

# **Pittsburgh Product Camp Presentation**

**Topic: Decision Quality: Making the Right Choice  
Every Time**

**Presenter: Bob Wasson, Ph.D.  
ETIM Program, CMU and SmartOrg, Inc.**

April 01, 2023

# Bob Wasson

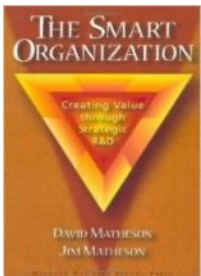


- Decades working with companies - either as part of R&D management team or as external consultant  
From aluminum products / processes to medical devices

- Industrial experience with Chevron Research, Alcoa Technical Center, and the Continental Group  
Connecting Innovation and Strategy / Finance

- Consulting Experience with A.T. Kearney, Strategic Decisions Group, Nu-Angle Consulting, and SmartOrg  
Connecting Innovation and Strategy / Finance

- Innovation & Portfolio Thought Leader  
Adjunct Professor, CMU (Engineering and Technology Innovation Management Program)



**SMARTORG**



# What is a decision?

**Definition: *Decision***

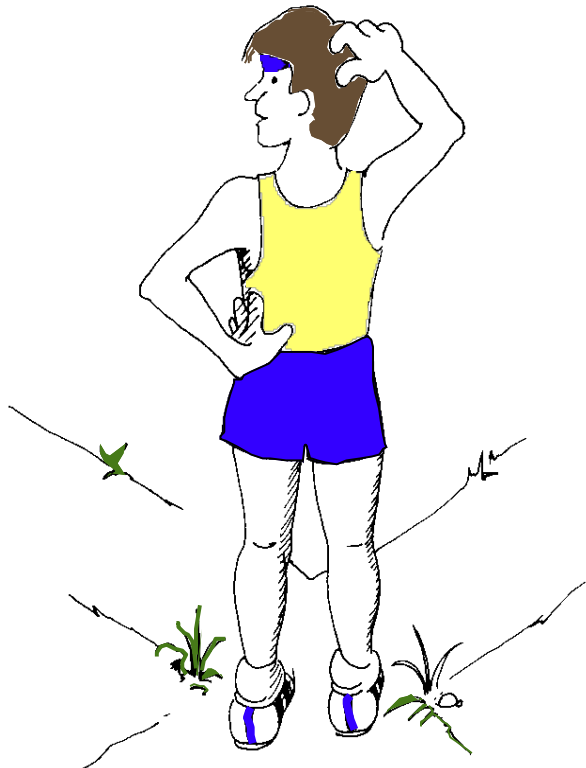
**A commitment of resources that is revocable only at some cost.**

## How do we evaluate decisions?

- What is a good decision?
- What is a bad decision?
- In most cases, we evaluate decisions based on the outcome!!!

# Corporate decision-makers are called on to perform two fundamentally different tasks.

## Making Strategic Decisions



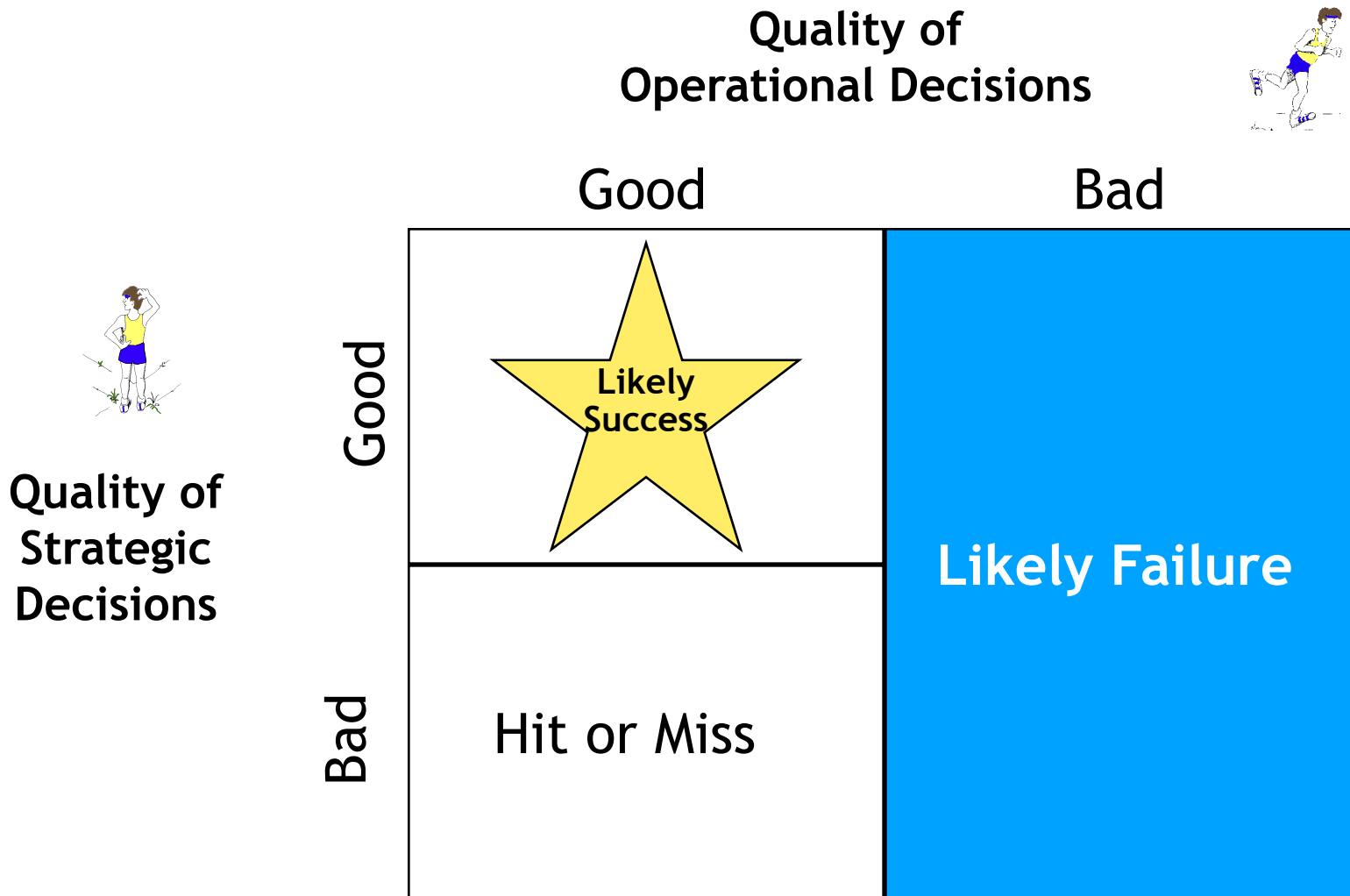
“Choosing the right road”

## Managing Operations





“Running well on the chosen road”

The quality of strategic and operational decisions can determine the organization's success or failure.



# Skills for effectively managing operations can be counterproductive in making major decisions.

Required Skills	
 <b>Making Strategic Decisions— “Decision Focused”</b>	<b>Managing Operations— “Results Focused”</b> 
<ul style="list-style-type: none"><li>• Focuses on important issues</li><li>• Considers long time horizons</li><li>• Accounts for uncertainty</li><li>• Chooses among significantly different alternatives</li></ul>	<ul style="list-style-type: none"><li>• Attends to detail and follow-through</li><li>• Concentrates on near-term performance</li><li>• Ignores uncertainties</li><li>• Avoids new alternatives— “Let’s get going!”</li></ul>

“Operational bias” can degrade decision quality.

# There are many strategic decision processes in corporations.

- R&D budgeting and allocation
- New venture selection
- Capital budgeting and allocation
- New product launch strategy
- Channel strategy
- Growth strategy
- Marketing strategy
- Acquisition strategy
- Strategic issues
- And....



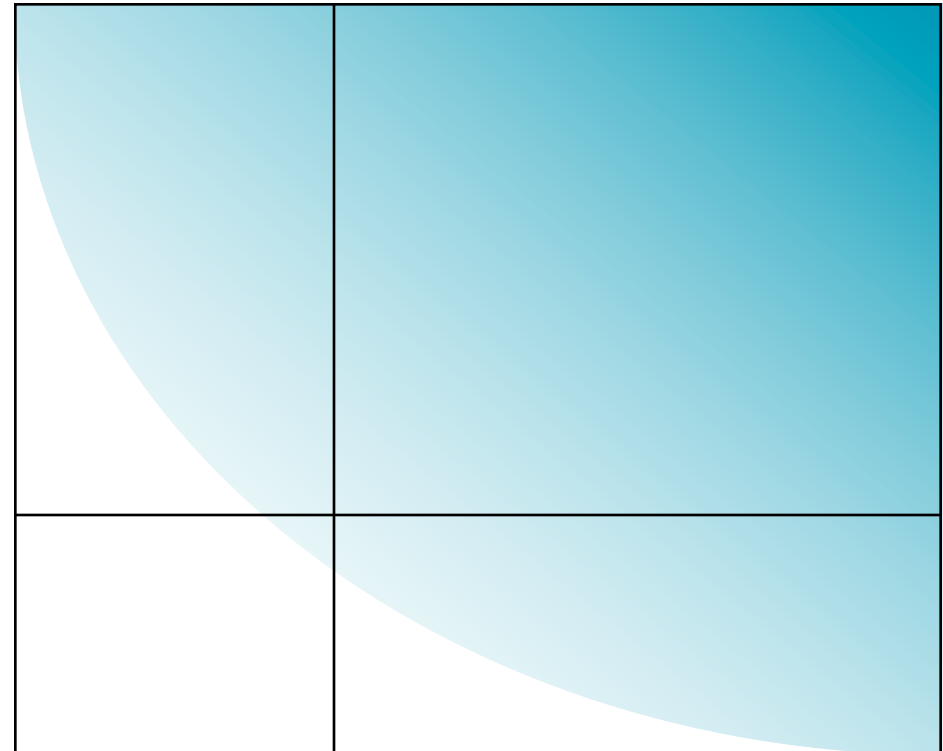
# Decisions in business can be examined according to the following grid.

## Organizational Complexity

- Many parties in conflict
- Individual and organizational differences
  - Values, desires, and motivation
  - Initial convictions
  - Fundamentally different frames
  - Personalities and competencies
  - Degrees of power and resources
- Group dynamics—human nature in groups

High

Low



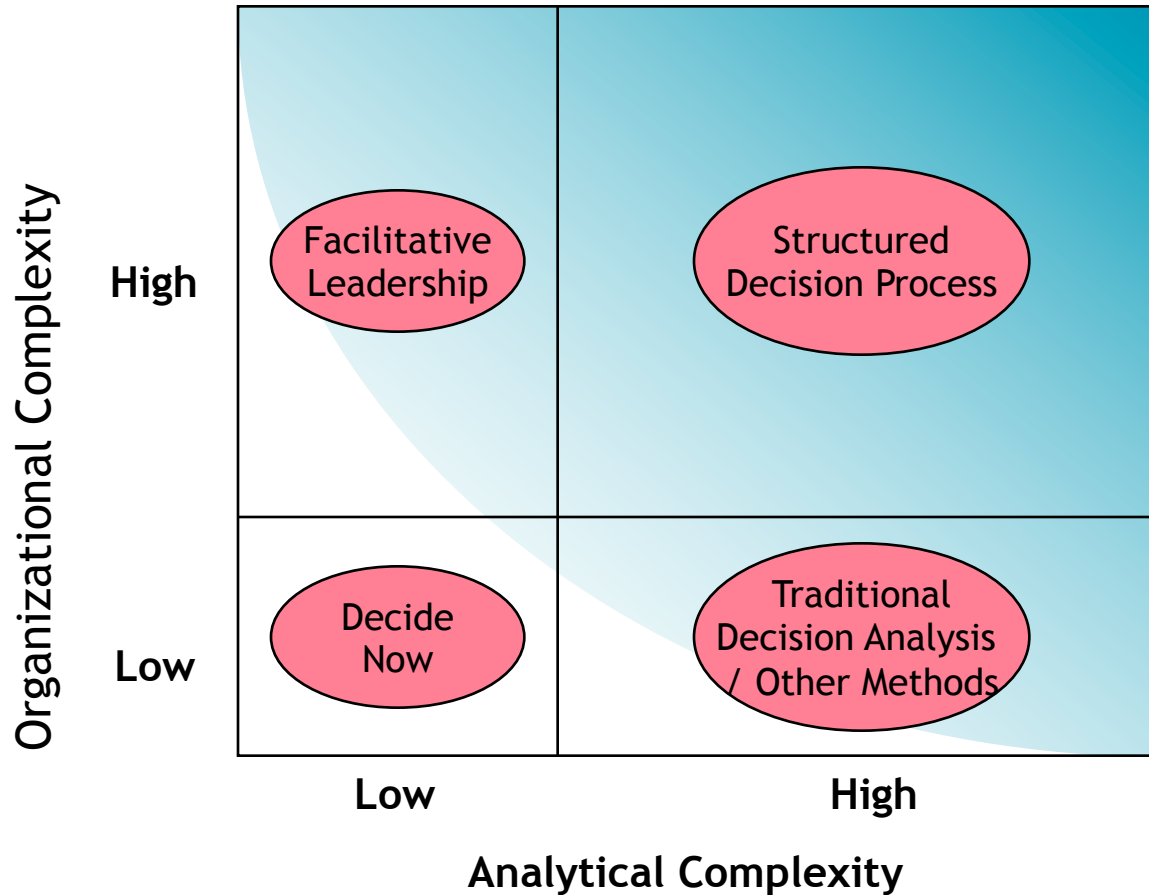
Low

High

## Analytical Complexity

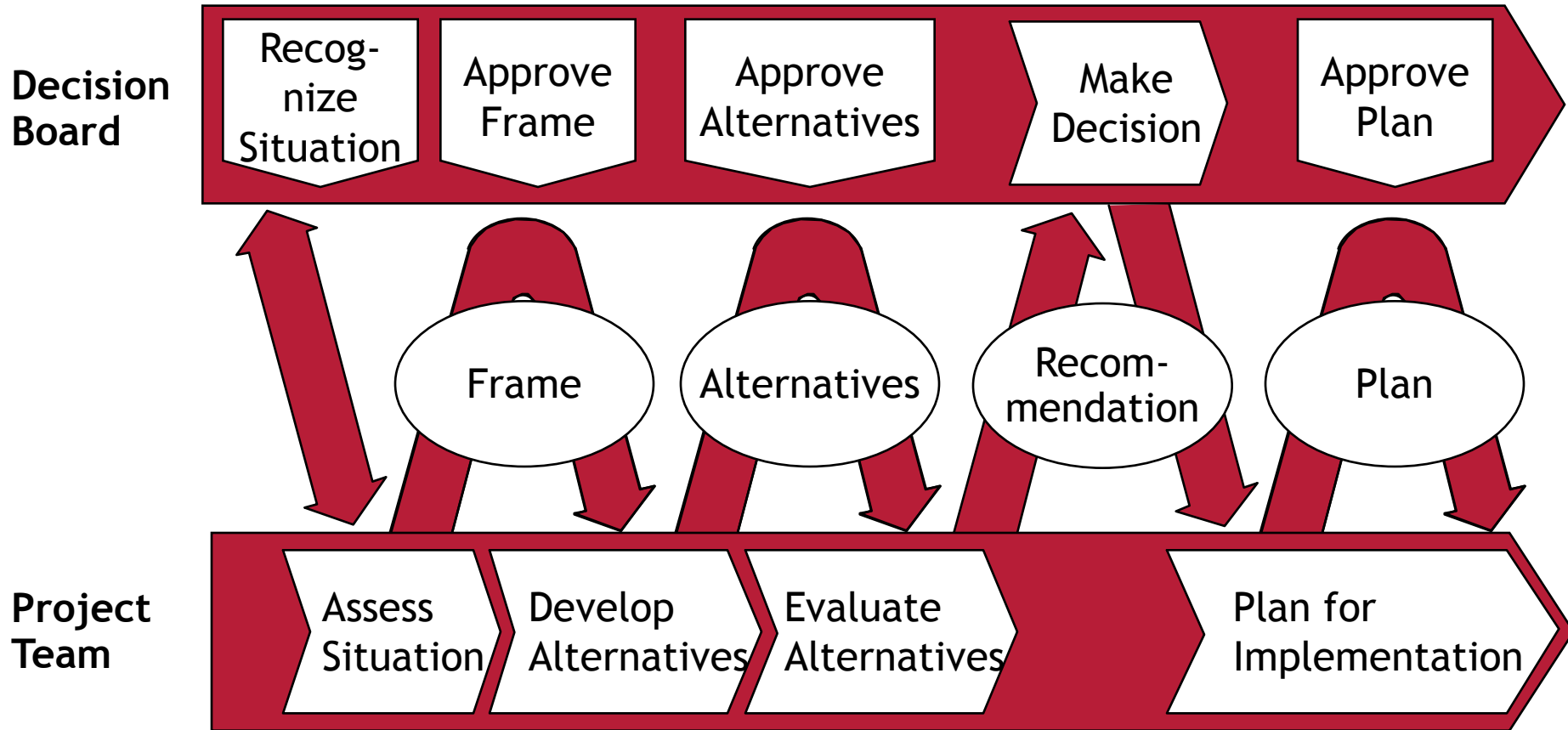
- Uncertainty
- Dynamics
- Many interrelated factors
- Many alternatives
- Multiple, interrelated decision criteria

