.
- 6** Prioritise by Quadrants: Prioritise Quick Wins, then Major Projects, then Fills; avoid Time Sinks.
- 7** Formulate Action Plan: Develop a plan based on the prioritisation results.

Source: Atlassian — Impact/Effort Matrix

WORKFLOW A-8

Risk Assessment Matrix

A visual tool used to evaluate the likelihood of a risk occurring against the severity of its potential consequences. Helps organisations prioritise risks and allocate resources for mitigation strategically.

STEPS

- 1 Identify Risks: Brainstorm and list all potential risks relevant to the project or system.
- 2 Define Likelihood Scale: Establish a scale for the likelihood of a risk occurring (e.g., 1–5).
- 3 Define Consequence Scale: Establish a scale for the severity of the risk's impact.
- 4 Create the Matrix: Construct a grid with Likelihood on one axis and Consequence on the other.
- 5 Assess Each Risk: Determine each risk's likelihood and consequence ratings.
- 6 Plot Risks on the Matrix: Place each risk into the corresponding matrix cell.
- 7 Determine Risk Level: The intersection determines the overall risk priority level.
- 8 Prioritise and Mitigate: Develop mitigation strategies for high-priority risks.

Source: ASQ — Risk Matrix

WORKFLOW A-9

FMEA — Failure Mode and Effects Analysis

A systematic, proactive method for identifying potential failure modes in a system, product, or process, assessing their effects, and then prioritising and implementing actions to eliminate or reduce the chances of failure.

STEPS

- 1 Define the Scope: Clearly define the system, product, or process to be analysed.
- 2 Identify Process Steps/Components: Break down the scope into individual steps.
- 3 Identify Potential Failure Modes: Brainstorm all possible ways each step could fail.
- 4 Identify Potential Effects of Failure: Determine what would happen if each failure occurred.
- 5 Assign Severity (S): Rate the severity of each effect on a standardised scale.
- 6 Identify Potential Causes: Brainstorm potential causes for each failure mode.
- 7 Assign Occurrence (O): Rate the likelihood of each cause occurring.
- 8 Identify Current Controls: List existing controls to prevent or detect failure.
- 9 Assign Detection (D): Rate the effectiveness of current controls in detecting the failure.
- 10 Calculate RPN: Risk Priority Number = $S \times O \times D$. Higher RPN = higher priority.
- 11 Prioritise and Recommend Actions: Develop actions to reduce S, O, or D.
- 12 Implement and Re-evaluate: Implement actions and recalculate RPN to verify improvement.

Source: ASQ — *Failure Mode and Effects Analysis (FMEA)*

WORKFLOW A-10

AHP — Analytic Hierarchy Process

A structured technique for organising and analysing complex decisions. Helps decision-makers find the best option by reducing complex decisions into a series of pairwise comparisons and then synthesising the results, incorporating both objective and subjective factors.

STEPS

- 1 Define the Goal: Clearly state the overall objective or decision.
- 2 Break Down into Hierarchy: Decompose the decision into criteria, sub-criteria, and alternatives.
- 3 Pairwise Comparisons (Criteria): Compare criteria based on their importance to the goal.
- 4 Calculate Weights (Criteria): Derive relative weights of each criterion.
- 5 Pairwise Comparisons (Alternatives): Compare alternatives for each criterion.
- 6 Calculate Weights (Alternatives): Derive relative weights of alternatives for each criterion.
- 7 Synthesise Results: Aggregate weights from all levels to get an overall score per alternative.
- 8 Make a Decision: The alternative with the highest synthesised score is the preferred choice.

Source: Saaty, T. L. (1980). *The Analytic Hierarchy Process*. McGraw-Hill.

WORKFLOW A-11

Spaced Repetition

An evidence-based learning technique that involves reviewing learned material at increasing time intervals. Strengthens memory retention by revisiting information just before it is forgotten, exploiting the psychological spacing effect.

STEPS

- 1** Initial Learning: Study information for the first time with active engagement.
- 2** First Review (Short Interval): Review shortly after initial learning (e.g., 1 day).
- 3** Second Review (Medium Interval): Review after a slightly longer period (e.g., 3 days).
- 4** Subsequent Reviews (Increasing Intervals): Continue reviewing at progressively longer intervals.
- 5** Adapt Interval Based on Recall: Adjust intervals based on how easily you recall each item.
- 6** Reinforce Long-Term Retention: Through spaced exposure, information moves to long-term memory.

Source: Scientific American — Spaced Repetition Does a Body Good

WORKFLOW A-12

Feynman Technique

A mental model for learning anything quickly and deeply by explaining it in simple terms, as if to a child. Emphasises understanding over memorisation, forcing you to identify and fill knowledge gaps through simplification.

STEPS

- 1** Choose a Concept: Select the concept you want to understand deeply.
- 2** Teach It to a Child: Explain the concept as simply as possible, writing it down without jargon.
- 3** Identify Gaps and Simplify: Pinpoint unclear areas, revisit source materials, and simplify further.
- 4** Organise and Refine: Structure your explanation logically, eliminating all unnecessary jargon.
- 5** Repeat (Optional): If needed, repeat the process until the explanation is fully clear and complete.

Source: Farnam Street — The Feynman Technique: The Best Way to Learn Anything

WORKFLOW A-13

Active Recall

A powerful learning strategy where you actively retrieve information from memory rather than passively rereading. This act of retrieval strengthens memory and improves long-term retention, leveraging the "testing effect" or retrieval practice.

STEPS

- 1** Study Initial Material: Read or listen to the material with focused attention.
- 2** Close the Source: Once done with a section, close your notes and materials completely.
- 3** Ask Questions/Self-Quiz: Actively try to recall the information, summarising or explaining from memory.
- 4** Check for Accuracy/Gaps: Compare your recall to the source material to identify mistakes or omissions.
- 5** Target Weak Areas: Focus subsequent study on areas of weak or inaccurate recall.
- 6** Repeat and Vary: Incorporate active recall regularly using varied question formats.

Source: The Learning Scientists — Retrieval Practice

WORKFLOW A-14

Mind Mapping

A visual thinking tool that helps organise information, brainstorm ideas, and generate creative solutions. Involves drawing a central idea and branching out related concepts, keywords, and images in a non-linear, radial structure.

STEPS

- 1** Central Topic: Start with the main topic written in the centre of the page.
- 2** Main Branches: Draw thick lines radiating out from the centre for key categories or themes.
- 3** Keywords on Branches: Write a single keyword or short phrase on each main branch.
- 4** Sub-Branches: Draw thinner branches for related ideas and supporting details.
- 5** Add Images and Icons (Optional): Incorporate visuals to enhance memory and creativity.
- 6** Connect Ideas (Optional): Use arrows to show connections between branches across the map.
- 7** Review and Expand: Review the map and add more connections or details as understanding deepens.

Source: Mind Tools — Mind Maps

WORKFLOW A-15

SQ3R Method

Survey, Question, Read, Recite, Review — a reading comprehension technique designed to help students and professionals get the most out of academic and technical readings. Encourages an active and systematic approach to reading for better understanding and retention.

STEPS

1

Survey: Skim the material for an overview before reading in detail.

2

Question: Turn headings into questions to guide reading and set a purpose.

3

Read: Actively read, seeking answers to your formulated questions.

4

Recite: Close the material and answer your questions aloud in your own words.

5

Review: Review notes and questions, focusing on areas of struggle or uncertainty.

Source: Virginia Tech — SQ3R Reading Method

WORKFLOW A-16

Concept Mapping

A visual tool that illustrates relationships between concepts, represented as nodes connected by labelled lines. Helps organise knowledge, making complex ideas more comprehensible and revealing deeper structural connections between ideas.

STEPS

1

Identify a Focal Question: Determine the central question your map will answer.

2

Identify Key Concepts: List all important related concepts, starting with the most general.

3

Arrange Concepts Hierarchically: Place the most general concept at the top, with specific ones below.

4

Connect Concepts with Labelled Arrows: Draw arrows between related concepts, labelling them with linking words.

5

Add Cross-Links (Optional): Draw connections between concepts in different branches of the hierarchy.

6

Review and Refine: Check the map for clarity, accuracy, and logical completeness.

Source: Novak, J. D., & Cañas, A. J. (2008). *The Theory Underlying Concept Maps*. Florida Institute for Human and Machine Cognition.

WORKFLOW A-17

Reflective Journaling

The practice of regularly writing about one's experiences, thoughts, and insights to gain a deeper understanding. Promotes self-awareness, critical thinking, and learning from experience through deliberate written reflection.

STEPS

- 1** Set a Purpose: Decide what you want to reflect on — a specific event, a project, or a period.
- 2** Choose a Medium: Select a comfortable journal (physical or digital) that you will use consistently.
- 3** Set Regular Times: Establish a consistent journaling schedule (daily, weekly, or after key events).
- 4** Write Freely: Begin writing without censoring yourself — let ideas flow naturally.
- 5** Probe Deeper with Prompts: Use structured prompts (e.g., "What did I learn?" "What would I do differently?").
- 6** Review and Synthesise (Optional): Periodically reread entries to identify recurring patterns or themes.
- 7** Take Action (Optional): Determine if any actionable steps arise from your reflections.

Source: University of Edinburgh — Reflective Journaling

WORKFLOW A-18

Deliberate Practice

A highly structured and purposeful approach to improving performance in a specific skill. Involves focused attention on areas of weakness, immediate feedback, and repeated practice designed to push beyond current abilities toward mastery.

STEPS

- 1 Define a Specific Goal: Identify a very specific aspect of a skill to improve.
- 2 Identify Weaknesses/Growth Areas: Pinpoint exactly what needs improvement with precision.
- 3 Design Focused Exercises: Create exercises specifically targeting those weaknesses.
- 4 Engage in Focused Practice: Dedicate undistracted time exclusively to these exercises.
- 5 Seek Immediate and Informative Feedback: Get timely and specific feedback on performance.
- 6 Refine and Repeat: Analyse feedback, adjust your approach, and repeat focused practice.
- 7 Maintain Motivation: Track progress and keep the long-term goal clearly in mind.

Source: Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in expert performance. *Psychological Review*, 100(3), 363-406.

WORKFLOW A-19

Teach-Back Method

A communication technique where the communicator asks the receiver to explain, in their own words, what they have understood. Confirms comprehension and identifies misunderstandings, ensuring effective information transfer — widely used in healthcare and education.

STEPS

- 1** Explain the Information: Clearly explain a concept or instruction to the other person.
- 2** Ask for Understanding: Ask "Can you tell me in your own words what you understood?"
- 3** Listen Actively: Pay close attention to their explanation without interrupting or correcting prematurely.
- 4** Assess Comprehension and Clarify: Re-explain any areas where gaps or misunderstandings are identified.
- 5** Re-Teach and Re-Check: Repeat the process until accurate understanding is confirmed.
- 6** Confirm Understanding: Give positive confirmation once an accurate explanation is given.

Source: Agency for Healthcare Research and Quality (AHRQ) — Teach-Back Method

WORKFLOW A-20

Analogy-Based Learning

Involves understanding new or complex concepts by comparing them to something familiar and simpler. Leverages existing knowledge to build new connections and facilitate comprehension across domains.

