Decision making for Organizational Effectiveness in Interactively, Complex Environments

Ravindra Singh Bangari
Lt Col (Retd.), Parachute Regiment
Fellow, IIM-B

Learning Objective

- How can we, as leaders, prepare ourselves and our organizations to better face routine and expected challenges in the continually shifting operating environment, where the expected can turn into unexpected, without any warning, at anytime?!

Broad Scope

- Routine Situations spinning out of Control
  - Mann Gulch
  - Tenerife & AI Express Flt 812, Mangalore
  - Mt Everest 1996
- Coordinating for High-Reliability
  - Friendly Fire
  - Kargil, 1999
  - Operation Cactus, 1989

Broad Scope

- Coping with Crises & Accidents
  - System 1 and System 2 thinking
  - Intuition
  - Sensemaking
  - Contingency Planning
  - Mindfulness
- Bringing it together: Setting the Context for Better Decisions

System 1 and System 2 Thinking

- Two types of thinking:
  - System 1 thinking: INTUITIVE—typically fast, automatic, effortless, implicit, emotional
  - System 2 thinking: REASONED—slower, conscious, effortful, explicit, logical
- In most situations, System 1 thinking is adequate
  - Convenient and fast in routine, familiar situations

Keith Stanovich and Richard West (2000); Bazerman (2006)

System 1 and System 2 Thinking

- System 2 logic should however influence our most important decisions
- Managers should know when to move from System 1 to System 2 thinking
  - Can they always know?
  - In advance of an emergent situation?
- These two systems, however, frequently work in tandem

Keith Stanovich and Richard West (2000); Bazerman (2006)

Interview Situation

- Your job is to review three candidates' qualities and decide which two you would hire for a vacant position with you.
  - Your choice is final and this is all the information you have.

What do you think of this person's personality?

- Rhea: envious—stubborn—critical—impulsive—intelligent—industrious
- Would you hire her for a vacant position with you?

What do you think of this person's personality?

- Jyoti: intelligent—industrious—thoughtful—critical—congenial—spirited
- Would you hire her for a vacant position with you?

What do you think of this person's personality?

- Anita: intelligent—industrious—impulsive—critical—stubborn—envious
- Would you hire her for a vacant position with you?

What do you think of this person's personality?

- Rhea: envious—stubborn—critical—impulsive—intelligent—industrious
- Jyoti: intelligent—industrious—thoughtful—critical—congenial—spirited
- Anita: intelligent—industrious—impulsive—critical—stubborn—envious
- What's happening here?

(Solomon Asch, 1946)

Intuitive Decision Making

- Study of "Chess Grandmasters"
- Complex decisions: all the data cannot substitute for experience that informs one's gut feeling
- Garry Kasparov: "The total number of possible different moves in a single game of chess is more than the number of seconds that have elapsed since the Big Bang…Intuition is the defining quality of a great chess player."

What's Intuition?

- Experiments have shown that intuitive decision making is really one's ability to recognize patterns at lightning speed—a process that often happens unconsciously.
- What's it based upon?
  - Knowledge of the domain
  - Experience (Learning)
  - Emotions
    - e.g., curiosity, openness, and propensity to seize opportunities

Matzler, Bailom & Mooradian (2007)

What are Complex Environments?

- Complex Interactions
  - many (small) closely interconnected parts / events
  - unexpected consequences
  - interconnected breakdowns and failures
- Tight Coupling
  - time-dependent processes
  - fairly rigid sequence of activities
  - one dominant path to the goal
  - very little slack

Normal Accident Theory (NAT)

- Developed in the aftermath of the accident at the Three Mile Island nuclear power plant in 1979
- Introduces the idea that in some technological systems, accidents are inevitable or “normal”
- Two related dimensions determine a system’s susceptibility to accidents
  - Interactive complexity
  - Loose/tight coupling

