Decision-Making Frameworks

Decision Support Systems

Kağan OKATAN, PhD

Types of Decisions: Structured vs. Semi-Structured vs. Unstructured

Structured Decisions

Characteristics:

- Well-defined problems with clear criteria
- Established procedures and rules
- Quantifiable outcomes
- Routine and repetitive nature
- Limited alternatives with predictable consequences

Examples:

- Inventory reordering (when stock hits reorder point)
- Credit approval based on credit scores
- Employee overtime calculations
- Standard pricing decisions

Semi-Structured Decisions

Characteristics:

- Partially defined problems
- Some established procedures, but require judgment
- Mix of quantitative and qualitative factors
- Moderate uncertainty
- Combination of routine and novel elements

Examples:

- Budget allocation across departments
- Performance evaluation and promotion decisions
- Vendor selection with multiple criteria
- Project resource allocation

Unstructured Decisions

Characteristics:

- Poorly defined or novel problems
- No established procedures
- High uncertainty and ambiguity
- Require creativity and intuition
- Significant strategic implications

Examples:

- Entering new markets
- Responding to crisis situations
- Innovation and R&D investments
- Organizational restructuring

Simon's Model: Intelligence–Design–Choice–Implementation

Herbert Simon's four-phase decision-making model provides a systematic approach to complex decisions.

Phase 1: Intelligence

Purpose: Problem identification and understanding

Activities:

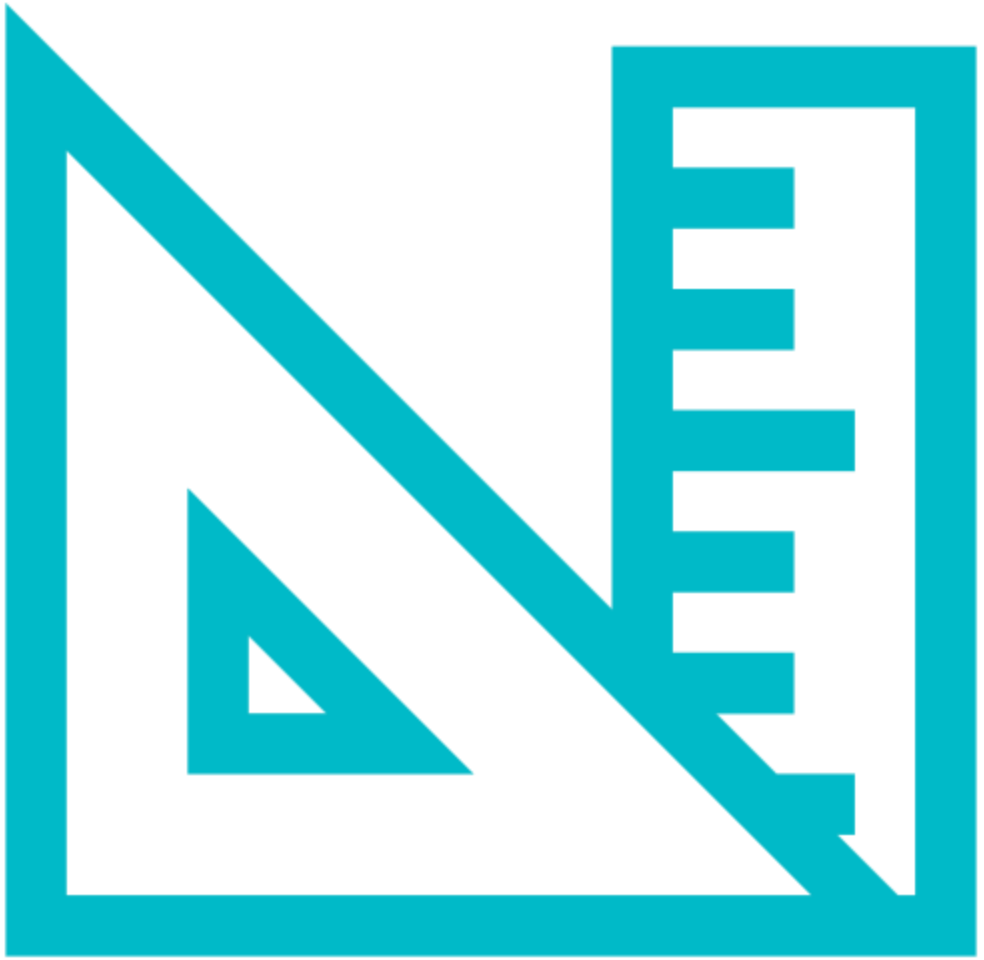
- Environmental scanning
- Problem recognition
- Information gathering
- Situation analysis
- Defining the decision context