STEPS

- 1 Identify the Target Concept: Clearly define the new or difficult concept to be learned.
- 2 Identify a Familiar Source Concept: Think of a well-understood concept with structural similarities.
- 3 Map Similarities: Identify common attributes or principles shared between the two concepts.
- 4 Identify Differences/Limitations: Recognise where the analogy breaks down and becomes misleading.
- 5 Draw Inferences about the Target: Use the mapped similarities to make predictions about the new concept.
- 6 Verify and Refine: Test your understanding and adjust the analogy if needed.
- 7 Articulate the Analogy: Explain the new concept using the analogy, clearly noting its limits.

Source: National Research Council (2000). *How People Learn: Brain, Mind, Experience, and School*. National Academies Press.

WORKFLOW A-21

Brainstorming (Classic)

A group creativity technique used to generate a large number of ideas in a short period. The primary rule is to suspend judgment and encourage all ideas, fostering a free flow of thought without constraint.

STEPS

1

Define the Problem/Topic: Clearly state the topic or challenge for brainstorming.

2

Set Ground Rules: Emphasise no criticism, quantity over quality, wild ideas welcome, and building on others' ideas.

3

Generate Ideas: Participants call out or write down ideas, which are recorded for everyone to see.

4

Time Limit: Set a specific time limit to maintain energy and urgency.

5

Review and Clarify: After the generation phase, review and clarify all ideas.

6

Organise and Evaluate (Separate Step): Group, prioritise, and evaluate ideas in a distinctly separate phase.

Source: Osborn, A. F. (1953). Applied Imagination. Scribner.

WORKFLOW A-22

Reverse Brainstorming

A problem-solving technique that involves identifying potential problems or ways to make a situation worse, then reversing those negative ideas to generate innovative solutions. Particularly useful for complex or deeply entrenched problems.

STEPS

1

Define the Problem/Goal: Clearly state the problem to solve or goal to achieve.

2

Reverse the Problem/Goal: Rephrase it into its opposite (e.g., "How do we make X worse?").

3

Brainstorm "Negative" Ideas: Generate as many ideas as possible for achieving the reversed problem.

4

Reverse the Negative Ideas: For each negative idea, think of its opposite to find potential solutions.

5

Evaluate and Refine: Select and refine the most promising reversed ideas into actionable solutions.

Source: Mind Tools — Reverse Brainstorming

WORKFLOW A-23

SCAMPER Method

A creative thinking tool that uses a set of action verbs as prompts to spark new ideas or improve existing items. SCAMPER stands for Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, and Reverse.

STEPS

- 1** Choose a Subject: Select a product, service, process, or problem to improve or reinvent.
- 2** Apply SCAMPER Questions: Go through each letter (S, C, A, M, P, E, R) and ask related questions about your subject.
- 3** Substitute: What elements can be replaced with something else?
- 4** Combine: What elements can be merged or combined with something else?
- 5** Adapt/Modify/Magnify/Minify: What can be adjusted, emphasised, or scaled?
- 6** Put to Another Use: How could this be used in a different context?
- 7** Eliminate/Reverse: What can be removed or reversed to create something new?
- 8** Generate and Evaluate Ideas: Select and develop the most promising ideas further.

Source: Eberle, B. (1971). SCAMPER: Games for Imagination Development. DOK Publishers.

WORKFLOW A-24

Lateral Thinking

Coined by Edward de Bono, this is a problem-solving method that involves approaching issues from unexpected angles. Focuses on challenging assumptions and seeking alternative entry points to generate creative, non-obvious solutions.

STEPS

- 1** Identify the Problem: Clearly define the problem or challenge to be addressed.
- 2** Challenge Assumptions: List and systematically question all assumptions about the problem.
- 3** Break Down the Problem: Deconstruct the problem into its component parts.
- 4** Seek Alternative Entry Points: Try approaching the problem from completely different perspectives.
- 5** Use Provocations (Po): Introduce deliberately illogical statements to disrupt conventional thought patterns.
- 6** Generate Random Inputs: Use random words or objects to create unexpected new associations.
- 7** Consider Different Perspectives: Think about how people from other fields or backgrounds might approach the problem.
- 8** Harvest and Develop Ideas: Collect all generated ideas and develop the most promising ones.

Source: De Bono, E. (1970). Lateral Thinking: A Textbook of Creativity. Harper & Row.

WORKFLOW A-25

Morphological Analysis

A systematic method for exploring all possible solutions to a complex problem by identifying key dimensions and listing their variations. Creates a "morphological box" to combine these characteristics in novel ways.

STEPS

1

Define the Problem/Function: Clearly state the problem or desired function.

2

Identify Key Dimensions/Parameters: Break down the problem into independent attributes or dimensions.

3

List Variations for Each Dimension: List all possible variations or values for each dimension.

4

Create the Morphological Box/Matrix: Construct a matrix with dimensions as rows and variations as columns.

5

Generate Combinations: Systematically combine one variation from each dimension to form candidate solutions.

6

Evaluate Combinations: Filter and evaluate combinations for feasibility and desirability.

7

Select and Refine: Select promising combinations for further development and prototyping.

Source: Ritchey, T. (2011). Wicked Problems — Social Mess and the Morphological Approach. Acta Morphologica Generalis.

WORKFLOW A-26

Six Thinking Hats

Developed by Edward de Bono, this is a parallel thinking technique that encourages looking at a decision or problem from six different perspectives. Each "hat" represents a different mode of thinking to ensure comprehensive, balanced analysis.

STEPS

- 1 Define the Subject: Clearly state the problem or decision to be examined.
- 2 Set the Order (Optional): Decide on a productive sequence for using the hats.
- 3 Blue Hat (Process): Organise the thinking process and manage the meeting.
- 4 White Hat (Facts): Focus solely on objective data, information, and what is known or unknown.
- 5 Red Hat (Feelings): Express emotions, intuitions, and gut feelings without justification.
- 6 Yellow Hat (Benefits): Explore all positive aspects, value, and advantages.
- 7 Black Hat (Cautions): Identify all problems, risks, weaknesses, and why it might fail.
- 8 Green Hat (Creativity): Generate new ideas, alternatives, and creative possibilities.
- 9 Synthesise (Blue Hat): Summarise findings from all hats and make a well-rounded decision.

Source: De Bono, E. (1985). Six Thinking Hats. Little, Brown, and Company.

WORKFLOW A-27

Random Word Association

A creative thinking technique used to generate new ideas or break through creative blocks. Involves picking a random word and forcing connections between that word and the problem at hand to produce unexpected insights.

STEPS

1

Define the Problem/Topic: Clearly state the problem or creative topic.

2

Choose a Random Word: Select a word randomly (dictionary, generator, or nearby objects).

3

List Associations: Brainstorm as many words and concepts associated with the random word as possible.

4

Force Connections: Try to find connections between the random word (or its associations) and your problem.

5

Generate Ideas: Write down all new ideas that emerge from these forced connections.

6

Evaluate and Refine: Select the most promising ideas and develop them further.

Source: VanGundy, A. B. (1988). *Techniques of Structured Problem Solving*. Van Nostrand Reinhold.

WORKFLOW A-28

Forced Connections

A creativity technique that involves deliberately linking two seemingly unrelated items or concepts to generate new ideas. By forcing a relationship, it encourages thinking outside established patterns and conventional associations.

STEPS

- 1 Define the Problem/Subject: Clearly identify the problem or subject to be explored.
- 2 Select a Random Item/Concept: Choose a completely unrelated item.
- 3 List Attributes of the Random Item: Brainstorm characteristics of the unrelated item.
- 4 Force Connections: Connect each attribute of the random item to your problem or subject.
- 5 Generate Ideas: Write down all ideas that emerge from these unexpected connections.
- 6 Evaluate and Refine: Select the most promising ideas and develop them into actionable solutions.

Source: Mind Tools — Forced Connections

WORKFLOW A-29

Design Sprint

A five-day (or compressed) process for answering critical business questions through design, prototyping, and testing ideas with customers. Reduces risk and accelerates innovation by generating validated learning without full-scale building.

STEPS

1

Monday — Map: Understand the problem, define the long-term goal, and identify a target moment for the week.

2

Tuesday — Sketch: Each team member develops individual detailed solutions independently.

3

Wednesday — Decide: Critique solutions and choose the best one to prototype.

4

Thursday — Prototype: Rapidly build a realistic, high-fidelity prototype sufficient for user testing.

5

Friday — Test: Test the prototype with 5 real users and gather structured feedback.

6

Synthesise Learnings: Analyse test results to validate or iterate on the core hypothesis.

Source: Knapp, J., Zeratsky, J., & Kowitz, B. (2016). *Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days*. Simon & Schuster.

WORKFLOW A-30

TRIZ — Theory of Inventive Problem Solving

A methodology for inventive problem-solving based on the premise that innovative solutions often come from applying known principles to resolve contradictions. TRIZ identifies 40 inventive principles derived from analysis of hundreds of thousands of patents.

STEPS

1

Formulate the Problem: Define the problem in terms of contradictions between parameters.

2

Identify the Contradiction: Determine whether it is a technical contradiction (improving X worsens Y) or physical contradiction (a parameter must be both A and not-A).

3

Identify Inventive Principles: Translate the contradiction into TRIZ's generic form using its matrix of parameters.

4

Generate Solutions: Apply the suggested Inventive Principles to your specific problem context.

5

Evaluate and Refine: Evaluate generated solutions for feasibility, effectiveness, and novelty.

6

Identify Ideal Final Result (Optional): Define what the perfect outcome looks like to guide further refinement.

Source: Altshuller, G. (1984). *Creativity as an Exact Science: The Theory of the Solution of Inventive Problems*. Gordon and Breach.

WORKFLOW A-31

5 Whys

An iterative interrogative technique used to explore the cause-and-effect relationships underlying a problem. Its goal is to determine the root cause by repeatedly asking "Why?" — typically five times — until a fundamental, addressable cause is reached.

STEPS

- 1** State the Problem: Clearly define the specific problem as concisely as possible.
- 2** Ask "Why?" (1st): Ask "Why did this problem occur?" and record the answer precisely.
- 3** Ask "Why?" (2nd–4th): Based on the previous answer, ask "Why did that happen?" at least three more times.
- 4** Ask "Why?" (5th): Continue until the fifth "Why" — or until you can no longer go deeper.
- 5** Identify the Root Cause: The final "Why" should reveal a fundamental, actionable issue.
- 6** Implement Corrective Action: Develop and implement a solution specifically targeting the root cause.
- 7** Verify Effectiveness: Monitor to ensure the problem does not recur after the fix is applied.

Source: ASQ — 5 Whys

WORKFLOW A-32

Fishbone Diagram (Ishikawa)

Also known as a Cause and Effect Diagram, this visual tool identifies and categorises the potential causes of a problem, systematically exploring all contributing factors across major categories to find root causes.

STEPS

1

Define the Problem/Effect: Write the problem at the "head" of the fishbone diagram.

2

Draw the Backbone: Draw a horizontal arrow leading to the problem statement.

3

Identify Major Cause Categories: Draw diagonal "bones" for broad categories (e.g., Manpower, Methods, Machines, Materials, Measurement, Environment).

4

Brainstorm Specific Causes: For each category, brainstorm specific causes and draw smaller "bones," asking "Why?" to go deeper.