# The decision-making process needs to be tailored to the problem's characteristics



An effective decision process adds significant value when applied efficiently and appropriately to strategic decisions

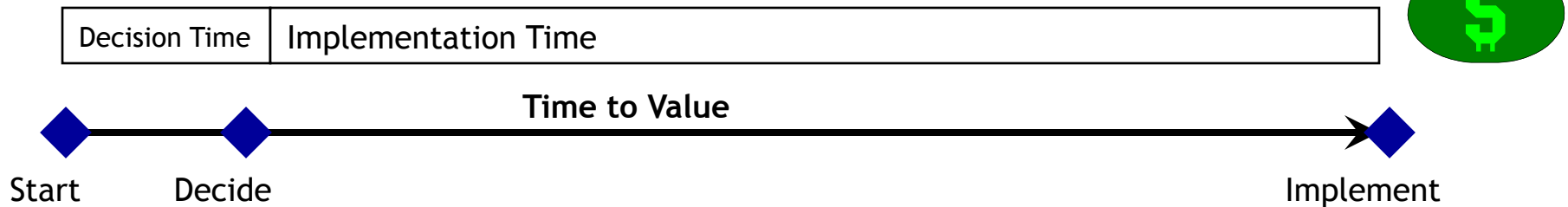
## Effective Decision Process



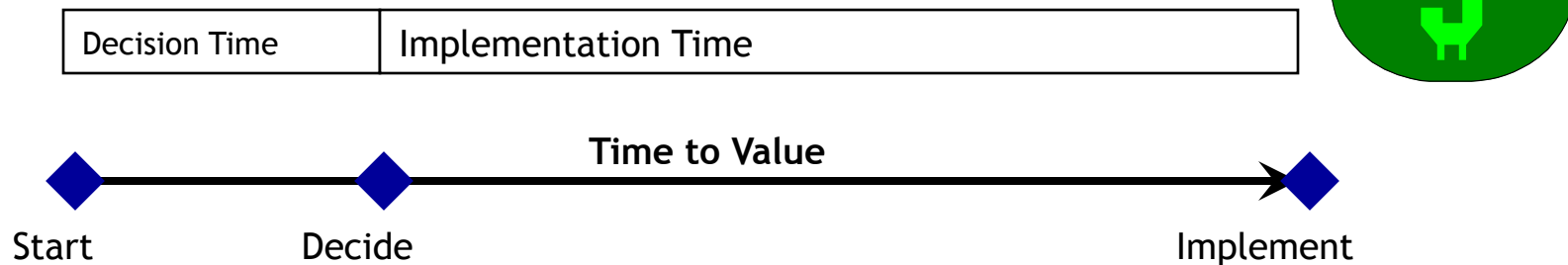
The actual decision situation dictates the appropriate number of interactions.

Frequently, the focus is on the Decision Time and not the Time to Value, when the latter should clearly be the focus.

### Traditional Situation



### Structured Decision Process

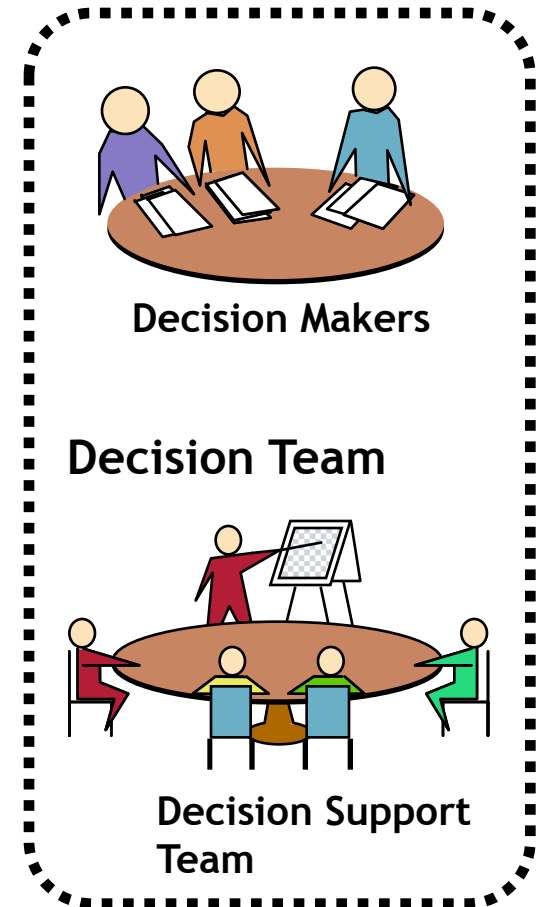


Common initial misconception is that additional time and resources not available for structured decision making through the Dialogue Decision Process.

***Structured Decision Process will shorten the overall Time to Value and...will likely increase the value of the price that is captured!!!!***

# A deliberate and well-executed process helps ensure efficient, successful decision-making.

- Determining the Appropriate Decision Process
- Building the Decision Team
- Planning Interaction Points
- Defining the Project Charter



# First decision is whether to embark on a formal decision-making process. Not all decisions need this process.

## Questions to Answer

- | Yes                      | No                       |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Will this decision irreversibly allocate resources?        |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Is there more than one compelling alternative?             |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Are the impacts of the decision significant?               |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Is this a major decision (i.e., not routine)?              |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Is the decision organizationally and analytically complex? |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Are the consequences of the decision uncertain?            |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Is there time for thought before the decision is made?     |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Will the decision be implemented?                          |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Will a formal decision process add significant value?      |

If most answers to questions 1-9 are “yes,” then the process will likely add significant value.

# Decision Quality Framework

- Let's discuss an appropriate framework to use to ensure quality in the decisions made through a structured decision process.
- This framework - based on years of practical experience in assisting corporations in making strategic decisions - was developed by a Stanford University / Strategic Decisions Group team.
- This framework sets out a set of steps that an organization should systematically go through to ensure that high quality decisions are being made through a robust decision process.

What I want to introduce today is that we need to understand the “what” and the “how” of a decision.

How:  
The Decision Process

- Process
- Methods
- Tools

What:  
The Decision

Definition  
and  
Requirements

- *Need to differentiate between decision process and decision outcome!!!*
- *Can only judge the quality of the decision at the time the decision is made and not by the outcome!!!*



## Consider this example

- **Situation:**

- Pharma company's executives decided to invest heavily in a newly discovered compound.
- After years of R&D and testing, the compound was approved and released as a drug - a breakthrough in cancer treatment. It produced substantial profits for the company.
- In the years following release, sales were huge - and company executives and the R&D team congratulated each other. Wall Street analysts and shareholders developed greater confidence in the company and the management team.
- Had management made a good decision?

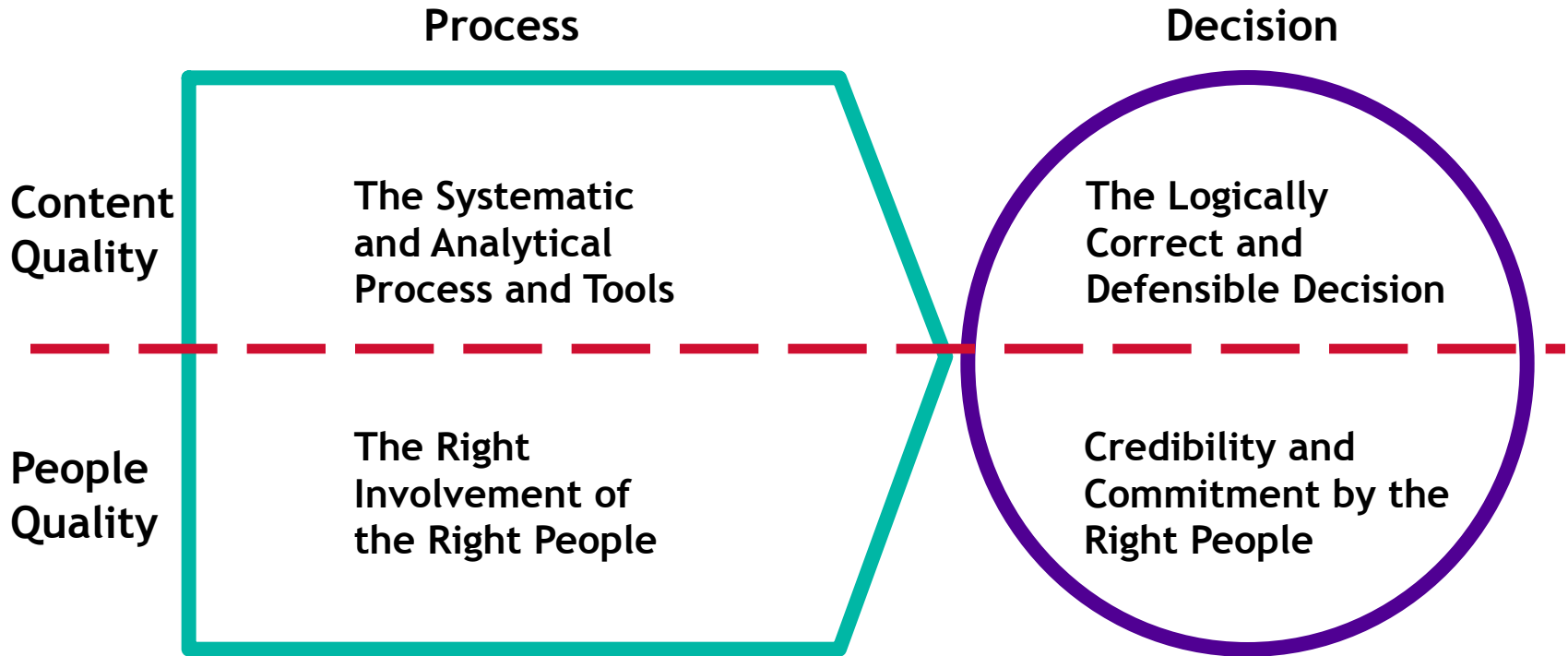
- **Situation - 8 years later:**

- Many patients started to develop serious side effects and several died.
- Drug was pulled from the market and the company was swamped with product liability lawsuits.
- How good does that decision look like now?

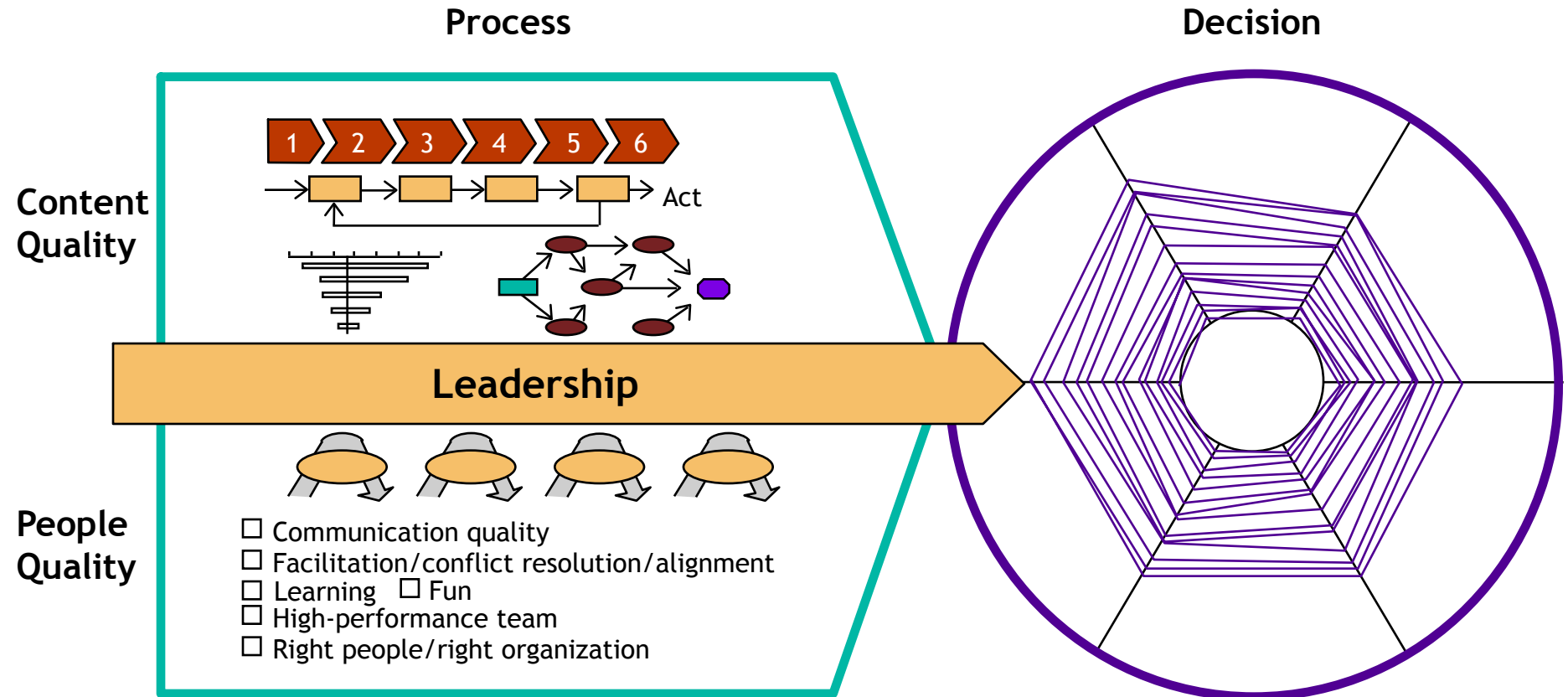
## Point of this example:

- ***The quality of a decision cannot be judged by its outcome.***
  - If we used outcomes along to rate the pharma company's decision, we would have to say that it was first good and then bad.
  - Determining the quality of a decision by its outcome would require withholding judgement until everything there is to know about the result becomes available.
- That is impractical - and the outcome does not tell us what the decision makers considered when making their choice.
- ***We need to judge the quality of a decision at the time it is being made.***
- ***Decisions and outcomes are two different things because of the uncertainties that surround every choice.***
  - If the future were certain, we would not have to make this distinction.
  - We can make a good decision in the face of uncertainty - and still get a bad outcome.
- The best way to increase good outcomes is to make good decisions and execute them well.