Phase 2: Design

Purpose: Developing alternative solutions

Activities:

- Generating possible alternatives
- Identifying constraints and resources
- Evaluating feasibility of options
- Creating decision criteria
- Structuring the problem



Phase 3: Choice

Purpose: Selecting the best alternative

Activities:

- Evaluating alternatives against criteria
- Analyzing trade-offs
- Making the final selection
- Justifying the decision
- Considering implementation requirements

Phase 4: Implementation

Purpose: Putting the decision into action

Activities:

- Planning implementation steps
- Allocating resources
- Monitoring progress
- Making adjustments as needed
- Evaluating outcomes

Group Decision-Making and Behavioral Aspects

Group Decision-Making Advantages

- **Diverse Perspectives:** Multiple viewpoints lead to better problem understanding
- **Increased Information:** More knowledge and experience available
- **Better Acceptance:** Participants more likely to support decisions they helped make
- **Risk Sharing:** Shared responsibility for outcomes
- **Quality Improvement:** Critical evaluation reduces errors

Group Decision-Making Disadvantages

- **Time Consuming:** Coordination and discussion take longer
- **Groupthink:** Pressure for consensus may suppress dissent
- **Dominant Members:** Some individuals may overly influence decisions
- **Social Loafing:** Some members may contribute less effort
- **Compromise Solutions:** May lead to suboptimal "middle-ground" decisions

Behavioral Factors in Decision-Making

Individual Biases

- **Confirmation Bias:** Seeking information that confirms existing beliefs
- **Anchoring:** Over-relying on first piece of information
- **Overconfidence:** Overestimating one's abilities or accuracy
- **Loss Aversion:** Preferring to avoid losses over acquiring gains
- **Availability Heuristic:** Judging probability by ease of recall

Group Dynamics

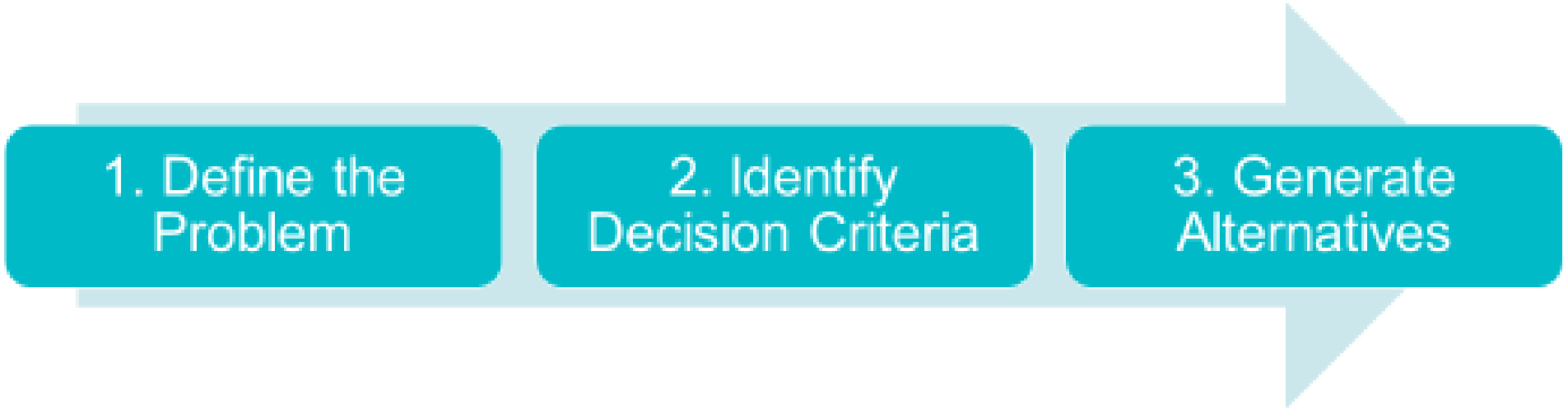
- **Groupthink:** Unanimous but poor decisions due to pressure for harmony
- **Polarization:** Groups making more extreme decisions than individuals
- **Social Facilitation:** Performance changes in presence of others
- **Conformity:** Aligning with group opinion despite personal disagreement

Case Study Analysis
Case Study 1: Restaurant Chain Expansion (Unstructured Decision)

Background: A successful regional restaurant chain with 15 locations is considering national expansion.