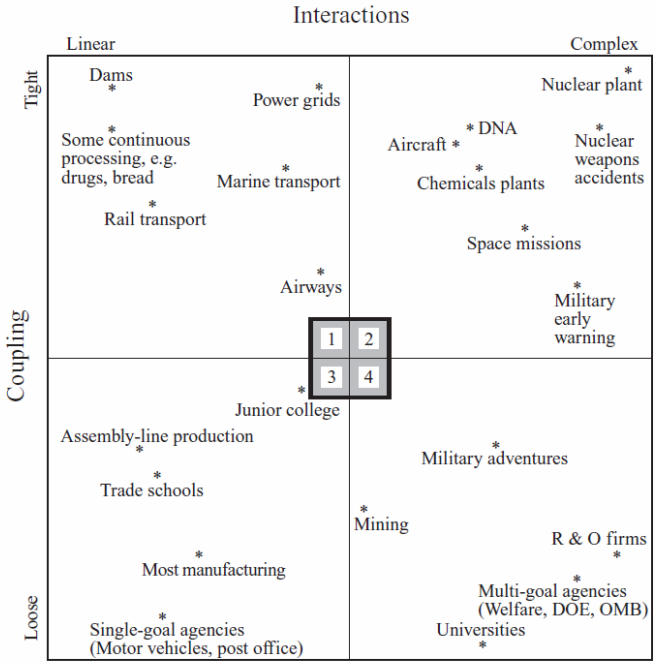
Normal Accident Theory (NAT)

- Utility of redundancy
  - introduces additional complexity, ambiguity
  - encourages risk taking
- Centralization / Decentralization
- Likely that systems can become less complex and loosely coupled with time (evolution from piston to jet engines; ATC system)

Characterstics of the two major variables, Complexity and Coupling

Complex systems	*Linear systems*
Proximity	Spatial segregation
Common-mode connections	Dedicated connections
Interconnected subsystems	Segregated subsystems
Limited substitutions	Easy substitutions
Feedback loops	Few feedback loops
Multiple and interacting controls	Single purpose, segregated controls
Indirect information	Direct information
Limited understanding	Extensive understanding
Tight coupling	*Loose coupling*
Delays in processing not possible	Processing delays possible
Invariant sequences	Order of sequences can be changed
Only one method to achieve goal	Alternative methods available
Little slack possible in supplies, equipment, personnel	Slack in resources possible
Buffers and redundancies are designed-in, deliberate	Buffers and redundancies fortuitously available
Substitutions of supplies, equipment, personnel limited and designed-in	Substitutions fortuitously available

