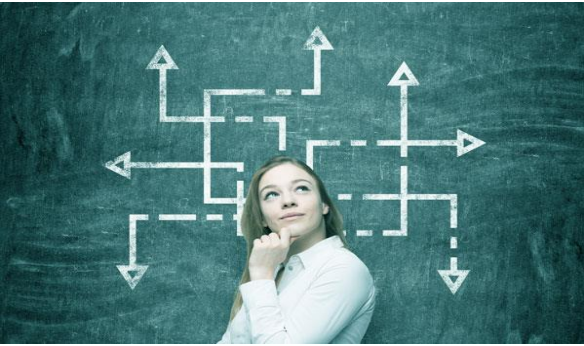


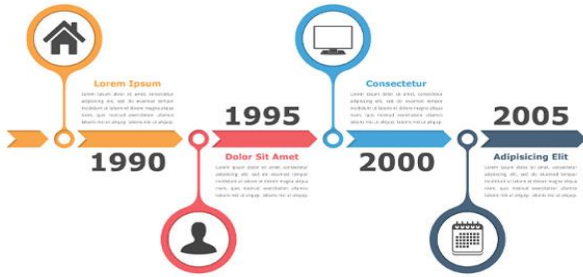




Critical Thinking Tools for Insider Threat Analysts

Critical Thinking Tool	Purpose
<p>Problem Restatement</p> 	<p>A means of looking at problem from other perspectives.</p> <p>Steps:</p> <ol style="list-style-type: none"> 1. Paraphrase: Restate using your own words. 2. 180 degrees: Turn the problem on its head. 3. Broaden the focus: Restate the problem in a larger context. 4. Redirect the focus: Boldly, consciously change the focus. 5. Make a decision or document results.
<p>Pros-Cons-Fixes</p> 	<p>A means of compensating for negative thinking by looking at the positives first.</p> <p>Steps:</p> <ol style="list-style-type: none"> 1. List all pros. 2. List all cons. 3. Review and consolidate the cons, merge the ones that are similar and eliminate the ones that are redundant. 4. Neutralize as many cons as possible. 5. Compare the Pros and remaining Cons for all options. 6. Pick one option.
<p>Divergent/Convergent Thinking</p> 	<p>A brainstorming technique that lets ideas build upon another, without judgment so that they can be clustered and winnowed to select promising ideas.</p> <p>In divergent thinking or brainstorming, all ideas are permitted.</p> <p>Rules for Divergent Thinking:</p> <ul style="list-style-type: none"> • The more ideas the better. • Build one idea upon another. • All ideas are accepted. • Don't evaluate the ideas. • Use at every stage of problem solving. <p>Convergent thinking selects one idea from a list of ideas.</p>

Chronologies/Timelines



A means of orderly examination of information related to our instinctual nature to look for cause and effect relationships. Chronologies and timelines allow us to understand and appreciate the context that events occur.

Steps:

1. Make a list of relevant events and dates; list dates first.
2. Construct a chronology, crossing off events on the list as they are included.
3. Make a decision or document results.

Causal Flow Diagram



Identifies a system’s components and how they interact (cause and effect relationships). Analyzes the behavior of relationships as an integrated system.

Steps:

1. Identify major factors.
2. Identify cause-and-effect relationships.
3. Characterize the relationships as direct or inverse.
4. Diagram the relationships.
5. Make a decision.

Matrix

Terrorism in Tokyo From Aum Shinrikyo				
		Weight	H: 1	H: 4
E3	Attacks on journalists	Medium	I	N
E2	Religious Affliction	Medium	C	I
E4	Established Party	Medium	N	N
E1	Blind Leader Mastsumoto	Medium	C	C

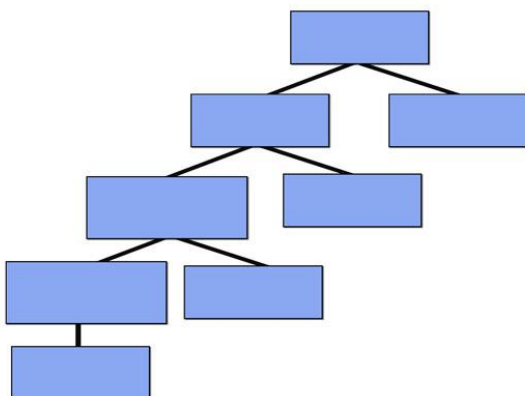
Enables separating elements of a problem, categorizing information by type, comparing one type of information as well as same types with another, and seeing correlations.

A matrix presents information in a grid and uses as many cells as necessary for whatever you need to analyze.

Use a matrix to:

- Separate elements of the problem.
- Categorize information by type.
- Compare one type of information to another.
- Compare information of the same type.
- See patterns among the information.

Scenario/Decision Tree



A graphic illustration of choices and outcomes at different junctures in alternative sequences or chains of events. Each sequence or chain is a separate scenario.

Steps:

1. Identify the problem.
2. Identify the major factors/issues (the decisions and events) to be addressed in the analysis.
3. Identify alternatives for each of these factors/issues.
4. Construct a tree portraying all important alternative scenarios.
5. Make a decision or document results.

Weighted Ranking

Criteria	Weight	Requirements score				
		A	B	C	D	E
Value	20%	90	45	40	15	35
Risk	20%	80	85	38	20	75
Difficulty	15%	56	80	50	15	25
Success	10%	30	60	56	65	30
Compliance	5%	35	50	80	50	35
Refresh	5%	90	70	85	85	80
Stakeholder	15%	25	60	45	60	50
Urgency	10%	80	25	40	65	90
Weighted Scores	100%	54.8	80.0	43.3	38.0	52.3

Use weighted ranking to compare, evaluate, and choose among alternatives.