The CEO must decide whether to expand, and if so, how quickly and through what method (franchising vs. company-owned stores).

Basic Process



1. Define the Problem

Should the restaurant chain expand nationally?

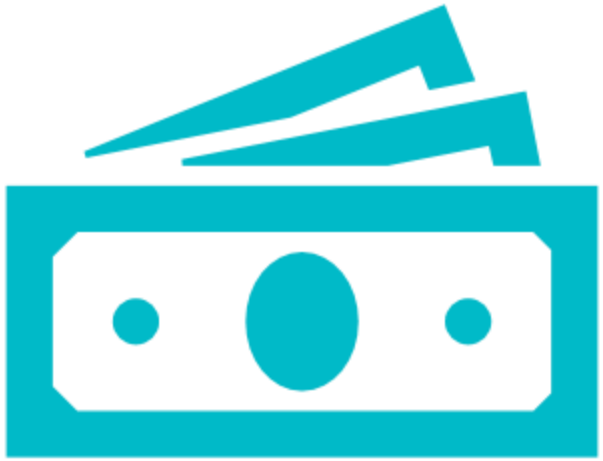
If yes, what is the optimal expansion method (franchising vs. company-owned)?

At what pace should the expansion occur?

2. Identify Decision Criteria

Key factors to consider:

- **Financial Resources** (capital requirements, cash flow, ROI)
- **Control & Quality** (brand reputation, customer experience consistency)
- **Growth Speed** (how fast can new markets be entered)
- **Risk Tolerance** (market risks, operational risks)
- **Scalability & Management Capacity**
- **Competitive Landscape**



3. Generate Alternatives

No Expansion → Maintain current 15 locations.

Gradual Company-Owned Expansion → Open 2–3 new locations per year, funded internally.

Aggressive Company-Owned Expansion → Rapid rollout in multiple cities, requiring external financing.

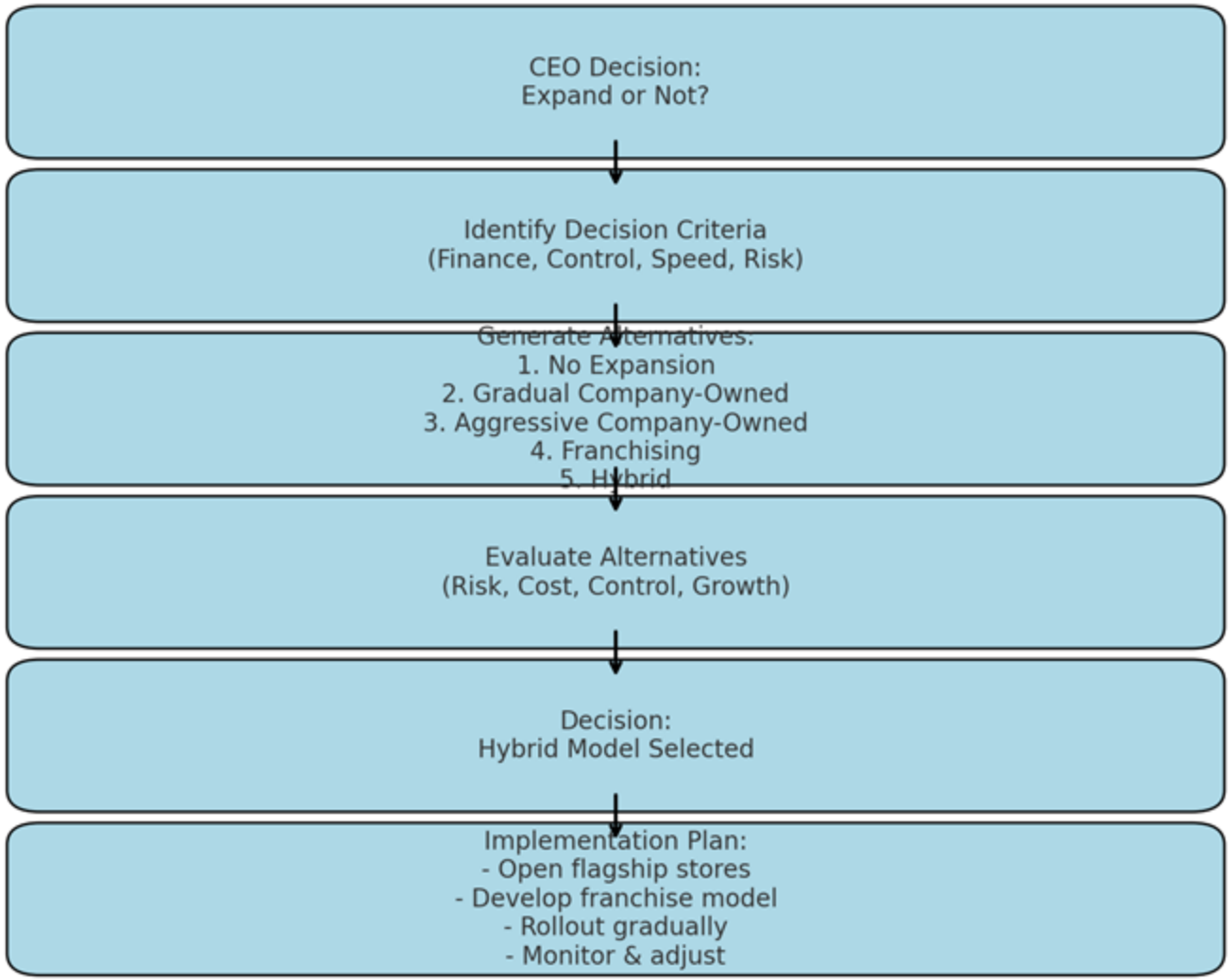
Franchising Model → Expand nationally via franchise partnerships, lower upfront capital, shared risk.