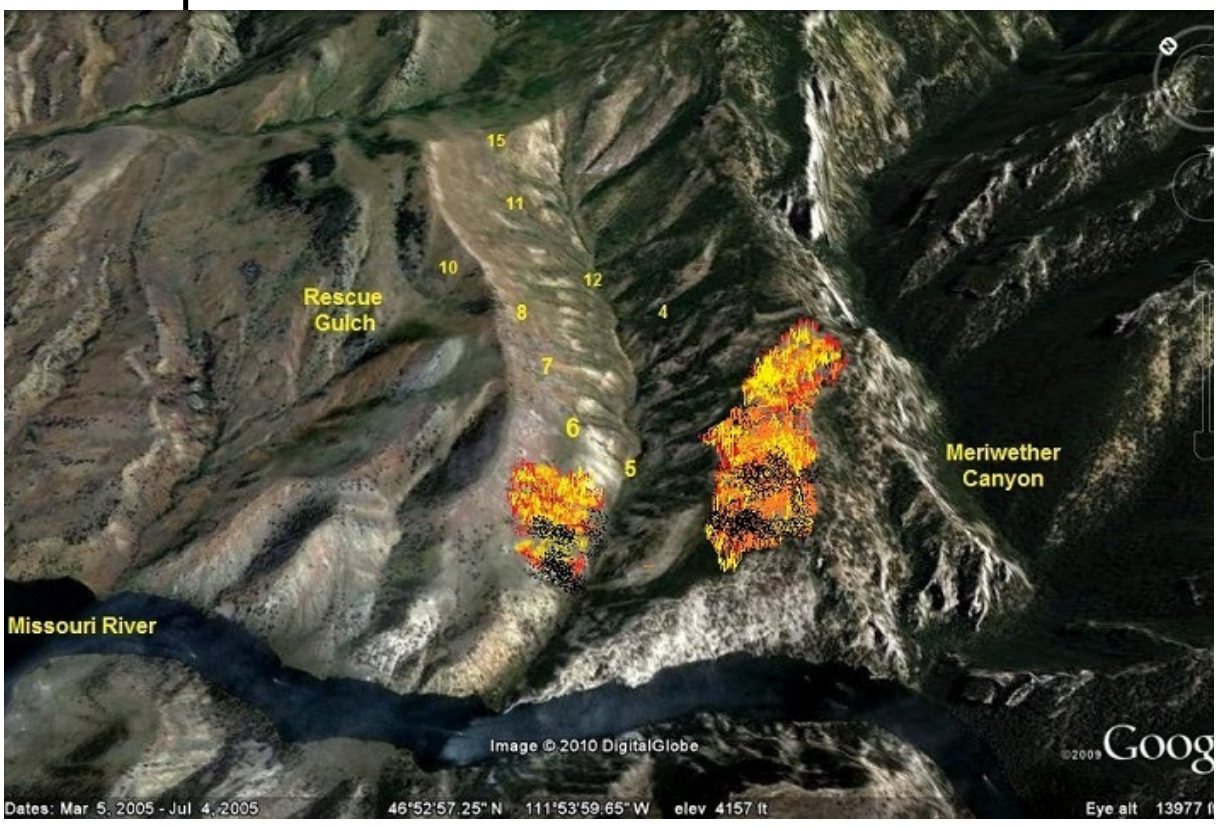
NAT: Interaction/Coupling chart showing which systems are most vulnerable to system accidents