In an organizational setting, Decision Quality requires both *content quality* and *people quality*.



# Decision Quality can only be assured with effective and knowledgeable leadership.



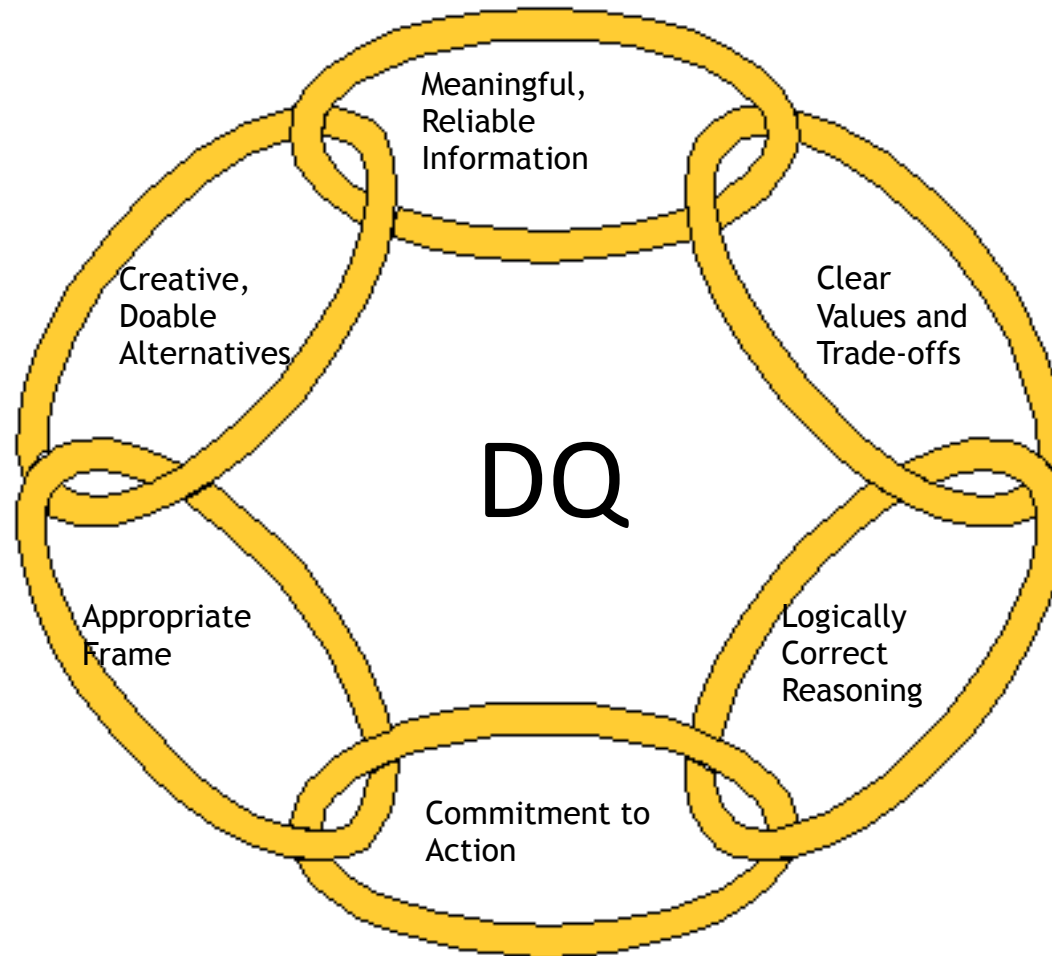
Leadership must be willing to strongly advocate a learning frame.

## To achieve Decision Quality, a person or group has to have clear responsibility for the quality of each decision.

- This person or group should be ready to certify that the specific decision meets the standards of decision quality.
- This person or group must be trained to understand and check for decision quality.
- This person or group must be able and willing to take the necessary time to carry out this responsibility.

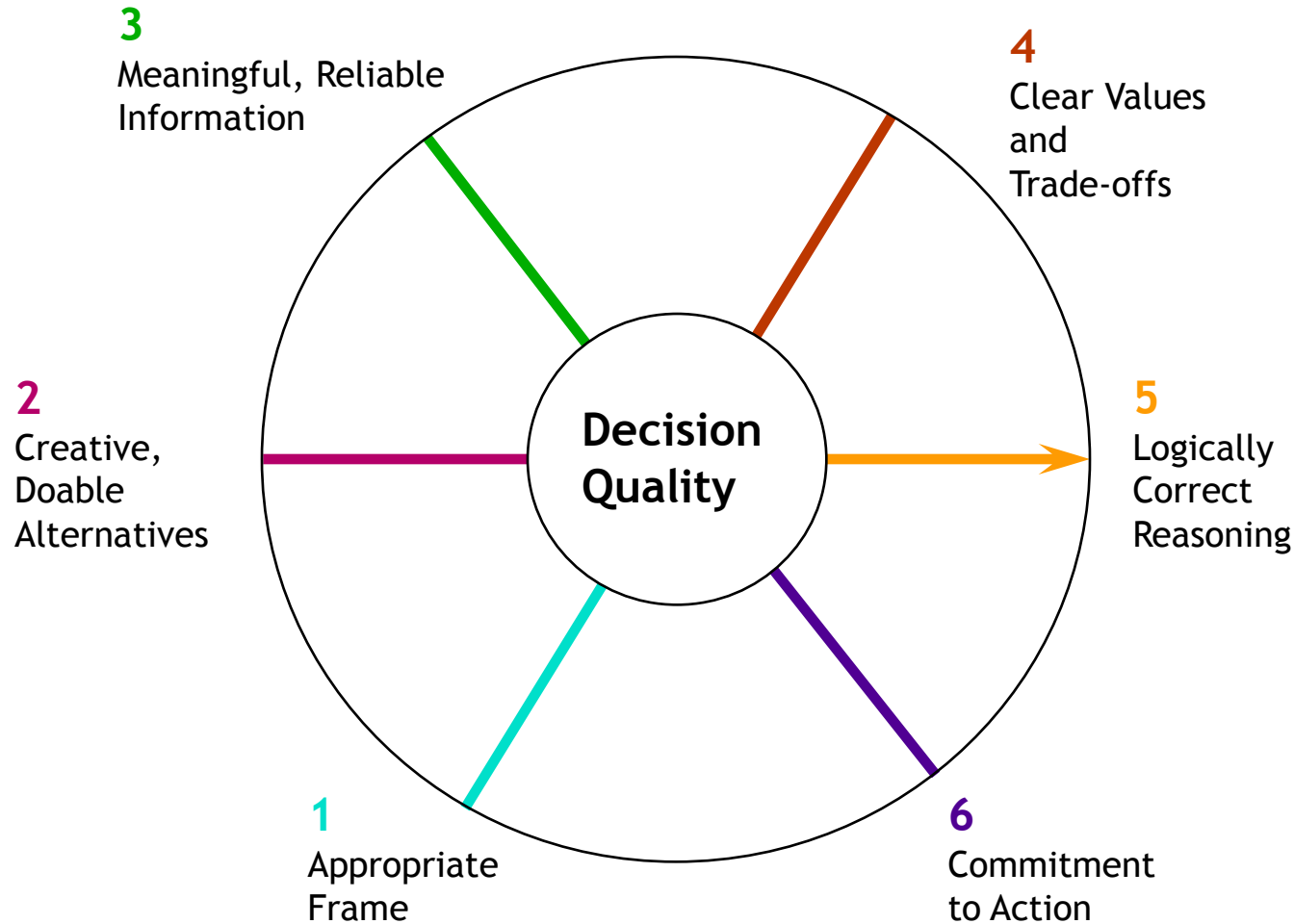
**If an executive or a committee has responsibility but does not have the time to carry out this function, it is better for them to delegate than to “make the call.”**

Six requirements comprise quality in a chosen course of action.



**The quality of a decision is only as good as the weakest link.**

# One hundred percent quality in each requirement is the target for achieving Decision Quality.



One hundred percent is the point at which additional improvement efforts would not be worth their cost.

# 1. Appropriate Frame

## Characteristics

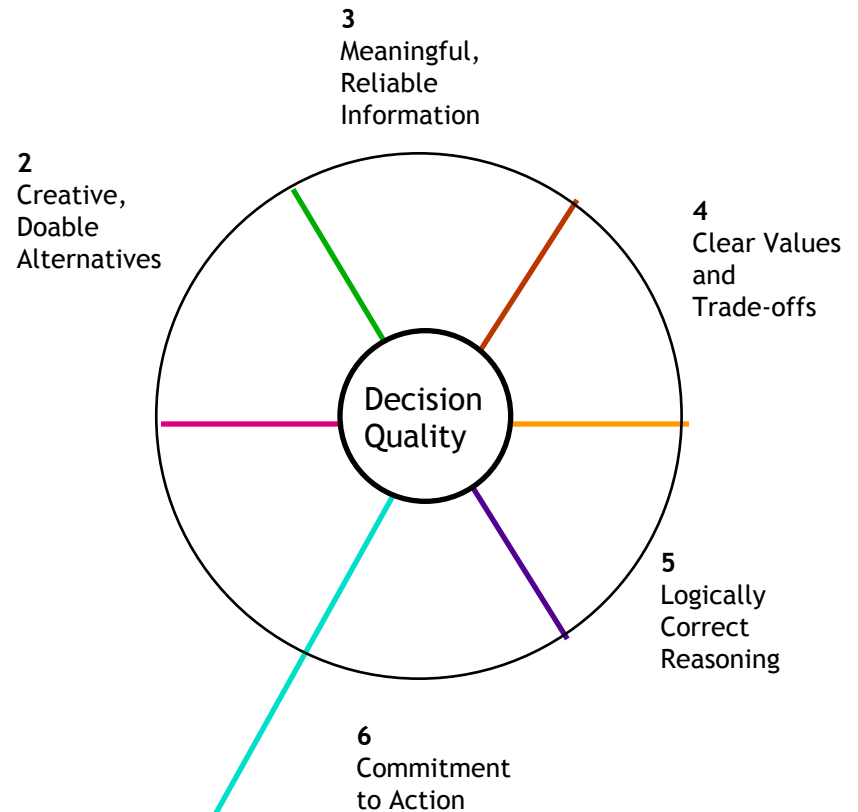
- Clear purpose
- Conscious perspective
- Defined scope

## Key tools

- Team balancing
- Vision statement
- Issues and challenges
- Assumption surfacing
- Decision hierarchy

## Failure modes

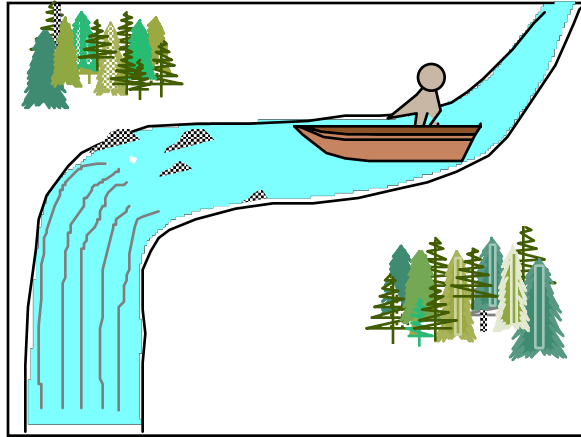
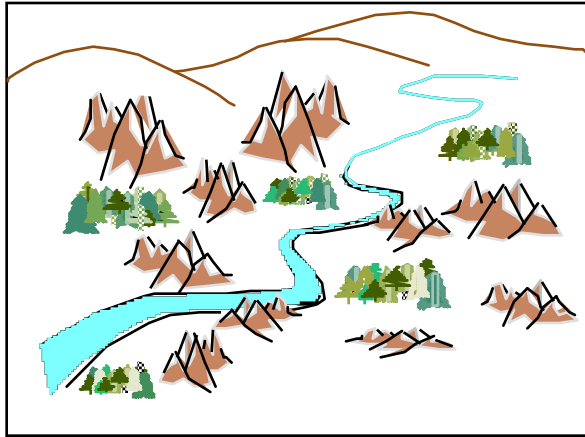
- Wrong people
- *“Frame blindness” or “plunging in”*
- *Scope too narrow*
- Unstated assumptions
- Lack of conscious choice of frame



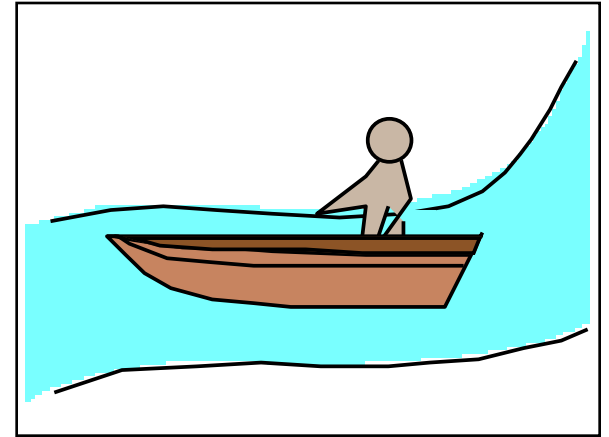


# A frame is a limited description of a problem that filters what is relevant.

**Problem:**  
Overwhelm



**Problem:**  
Blindness



**Results:**

- Non-decisions
- Oversight

**Results:**

- Errors of the third kind—right answer; wrong question
- Unforeseen threats
- Lost opportunities

## 2. Creative, Doable Alternatives

### Characteristics

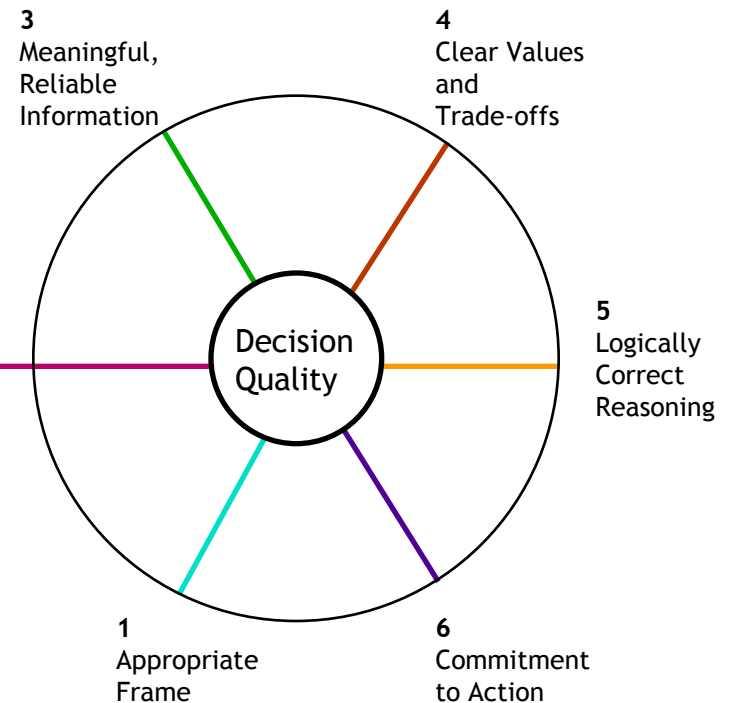
- Creative
- Doable
- Significantly different
- Comprehensive
- Compelling