Hybrid Model → Open flagship stores in major cities + franchise smaller markets.

4. Evaluate Alternatives

Criteria	No Expansion	Gradual Company-Owned	Aggressive Company-Owned	Franchising	Hybrid
Financial Investment	Low	Medium	High	Low	Medium
Control & Quality	High	High	Medium	Low	Medium
Speed of Growth	None	Slow	Fast	Very Fast	Fast
Risk Level	Low	Medium	Very High	Medium	Medium
Scalability	Low	Medium	High	Very High	High
Profit Potential	Medium	High	Very High	Medium	High

Decision-Making Framework: Restaurant Chain Expansion



Simon's Model
Application: Intelligence Phase:

- Market research reveals growing demand for the cuisine type
- Financial analysis shows strong cash flow but limited capital for rapid expansion
- Competitive analysis identifies both opportunities and threats
- Internal assessment reveals operational strengths and weaknesses

Design Phase:

- Alternative 1: Gradual company-owned expansion (2-3 stores/year)
- Alternative 2: Aggressive franchising model (10-15 stores/year)
- Alternative 3: Strategic partnership with established restaurant group
- Alternative 4: Status quo with regional focus

Choice Phase:

- Evaluation criteria: Financial returns, risk level, control retention, growth speed
- Decision matrix analysis weighing each alternative
- Selection of franchising model with selective company-owned flagship stores

Implementation Phase:

- Development of franchise operations manual
- Legal framework establishment
- Franchisee recruitment and training program
- Performance monitoring systems

Group Decision-Making Elements:

- Board of directors' involvement in strategic choice
- Management team input on operational feasibility
- Customer focus groups for market validation
- Potential for groupthink if board is too cohesive

Case Study 2: IT System Upgrade (Semi-Structured Decision)

Background: A mid-size manufacturing company needs to replace its aging ERP system.

The IT director must choose between three vendor proposals while balancing cost, functionality, and implementation timeline.

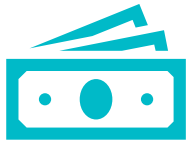
Decision Type Analysis:

- Semi-structured because there are established evaluation criteria for IT systems
- However, each implementation is unique with company-specific requirements
- Combines quantitative factors (cost, performance) with qualitative factors (vendor support, user experience)

Simon's Model Application: Intelligence Phase:

Current system performance assessment

User needs analysis across departments



Budget constraints identification

Timeline requirements from business planning

Design Phase:

- RFP process with three qualified vendors
- Evaluation criteria development (cost 30%, functionality 40%, implementation 20%, support 10%)
- Site visits to reference customers
- Proof of concept testing

Choice Phase:

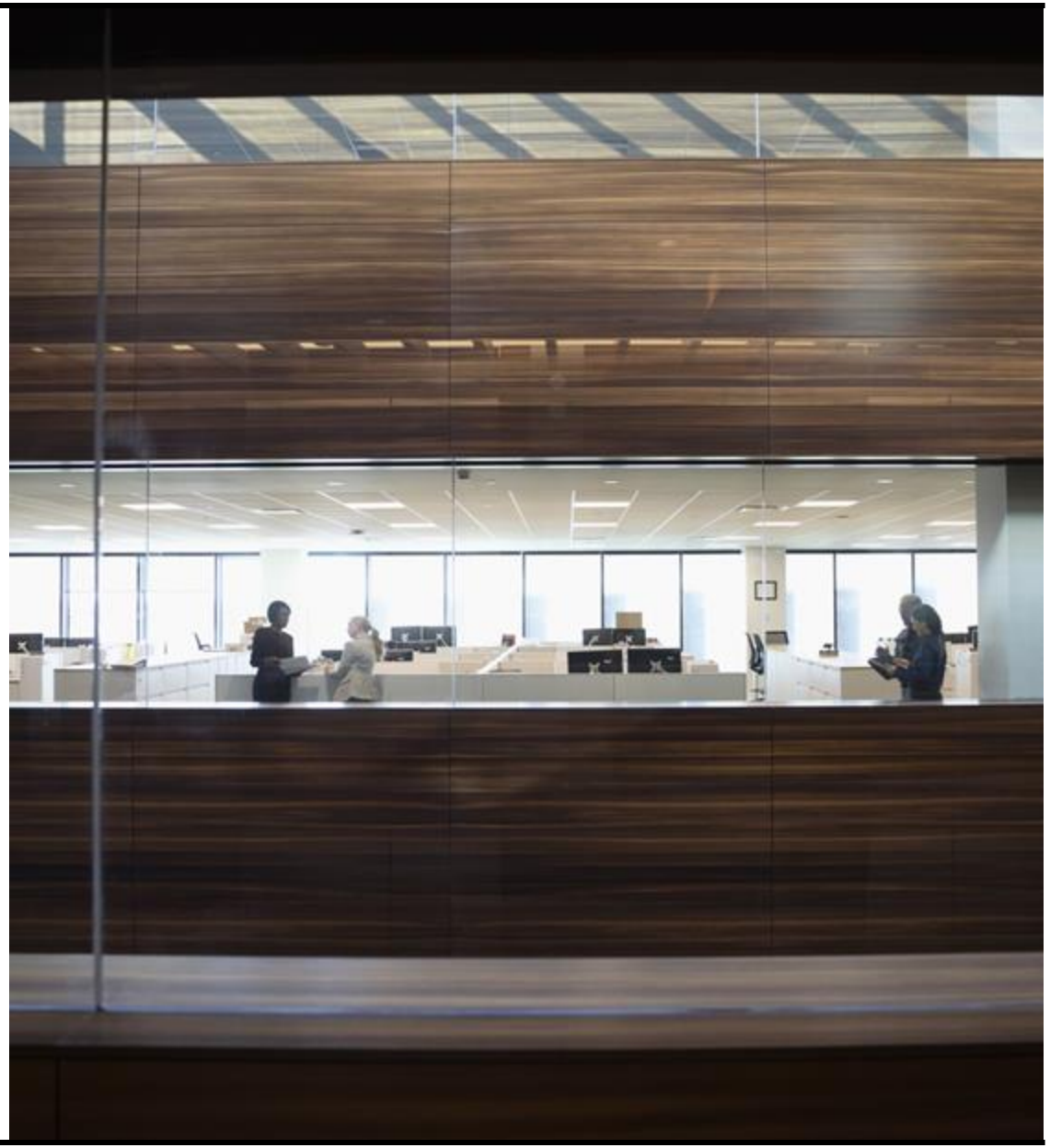
- Scoring matrix for each vendor proposal
- Cost-benefit analysis over 5-year period
- Risk assessment for each option
- Final selection based on weighted criteria

Implementation Phase:

- Project plan with milestones and resource allocation
- Change management program for users
- Training schedule development
- Go-live support and monitoring

Behavioral Considerations:

- IT staff may have vendor preferences based on technical familiarity
- Department heads may lobby for features benefiting their areas
- Need to manage resistance to change from current system users



Case Study 3: Emergency Response - Product Recall (Unstructured Decision)

Background: A consumer products company discovers a potential safety issue with one of its best-selling items.