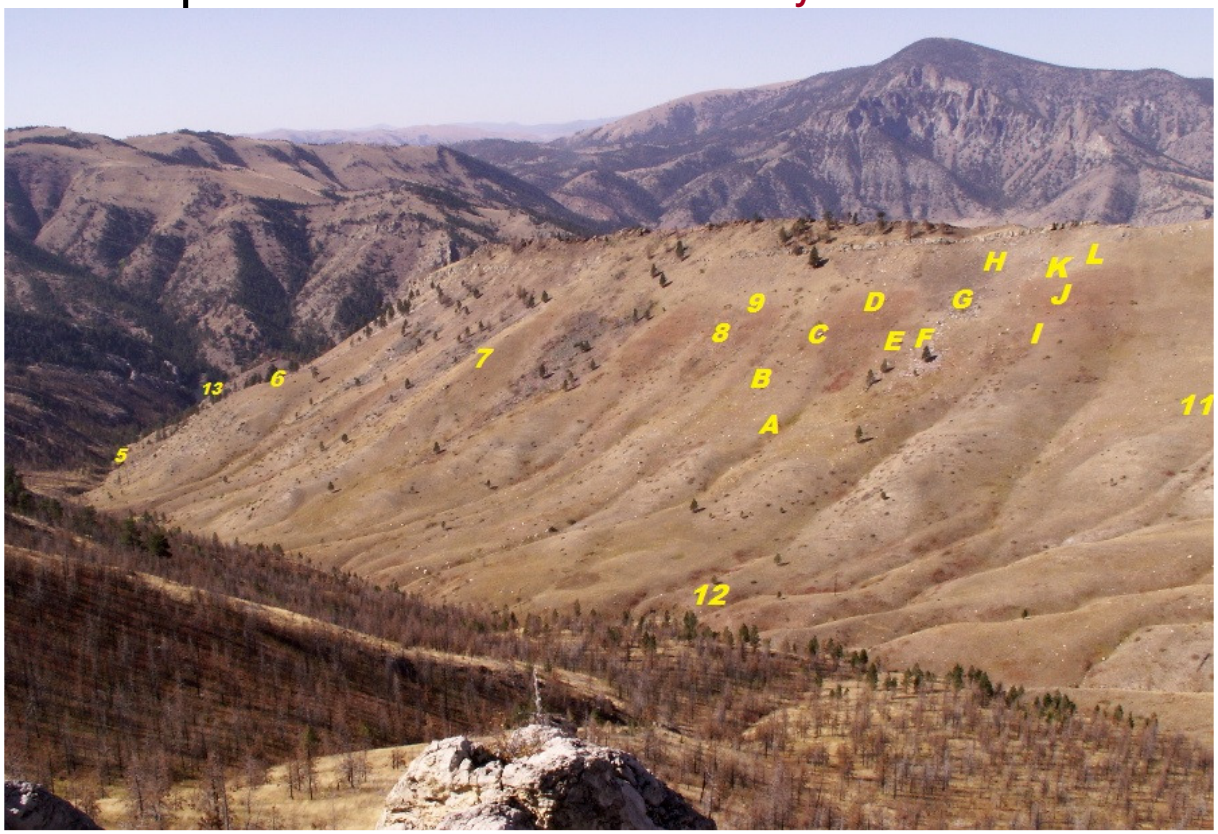
Case: Fire at Mann Gulch

- Mann Gulch, Montana, 1949: 13 ***smokejumpers*** die trying to outrun a wildfire that had reached a critical stage known as a “blow-up”
- First of its kind tragedy for the new breed of wildfire fighters (see the intro. video clip)
  - 10 years and 52,000 fires!
- One incident, many perspectives
- What are the lessons in it for us?

Fire from the Top



The Race and where they fell



Mann Gulch: Movement of the Crew & Fire

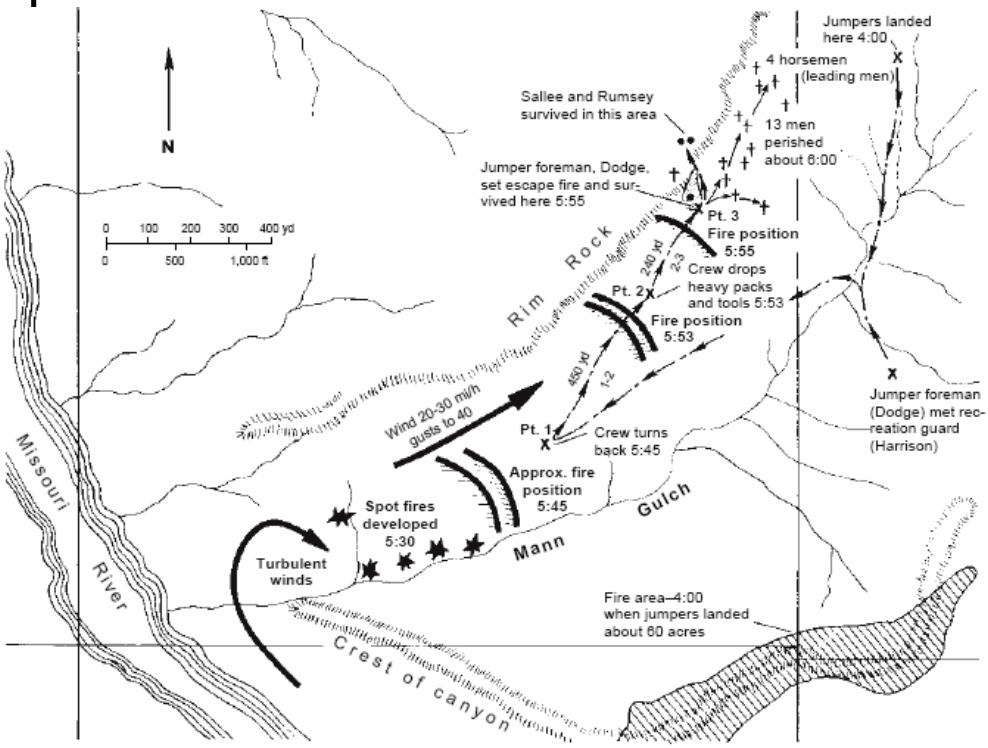


Figure 1—Map of Mann Gulch illustrating the movement of the crew and the position of the fire as it approached the crew at points (pt.) 1, 2, and 3.