5

Analyse the Diagram: Review for root causes that appear impactful or that recur across multiple categories.

6

Prioritise and Take Action: Focus on investigating and addressing the most likely or impactful root causes.

Source: ASQ — Cause and Effect (Fishbone) Diagram

WORKFLOW A-33

Fault Tree Analysis (FTA)

A top-down, deductive failure analysis method where an undesired system state is analysed using Boolean logic to identify combinations of lower-level events that could lead to system failure. Especially used in safety-critical engineering systems.

STEPS

1

Define the Top Event: Identify the undesired "top event" (the system failure to be analysed).

2

Identify Immediate Causes: Determine direct causes leading to the top event, using AND/OR logic gates.

3

Decompose Causes: Break down each cause into underlying contributing events until basic events are reached.

4

Assign Probabilities (Optional): Assign probabilities to basic events for quantitative risk analysis.

5

Evaluate the Tree: Identify minimal cut sets (the smallest combination of events that causes failure).

6

Identify Critical Paths and Mitigate: Focus on the combinations most likely to cause failure and develop mitigation strategies.

Source: US Nuclear Regulatory Commission — Fault Tree Handbook

WORKFLOW A-34

FEMA — Failure Modes and Effects Management

The continuous management process that follows FMEA. While FMEA identifies and prioritises potential failures, FEMA refers to the ongoing process of managing these identified risks, ensuring recommended actions are implemented, tracked, and verified.

STEPS

- 1** Conduct FMEA: Complete a comprehensive Failure Mode and Effects Analysis (see A-9).
- 2** Establish Responsibilities: Assign clear ownership for each recommended risk-reduction action.
- 3** Implement Actions: Execute all planned risk-reduction activities on schedule.
- 4** Track Progress: Monitor the status of each action item to ensure timely completion.
- 5** Re-evaluate RPN: After implementing actions, reassess Severity, Occurrence, and Detection ratings and recalculate RPN.
- 6** Verify Effectiveness: Confirm that actions have successfully reduced the identified risk.
- 7** Document and Communicate: Maintain thorough records and communicate updates to relevant stakeholders.
- 8** Continuous Improvement: Integrate lessons learned back into design and operational processes.

Source: Quality-One International — FEMA vs. FMEA

WORKFLOW A-35

Root Cause Analysis (RCA)

A systematic process for identifying the fundamental reasons for an undesirable problem or event. Goes beyond merely addressing symptoms to find and fix the underlying causes, aiming to prevent recurrence.

STEPS

- 1** Define the Problem: Clearly articulate the specific problem, its scope, and its impact.
- 2** Collect Data: Gather all relevant information, facts, and evidence related to the problem.
- 3** Identify Causal Factors: List all immediate and contributing factors that led to the problem.
- 4** Determine Root Causes: Using tools such as 5 Whys, Fishbone, or Fault Tree Analysis, systematically uncover fundamental reasons.
- 5** Develop Solutions: Brainstorm and develop effective corrective actions that address root causes.
- 6** Implement Solutions: Put the chosen solutions into practice.
- 7** Verify Effectiveness: Monitor to ensure solutions have eliminated or significantly reduced recurrence.
- 8** Prevent Recurrence: Implement systemic changes to prevent similar problems in the future.

Source: ASQ — Root Cause Analysis (RCA)

WORKFLOW A-36

Causal Loop Diagram (CLD)

A tool used in system dynamics to represent the feedback structure of a complex system. Shows how different variables influence each other in loops, illustrating reinforcing (positive) or balancing (negative) feedback to understand dynamic system behaviour.

STEPS

- 1** Identify Key Variables: List the most important elements or factors in the system.
- 2** Draw Causal Links: Draw arrows between variables to show cause-and-effect relationships.
- 3** Indicate Polarity: Label each arrow "+" (same direction) or "-" (opposite direction) to show how cause affects effect.
- 4** Identify Loops: Trace paths through the diagram to find closed feedback loops.
- 5** Determine Loop Polarity: Reinforcing (R) loops amplify change; Balancing (B) loops seek equilibrium.
- 6** Add Delays (Optional): Indicate time delays between cause and effect where relevant.
- 7** Narrate the Story: Explain how the identified loops drive the system's behaviour.
- 8** Refine and Test: Review with others and revise as understanding deepens.

Source: Sterman, J. D. (2000). Business Dynamics: Systems Thinking and Modeling for a Complex World. McGraw-Hill.

WORKFLOW A-37

Porter's Five Forces Analysis

A framework for analysing the competitive intensity and attractiveness of an industry. Helps understand industry structure and identify sources of competitive pressure, informing strategic positioning.

STEPS

1

Identify Threat of New Entrants: Analyse barriers to entry, economies of scale, and capital requirements.

2

Identify Bargaining Power of Buyers: Assess how much power customers have to drive down prices.

3

Identify Bargaining Power of Suppliers: Evaluate how much power suppliers have to drive up prices.

4

Identify Threat of Substitute Products: Analyse the likelihood of customers finding alternative solutions.

5

Identify Rivalry Among Existing Competitors: Assess the intensity of competition among existing firms.

6

Synthesise and Conclude: Combine analysis of each force to understand overall industry attractiveness.

7

Develop Strategies: Formulate strategies to mitigate competitive threats and leverage strengths.

Source: Porter, M. E. (1980). Competitive Strategy: Techniques for Analysing Industries and Competitors. Free Press.

WORKFLOW A-38

VRIO Framework

An internal analysis tool used to evaluate a firm's resources and capabilities to determine if they can be a source of sustained competitive advantage. VRIO stands for Valuable, Rare, Inimitable, and Organised.

STEPS

- 1 Identify Key Resources and Capabilities: List the firm's major assets, skills, and unique abilities.
- 2 Assess Value (V): Does this resource enable the firm to exploit opportunities or neutralise threats?
- 3 Assess Rarity (R): Do few or no competitors currently possess this resource or capability?
- 4 Assess Inimitability (I): Is it costly or difficult for competitors to imitate or substitute?
- 5 Assess Organisation (O): Is the firm organised with appropriate structures and systems to fully exploit this resource?
- 6 Formulate Strategy: Develop strategies that leverage resources leading to sustained competitive advantage.

Source: Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. Journal of Management, 17(1), 99-120.

WORKFLOW A-39

PESTEL Analysis

A framework used to analyse and monitor macro-environmental factors that may have a profound impact on an organisation's performance. PESTEL stands for Political, Economic, Social, Technological, Environmental, and Legal factors.

STEPS

1

Identify Political Factors: Analyse government policies, political stability, trade regulations, and taxation.

2

Identify Economic Factors: Analyse economic growth, interest rates, exchange rates, inflation, and consumer spending.

3

Identify Social/Sociocultural Factors: Analyse demographics, cultural trends, health consciousness, and lifestyle shifts.

4

Identify Technological Factors: Analyse technological advancements, automation, AI, and digital communication trends.

5

Identify Environmental Factors: Analyse climate change, sustainability requirements, and ecological regulations.

6

Identify Legal Factors: Analyse consumer rights, employment law, antitrust, and data protection legislation.

7

Synthesise and Assess Impact: Evaluate how these factors collectively could affect the organisation.

8

Develop Strategic Implications: Formulate strategies to adapt to or capitalise on macro-environmental forces.

Source: Aguilar, F. J. (1967). Scanning the Business Environment. The Macmillan Company.

WORKFLOW A-40

Ansoff Matrix

A strategic marketing tool that helps businesses decide their product and market growth strategy. Presents four generic growth options based on whether the product and market are new or existing.

STEPS

- 1 Define Current Products and Markets: Understand where the business currently stands.
- 2 Market Penetration: Consider selling existing products to existing markets — the lowest risk option.
- 3 Market Development: Consider selling existing products into new markets (new segments, geographies).
- 4 Product Development: Consider introducing new products to existing markets.
- 5 Diversification: Consider entering entirely new markets with new products — the highest risk strategy.
- 6 Evaluate and Select: Assess the risk/return of each strategy given available resources and capabilities.

Source: Ansoff, H. I. (1957). Strategies for Diversification. Harvard Business Review, 35(5), 113-124.

WORKFLOW A-41

BCG Matrix (Growth-Share Matrix)

A portfolio management framework that helps companies analyse their product lines or business units based on Market Growth Rate and Relative Market Share. Categorises products into Stars, Cash Cows, Question Marks, and Dogs.

STEPS

1

Identify Business Units/Products: List the individual products, services, or business units to be analysed.

2

Determine Relative Market Share: Calculate market share relative to the largest competitor.

3

Determine Market Growth Rate: Identify the annual growth rate of each unit's market.

4

Plot on Matrix: Place each unit into its quadrant — Stars, Cash Cows, Question Marks, or Dogs.

5

Formulate Strategic Implications: Stars (invest), Cash Cows (harvest), Question Marks (invest or divest), Dogs (divest or milk).

6

Balance the Portfolio: Aim for a balanced mix with Cash Cows funding Stars and promising Question Marks.

Source: Henderson, B. D. (1970). The Product Portfolio. Boston Consulting Group.

WORKFLOW A-42

Value Chain Analysis

A strategic tool developed by Michael Porter that helps a firm analyse its activities to see where it can create value for customers. Breaks down the firm into primary and support activities to identify sources of competitive advantage.

STEPS

1

Identify Primary Activities: Detail inbound logistics, operations, outbound logistics, marketing and sales, and service.

2

Identify Support Activities: Detail firm infrastructure, human resource management, technology development, and procurement.

3

Analyse Costs and Value Drivers: For each activity, determine its cost and contribution to customer value.

4

Identify Competitive Advantages: Pinpoint activities where the firm excels or creates unique value.

5

Develop Strategies: Formulate strategies to enhance value-creating activities or improve cost efficiency.

Source: Porter, M. E. (1985). Competitive Advantage: Creating and Sustaining Superior Performance. Free Press.

WORKFLOW A-43

Balanced Scorecard

A strategic performance management framework by Kaplan and Norton that translates organisational vision and strategy into a comprehensive set of performance measures across four key perspectives: Financial, Customer, Internal Process, and Learning & Growth.

STEPS

1

Define Vision and Strategy: Clearly articulate the overarching vision, mission, and strategic objectives.

2

Financial Perspective: Define objectives, measures, and targets for financial performance.

3

Customer Perspective: Define objectives and measures for customer satisfaction, retention, and market share.

4

Internal Business Process Perspective: Define objectives for operational efficiency, quality, and innovation.

5

Learning and Growth Perspective: Define objectives for employee capabilities, culture, and technology.

6

Create Strategic Linkages: Establish cause-and-effect relationships between objectives across perspectives.

7

Implement and Monitor: Deploy the scorecard, collect data, and review performance regularly.

8

Adapt and Refine: Continuously adapt the scorecard based on feedback and changing priorities.

Source: Kaplan, R. S., & Norton, D. P. (1992). The Balanced Scorecard. Harvard Business Review, 70(1), 71-79.

WORKFLOW A-44

Gap Analysis

A tool used to compare the current state of an organisation, process, or individual to a desired future state. Identifies the "gap" between where you are and where you want to be, and determines the steps needed to close it.

STEPS

1

Define the Current State: Clearly describe the existing situation, performance, or capabilities with data.