### Key tools

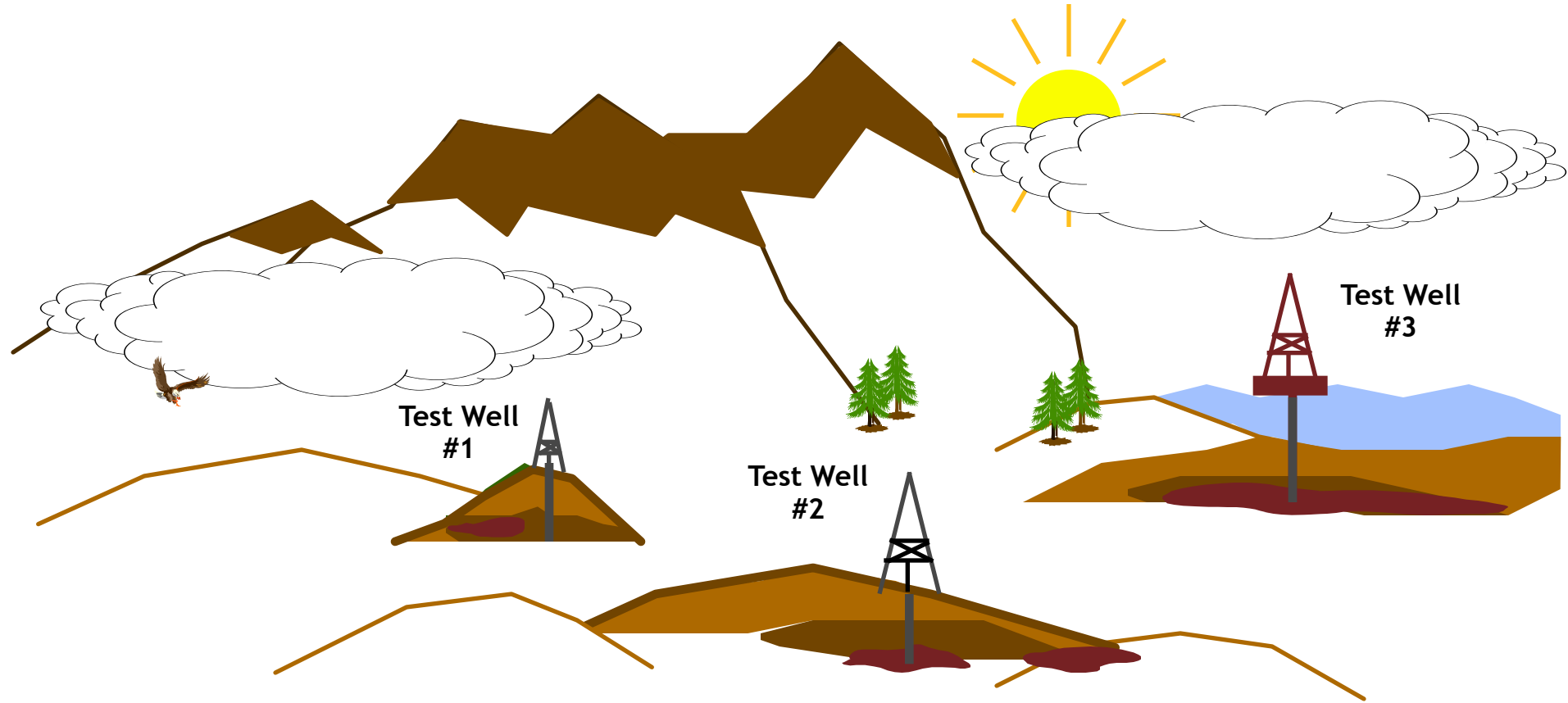
- Creativity methods
- Strategy table

### Failure modes

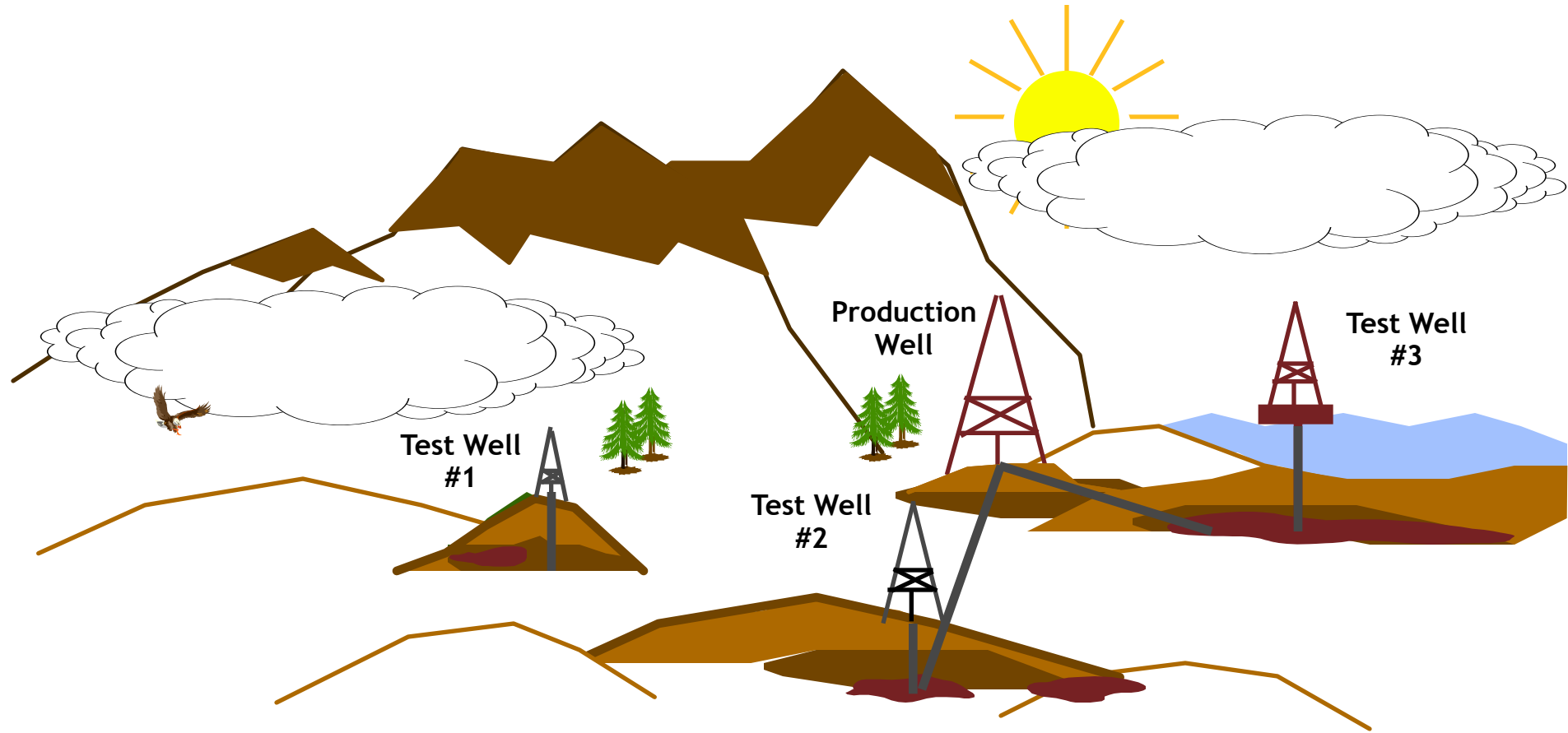
- *Only one alternative*
- Missing a great alternative
- Considering “not doable” alternatives



Think of alternatives as being similar to the concept of test wells in the oil and gas industry.



Frequently, the appropriate alternative is a hybrid alternative that combines the best of the alternatives considered.



*In fact, we expect that the location of the production well (chosen course of action) will not be one of the test well sites (initial alternatives).*

# Business Alternatives - What Commonly Happens When Teams Develop Business Alternatives

- Team has energy for one alternative - then loses interest
- Each alternative must be a business case / scenario that make sound business case - and not a throw-away case - such as these:



*Scene of Pickett's Charge at Gettysburg, PA during the American Civil War.*

*Approximately 12,500 men in nine infantry brigades that charged across an open field with no cover or concealment*

*The Battle of Gallipoli – World War I - the only major Ottoman victory of the war with 187,959 English, French and ANZAC soldiers killed.*

*The Allied campaign was plagued by ill-defined goals, poor planning, insufficient artillery, inexperienced troops, inaccurate maps and intelligence, overconfidence, inadequate equipment and logistics and tactical deficiencies at all levels*



# Or this equivalent bad business alternative - the Charge of the Light Brigade in the Crimean War

- A failed military action involving the British light cavalry led by Lord Cardigan against Russian forces during the Battle of Balaclava on 25 October 1854 in the Crimean War.
- *Lord Raglan had intended to send the Light Brigade to prevent the Russians from removing captured guns from overrun Turkish positions*
- However, there was miscommunication in the chain of command and the Light Brigade was instead sent on a *frontal assault against the main artillery battery*, one well-prepared with excellent fields of defensive fire.
- The Light Brigade reached the battery under withering direct fire and scattered some of the gunners, but they were forced to retreat immediately, and the assault ended with very high British casualties.



CHARGE OF THE LIGHT BRIGADE AT BALACLAVA, OCTOBER 25th, 1854

### 3. Meaningful, Reliable Information

#### Characteristics

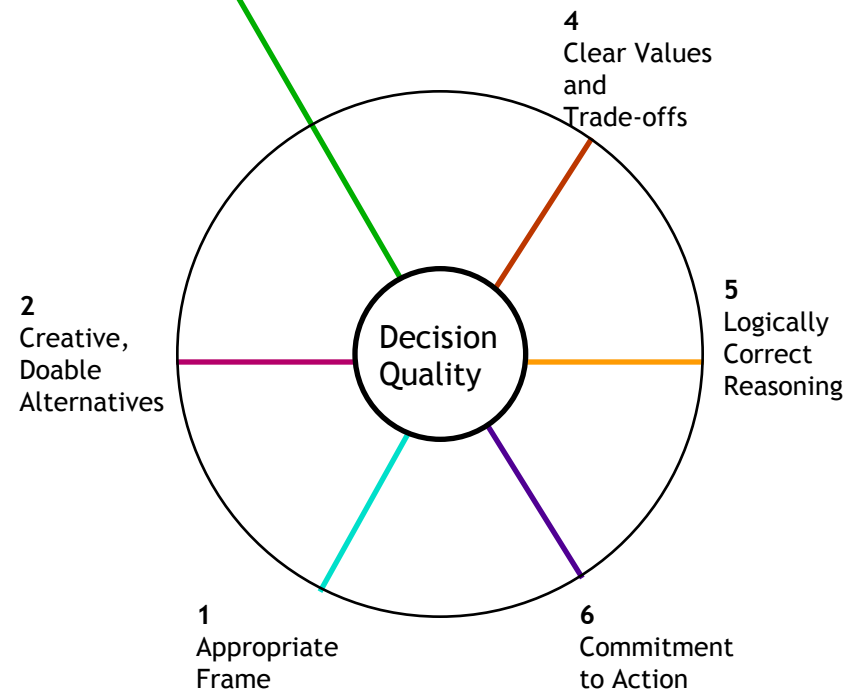
- Knowing what's important
- Having it correct and explicit
- Based on appropriate facts
- Including uncertainty
  - What we know
  - The limits of what we know

#### Key tools

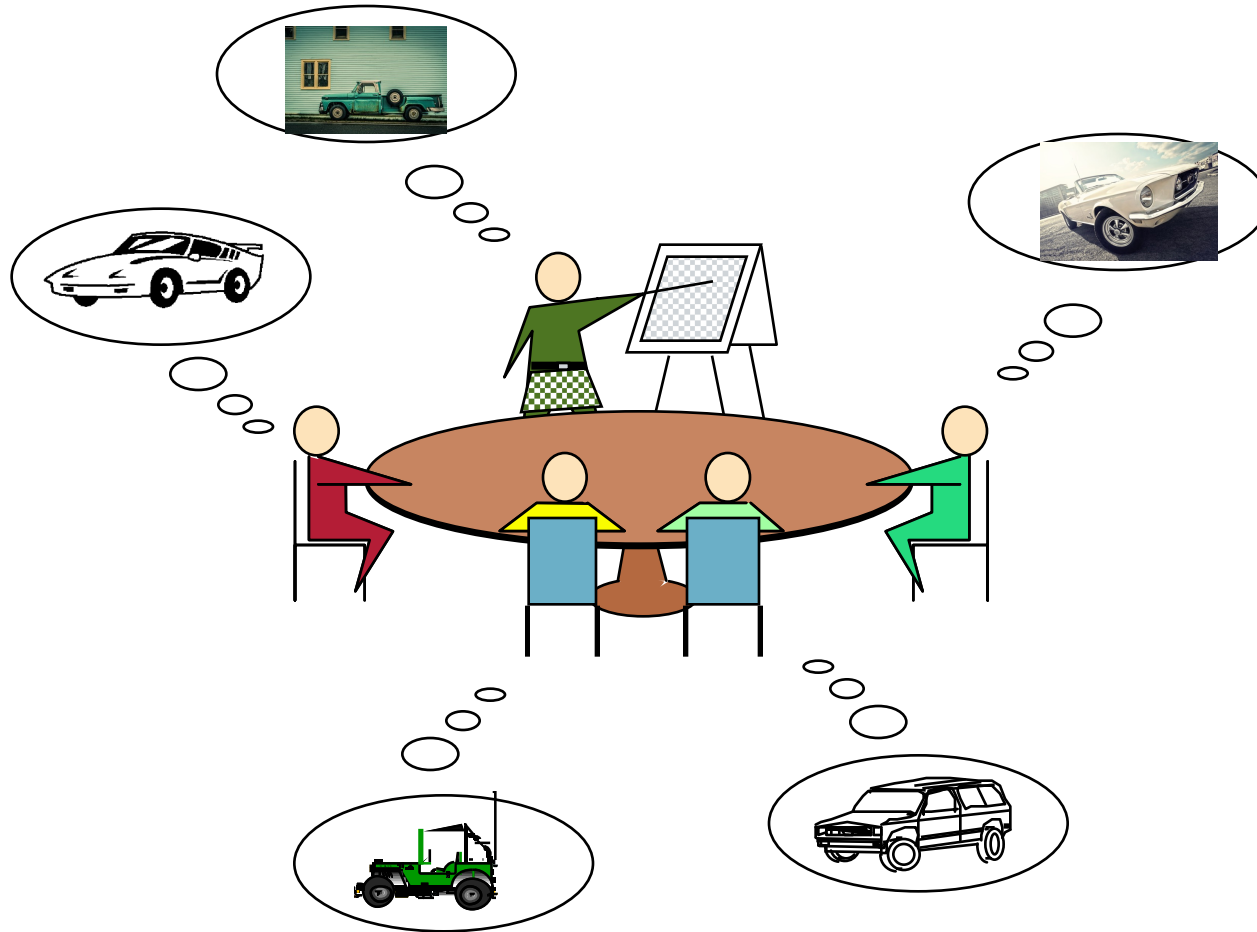
- Information research
- Encoding of judgment
- De-biasing techniques
- Influence diagrams
- Sensitivity analysis

#### Failure modes

- Neglecting to obtain important information
- *Ignoring uncertainty*
- Missing interdependencies
- *Focusing on what we know, not what's important*
- Ignoring “intangibles”



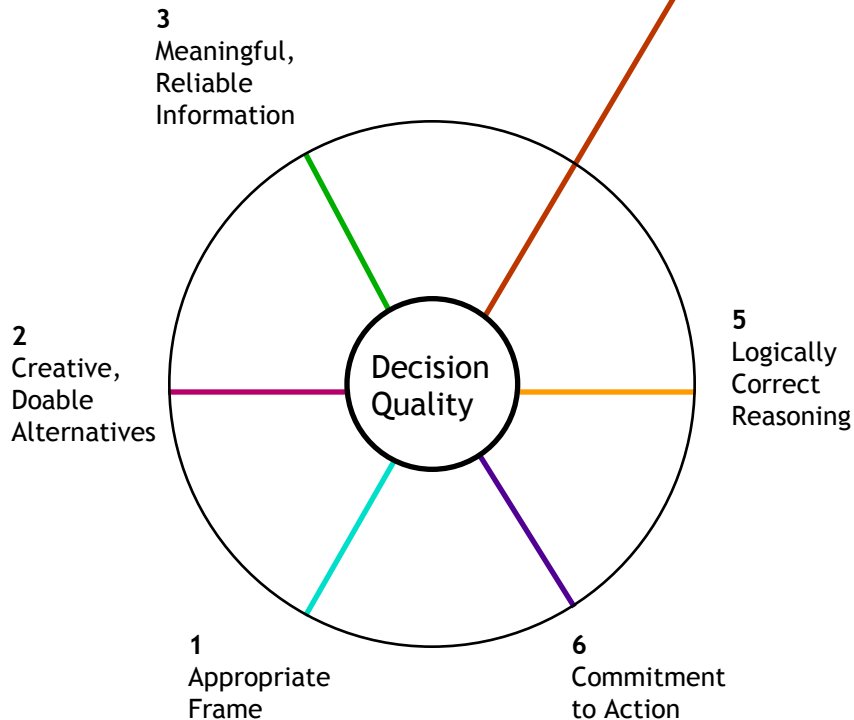
The key is to recognize and gain value from diverse perspectives ...