Mann Gulch: Setting the Context

- What is happening here?
- What would you do?
  - As Dodge
  - As a firefighter crew
- Visualize this as an Organization with People trying to do their jobs…
  - Inherently risky, but something routine
  - Moving from one task to another…

Mann Gulch: Reflection

- Let's focus on:
- Why did firefighters ignore Dodge's sound orders to join him in the escape fire?
  - And, how did Dodge come upon the idea of the escape fire?!
- What role did stress and experience play in this tragedy?

What went wrong at Mann Gulch?

- Minimal organizations, such as we find in the crew of Mann Gulch, are susceptible to sudden losses in meaning.
- Mann Gulch, 5:40 pm: it could be just another day
  - How often have we come across groups and teams that we saw in Mann Gulch?
- Weick identifies two critical causes behind Mann Gulch:
  - Breakdown of sensemaking
  - Breakdown of the role structure (the only structure that had kept them organized)

What do we observe from this incident?

And, what's the learning?

Some General Patterns

- Exploration and developments in new domains of endeavour
  - Initial care and tentative nature of progress
- Pushing the envelope
- Establishment of a Routine
- Creeping lapses, leading to disasters

Individual/Group Decision Making

Beyond "Decisions" to "Making Meaning"

Sensemaking and Social Interpretation of Reality

Draws largely on Karl Weick's work on Sensemaking

Karl Weick

Karl Edward Weick is an American organizational theorist who is noted for introducing the notions of "loose coupling", "mindfulness", and "sensemaking" into organizational studies. Wikipedia

On Weick: An Appreciation

Dennis A. Gioia

Dennis A. Gioia
Penn State University, USA

Keywords: Weick, sensemaking, organizing, enactment, understanding, ambiguity

When I first read Weick in 1977, I had no idea what to make of him. The style of writing and thinking was unusual, even weird to me. It struck me initially as cryptic and arcane, and also as rooted in ideas that seemed obscure and esoteric. Furthermore, he demonstrated these ideas — supposedly about life in organizations — with examples that did not appear to focus very much at all on organizations. What to make of this mysterious persona and his puzzling ideas? He seemed to use the same tools — ideas and words — that I and others in my newly adopted field used to play the scholarship game, but he used them in ways that other writers didn't, to fashion a different way of understanding the game itself. I was reminded of the great golfer Bobby Jones's comment on Jack Nicklaus: 'Mr. Nicklaus plays a game with which I am not familiar.'

You can imagine, then, my new-found scholarly pleasure — rather early on in my doctoral program — in finding an author who purported to address my major interests. So I jumped right in — at the very deep end, as it turns out — reading 'Enactment processes in organizations' (1977) as my first exposure to Weick. Oh my god; I wasn't even sure this was English. The language, as well as the ideas, at first seemed to me confusing, contrived, and even convoluted. Yet, they also seemed rich with possibility and obviously were rendered by someone who wrote as if he knew what he was talking about.

Gioia (2006)

The Attitude of Wisdom

"Each new domain of knowledge appears simple from the distance of ignorance. The more we learn about a particular domain, the greater the number of uncertainties, doubts, questions, and complexities. Each bit of knowledge serves as the thesis from which additional questions or antithesis arise." (Meacham, 1983)

Understanding Sensemaking

- Let's see this in action
  - The case of the nurse who notices a child's deteriorating condition, even as it has just begun to…
  - She is concerned, and somewhat worried… doesn't know why
  - She's drawn back to the child…
  - She recalls "what he looked like two hours ago. It's a dramatic difference."
  - Symptoms are not discovered at 11:00. Instead, symptoms are created at 11:00 by looking back over earlier observations and seeing a pattern.

Weick et al. (2005)

What's Sensemaking?