2

Define the Desired Future State: Clearly articulate the target, goal, or ideal performance level.

3

Identify the Gap: Quantify or qualitatively describe the difference between current and desired states.

4

Analyse the Gap: Investigate what factors (skills, resources, processes, technology) are preventing progress.

5

Develop Action Plan: Propose specific, prioritised actions to close the identified gap.

6

Implement and Monitor: Put the action plan into effect and continuously track progress toward closing the gap.

Source: Mind Tools — Gap Analysis

WORKFLOW A-45

Scenario Planning

A strategic planning method involving the development of several plausible future scenarios to help organisations prepare for different potential environments. Moves beyond single-point forecasting to consider uncertainty and its strategic implications.

STEPS

- 1 Identify Focal Issue/Decision: Define the specific strategic challenge requiring scenarios.
- 2 Identify Key Driving Forces: Brainstorm major external trends and uncertainties using PESTEL.
- 3 Identify Critical Uncertainties: Select 2-4 most uncertain and impactful factors as scenario axes.
- 4 Develop Scenario Logics/Plots: Combine extreme outcomes to create 2-4 distinct, internally consistent scenarios.
- 5 Analyse Implications: For each scenario, determine the opportunities and threats it creates.
- 6 Develop Strategic Options: Formulate robust strategies effective across multiple scenarios.
- 7 Identify Leading Indicators: Determine early signals that would indicate which scenario is unfolding.
- 8 Monitor and Adapt: Continuously watch for these indicators and be prepared to adjust strategies.

Source: Schoemaker, P. J. H. (1995). *Scenario Planning: A Tool for Strategic Thinking*. *Sloan Management Review*, 36(2), 25-40.

WORKFLOW A-46

Delphi Method

A structured communication and forecasting technique that relies on a panel of experts. Achieves consensus on a specific issue through iterating rounds of questionnaires and anonymous feedback, reducing the influence of individual biases or dominant personalities.

STEPS

- 1** Formulate the Problem: Clearly define the question or problem requiring expert judgment.
- 2** Select Experts: Choose a diverse group of knowledgeable experts.
- 3** First Round Questionnaire: Distribute an initial questionnaire asking for opinions, forecasts, or solutions with justifications.
- 4** Summarise Responses: Anonymously summarise findings, identifying common themes and divergent opinions.
- 5** Second Round Questionnaire: Share summarised results and ask experts to reconsider their positions.
- 6** Iterate Rounds: Repeat the process (typically 3-4 rounds) until consensus or stable opinions are reached.
- 7** Final Report: Present aggregated results including the range of opinions and key justifications.

Source: Linstone, H. A., & Turoff, M. (Eds.). (1975). *The Delphi Method: Techniques and Applications*. Addison-Wesley.

WORKFLOW A-47

Blue Ocean Strategy

A business strategy framework focused on creating new, uncontested market space — a "blue ocean" — rather than competing in existing, crowded markets ("red oceans"). Emphasises value innovation to achieve both differentiation and low cost simultaneously.

STEPS

1

Visualise the Strategic Canvas (Current State): Plot the industry's key competitive factors and current offering levels.

2

Apply the Four Actions Framework: Systematically ask — Eliminate, Reduce, Raise, and Create.

3

Eliminate: Which factors the industry takes for granted should be eliminated entirely?

4

Reduce: Which factors should be reduced well below the industry standard?

5

Raise: Which factors should be raised well above the industry standard?

6

Create: Which factors should be created that the industry has never offered?

7

Reconstruct Market Boundaries: Look across alternative industries, strategic groups, and buyer chains.

8

Draw the Future State Canvas: Create a new strategic canvas showing the new distinct value curve.

9

Launch and Learn: Implement the blue ocean strategy, continuously learning and adapting.

Source: Kim, W. C., & Mauborgne, R. (2005). Blue Ocean Strategy. Harvard Business School Press.

WORKFLOW A-48

Business Model Canvas

A strategic management tool that allows you to describe, design, challenge, invent, and pivot your business model using nine building blocks that cover all key dimensions of a business on a single visual page.

STEPS

- 1 Customer Segments (CS): Identify the specific groups of people or organisations to be served.
- 2 Value Propositions (VP): Describe the bundle of products and services creating value for customers.
- 3 Channels (CH): Describe how the company reaches its customers to deliver the value proposition.
- 4 Customer Relationships (CR): Describe the type of relationship established with each customer segment.
- 5 Revenue Streams (RS): Define how the company generates revenue from each customer segment.
- 6 Key Resources (KR): Describe the most important assets required to operate the business.
- 7 Key Activities (KA): Describe the most important things the company must do to succeed.
- 8 Key Partnerships (KP): Describe the network of suppliers and partners that make the model work.
- 9 Cost Structure (CS): Describe all costs incurred to operate the business model.
- 10 Synthesise and Iterate: Analyse how the nine blocks interact and refine through experimentation.

Source: Osterwalder, A., & Pigneur, Y. (2010). Business Model Generation. Wiley.

WORKFLOW A-49

OKRs — Objectives and Key Results

A goal-setting framework used by individuals, teams, and organisations to define and track objectives and their measurable results. Promotes alignment, focus, and transparency, ensuring everyone works towards the same strategic goals.

STEPS

1

Define Objectives (O): Establish clear, aspirational, qualitative, and time-bound objectives stating what to achieve.

2

Define Key Results (KR): For each objective, define 3-5 measurable, specific, quantitative, and challenging key results.

3

Align Objectives: Ensure that individual and team OKRs align with higher-level organisational OKRs.

4

Communicate and Make Transparent: Share OKRs openly across the organisation.

5

Regular Check-ins: Periodically review progress on Key Results (weekly or bi-weekly).

6

Grading and Learning: At the end of the cycle, grade each Key Result and reflect on learnings for the next cycle.

Source: Doerr, J. (2018). Measure What Matters. Portfolio.

WORKFLOW A-50

SMART Goals

A widely used mnemonic for setting objectives that ensures goals are Specific, Measurable, Achievable, Relevant, and Time-bound, increasing their clarity and the likelihood of success.

STEPS

- 1 Specific: Clearly define what you want to achieve. Who, what, where, when, why?
- 2 Measurable: Determine how you will track progress and know when the goal is achieved.
- 3 Achievable: Ensure the goal is realistic and attainable given available resources and constraints.
- 4 Relevant: Confirm the goal aligns with broader objectives, values, or strategic direction.
- 5 Time-bound: Set a specific deadline or timeframe to create urgency and a clear endpoint.
- 6 Write Down the Goal: Formulate the complete SMART goal statement in one clear sentence.
- 7 Review and Adjust: Periodically review the goal and adjust if circumstances change materially.

Source: Doran, G. T. (1981). There's a S.M.A.R.T. way to write management's goals and objectives. *Management Review*, 70(11), 35-36.

WORKFLOW A-51

Eisenhower Matrix

A time management tool that helps prioritise tasks by categorising them based on urgency and importance, creating four actionable quadrants: Do First, Schedule, Delegate, and Eliminate.

STEPS

- 1** List All Tasks: Write down all tasks, projects, and activities needing to be done.
- 2** Create the Matrix: Draw a 2x2 grid with "Urgent" (horizontal) and "Important" (vertical) axes.
- 3** Quadrant 1 — Urgent & Important (Do First): Crises, deadlines, pressing problems requiring immediate attention.
- 4** Quadrant 2 — Not Urgent & Important (Schedule): Planning, prevention, and development — crucial for long-term success.
- 5** Quadrant 3 — Urgent & Not Important (Delegate): Interruptions and requests that don't advance your goals.
- 6** Quadrant 4 — Not Urgent & Not Important (Eliminate): Time-wasters and busywork offering little value.
- 7** Categorise Each Task: Place each task into its appropriate quadrant.
- 8** Prioritise and Act: Follow quadrant actions. Review regularly to keep priorities aligned.

Source: Covey, S. R. (1989). The 7 Habits of Highly Effective People. Simon & Schuster.

WORKFLOW A-52

GTD — Getting Things Done

A personal productivity methodology by David Allen designed to manage all commitments and information effectively. Based on getting everything out of your head and into an organised system to achieve a stress-free state of "mind like water."

STEPS

1

Capture: Collect everything demanding your attention — thoughts, tasks, emails, anything — into a single inbox.

2

Clarify: Process each inbox item. Is it actionable? If no: trash, incubate (Someday/Maybe), or file. If yes: what's the very next physical action?

3

Organise: Put clarified items into appropriate lists — Projects, Next Actions, Waiting For, Calendar, or Someday/Maybe.

4

Reflect (Daily/Weekly Review): Regularly review all lists. Weekly: clean up, update, and get clear on all projects and next actions.

5

Engage: Do the work. Choose what to work on based on context, time available, energy level, and priority.

Source: Allen, D. (2001). Getting Things Done: The Art of Stress-Free Productivity. Penguin Books.

WORKFLOW A-53

Pomodoro Technique

A time management method that uses a timer to break work into focused intervals (traditionally 25 minutes) separated by short breaks. Aims to improve focus and productivity by preventing burnout and managing mental energy.

STEPS

- 1** Choose a Task: Select a single, clearly defined task to work on.
- 2** Set the Timer: Set a timer for 25 minutes (one "Pomodoro").
- 3** Work with Full Focus: Work on the task intently until the timer rings. Note any distractions but don't act on them.
- 4** Take a Short Break: Mark one Pomodoro complete and take a 5-minute break away from the work.
- 5** Repeat: After four Pomodoros, take a longer break of 15-30 minutes.
- 6** Iterate: Continue working in Pomodoro cycles throughout the day.
- 7** Adapt and Refine: Adjust Pomodoro length and break times to suit your concentration patterns.

Source: Cirillo, F. (2006). *The Pomodoro Technique*. Lulu.com.

WORKFLOW A-54

Time Blocking

A time management technique where you schedule specific blocks of time in your calendar for specific tasks or activities. Treats your time as appointments, helping you dedicate focused attention to important work and reduce multitasking.

STEPS

1

List All Tasks/Activities: Write down everything you need to do — work tasks, meetings, personal activities, and breaks.

2

Estimate Time: Estimate how much time each task will realistically take, then add a buffer.

3

Open Your Calendar: Use a digital or physical calendar.

4

Allocate Time Blocks: Assign specific calendar blocks to each task. Treat them as non-negotiable appointments.

5

Color-Code (Optional): Use different colours for deep work, meetings, and admin tasks.

6

Protect Your Blocks: During a time block, eliminate distractions and focus solely on the assigned task.

7

Buffer Time: Include buffers between blocks to account for overruns.

8

Review and Adjust: At end of day or week, evaluate adherence and adjust future blocks.

Source: Newport, C. — Why and How I Time-Block My Day

WORKFLOW A-55

Eat the Frog

"Eat a live frog first thing in the morning and nothing worse will happen to you the rest of the day" (attr. Mark Twain). Means tackling your most challenging, most important, and most dreaded task first thing, before anything else.

STEPS

1

Identify Your "Frog": The previous evening or first thing each morning, identify the single most important and difficult task of the day.

2

Prepare to Eat the Frog: Gather all necessary materials, close distractions, and mentally commit.

