

Making Trade-offs Under Risk Explicit

Executive Brief

Control field	Value
Module	EP-M02 Making Trade-offs Under Risk Explicit
Asset	EP-M02-A02
Version	v0.1
Status	G2 content prototype
Source	Former Book 6 Chapter 2 Utility and Value
Terminal artifact	Value Consequence and Risk Profile
Decision	ACCEPT, REVISE or ESCALATE
Date	16 September 2026

Decision message

An AI option should not be approved merely because it has the highest expected monetary benefit. Approval requires a declared value authority, an explicit risk posture, satisfied rights and safety constraints, visible distributional effects, and evidence that the recommendation is not driven by a fragile assumption.

Module 2 gives executives a disciplined way to challenge proposed trade-offs. Its final record is the Value Consequence and Risk Profile, ending in one governed decision: ACCEPT, REVISE or ESCALATE.

What executives must distinguish

Concept	Executive meaning	Control question
Outcome	What may happen under an alternative.	What is measured, in which unit, for whom and over what horizon?
Value	Why and how much an outcome matters.	Whose priorities and obligations are represented?
Utility	A numerical preference representation under stated conditions.	Who authorized its form, range and parameters?
Hard constraint	A condition that cannot be compensated by benefits elsewhere.	Which rights, safety or legal limits make an option infeasible?

Core executive test

1. Confirm that probabilities are non-negative, sum to one and have credible sources.
2. Use expected value as a benchmark, not as automatic authorization.
3. Where risk attitude matters, compare alternatives using expected utility over a declared valid range.
4. Translate the result into a certainty equivalent and risk premium that leaders can interpret.
5. Reject any attempt to hide a rights or mandatory safety violation inside an aggregate score.
6. Test severe-loss probabilities, risk parameters, subgroup impacts and information costs for recommendation reversals.

Technical bridge

For consequence x_i with probability p_i , expected value is $E[X] = \sum p_i x_i$. Expected utility is $EU = \sum p_i u(x_i)$. The certainty equivalent CE satisfies $u(CE) = EU$, and the risk premium is $E[X] - CE$. These quantities are conditional on the outcome model, utility function, parameter values and constraints.

Quantity	What it tells the executive	What it does not prove
Expected value	Average outcome under the stated probability model.	That the average will occur or that money captures all value.
Expected utility	Preference-adjusted comparison under the declared utility model.	That the model has legitimate authority or that constraints are satisfied.
Certainty equivalent	Certain outcome judged equivalent to the risky prospect.	A market price or universally accepted value.
Risk premium	Expected outcome surrendered to remove uncertainty under the model.	That the institution should actually pay this amount.
Value of information	Potential improvement when evidence can change action.	That research is worthwhile after cost, delay and implementation limits.

Worked reference

For outcomes 0, 50 and 100 with probabilities 0.20, 0.50 and 0.30, expected value is 55. Under normalized linear utility on 0 to 100, expected utility is 0.55. Under an authorized concave utility, the certainty equivalent will normally be below 55 and the risk premium positive. The exact conclusion must be tested across plausible curvature values.

Non-negotiable governance controls

Control	Minimum evidence	Failure response
Value authority	Named owner, elicitation process, affected-group participation.	REVISE or ESCALATE.
Valid range	Outcome unit, lower and upper bounds, extrapolation rule.	REVISE model.
Hard constraints	Rights, legal, safety and minimum-service gates.	Option infeasible or ESCALATE.
Distribution	Consequences shown by affected group before aggregation.	REVISE safeguards or ESCALATE.
Sensitivity	Plausible ranges and ranking-reversal points.	REVISE or obtain information.
Human accountability	Named approver and review triggers.	Do not authorize.

Information decision

Acquire information only when it can change the selected feasible action or materially improve implementation. Gross value equals the optimized result with information minus the optimized result without it. Net value subtracts acquisition cost, governance burden and the consequence of delay. Positive gross value is not enough.

Executive decision meanings

- ACCEPT when the value authority, model, constraints, information decision and sensitivity evidence are adequate for the stated use.
- REVISE when correctable weaknesses remain in elicitation, parameters, safeguards, evidence or documentation.
- ESCALATE when authority is unclear, stakeholder conflict is unresolved, or a rights, safety or legitimacy issue exceeds the current decision level.

Questions for the approval meeting

1. What exact consequences are being compared, and who bears them?
2. Which value judgments are encoded in the model and who approved them?
3. Why is the chosen utility function appropriate over this range?
4. What is the certainty equivalent and what does the risk premium mean here?
5. Which constraints are non-compensatory?
6. Which subgroup result is worst, even if the aggregate result looks favorable?
7. Which single assumption is most capable of reversing the recommendation?
8. What additional information could change the decision, at what cost and delay?
9. What event will trigger review, suspension or re-authorization?
10. Who signs the final ACCEPT, REVISE or ESCALATE decision?

Required meeting output

The approval meeting should produce a completed Value Consequence and Risk Profile, a named approver, a review date, monitoring triggers, and an explicit record of unresolved dissent. Notebook output may support the meeting but cannot authorize the decision.

Source continuity

This brief preserves the technical essence of former Book 6 Chapter 2: expected value, expected utility, utility curvature, certainty equivalent, risk premium and value of information. The executive transformation changes how the material is entered and governed; it does not remove the mathematics or its limitations.