*... and have the decision makers adopt a “conscious” perspective.*



## 4. Clear Values and Trade-offs



### Characteristics

- Explicit statement of preferences in terms of decision criteria
- Trade-off values among decision criteria

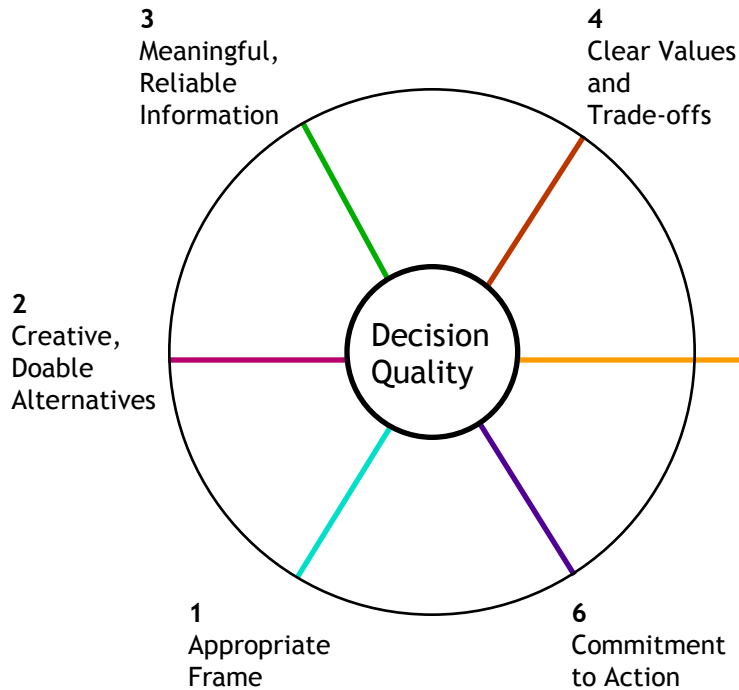
### Key tools

- Stakeholder expectations
- Value attributes
- Explicit trade-offs
  - Long term vs. short term
  - Customers vs. shareholders
  - Cost vs. environment
- Distinction between direct and indirect values

### Failure modes

- *Neglecting a key constituency - especially a senior executive*
- Insufficient clarity on trade-offs
- Ignoring “intangibles”
- Double-counting risk

# 5. Logically Correct Reasoning



## Characteristics

- The logic that distills
  - Frame (“what’s the problem”)
  - Alternatives (“what you can do”)
  - Information (“what you know”)
  - Values (“what you want”)into a clear choice

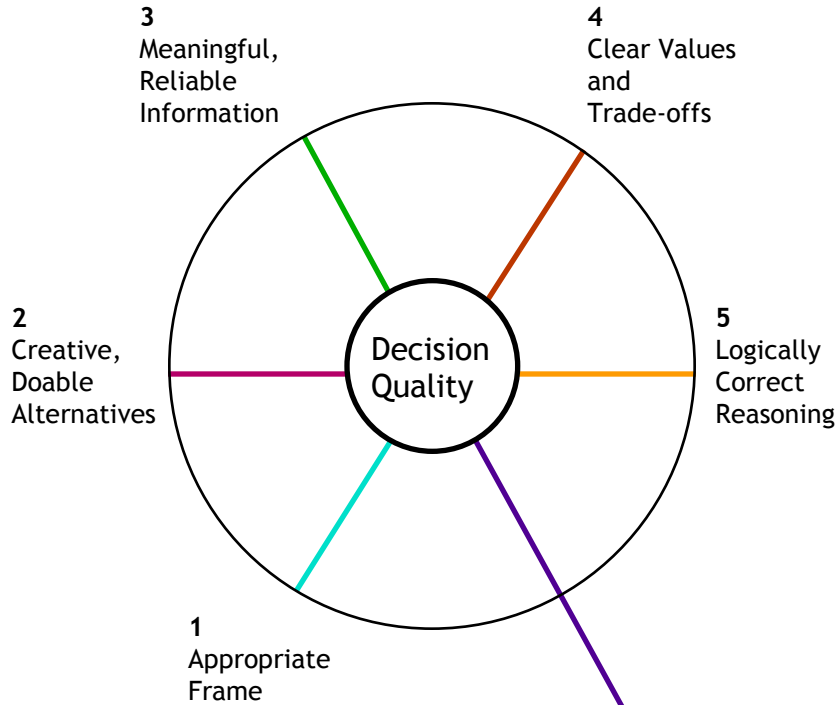
## Key decision analysis tools

- Modeling the consequences of alternatives
- Sensitivity analysis
- Probabilistic analysis
- Value of information

## Failure modes

- *Wrong logic for this decision*
- Models too cumbersome to enable sensitivity and probability analysis
- Relying only on deterministic cases
- Ignoring dependencies

# 6. Commitment to Action



## Characteristics

- Gaining motivation and commitment to action from necessary individuals

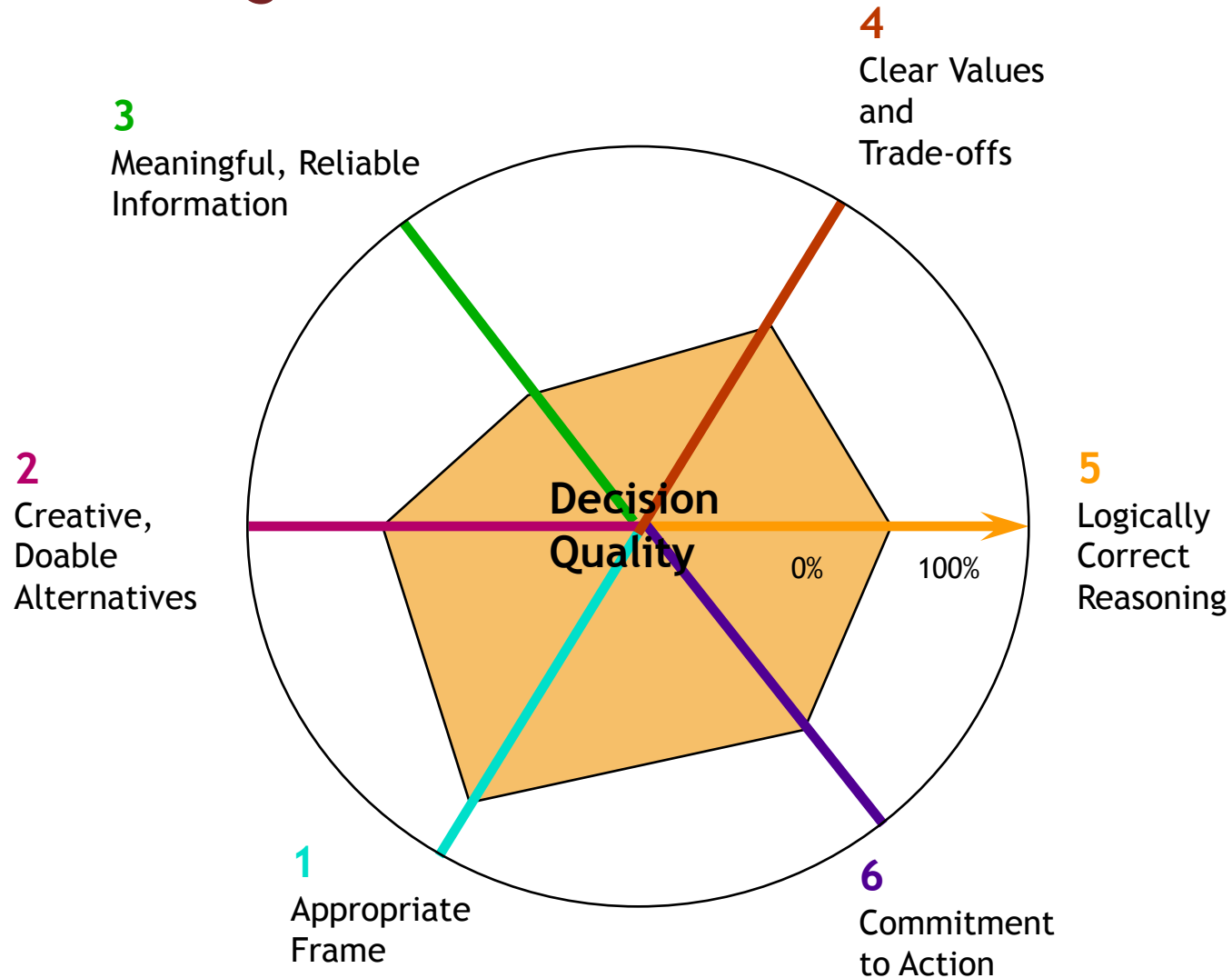
## Key tools

- Involvement of key individuals during the process
- Building organizational readiness from the start
- Credibility of input sources

## Failure modes

- Poor quality in other elements
- Continual reworking of a decision
- *Insufficient support - especially from senior leadership*
- Organizational infrastructure kills it
- *Lack of motivation*

# The quality of a decision can be described by a “spider” diagram.



# The most common source of difficulty that hinders the implementation of a new decision-making process is generally associated with the leadership.

- Leadership's role in and commitment to the implementation of a new decision-making process is of the utmost importance.
  - Failure to not implement is a leadership issue.
  - If the leadership not on board and not willing to put this high on the leadership strategic agenda, it is hard to push a new decision-making process “uphill”.
  - Leadership must be willing to say that “*this is the work*”.
- Lack of management commitment cascades into other failure modes:
  - Lack of prioritization
  - Lack of resources (time, people, financial)
  - Lack of organization's attention
  - Previous decision-making methods resurface
  - Etc., etc.

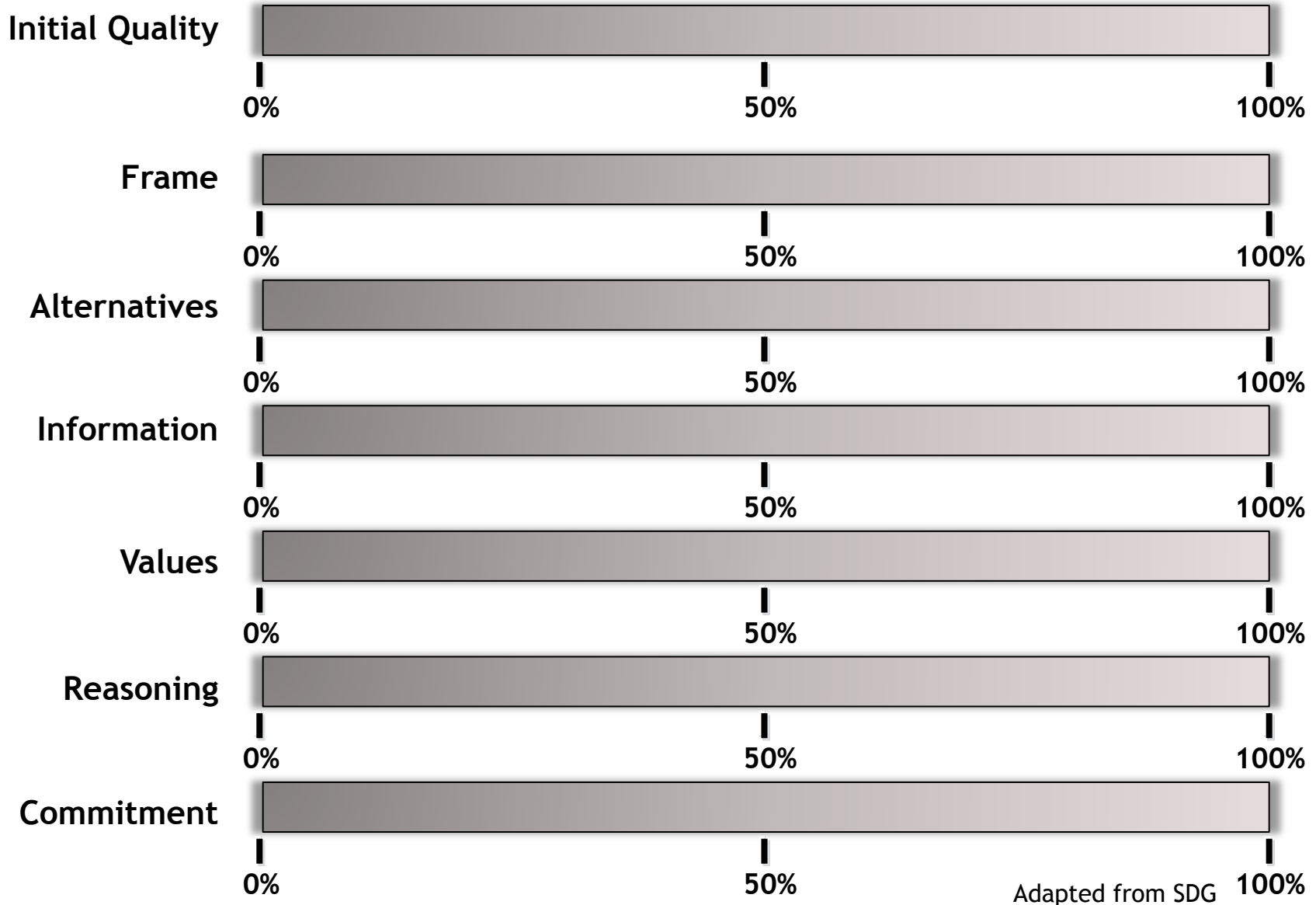
## Within a specific decision, some of the common sources of failure include the following (I):

- The wrong people are involved.
  - An influential and interested party is not represented.
  - Project team members do not have the required time, motivation, commitment, or competence.
- The project was commissioned for the wrong reason.
  - Justification for a decision that has already been made
  - Used by an advocate to steer the decision process
- Insufficient resources (people, time, budget) are allocated to the project.
  - Working through a complex set of decisions requires time and resources.
  - Developing insight and good communication requires time.
  - A short decision process is feasible if participants acknowledge the effects of time limits.