3

Eat the Frog: Start working on this task immediately, without delay. Focus solely on it until significant progress is made.

4

Enjoy the Momentum: Once the "frog" is eaten, you will feel accomplishment and momentum for the rest of the day.

5

Repeat Daily: Make "eating the frog" a daily non-negotiable habit.

Source: Tracy, B. (2001). *Eat That Frog!: 21 Great Ways to Stop Procrastinating*. Berrett-Koehler Publishers.

WORKFLOW A-56

Flow State (Csikszentmihalyi)

A mental state of complete immersion, energised focus, and enjoyment in an activity. Characterised by total absorption and optimal performance — described by Mihaly Csikszentmihalyi as "optimal experience."

STEPS

- 1** Define Clear Goals: Know exactly what you need to achieve. Clarity of purpose is essential.
- 2** Balance Skill and Challenge: The task must be challenging enough to require concentration but not so difficult as to cause frustration.
- 3** Receive Immediate Feedback: Have a clear and immediate sense of how well you are performing.
- 4** Eliminate Distractions: Create an environment free from interruptions — turn off notifications.
- 5** Maintain Focused Attention: Consciously direct all your attention to the task at hand.
- 6** Lose Self-Consciousness: Become so immersed that you lose track of time and your surroundings.
- 7** Maintain Intrinsic Motivation: The activity itself should be enjoyable and inherently rewarding.

Source: Csikszentmihalyi, M. (1990). *Flow: The Psychology of Optimal Experience*. Harper & Row.

WORKFLOW A-57

Marginal Gains

A strategy focused on making small, incremental improvements across many different areas rather than seeking one large improvement. The aggregation of these small gains can lead to significant overall performance improvement — famously used by British Cycling.

STEPS

1

Define the Goal/System: Clearly identify the overall goal or system to improve.

2

Break Down the System: Deconstruct the system into its smallest constituent parts.

3

Identify All Contributing Factors: For each part, list every factor contributing to performance, no matter how minor.

4

Seek Small Improvements: For each factor, identify even 1% improvements that can be made.

5

Implement Iteratively: Implement these small improvements consistently across all identified areas.

6

Measure and Track: Continuously measure the cumulative impact of these small changes.

7

Aggregate and Refine: Recognise the compounding power of aggregated small gains and continue seeking further improvements.

Source: Syed, M. (2015). Black Box Thinking. Portfolio.

WORKFLOW A-58

Seinfeld Strategy — Don't Break the Chain

A motivational habit-building technique using a calendar to visually track daily consistency. Each day you complete your chosen habit, you mark an "X." The growing visual chain provides powerful motivation not to break the streak.

STEPS

1

Identify Your Habit: Choose one specific habit to build (e.g., write 500 words, code for 1 hour, exercise).

2

Get a Calendar: Obtain a large physical calendar where all days are clearly visible.

3

Commit to Daily Action: Decide that you will perform this habit every single day without exception.

4

Mark Your Progress: Each day you successfully complete the habit, mark a big red "X" on the calendar.

5

Don't Break the Chain: The primary motivation becomes seeing the growing chain and refusing to break it.

6

Celebrate the Chain: As the streak grows, it builds momentum and reinforces the habit over time.

Source: Lifehacker — The "Don't Break the Chain" Productivity Secret

WORKFLOW A-59

Kaizen — Continuous Improvement

A Japanese philosophy and practice focused on continuous, small, incremental improvements in processes. Emphasises that everyone in an organisation — from leadership to frontline — should constantly look for ways to improve efficiency and quality.

STEPS

1

Identify an Opportunity for Improvement: Recognise a problem, inefficiency, or area for enhancement.

2

Analyse the Current State: Gather data, observe the process, and understand existing conditions.

3

Develop Solutions: Propose small, practical changes. Focus on simplicity and immediate implementability.

4

Implement the Change: Put the proposed solution into practice on a small scale.

5

Measure and Evaluate Results: Observe and measure the impact of the change.

6

Standardise (if successful): Document the new process and train others on it.

7

Iterate and Improve Further: The improved state becomes the new baseline for the next improvement cycle.

8

Promote a Culture of Improvement: Encourage all team members to participate in Kaizen activities.

Source: Imai, M. (1986). Kaizen: The Key to Japan's Competitive Success. McGraw-Hill.

WORKFLOW A-60

Scrum Framework

An agile framework for developing, delivering, and sustaining complex products through short, fixed-length iterations called "sprints" (1-4 weeks), delivering potentially shippable increments of product with self-organising teams.

STEPS

1

Product Backlog Refinement (Ongoing): The Product Owner maintains a prioritised list of features and requirements.

2

Sprint Planning (Start of Sprint): The Scrum Team selects items from the Product Backlog to complete in the sprint.

3

Daily Scrum (Daily, 15 min): Developers synchronise and plan — what did I do yesterday? Today? Any impediments?

4

Sprint Execution: Developers work on selected Sprint Backlog items throughout the sprint.

5

Sprint Review (End of Sprint): Inspect the increment and adapt the Product Backlog with stakeholders.

6

Sprint Retrospective (End of Sprint): Inspect the team's process and create a plan for improvement in the next sprint.

7

Potentially Shippable Increment: Each sprint ends with a "Done" increment that is usable and potentially releasable.

Source: Schwaber, K., & Sutherland, J. (2020). The Scrum Guide. Scrum.org.

WORKFLOW A-61

Kanban Method

A method for managing and improving work — especially knowledge work — with emphasis on visualising work, limiting work in progress (WIP), and maximising efficiency and continuous flow.

STEPS

1

Visualise the Workflow: Create a Kanban board with columns representing different stages of your workflow.

2

Limit Work In Progress (WIP): Set explicit limits on the number of items in any given stage at one time.

3

Manage Flow: Track the movement of items through the workflow and address bottlenecks.

4

Make Policies Explicit: Clearly define the rules for how work moves through the system.

5

Implement Feedback Loops: Establish regular meetings for reviewing the board and adapting policies.

6

Improve Collaboratively: Encourage continuous improvement through hypothesis-driven experimentation.

Source: Anderson, D. J. (2010). Kanban: Successful Evolutionary Change for Your Technology Business. Blue Hole Press.

WORKFLOW A-62

Lean Thinking

A philosophy and set of principles focused on maximising customer value while minimising waste. Originated from the Toyota Production System, aiming to create more value with less work by eliminating non-value-adding activities.

STEPS

1

Specify Value: Define value precisely from the perspective of the end customer.

2

Identify the Value Stream: Map all steps — value-adding and non-value-adding — from raw materials to delivery.

3

Make Value Flow: Eliminate obstacles and waste (DOWNTIME: Defects, Overproduction, Waiting, Non-utilised talent, Transportation, Inventory, Motion, Over-processing).

4

Pull Production: Initiate production only when the customer demands it, reducing inventory and waste.

5

Pursue Perfection: Continuously strive for perfection by iteratively removing all remaining layers of waste.

Source: Womack, J. P., & Jones, D. T. (1996). Lean Thinking. Simon & Schuster.

WORKFLOW A-63

A3 Problem Solving

A structured approach to continuous improvement developed at Toyota, named after the A3-sized paper on which the entire problem-solving process is documented. Forces conciseness, clarity, and systematic thinking.

STEPS

1

Background/Theme: Briefly describe the business context and importance of the problem.

2

Current Condition: Describe the problem with data, graphs, and visual representations. What is the gap?

3

Target Condition: Define the desired future state with measurable targets and a timeline.

4

Root Cause Analysis: Use 5 Whys or Fishbone to thoroughly investigate underlying root causes.

5

Countermeasures: Propose specific, actionable solutions addressing the identified root causes.

6

Implementation Plan: Detail the steps, responsible parties, and deadlines for implementation.

7

Follow-up/Check: Describe how effectiveness will be measured and monitored post-implementation.

8

Learning/Key Takeaways: Summarise lessons learned and how they will be shared or applied elsewhere.

Source: Shook, J. (2009). *Managing to Learn: Using the A3 Management Process*. Lean Enterprise Institute.

WORKFLOW A-64

Gemba Walk

A fundamental Lean practice where leaders go to the actual place ("Gemba" in Japanese) where work is performed — factory floor, office, or service desk — to observe, understand, and learn about processes firsthand rather than relying on reports.

STEPS

1

Define a Purpose/Theme: Establish a clear focus before the walk. This is NOT an audit or critique.

2

Go to the Gemba: Physically go to the actual workplace where value-adding activities occur.

3

Observe: Watch the process as it unfolds. Look for variation, waste, and bottlenecks in real time.

4

Engage: Ask open-ended "What," "How," and "Why" questions to the people doing the work. Show genuine respect.

5

Take Notes: Jot down observations, questions, and initial thoughts without judgment.

6

Reflect and Follow Up: Share insights with the team and commit to follow-up actions based on what you learned.

Source: Liker, J. K. (2004). The Toyota Way: 14 Management Principles. McGraw-Hill.

WORKFLOW A-65

PDCA Cycle — Plan-Do-Check-Act

Also known as the Deming or Shewhart Cycle, this is an iterative four-step management method for the control and continuous improvement of processes and products. Provides a structured approach to problem-solving and implementing change.

STEPS

1

Plan: Identify the problem, analyse the current situation, establish objectives, and develop a detailed plan with measurable success criteria.

2

Do: Implement the plan on a small scale or in a controlled pilot environment. Collect data during implementation.

3

Check/Study: Analyse the data collected. Compare results against the objectives set in the Plan phase. Identify what worked and what did not.

4

Act: If successful — standardise and scale the improvement. If not successful — analyse failure, adjust the plan, and repeat the cycle.

Source: Deming, W. E. (1986). Out of the Crisis. MIT Press.

WORKFLOW A-66

Theory of Constraints (TOC)

Developed by Eliyahu Goldratt, this management philosophy states that any complex system has at least one constraint that limits its ability to achieve its goals. TOC focuses on identifying and managing these constraints to improve overall system performance.

STEPS

1

Identify the Constraint: Find the part of the process or system that limits overall throughput.

2

Exploit the Constraint: Maximise the output of the constraint using existing resources. Ensure it is never idle.

3

Subordinate Everything Else: Align all other parts of the system to support the constraint's needs.

4

Elevate the Constraint: If still limiting after exploitation, invest resources to increase its capacity.

5

Do Not Let Inertia Set In: Once one constraint is broken, a new constraint will emerge. Return to Step 1 and repeat.

Source: Goldratt, E. M. (1984). The Goal: A Process of Ongoing Improvement. North River Press.

WORKFLOW A-67

Value Stream Mapping (VSM)

A Lean management tool used to visualise, analyse, and improve the flow of material and information required to bring a product or service to a customer. Identifies waste and areas for improvement across the entire value stream.

STEPS

1

Identify a Product Family: Choose a specific product or service that flows through the system.

2

Draw the Current State Map: Map all process steps, information flows, inventory points, and add data boxes with cycle times, uptime, and operator counts.

3

Analyse the Current State: Identify all sources of waste, bottlenecks, and non-value-adding activities.

4

Draw the Future State Map: Design an improved value stream applying Lean principles.

5

Develop an Implementation Plan: Create a detailed action plan to transition from current to future state.

6

Implement and Monitor: Execute the plan and continuously monitor for further improvements.