The quality control manager must decide whether to issue a voluntary recall, despite uncertain risk levels and significant financial implications.

Decision Characteristics:

Unstructured due to novel situation and high uncertainty

Time pressure prevents extensive analysis

High stakes with public safety and company reputation at risk

Limited precedent for exact situation

Simon's Model Application:

Intelligence Phase (Compressed):

Rapid assessment of safety risk data

Legal consultation on liability exposure

Review of similar industry incidents

Stakeholder impact analysis (customers, retailers, shareholders)

Design Phase (Accelerated):

- Option 1: Full immediate recall with public announcement
- Option 2: Quiet recall through retailers without publicity
- Option 3: Enhanced monitoring with recall if issues confirmed
- Option 4: Continue sales with additional warning labels

Choice Phase:

Risk assessment matrix (safety risk vs. business impact)

Ethical framework application (stakeholder welfare priority)

Decision under time pressure with incomplete information

Selection of full immediate recall prioritizing safety

Implementation Phase:

- Crisis communication plan activation
- Retail partner coordination for product removal
- Customer notification and refund process
- Media relations and stakeholder communication

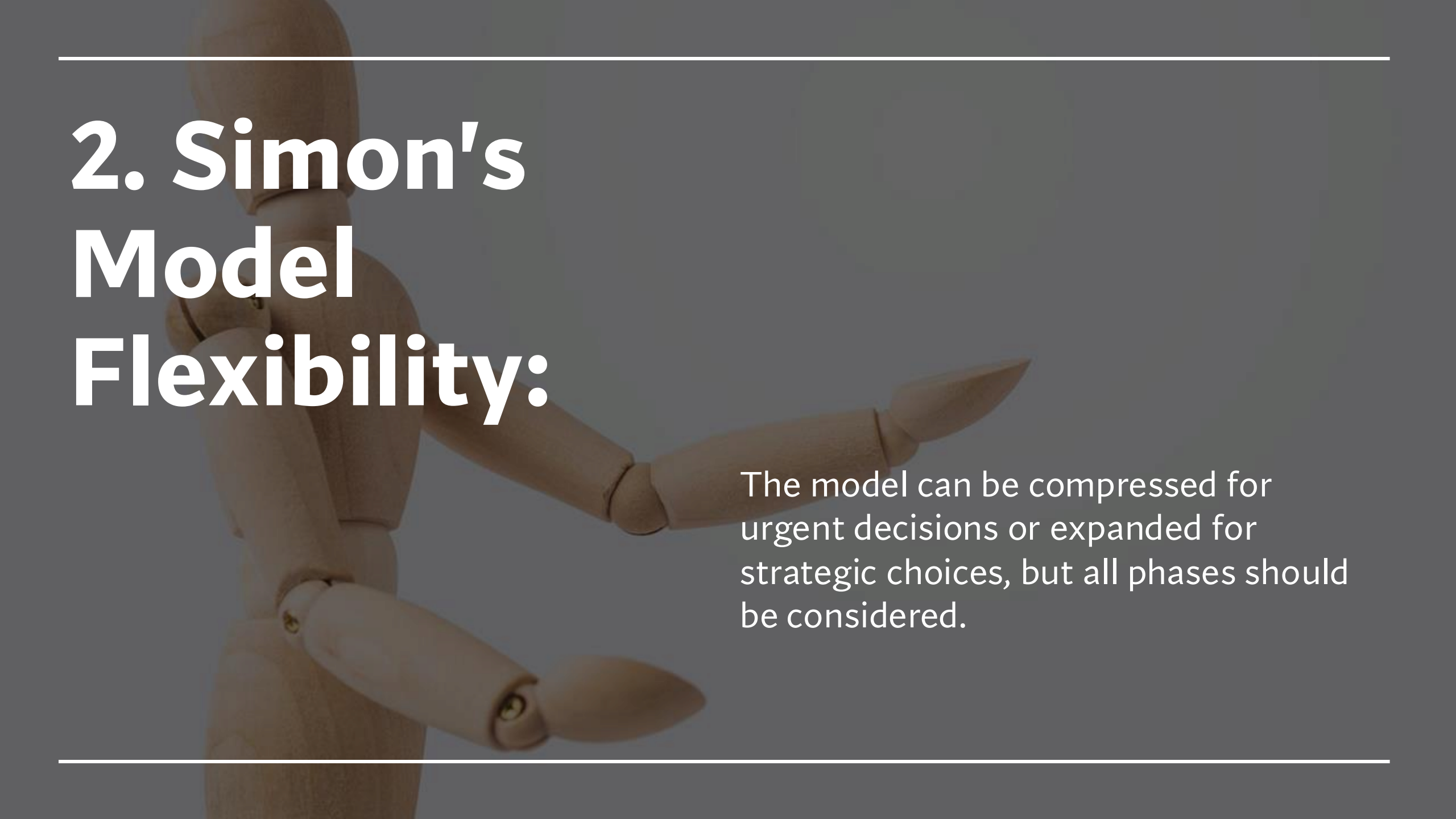
Group Decision-Making Dynamics:

- Crisis team with representatives from legal, marketing, operations, and quality
- Potential for conflict between safety-first and business-protection perspectives
- Need for rapid consensus despite high stakes
- CEO involvement for final authorization

Key Learning Points from Case Studies

1. Decision Type Recognition:

- Understanding whether a decision is structured, semi-structured, or unstructured helps determine appropriate tools and processes.



2. Simon's Model Flexibility:

The model can be compressed for urgent decisions or expanded for strategic choices, but all phases should be considered.

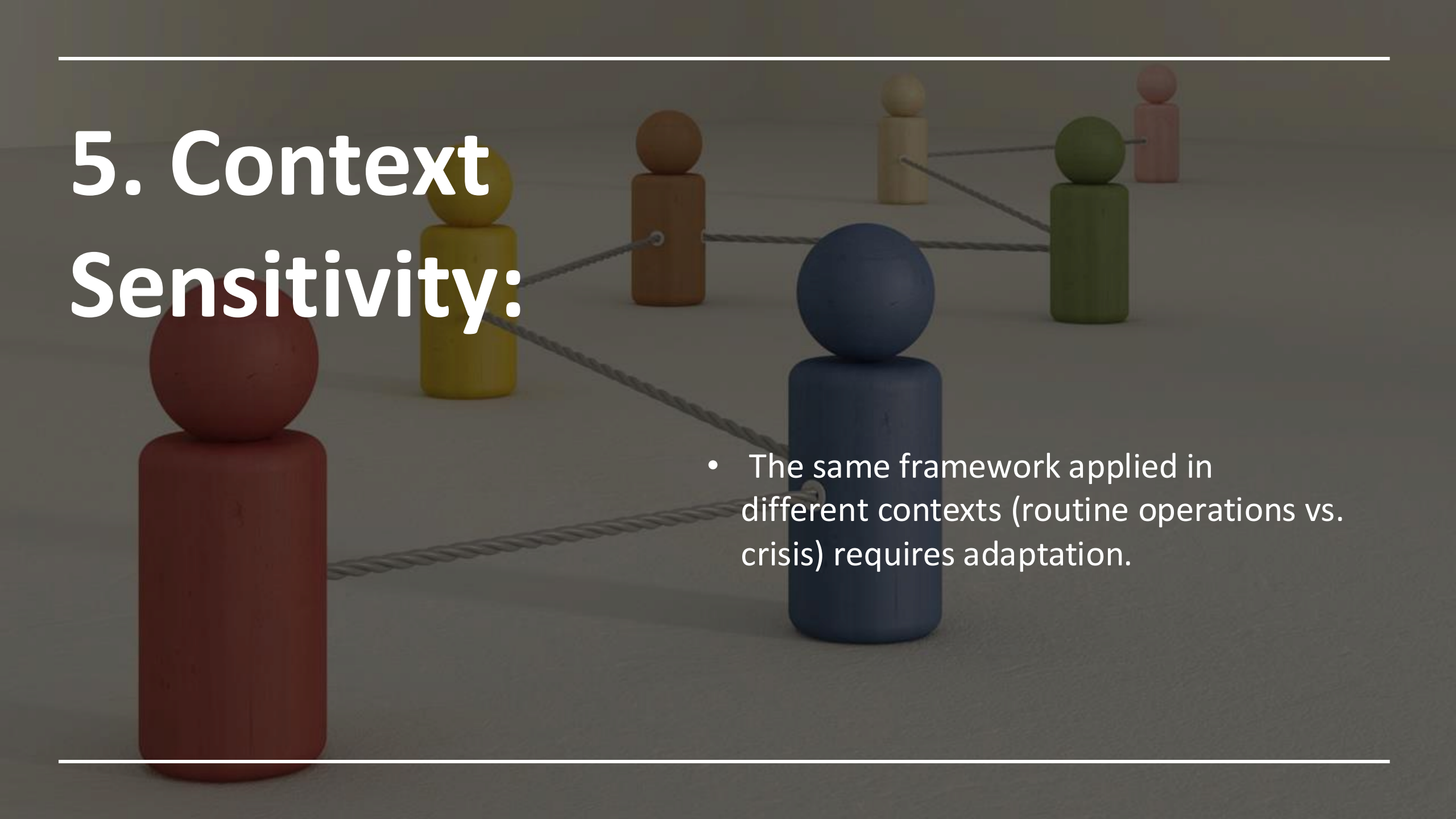
3. Group Composition Matters:

- Different decisions benefit from different group compositions and decision-making processes.

4. Behavioral Awareness:

Recognizing potential biases and group dynamics helps improve decision quality.

5. Context Sensitivity:



- The same framework applied in different contexts (routine operations vs. crisis) requires adaptation.

6. Implementation Focus:

Even excellent decisions fail without proper implementation planning and execution.

Practical Application Guidelines When to Use Each Decision Type Approach

Structured Decisions:

- Develop standard operating procedures
- Use automated decision systems where possible
- Focus on efficiency and consistency
- Regular review and updating of criteria

Semi-Structured Decisions:

Combine analytical tools with expert judgment

Use decision support systems

Document rationale for future reference

Balance quantitative and qualitative factors

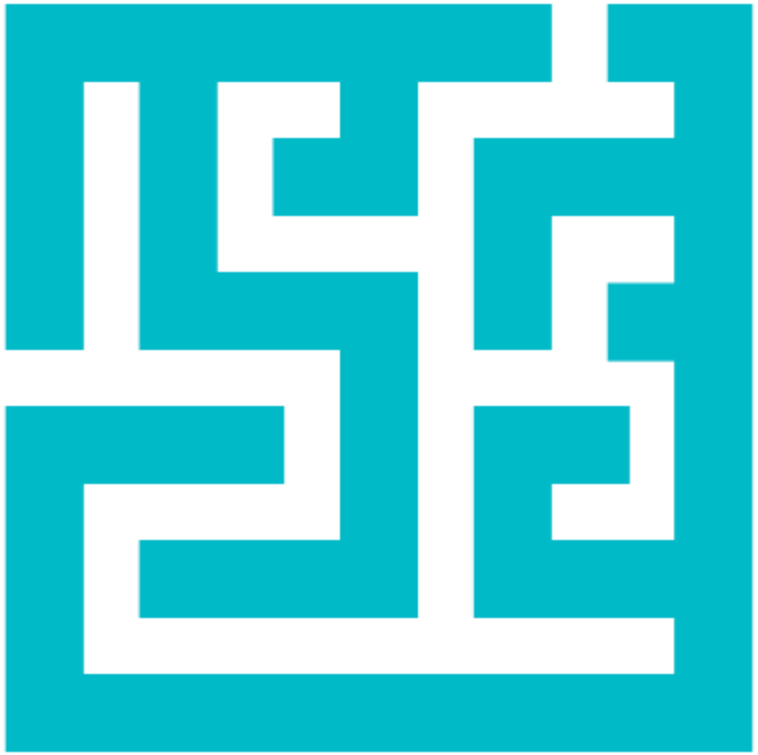
Unstructured Decisions:

EMPHASIZE CREATIVITY AND INNOVATION

USE SCENARIO PLANNING AND SIMULATION

INVOLVE DIVERSE PERSPECTIVES

ACCEPT HIGHER UNCERTAINTY AND RISK



Optimizing Simon's Model

1. **Intelligence Phase:** Invest time in problem definition - a well-defined problem is half-solved
2. **Design Phase:** Generate multiple alternatives before evaluating any
3. **Choice Phase:** Use appropriate decision tools (cost-benefit analysis, decision trees, etc.)
4. **Implementation Phase:** Plan for monitoring and adjustment from the beginning

Managing Group Decision-Making:

Best Practices:

- Clearly define roles and decision authority
- Encourage constructive dissent and devil's advocacy
- Use structured techniques (nominal group technique, Delphi method)
- Separate idea generation from evaluation
- Consider anonymous input methods for sensitive topics