## Within a specific decision, some of the common sources of failure include the following (II):

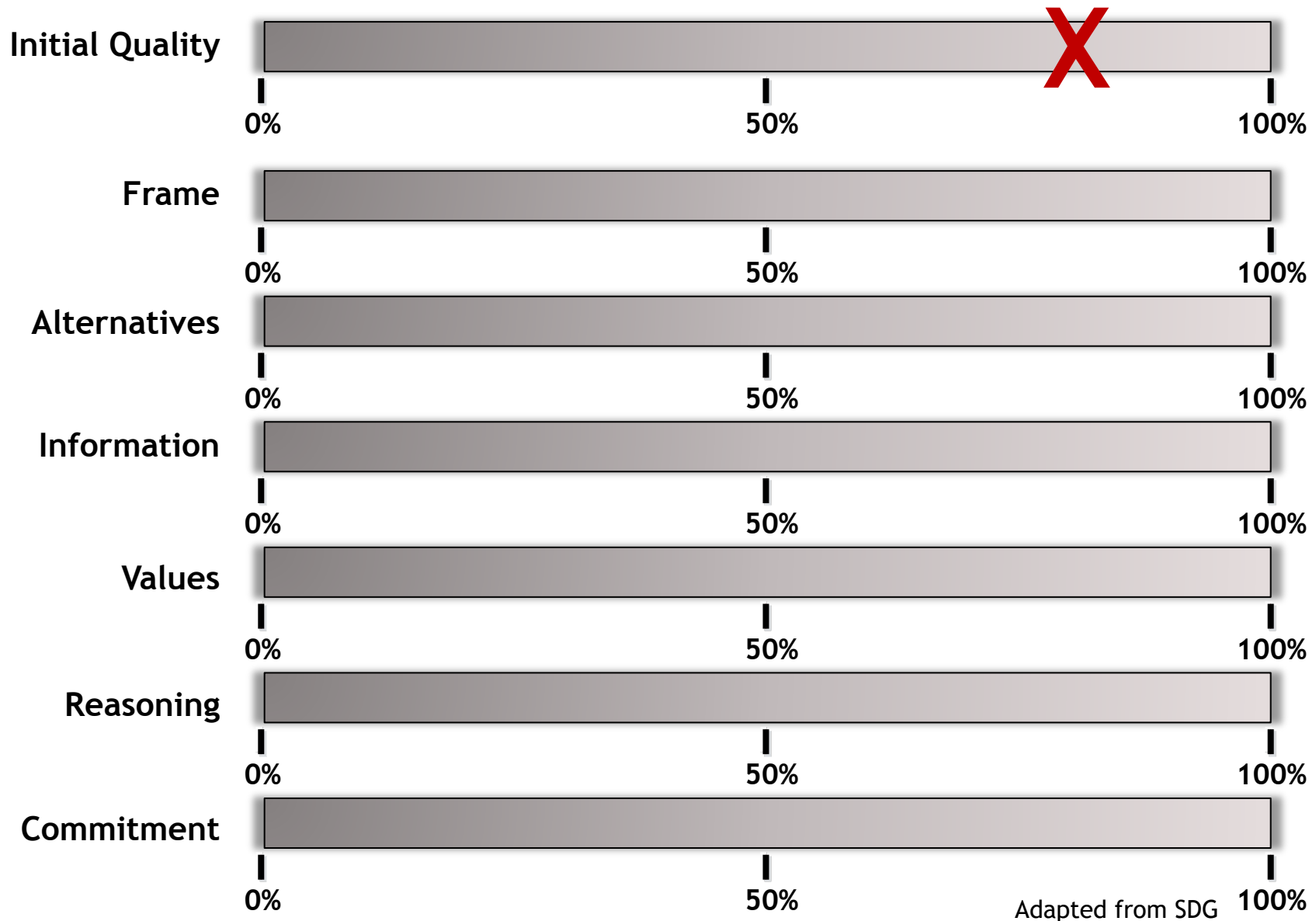
- Access to information sources is denied.
  - The decision process is secret or information sources are being protected.
  - Decision quality suffers if valid and useful information is consciously ignored.
- The decision makers do not function well as a team.
  - It is not empowered to make the decision.
  - Members do not share the same values and understanding of the project.
  - The support team does not understand the decision makers' expectations.
  - Discussion at meetings is not full, open, and honest.

# How do we assess the overall quality of our decisions?

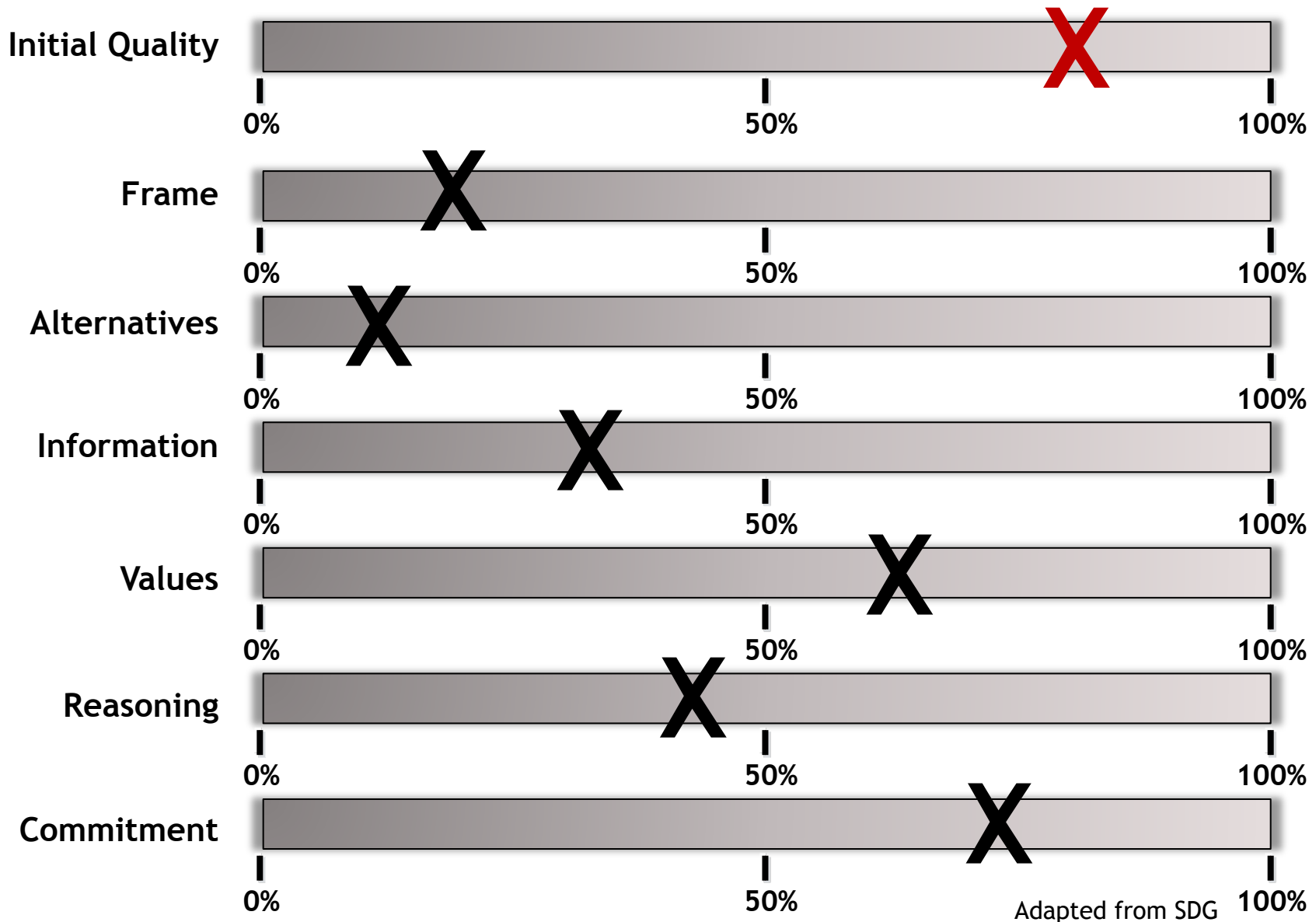




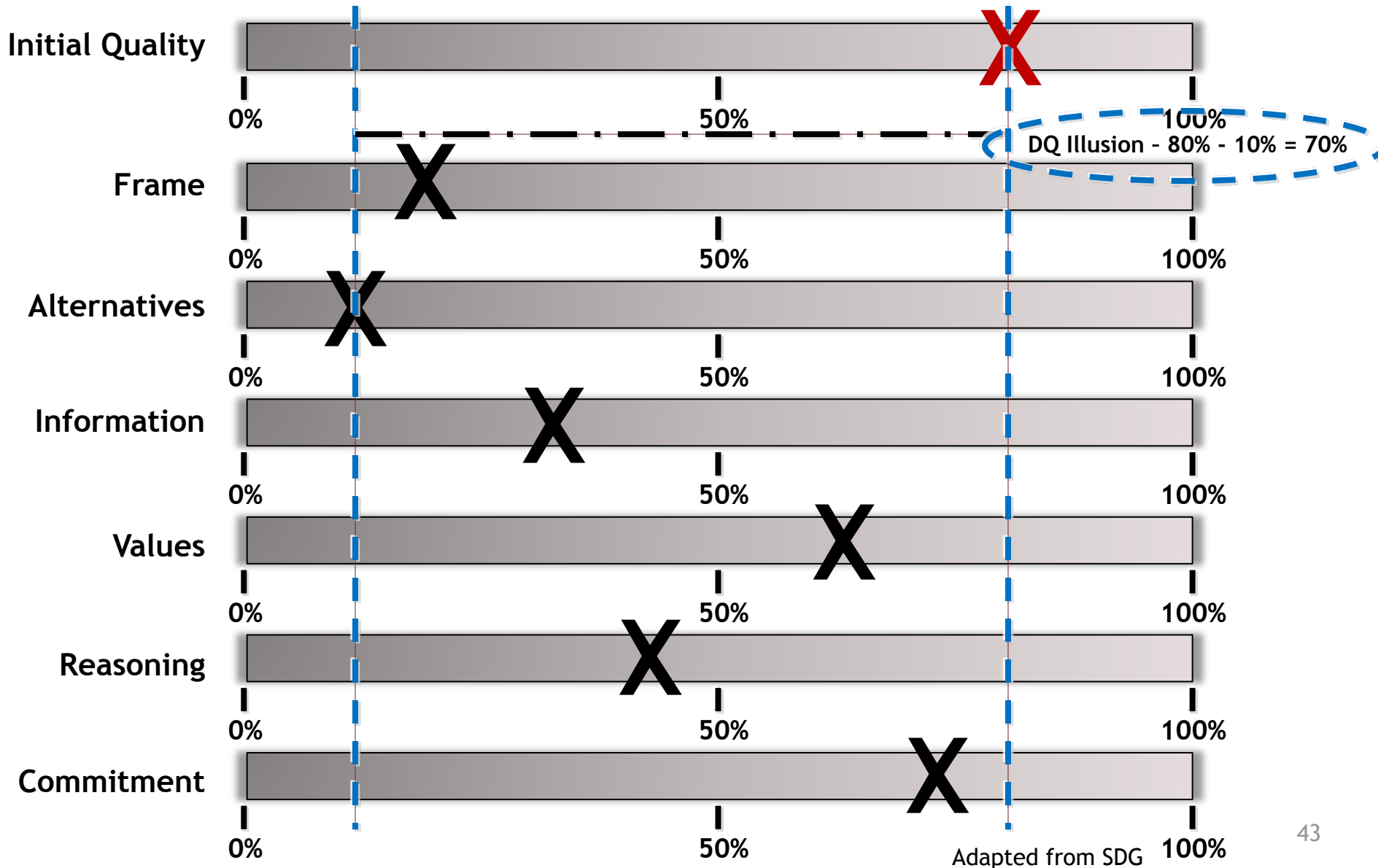
# Typically, we rate our decision-making as good.



# Then we assess each factor of DQ.



Typically, we rate our decision-making as good but, after assessing DQ, we find that to be an illusion.



## Key Insights from DQ Illusion Example

- DQ is as strong as weakest link - 10% in this case (Alternatives)
- In this particular case, the management felt that their DQ was at 80% - when, in reality, it was only 10% - as the DQ is as strong as the weakest link.
- 80 - 85% is typical average response received from management team in doing assessment prior to DQ training.
- Quality of decisions is dependent on every element as every element is critical.
- Remember: A “great car” without brakes is not a great car!!!!

## *Decision Quality: Making the Right Choice Every Time*

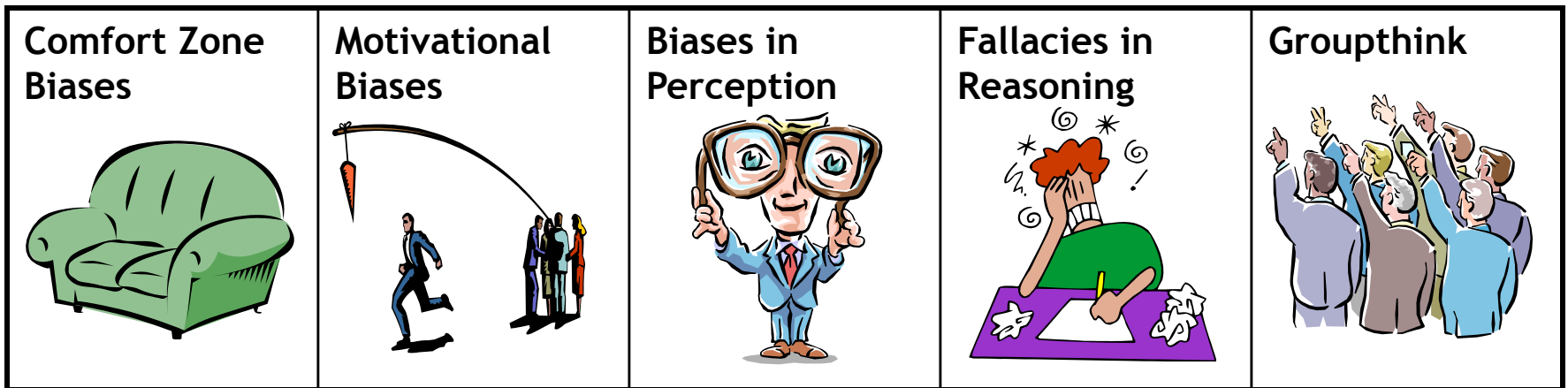
- For further information, feel free to contact
  - Bob Wasson
  - [rwasson@smartorg.com](mailto:rwasson@smartorg.com)
  - [rwasson@andrew.cmu.edu](mailto:rwasson@andrew.cmu.edu)

# **APPENDIX A**


# **AVOIDING DECISION TRAPS**

# **AND BIASES**

We can use five key classifications to categorize the many types of biases that permeate the decision-making process.