Source: Rother, M., & Shook, J. (1999). Learning to See. Lean Enterprise Institute.

WORKFLOW A-68

Total Productive Maintenance (TPM)

A system for maintaining and improving the integrity of production and quality systems through machines, equipment, employees, and supporting processes. Aims for zero breakdowns, zero defects, and zero accidents by engaging all employees.

STEPS

1

Autonomous Maintenance: Train operators to perform routine maintenance and inspection of their own equipment.

2

Planned Maintenance: Schedule maintenance activities based on predicted failure rates to prevent breakdowns.

3

Quality Maintenance: Design equipment and processes to prevent defects and error-proof operations.

4

New Equipment Management: Design new equipment that is easy to operate, maintain, and adjust.

5

Education and Training: Provide comprehensive training for all employees on TPM principles and practices.

6

Safety, Health, and Environment: Create a safe working environment and eliminate potential hazards.

7

Office TPM: Apply TPM principles to administrative and support functions.

8

Development Management: Standardise and manage continuous improvement processes within TPM.

Source: Nakajima, S. (1988). Introduction to TPM: Total Productive Maintenance. Productivity Press.

WORKFLOW A-69

OEE — Overall Equipment Effectiveness

A metric that identifies the percentage of planned production time that is truly productive. Calculated by multiplying three factors: Availability × Performance × Quality. Provides a comprehensive measure of manufacturing productivity.

STEPS

1

Define Planned Production Time: Determine total scheduled time for equipment to run.

2

Calculate Availability (A): $(\text{Operating Time} / \text{Planned Production Time}) \times 100\%$. Operating Time = Planned Time minus all downtime.

3

Calculate Performance (P): $((\text{Actual Pieces Produced} \times \text{Ideal Cycle Time}) / \text{Operating Time}) \times 100\%$.

4

Calculate Quality (Q): $(\text{Good Pieces Produced} / \text{Total Pieces Produced}) \times 100\%$.

5

Calculate OEE: $\text{OEE} = \text{Availability} \times \text{Performance} \times \text{Quality}$ (all as decimals).

6

Analyse and Improve: Use the OEE score and its components to identify the largest loss areas and focus improvement efforts there.

Source: OEE.com — Overall Equipment Effectiveness

WORKFLOW A-70

Design Thinking (Extended)

A human-centred, iterative problem-solving approach involving understanding users, challenging assumptions, redefining problems, and creating innovative solutions through prototyping and testing — particularly effective for ill-defined or "wicked" problems.

STEPS

1

Empathize: Gain a deep understanding of users — their needs, motivations, and pain points through interviews and observation.

2

Define: Synthesise empathy research into a clear problem statement from the user's perspective. Frame as "How Might We..."

3

Ideate: Brainstorm a wide range of creative solutions. Encourage divergent thinking — quantity over quality.

4

Prototype: Build quick, low-fidelity representations (sketches, wireframes, models) to make ideas tangible.

5

Test: Put prototypes in front of real users. Gather feedback and learn what works.

6

Iterate: Based on test results, return to any previous step. Design Thinking is non-linear and cyclical by design.

Source: Brown, T. (2009). *Change by Design: How Design Thinking Transforms Organizations*. HarperBusiness.

WORKFLOW A-71

Empathy Map

A collaborative Design Thinking tool used to gain deeper understanding of a user by capturing what they Say, Think, Do, and Feel in relation to a specific product, service, or experience, along with their Pains and Gains.

STEPS

- 1 Define the User/Persona: Identify the specific user or customer segment to be understood.
- 2 Define the Scenario/Situation: Specify the context — what is the user doing or trying to accomplish?
- 3 Says: Capture what the user explicitly articulates, states, or says in interviews.
- 4 Thinks: What might the user be thinking — their beliefs, attitudes, and concerns (often inferred)?
- 5 Does: What actions does the user take? What are their observable behaviours?
- 6 Feels: What is the user's emotional state — anxieties, excitements, frustrations?
- 7 Pains: What frustrates or challenges the user? What fears do they have?
- 8 Gains: What does the user want to achieve? What defines success for them?
- 9 Synthesise and Discover: Look for patterns and formulate "How Might We" questions to drive ideation.

Source: XPLANE — Empathy Map

WORKFLOW A-72

User Story Mapping

A visual technique for organising user stories into a meaningful narrative. Helps teams understand the user's journey, prioritise features, identify gaps, and plan product releases effectively.

STEPS

1

Identify the User's Journey/Activities: Map high-level activities a user performs as the "backbone" of the map.

2

Break Down Activities into Tasks/Steps: For each activity, identify the specific steps a user takes.

3

Write User Stories: For each task, write user stories ("As a customer, I want to... so that I can...").

4

Prioritise Vertically: Arrange user stories vertically under each task, with the most valuable at the top.

5

Slice into Releases/Iterations: Draw horizontal lines defining potential releases — the MVP is at the top.

6

Identify Gaps and Dependencies: Review the map for missing stories, assumptions, or inter-story dependencies.

7

Refine and Collaborate: Continuously refine the map with the team to ensure shared understanding.

Source: Patton, J. (2014). User Story Mapping: Discover the Whole Story, Build the Right Product. O'Reilly Media.

WORKFLOW A-73

Persona Development

A process of creating fictional, generalised representations of ideal or typical users based on research and data. Personas help teams understand user needs, experiences, behaviours, and goals in a concrete and empathetic way.

STEPS

1

Conduct User Research: Gather qualitative and quantitative data through interviews, surveys, usability tests, and analytics.

2

Identify Behavioural Patterns: Analyse data for common characteristics, behaviours, needs, and motivations.

3

Create 3-5 Persona Profiles: For each persona, define a name, demographics, photo/sketch, goals, behaviours, pain points, and a representative quote.

4

Bring Personas to Life: Share personas with the team. Print them out and refer to them in all design decisions.

5

Validate and Evolve: Continuously validate and refine personas as new research emerges or the market changes.

Source: Cooper, A. (1999). The Inmates Are Running the Asylum. Sams.

WORKFLOW A-74

Customer Journey Mapping

A visual representation of the entire experience a customer has with a company, product, or service. Helps businesses understand customer pain points, moments of truth, and improvement opportunities from the customer's perspective.

STEPS

1

Define Scope and Persona: Choose a specific persona and the journey scenario to map.

2

Identify Touchpoints: List all interactions across different channels (website, email, phone, in-person).

3

Outline Phases/Stages: Break the journey into chronological stages (Awareness, Consideration, Purchase, Support, Loyalty).

4

Map Actions, Thoughts, and Feelings: For each stage, document what the customer does, thinks, and feels.

5

Plot the Emotional Journey Line: Create a visual representation of emotional highs and lows across the journey.

6

Identify Pain Points and Opportunities: Highlight negative experience areas and identify improvement opportunities.

7

Analyse and Act: Use the map to build empathy, align teams, and prioritise experience improvements.

Source: Kalbach, J. (2016). Mapping Experiences. O'Reilly Media.

WORKFLOW A-75

A/B Testing (Split Testing)

A controlled experiment where two or more versions of a variable are shown to different random user segments, with statistical analysis used to determine which version performs better against a defined goal.

STEPS

1

Identify a Goal/Metric: Define the single primary metric to improve (e.g., conversion rate, click-through rate).

2

Formulate a Hypothesis: State which version you expect to perform better and why.

3

Identify the Variable: Pinpoint the specific element to test (headline, button, image, layout).

4

Create Variations: Develop the control (A) and at least one variation (B).

5

Divide Traffic: Randomly split audience traffic between the control and variation(s).

6

Run the Experiment: Let the test run until statistical significance is achieved.

7

Analyse Results: Compare performance statistically. Is the difference significant or due to chance?

8

Implement or Iterate: Implement the winner or learn from the results and formulate a new hypothesis.

Source: Kohavi, R., Tang, D., & Xu, Y. (2020). Trustworthy Online Controlled Experiments. Cambridge University Press.

WORKFLOW A-76

Minimum Viable Product (MVP)

A version of a new product with just enough features to satisfy early adopters and generate maximum validated learning about customers with minimum effort. Designed to test core hypotheses with minimal resources.

STEPS

1

Identify the Core Problem: Clearly define the problem you are solving for target users.

2

Define the Core Value Proposition: Determine the absolute minimum value the product must deliver.

3

Identify the Riskiest Assumption: What is the biggest unknown that, if false, would invalidate the entire idea?

4

Prioritise Core Features: Strip down to only the features required to test the riskiest assumption.

5

Build the MVP: Develop the bare-bones version quickly, prioritising functionality over polish.

6

Launch to Early Adopters: Release to a small group of target users willing to provide feedback.

7

Measure and Learn: Collect data on user behaviour and gather qualitative feedback.

8

Iterate or Pivot: Based on learning, decide whether to persevere with refinements or pivot direction entirely.

Source: Ries, E. (2011). The Lean Startup. Crown Business.

WORKFLOW A-77

Continuous Delivery (CD)

A software engineering approach where teams ensure software can be reliably released at any time through short development cycles, automated testing, and continuous deployment pipelines.

STEPS

1

Version Control All Assets: Store every piece of code, configuration, and test script in version control.

2

Automate the Build Process: Create a repeatable, automated build and packaging process.

3

Implement Continuous Integration (CI): Developers integrate code frequently with automated builds and tests.

4

Automate Testing: Implement comprehensive automated test suites covering unit, integration, regression, and performance tests.

5

Automate Deployment to Staging: Automatically deploy validated builds to staging environments.

6

Automate Release Process: Make the production release a low-risk, repeatable automated process.

7

Monitor and Alert: Implement monitoring with alerting for health and performance issues.

8

Foster Collaboration and Feedback: Maintain close collaboration between dev, ops, and business teams.

Source: Humble, J., & Farley, D. (2010). Continuous Delivery. Addison-Wesley.

WORKFLOW A-78

Continuous Integration (CI)

A development practice where developers regularly merge code changes into a central repository, with each merge automatically verified by builds and automated tests, enabling rapid detection and resolution of integration problems.

STEPS

1

Version Control System: Manage all source code in a shared version control system (e.g., Git).

2

Shared Repository: Use a single shared code repository for the entire team.

3

Automated Build Server: Set up a CI server (Jenkins, GitHub Actions) to automatically trigger builds on commit.

4

Frequent Commits: Developers commit code changes frequently in small, logical increments.

5

Automated Build and Test on Each Commit: Each commit triggers an automated build and full test suite.

6

Fast Feedback: If build or tests fail, the CI server immediately notifies the team.

7

Maintain a Green Build: Failing builds are the team's highest priority to fix immediately.

8

Automated Deployment (Optional): Successful builds can be automatically deployed to development environments.

Source: Fowler, M. (2006). Continuous Integration. martinfowler.com.

WORKFLOW A-79

DevOps Philosophy

A set of practices combining software development (Dev) and IT operations (Ops) to shorten the systems development lifecycle and provide continuous delivery with high software quality through automation, collaboration, and shared responsibility.

STEPS

1

Culture: Foster a culture of collaboration, communication, and shared responsibility — break down silos between Dev and Ops.

2

Automation: Automate as many processes as possible across the entire software delivery pipeline.

3

Lean Flow (CI/CD): Implement Continuous Integration and Continuous Delivery for rapid, smooth code deployment.