Steps:

1. List all of the major criteria for ranking.
2. Pair-rank the criteria (rank the first against the second, the first against the third, etc.).
3. Select the top several criteria and weight them in percentiles (their sum must equal 1.0).
4. Construct a Weighted Ranking Matrix and enter the items to be ranked, the selected criteria, and the criteria weights.
5. Pair-rank all of the items by each criterion, recording in the appropriate spaces the number of “votes” each item receives.
6. Multiply the number of votes by the respective criterion’s weight.
7. Add the weighted values for each item and enter the sums in the column labeled “Total Votes.”
8. Determine the final rankings and enter them in the last column, labeled “Final Ranking” (The items with the most points are ranked highest).
9. Verify outcome.

Hypothesis Testing

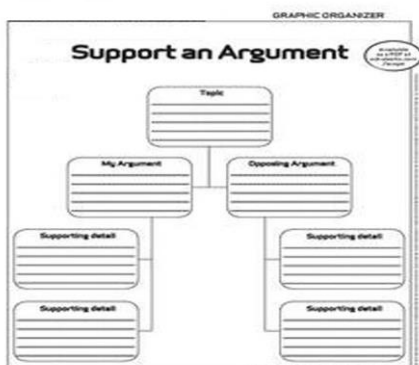
Evidence	Hypotheses		
	A	B	C
1.			
2.			
3.			
4.			

A means of testing all hypotheses sufficiently by a matrix that compares significant evidence to different hypotheses.

Steps:

1. Generate hypothesis.
2. Construct a matrix.
3. List “significant” evidence down the left-hand margin, including “absent” evidence.
4. Working across the matrix, test the evidence for consistency with each hypothesis, one item of evidence at a time.
5. Update the matrix based on results of the previous step.
6. Working downward, evaluate each hypothesis.
7. Rank the remaining hypotheses by the weakness of inconsistent evidence. The hypothesis with the weakest inconsistent evidence is the most likely.
8. Validate conclusion.

Devil’s Advocacy



A means of challenging the rationale presented by a potential course of action:

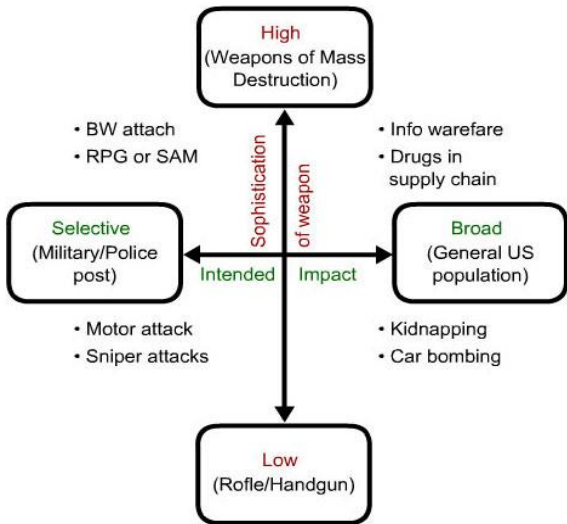
1. Focus on the contrary or opposite viewpoint.
2. Examine the opposing side’s supporting arguments and evidence.
3. Critique and attempt to disprove arguments and evidence.

Devil’s advocacy:

- Promotes objectivity.
- Can undermine and show weakness of the primary view.

This tool is not concerned with negative, contradictory evidence. The Pro for one side is the Con of the other.

Probability Tree or Matrix

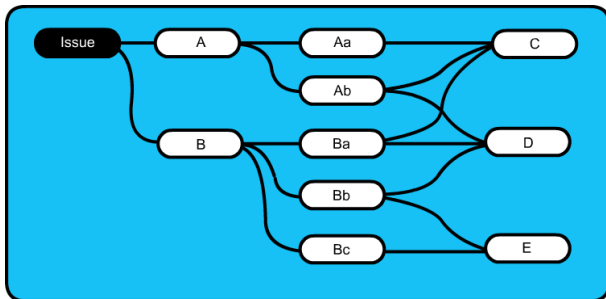


A means to address random and indeterminate problems by assigning a statistical probability or likelihood; a means of estimating an outcome when there is not enough data.

Steps:

1. Identify the problem.
2. Identify the major decisions and events to be analyzed.
3. Construct a scenario tree portraying all-important alternative scenarios.
4. Assign a probability to each decision/event. Probabilities at each branch must equal 1.0.
5. Calculate the conditional probability of each individual scenario.
6. Calculate the answers to probability questions relating to the decisions/events.
7. Make a decision or document results.

Utility Tree/Matrix



A means of looking at options and outcomes, determining their utility (benefit), and ranking them.

Steps:

1. Identify the options and outcomes to be analyzed.
2. Identify the perspective of the analysis.
3. Construct a utility matrix.
4. Assign a utility value of 0 to 100 (unless dollars are used) to each option-outcome-combination—each cell of the matrix—by asking the Utility Question: If we select this option, and this outcome occurs, what is the utility from the perspective of...? There must be at least one 100 unless dollars are used.
5. Assign a probability to each outcome. Determine or estimate this probability by asking the Probability Question: If this option is selected, what is the probability this outcome will occur? The probabilities of all outcomes for a single option must add up to 1.0.
6. Determine the expected values by multiplying each utility by its probability and then adding the expected values for each option.
7. Determine the ranking of the alternative options.
8. Verify results.