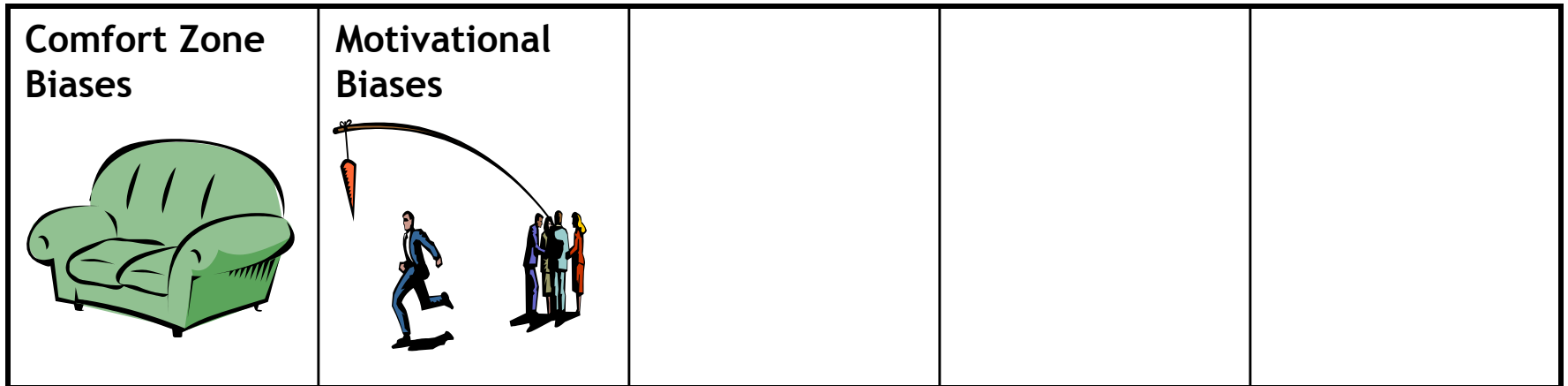
Humans consciously or unconsciously drag a problem into their comfort zone; people resist changes.

<p>Comfort Zone Biases</p> 				
---	--	--	--	--

- People
  - Do what comes naturally rather than what is important
  - Become attached to the status quo and continue what they have been doing
  - Hang on to false beliefs and fail to learn even with strong evidence

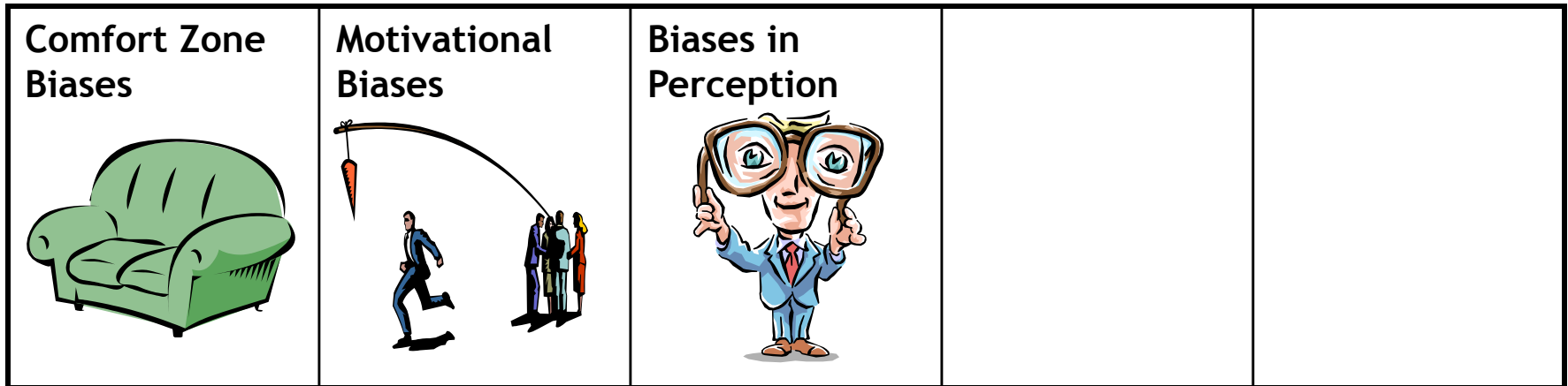


# Individuals' motivations can distort judgments and beliefs.



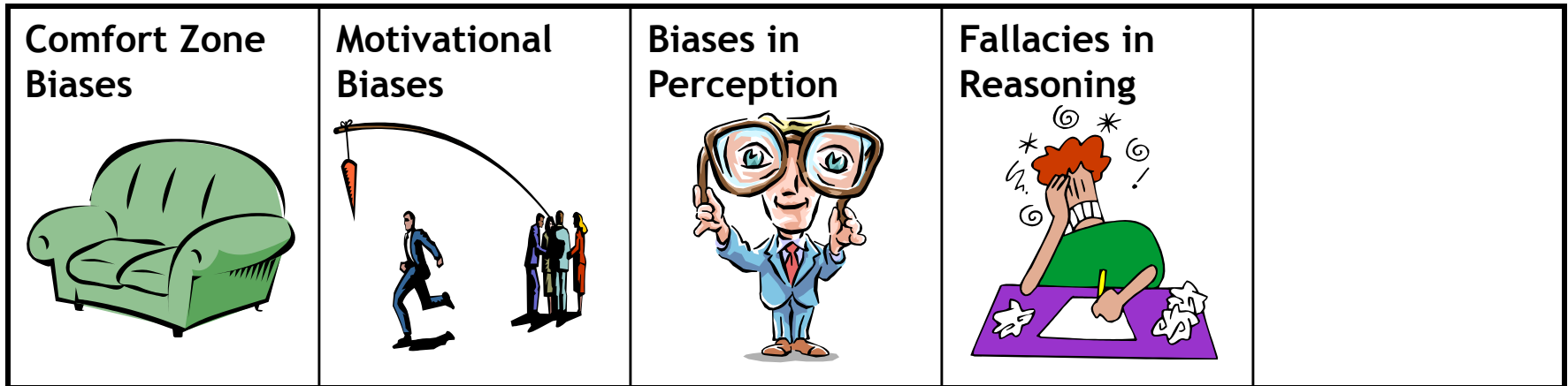
- People:
  - Distort their judgments to “look good and get ahead”
  - Escalate commitment irrationally to protect their earlier choices
    - “Throw good money after bad”
  - Exhibit wishful thinking and undue optimism
  - Seek confirmatory evidence while avoiding contradicting information

# Perceptions are inevitably distorted because of the way the brain senses stimuli and processes information.



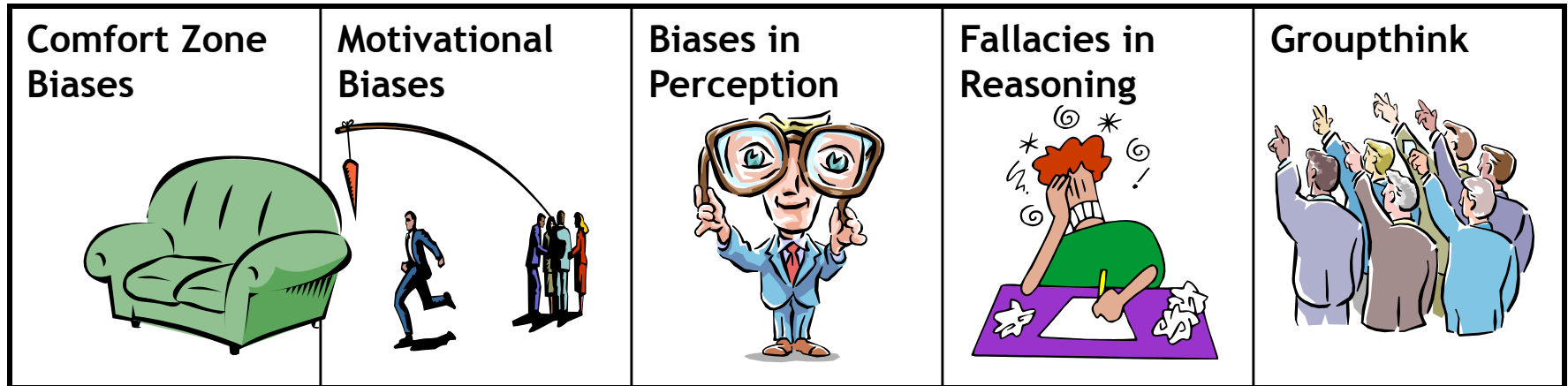
- People:
  - Anchor judgments on the information that is easiest to recall
    - Dramatic information, recent information, “official” information
  - Make insufficient adjustments from their initial anchors
  - Overestimate what they know
  - Give different answers to the same question presented in different ways

# People often reach incorrect conclusions using casual reasoning.



- People:
  - Apply inappropriate mental heuristics
    - Substitute relative comparisons for absolute measures
    - Simplify inappropriately
  - Have almost no ability to reason casually about uncertainty
    - Exhibit surprise at coincidences that are explainable as random effects
    - Form false beliefs based on random effects
    - Cannot solve the simplest probabilistic problems in their head - even experts

# Groups combine individual distortions and add additional distortions due to group dynamics.

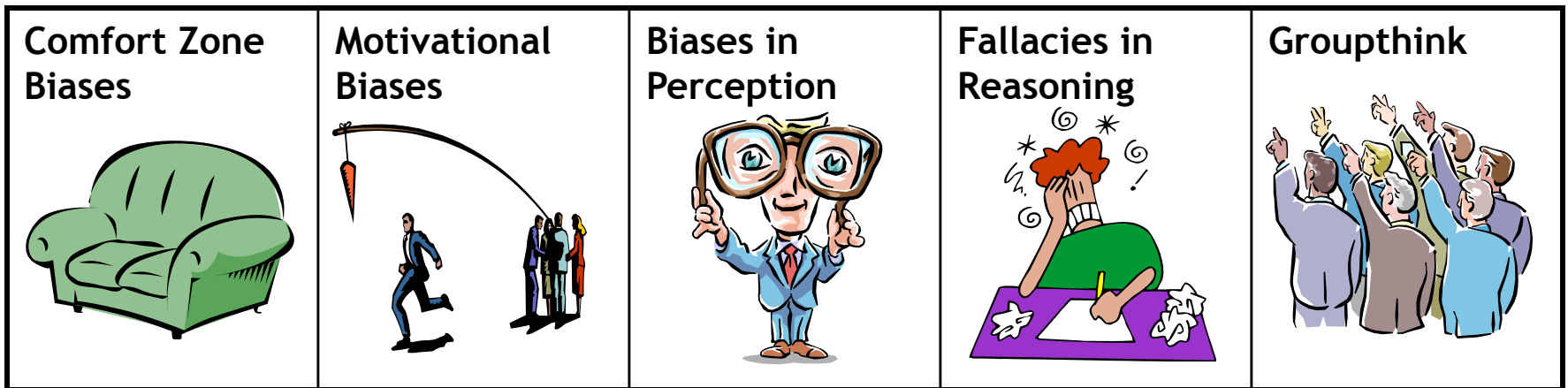


- People in groups:
  - Either jump to conclusions prematurely or get bogged down and never reach a consensus
  - Are reluctant to voice dissenting opinions
  - Believe falsely that everyone agrees with the group decision
  - Create cultures that institutionalize distortions

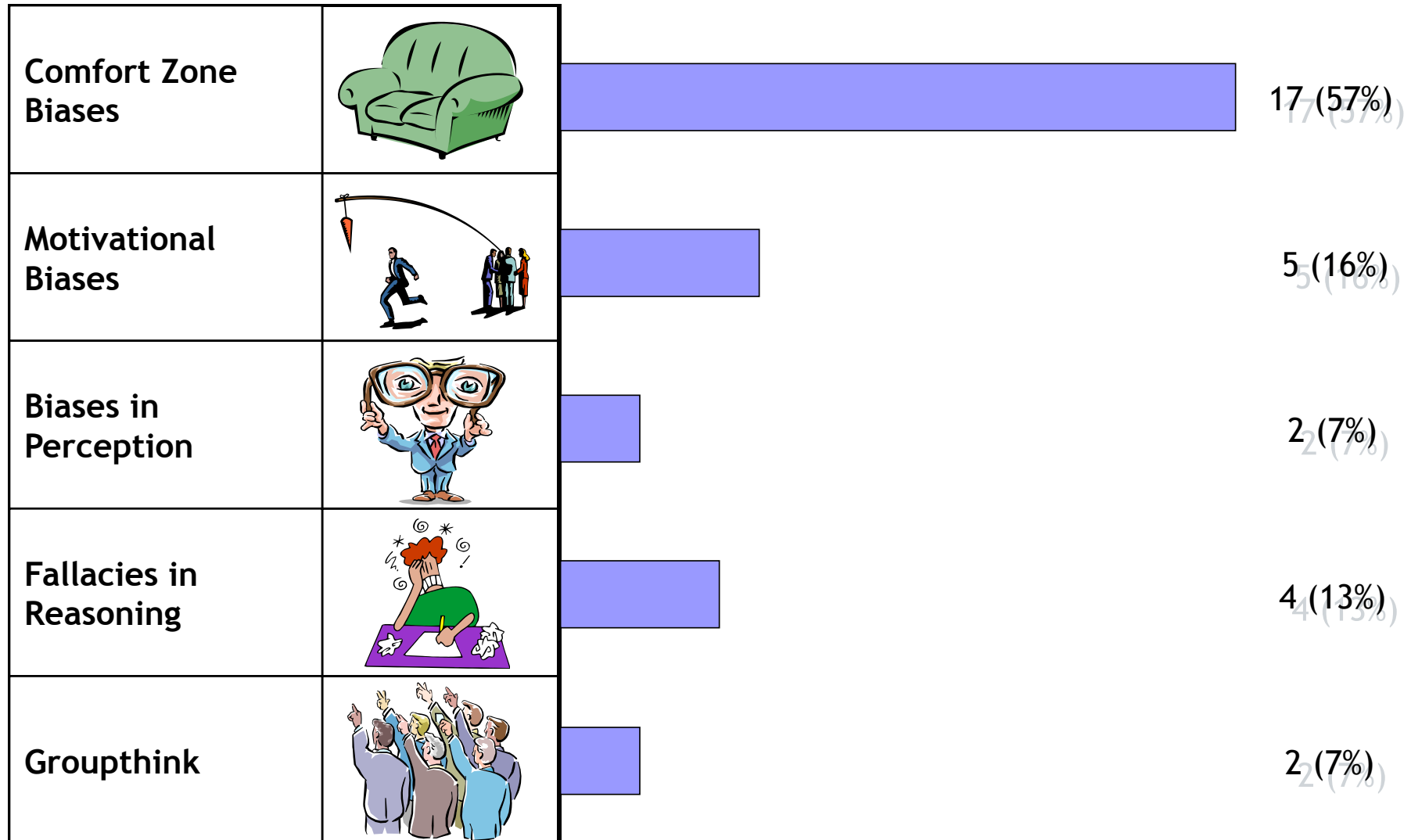
# There is an extensive body of research that documents these biases and distortions.

- **Comfort Zone**
  - Personality Based Perspectives, Status Quo Effect, Tyranny of Choice, Endowment Effect, ...
- **Motivational Biases**
  - Positive Illusions, Wishful Thinking, Undue Optimism, Overconfidence, Sunk Cost, Prudence Trap, Incentive Effects, Confirming Evidence Trap, Escalation of Commitment, Minimizing Regret, Hindsight Effects, ...
- **Biases in Perception**
  - Anchoring and Adjustment, Loss Aversion, Framing Effects, Context Effects, Primacy/Recency, Coherence, Vividness, Weber's Law, ...
- **Fallacies in Reasoning**
  - Base Rate Neglect, Sample Size Neglect, Ignoring Regression to Mean, Substitution of Relative Comparisons for Absolute Measures, Mental Accounting, Gambler's Fallacy, ... and general inability to deal intuitively with uncertainty
- **Groupthink (broadly defined)**
  - Premature Harmony, Never-Ending Debate, Emphasis on Shared Information, Self-Censorship and Fear of Dissent, Illusion of Invulnerability, Collective Rationalization, Excessive Stereotyping, Illusion of Morality, Pressure for Conformity, Illusion of Unanimity (Abilene Paradox), Mindguards, ...