4

Feedback Loops: Establish fast and constant feedback loops throughout the entire application lifecycle.

5

Shared Responsibility: Development and Operations share responsibility for the entire application lifecycle.

6

Measurement and Metrics: Track key metrics (deployment frequency, lead time, mean time to recovery, change failure rate).

7

Experimentation and Learning: Encourage a culture of experimentation and learning from failures.

Source: Kim, G., Humble, J., & Debois, P. (2016). The DevOps Handbook. IT Revolution Press.

WORKFLOW A-80

Lewin's 3-Step Change Model

Kurt Lewin's foundational framework for managing organisational change posits three distinct phases: Unfreeze (preparing for change), Change (implementing the transition), and Refreeze (embedding the new state).

STEPS

1

Unfreeze: Create urgency and dismantle the status quo. Address resistance, challenge existing norms, and prepare people psychologically for transition.

2

Change (Move): Implement the new processes, systems, or behaviours. Communicate clearly, provide training and support, and empower action.

3

Refreeze: Solidify the change as the new norm. Institutionalise changes into culture, policies, and reward systems. Celebrate successes.

4

Monitor and Adjust: Continuously monitor the effectiveness of the change and make further adjustments to ensure long-term stability.

Source: Lewin, K. (1951). *Field Theory in Social Science: Selected Theoretical Papers*. Harper & Row.

WORKFLOW A-81

ADKAR Change Management Model

A goal-oriented change management model focusing on five elements necessary for successful individual change: Awareness, Desire, Knowledge, Ability, and Reinforcement.

STEPS

1

Awareness: Ensure individuals understand why the change is happening and what will occur if it does not.

2

Desire: Help individuals choose to support the change. Address personal motivation and resistance.

3

Knowledge: Provide training and information on how to change — new skills, processes, and behaviours required.

4

Ability: Ensure individuals can put their knowledge into practice through coaching and removing obstacles.

5

Reinforcement: Put measures in place to sustain the change — celebrate success, provide feedback, integrate into culture.

6

Diagnose and Prescribe: Use ADKAR to diagnose where a change initiative is struggling and prescribe targeted interventions.

Source: Hiatt, J. M. (2006). ADKAR: A Model for Change in Business, Government and Our Community. Prosci.

WORKFLOW A-82

Stakeholder Analysis

A process of identifying all individuals or groups impacted by or able to impact a project or decision, then analysing their interests, influence, and potential impact to inform communication and engagement strategies.

STEPS

1

Identify All Stakeholders: List all individuals, groups, and organisations with an interest in the project.

2

Analyse Stakeholder Interests: For each stakeholder, determine their interests, concerns, and what they stand to gain or lose.

3

Assess Influence/Power: Determine the level of power or influence each stakeholder has over project success.

4

Map Stakeholders (Power/Interest Grid): Plot stakeholders in four quadrants — Manage Closely, Keep Satisfied, Keep Informed, Monitor.

5

Develop Engagement Strategy: Create a communication and engagement plan tailored to each stakeholder group.

6

Monitor and Review: Continuously monitor stakeholder positions and adapt strategies as the project evolves.

Source: Eden, C., & Ackermann, F. (1998). *Making Strategy: The Journey of Strategic Management*. Sage Publications.

WORKFLOW A-83

Communication Plan Development

A framework for outlining how information will be shared with various stakeholders throughout a project or initiative. Ensures the right information reaches the right people at the right time through the right channels.

STEPS

1

Identify Communication Objectives: What do you want to achieve — inform, persuade, solicit feedback, manage expectations?

2

Identify Key Stakeholders/Audiences: Segment them by their information needs and interests.

3

Define Key Messages: Determine what core information needs to be conveyed to each audience.

4

Select Communication Channels: Choose the most effective methods (email, meetings, newsletters, intranet, one-on-one).

5

Determine Frequency and Timing: How often and when should each communication be delivered?

6

Assign Responsibilities: Clearly assign who creates, approves, and delivers each communication.

7

Establish Feedback Mechanisms: How can stakeholders provide feedback or ask questions?

8

Create a Communication Matrix: Document all of the above in a clear table format.

9

Monitor and Adjust: Review effectiveness regularly and adjust based on feedback.

Source: Project Management Institute. (2017). PMBOK Guide (6th ed.). PMI.

WORKFLOW A-84

RACI Matrix

A responsibility assignment matrix that clarifies roles for specific tasks, deliverables, or decisions. RACI stands for Responsible, Accountable, Consulted, and Informed — eliminating role ambiguity in projects and processes.

STEPS

- 1 Identify Tasks/Deliverables: List all key tasks, activities, or deliverables as rows.
- 2 Identify Roles/Individuals: List all roles or individuals involved as columns.
- 3 Responsible (R): The person(s) who do the work to complete the task.
- 4 Accountable (A): The single person ultimately answerable for the task's outcome. Only one "A" per task.
- 5 Consulted (C): Person(s) whose opinions are sought before decisions are made (two-way communication).
- 6 Informed (I): Person(s) kept up-to-date on progress or decisions (one-way communication).
- 7 Review and Resolve: Ensure every task has exactly one "A" and at least one "R." Simplify where there are too many "C"s or "I"s.
- 8 Communicate and Implement: Share the matrix with the team and ensure everyone understands their role.

Source: Project Management Institute. (2017). PMBOK Guide (6th ed.). PMI.

WORKFLOW A-85

Delegation Framework (Situational Leadership)

A structured approach to assigning tasks and authority to others, ensuring clarity, efficiency, and effective team member development. Based on Hersey and Blanchard's Situational Leadership, matching delegation level to individual competence and commitment.

STEPS

1

Assess the Task: Is it suitable for delegation? What are the objectives, desired outcomes, and constraints?

2

Assess the Individual: What are their current skills, experience, motivation, and developmental needs for this task?

3

Determine Delegation Level: Tell (full instruction), Sell (explain why), Consult (seek input), Agree (collaborative), Advise (they decide with input), Delegate (full autonomy).

4

Communicate Clearly: Explain the task, purpose, desired results, deadline, authority level, and reporting frequency.

5

Provide Support: Offer resources, training, and availability without micromanaging.

6

Monitor and Provide Feedback: Check in according to the agreed delegation level. Provide constructive feedback.

7

Review and Learn: Reflect on the delegation process for future improvement.

Source: Blanchard, K., & Hersey, P. (1969). Management of Organizational Behavior. Prentice-Hall.

WORKFLOW A-86

Affinity Diagram (KJ Method)

A business tool for organising large numbers of ideas into natural groupings based on their relationships. Makes sense of unstructured brainstorming output by having participants silently cluster related ideas.

STEPS

1

Generate Ideas: Start with a brainstorming session to generate ideas written on individual sticky notes.

2

Lay Out All Ideas: Spread all sticky notes randomly on a large surface.

3

Silence Grouping: Without talking, participants move sticky notes into groups based on natural affinity.

4

Handle Disagreements Silently: If you disagree with a placement, move it. The owner can move it back.

5

Create Header Cards: Once grouped, create header cards summarising the theme of each cluster.

6

Discuss and Refine: Discuss the groupings and headers to ensure consensus and clarity.

7

Draw Relationships (Optional): Draw arrows between groups to show inter-group relationships.

8

Synthesise Findings: Use organised groups to identify key patterns, themes, and actionable insights.

Source: ASQ — Affinity Diagram

WORKFLOW A-87

Interrelationship Digraph

A tool that helps identify and analyse cause-and-effect relationships between various factors in a complex problem. Determines key drivers and outcomes especially when many elements interact in a non-linear way.

STEPS

- 1** Define the Problem/Issue: Clearly state the complex problem or issue to be analysed.
- 2** Brainstorm Related Factors: Generate all relevant ideas or factors (often from an Affinity Diagram), each on a separate card.
- 3** Arrange Factors: Place the factors in a circle or scattered pattern on a large surface.
- 4** Draw Relationship Arrows: Compare each factor to every other. Draw an arrow FROM a factor if it causes or influences another.
- 5** Count In- and Out-Arrows: For each factor, count arrows pointing out (causes) and arrows pointing in (effects).
- 6** Identify Drivers and Outcomes: Many out-arrows = driver/root cause. Many in-arrows = key outcome/effect.
- 7** Analyse and Prioritise: Focus problem-solving on addressing key drivers for maximum system impact.

Source: ASQ — Interrelationship Digraph

WORKFLOW A-88

Tree Diagram (Systematic Diagram)

A visual tool used to break down broad categories or goals into progressively finer levels of detail. Identifies all necessary steps to achieve an objective or all possible components of a system in a hierarchical structure.

STEPS

1

State the Goal/Problem: Begin with the main goal at the far left (or top) of the diagram.

2

Identify Main Categories/Steps: Determine primary categories required to achieve the goal. Draw branches.

3

Decompose into Sub-Categories: For each main category, identify sub-components or next-level actions. Draw sub-branches.

4

Continue Decomposition: Keep breaking down until you reach specific, actionable items.

5

Review for Completeness and Logic: Ensure all necessary elements are included and the logical flow is sound.

6

Assign Responsibility/Timeline (Optional): For actionable tasks at the branch ends, add responsible parties and deadlines.

Source: ASQ — Tree Diagram

WORKFLOW A-89

PICK Chart (Prioritisation Matrix)

A specific prioritisation matrix used to rank and prioritise options based on Payoff (benefit/impact) and Ease of Implementation (effort/difficulty). Categorises options into Possible, Implement, Challenge, and Kill quadrants.

STEPS

1

List All Options/Ideas: Gather all the ideas, solutions, or initiatives to be prioritised.

2

Define Criteria: For PICK, the two criteria are "Payoff" (Benefit/Impact) and "Ease of Implementation."

3

Create the PICK Matrix: Draw a 2×2 matrix with Ease on the horizontal axis and Payoff on the vertical axis.

4

Possible (Low Payoff, Easy): Small gains — do only if time allows.

5

Implement (High Payoff, Easy): Quick Wins — highest priority for immediate action.

6

Challenge (High Payoff, Difficult): Strategic projects — high reward but require significant planning.

7

Kill (Low Payoff, Difficult): Avoid entirely — do not waste time or resources.

8

Plot, Discuss, and Prioritise: Place each idea in the appropriate quadrant, discuss with the team, and prioritise Implement first.

Source: Lean Six Sigma Institute — PICK Chart

WORKFLOW A-90

Process Decision Program Chart (PDPC)

A planning tool used to anticipate potential problems during the implementation of a project and develop countermeasures. Particularly useful for complex or high-risk projects requiring proactive risk management.

STEPS

1

Identify Key Steps: Create a high-level flowchart or list of main steps in the plan (often from a Tree Diagram).

2

Brainstorm Potential Problems: For each key step, brainstorm all possible things that could go wrong.

3

Identify Countermeasures: For each potential problem, brainstorm specific preventive or mitigating actions.

4

Evaluate Countermeasures: Assess the feasibility, effectiveness, and cost of each countermeasure.

5

Draw the PDPC Chart: Visualise the plan — steps in rectangles, problems in dashed boxes, countermeasures in circles.

6

Develop Contingency Plans (Optional): For very high-risk items, develop full contingency plans.