# Biases permeate the decision-making process and can sabotage decisions.



In a recent survey, highly experienced consultants concluded that the Comfort Zone biases were the most important bias to address.

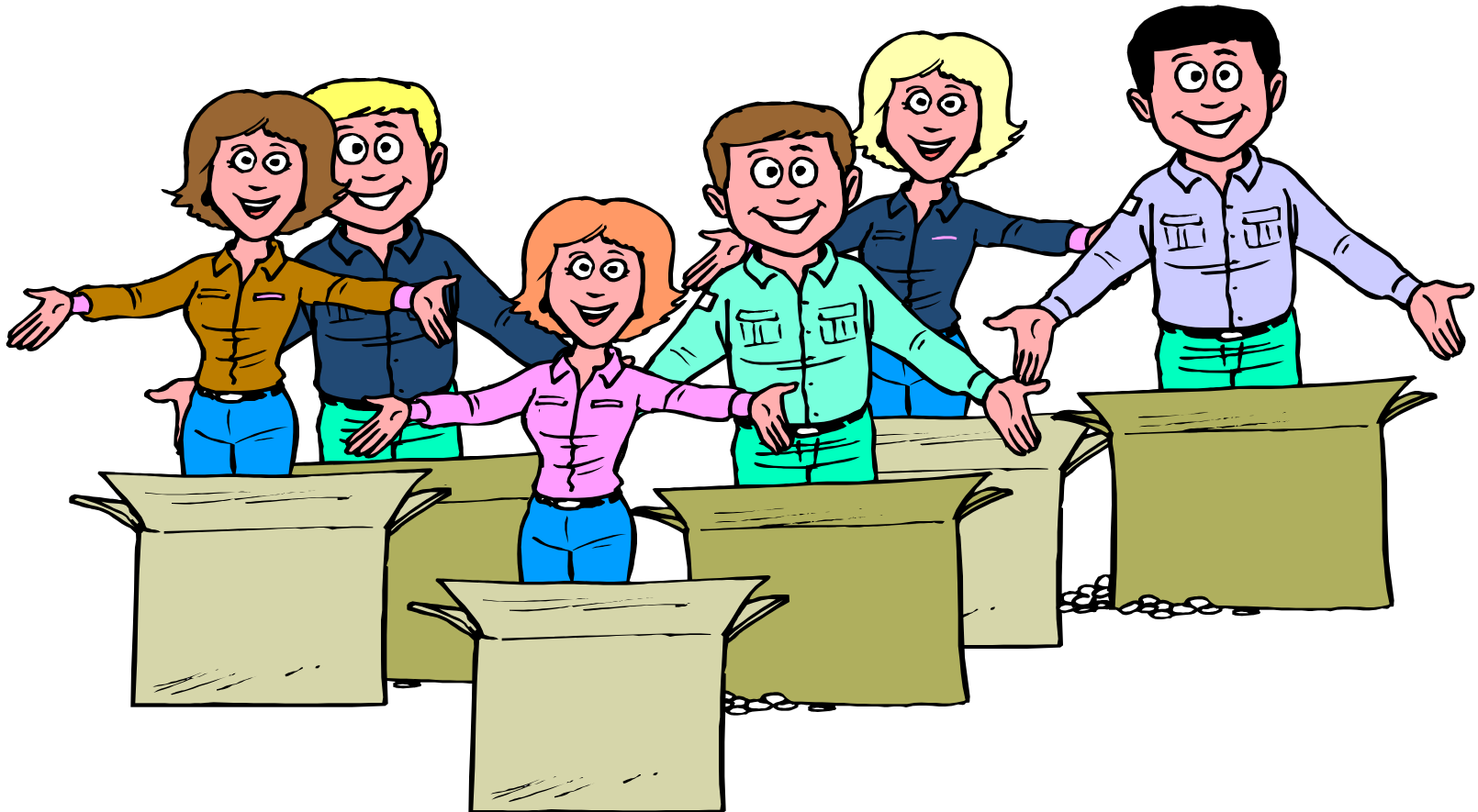


**Insight 1: People tend to do what comes naturally rather than what's important, even if that is pouring money down a hole.**

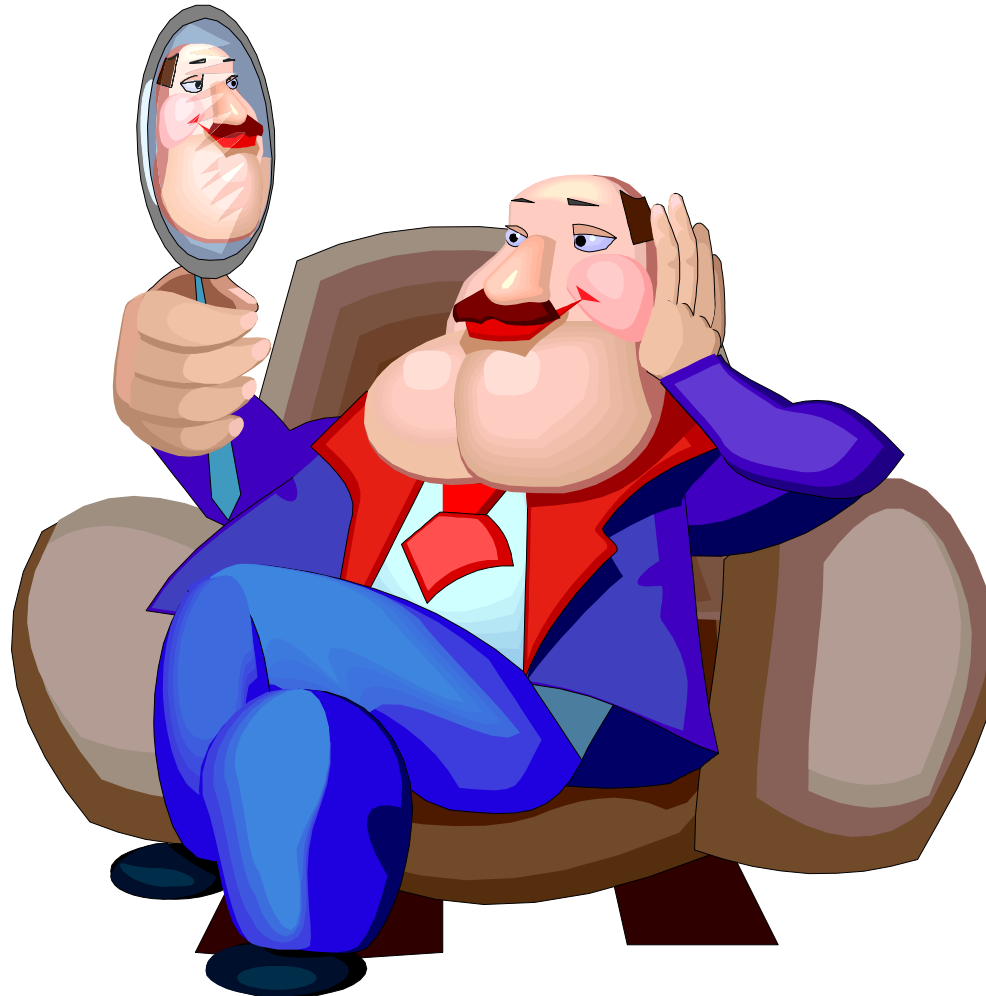




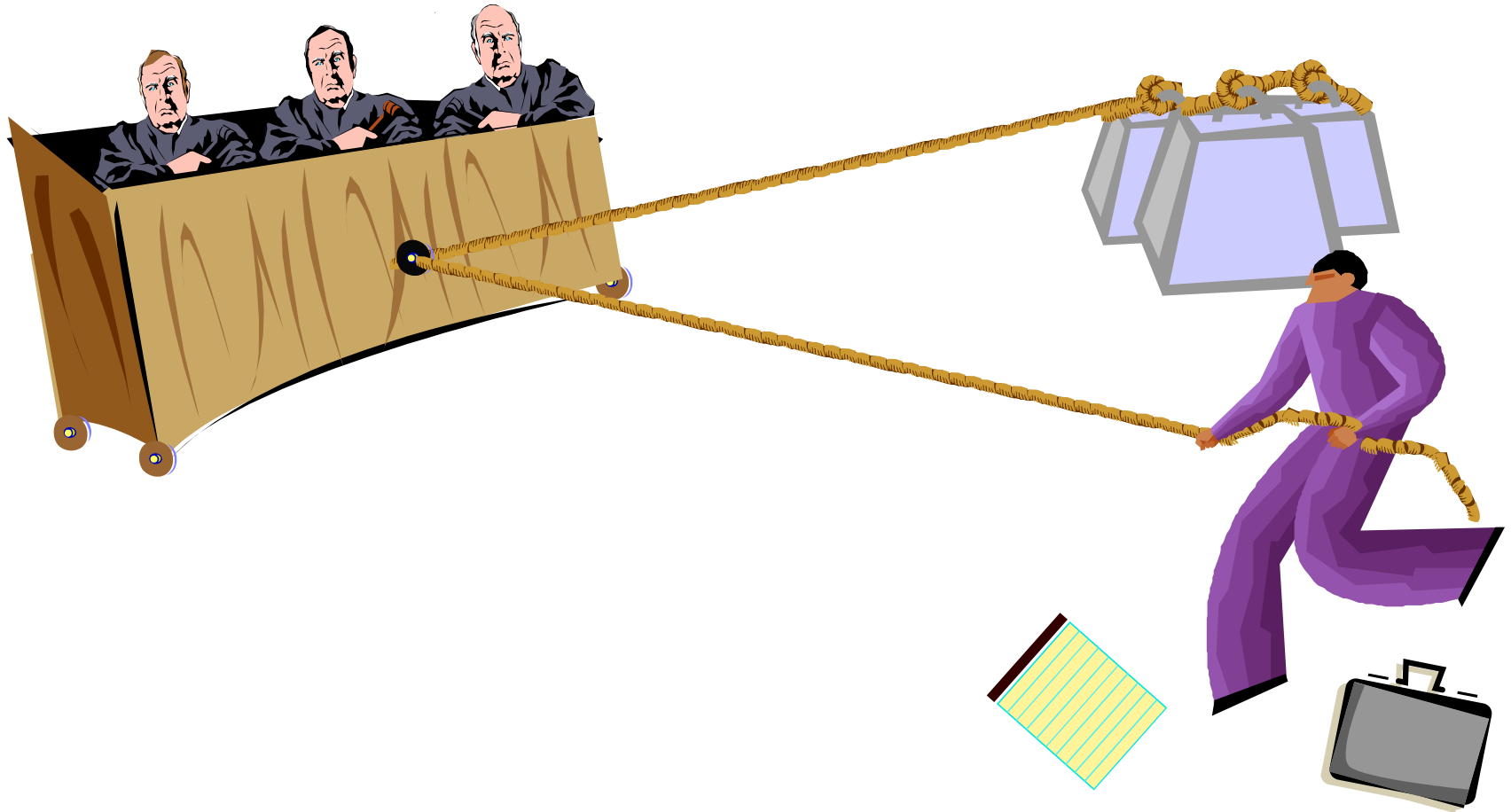
**Insight 2: Groups lock themselves into a frame and it takes an “aha” to get them out of their boxes.**



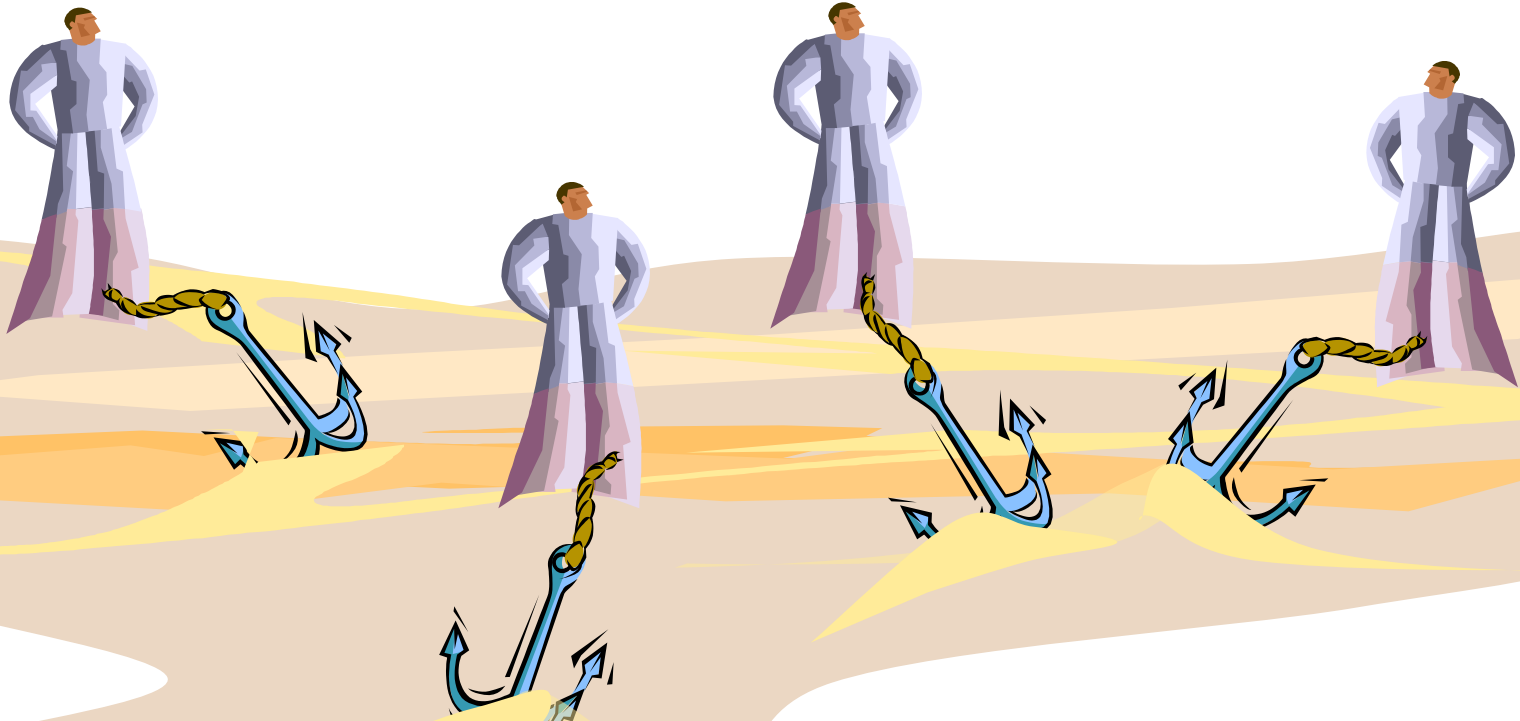
**Insight 3: People have incentive to provide information that makes them look good.**



**Insight 4: If you want to convince someone, get them to accept an anchor and frame the problem as one of adjustment from this anchor.**



**Insight 5: Even with a clear conclusion, a group may have difficulty breaking their anchor to the current strategy.**



# Five principal categories of biases that you will deal with in making major strategic or operational decisions.