7

Review and Refine: Review with the team to ensure all potential problems are covered with effective countermeasures.

Source: ASQ — Process Decision Program Chart (PDPC)

WORKFLOW A-91

Storytelling for Communication

The structured process of crafting and delivering narratives to communicate complex information, persuade an audience, build empathy, or inspire action. Leverages the human brain's natural inclination for narrative to make information more memorable than raw data.

STEPS

1

Identify the Core Message/Purpose: What is the single most important point for the audience to take away?

2

Know Your Audience: Understand their background, interests, existing knowledge, and what resonates with them.

3

Define the Character(s): Who is the protagonist? Give them relatable traits the audience can connect with.

4

Establish the Setting/Context: Provide enough background to understand where and when the story takes place.

5

Introduce the Conflict/Challenge: Every compelling story has a problem, obstacle, or turning point creating tension.

6

Outline the Journey/Struggle: Describe the efforts, actions, and challenges faced in addressing the conflict.

7

Achieve Resolution/Transformation: Show how the conflict was resolved or how the character changed.

8

State the Call to Action/Moral: Explicitly link the story back to the core message and desired next step.

9

Practice and Refine: Tell the story aloud, adjust pacing, and gather feedback from trusted peers.

Source: Denning, S. (2001). The Springboard: How Storytelling Ignites Action. Butterworth-Heinemann.

WORKFLOW A-92

Hypothesis-Driven Development

An iterative approach to building products or features where every new idea is treated as a testable hypothesis. Emphasises defining clear assumptions, designing minimal experiments to validate or invalidate them, and learning rapidly from results.

STEPS

1

Formulate a Hypothesis: "We believe [this capability] will result in [this outcome] for [these users] because [this reason]."

2

Define Success Metrics: How will you quantitatively and qualitatively measure if the hypothesis is true or false?

3

Design the Smallest Experiment: Create the absolute minimum product, feature, or prototype to test the core hypothesis.

4

Build and Deploy: Implement the minimal experiment quickly and efficiently.

5

Measure and Collect Data: Release to target users and collect data against the defined success metrics.

6

Analyse and Learn: Evaluate results. Was the hypothesis validated or invalidated? What insights were gained?

7

Persevere: If validated, proceed with further development. Pivot: If invalidated, adjust strategy and form a new hypothesis. Stop: If overwhelmingly negative.

Source: Gothelf, J., & Seiden, J. (2016). Lean UX: Applying Lean Principles to Improve User Experience. O'Reilly Media.

WORKFLOW A-93

Mental Models Application

The deliberate process of identifying, understanding, and applying diverse mental models (frameworks, concepts, or theories) from multiple disciplines to analyse situations, solve problems, and make better decisions.

STEPS

1

Build a Repertoire: Collect mental models from diverse fields — physics, biology, economics, psychology, philosophy, statistics.

2

Understand Each Model Deeply: Know the core logic, underlying assumptions, and contexts where each model applies or breaks down.

3

Define the Problem/Situation: Clearly articulate the problem, decision, or situation to be analysed.

4

Systematically Apply Models: Ask — how does [Model X] illuminate this problem? What does [Model Y] reveal?

5

Combine and Synthesise: Look for how different models intersect or complement each other for richer analysis.

6

Formulate Action/Decision: Based on the multi-faceted analysis, make a more informed, robust decision.

7

Reflect and Refine: After the outcome, reflect on which models were most useful and how to apply them better.

Source: Dobelli, R. (2013). The Art of Thinking Clearly. Harper.

WORKFLOW A-94

Pre-Mortem Analysis

A prospective technique where a team imagines that a project has already failed and then works backwards to identify what could have gone wrong. Surfaces hidden concerns, vulnerabilities, and blind spots before they become real problems.

STEPS

1

Define the Project/Plan: Clearly describe the project or plan to be analysed.

2

Set the Scene (Imagine Failure): Ask the team to imagine it is 6-12 months in the future and the project has failed completely.

3

Generate Reasons for Failure: Individually and silently, each team member writes down all the reasons why the project failed.

4

Share and Compile: Each person shares their reasons. Compile a comprehensive list of all potential failure modes.

5

Assess Probability and Impact: For each reason, assess how likely it is and how severe its impact would be.

6

Identify Preventive Actions: For high-probability, high-impact risks, develop specific preventive countermeasures.

7

Integrate into Planning: Incorporate the identified risks and countermeasures into the project plan.

Source: Klein, G. (2007). Performing a Project Pre-Mortem. Harvard Business Review.

WORKFLOW A-95

First Principles Thinking

A method of reasoning that involves breaking down complex problems into their most fundamental components — the irreducible facts — and then rebuilding solutions from scratch rather than by analogy. Used by Elon Musk and Aristotle.

STEPS

1

Identify and Define Your Assumptions: List all the assumptions you are currently making about the problem or situation.

2

Break Down the Problem to Fundamentals: Ask "What do we know with absolute certainty to be true?" Drill down to the irreducible facts.

3

Question Every Assumption: Challenge each assumption. Ask "Why?" repeatedly. Does it hold up to scrutiny?

4

Reconstruct from the Ground Up: Using only verified fundamental truths, reason upward to build new, innovative solutions.

5

Compare to Conventional Approaches: Evaluate your first-principles solution against existing approaches. Where does it diverge and why?

6

Test and Validate: Prototype and test the reconstructed solution to validate it in the real world.

Source: Aristotle (c. 350 BCE). *Posterior Analytics*. Oxford University Press (Trans. 1994).

WORKFLOW A-96

Inversion Thinking

A problem-solving mental model that involves approaching a problem backwards — instead of thinking about how to achieve success, you think about how to guarantee failure, then avoid those things. Popularised by Charlie Munger.

STEPS

1

Define Your Goal: Clearly state the outcome you want to achieve.

2

Invert the Problem: Ask the opposite question: "How could I guarantee the worst possible outcome?" or "How could I completely fail at this?"

3

Brainstorm All Ways to Fail: Generate as many ways as possible to achieve the inverted (negative) outcome.

4

List What to Avoid: Convert your list of failure modes into a list of things to actively avoid.

5

Identify Systemic Risks: Look for patterns in the failure list that reveal systemic vulnerabilities.

6

Integrate Insights into Planning: Build explicit safeguards and anti-patterns into your plan based on what to avoid.

7

Review Regularly: Use inversion as a recurring check throughout project execution.

Source: Munger, C. T. (2005). Poor Charlie's Almanack. Walsworth Publishing.

WORKFLOW A-97

Second-Order Thinking

A mental model that involves thinking beyond the immediate, first-order consequences of a decision to consider the second and third-order effects — the consequences of the consequences. Prevents short-term thinking and unintended side effects.

STEPS

1

Make the Initial Decision or Take the Action: Define what you plan to do.

2

Identify First-Order Consequences: Ask "And then what?" List the immediate, direct effects of your decision.

3

Identify Second-Order Consequences: For each first-order consequence, ask "And then what?" again.

4

Identify Third-Order Consequences (Optional): Continue the chain of consequences as far as is relevant.

5

Evaluate the Full Picture: Assess whether the chain of consequences supports or undermines your original decision.

6

Adjust the Decision: Modify your plan based on the full picture of downstream consequences you have mapped.

7

Seek Feedback Loops: Identify where second-order effects might create self-reinforcing feedback loops.

Source: Howard Marks. (2011). *The Most Important Thing: Uncommon Sense for the Thoughtful Investor*. Columbia University Press.

WORKFLOW A-98

Occam's Razor

A problem-solving principle attributed to William of Ockham that states: "Among competing hypotheses, the one with the fewest assumptions should be selected." The simplest explanation is usually correct.

STEPS

1

Identify Competing Explanations/Solutions: List all plausible explanations or solutions for the problem.

2

Count the Assumptions in Each: For each explanation, explicitly list all the assumptions it requires to be true.

3

Identify the Simplest Explanation: Select the explanation that requires the fewest unproven assumptions.

4

Test the Simplest Explanation First: Before exploring complex explanations, rigorously test the simplest one.

5

Increase Complexity Only If Necessary: Move to more complex explanations only when simpler ones have been definitively ruled out.

6

Beware of Over-Simplification: Recognise that Occam's Razor is a heuristic, not a law. Sometimes the correct answer is genuinely complex.

Source: William of Ockham (c. 1287-1347). Summa Logicae.

WORKFLOW A-99

Bayes' Theorem (Bayesian Updating)

A mathematical theorem describing how to update beliefs based on new evidence. Bayesian thinking involves starting with a prior probability, incorporating new evidence, and arriving at an updated posterior probability.

STEPS

1

Define the Prior: Establish your initial belief about the probability of a hypothesis being true ($P(H)$) based on existing knowledge.

2

Identify New Evidence: Gather the new data or observation (E) that you want to incorporate.

3

Assess Likelihood: Determine $P(E|H)$ — how probable is this evidence if the hypothesis is true? And $P(E|\text{not-}H)$ — how probable is this evidence if the hypothesis is false?

4

Apply Bayes' Theorem: $P(H|E) = [P(E|H) \times P(H)] / P(E)$, where $P(E) = P(E|H) \times P(H) + P(E|\text{not-}H) \times P(\text{not-}H)$.

5

Arrive at the Posterior: The result $P(H|E)$ is your updated belief given the new evidence.

6

Iterate with New Evidence: Each posterior becomes the prior for the next round of updating as new evidence arrives.

7

Communicate Uncertainty: Express conclusions as probabilities, not certainties, to maintain epistemic humility.

Source: Bayes, T. (1763). *An Essay towards Solving a Problem in the Doctrine of Chances*. *Philosophical Transactions of the Royal Society*.

WORKFLOW A-100

The Cognitive Workflow Integration Framework

A meta-workflow describing how to consciously select, combine, and apply cognitive workflows from your repertoire to match the nature of any given challenge. The master framework for orchestrating all other workflows presented in this guide.

STEPS

1

Characterise the Challenge: Determine the nature of the problem — is it empirical, creative, analytical, strategic, interpersonal, operational, or a combination?

2

Select the Primary Workflow: Choose the cognitive workflow best suited to the challenge type (e.g., Scientific Method for empirical questions, Design Thinking for user problems, 5 Whys for root cause).

3

Identify Complementary Workflows: Determine which secondary workflows can enhance the primary one (e.g., Critical Thinking during PQRS reading, SWOT during Strategic Planning).

4

Define Entry and Exit Criteria: Establish when to begin, when to move between steps, and when the workflow is complete.

5

Execute with Conscious Awareness: Apply the selected workflows deliberately, noting where they help and where they fall short.

6

Mix and Match Dynamically: Do not be afraid to pivot to a different workflow mid-process if the situation demands it.

7

Reflect and Adapt: After using a workflow, take time to reflect. What worked well? What was challenging? How will you refine your application next time?

8

Build Your Personal Workflow Library: Continuously expand your repertoire by learning new cognitive workflows and practising existing ones.

Source: Landry, M. S. (2025). Cognitive Workflows 101. Marie Landry's Spy Shop / Landry Industries Inc.

Cognitive Workflows 101

A Complete Reference Guide — 107 Workflows

*"In a world that demands agility, clarity, and innovation,
mastering these cognitive workflows will be your superpower."*

Marie-Soleil Seshat Landry

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