- Retrospective process
- Job of the sensemaker to convert a "world of experience" into an "intelligible world"
- Not to look for the one true picture that corresponds to a pre-existing, preformed reality
- Role of imagination and need
- Largely a social activity

Sensemaking…

- A process of social construction in which individuals attempt to interpret and explain sets of cues from their environments (Weick, 1995)
- …takes place through the production of "accounts" or "narratives" (Antaki, 1994; Bruner, 1990)
- …triggered by surprise and confusion (Gioia & Thomas, 1996)

Decision Making and Sensemaking

- Organizations become important as they provide meaning and order in face of ill-defined and contradictory demands of the environment.
- Examining "sensemaking" in organizations helps shift the focus from "decision making" to "*making meaning*"
  - finding answers to the "whys"
  - beyond the actors seen upfront

Tenerife Air Disaster:

Viewed Through a *Sensemaking* Lens

The Accident

- On March 27, 1977, KLM flight 4805 and Pan Am flight 1736 were both diverted to Los Rodeos airport at Tenerife, because Las Palmas airport, their original destination, was closed due to a bomb explosion.
- In the process of taking off for their destination, when clearance finally came, the two aircrafts collided at 5:06 pm, resulting in 583 deaths.

TENERIFE AIR DISASTER

TENERIFE AIRPORT DIAGRAM

accident between

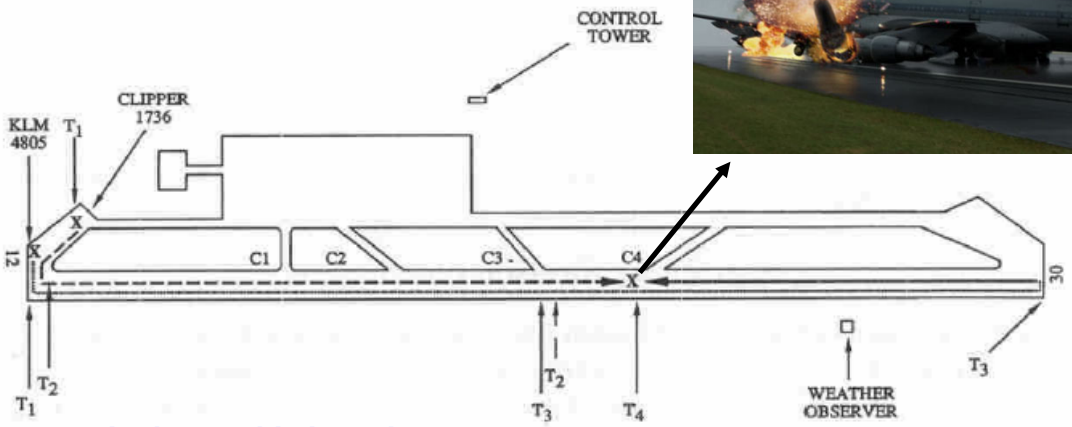
KLM 4805 and PAA 1736
March 27, 1977
Elevation: 2073 feet
Runway: 3400 x 45 meters

T_1 = 1659:10 (GMT)
Pan Am on range
KLM enters runway

T_2 = 1702:08 (GMT)
Pan Am enters runway
KLM at C3

T_3 = 1705:53 (GMT)
Pan Am passing C3
KLM receiving ATC clearance

T_4 = 1706:49 (GMT)
Impact point near C4



Let's see this in action

Understanding what went wrong at Tenerife?

- What does what happened at Tenerife stand for?
  - When does it happen?
- Could it have been averted?
  - Undeniably; yes, at many places.
  - But, that was not to happen!
  - Why?

What do you see happening here?

- Routine operations
- Some (normal?) disruptions
- How can we see what was happening here?
  - One way:
    - **Distal (far) causes**
    - **Proximal (up close) causes**
- Key Factors:
  - Individual level
  - Group/Team level
  - Organizational level

Air India Express Flight 812 Crash

- Tentative Causes from Inquiry:
  - “Hard landing” norms of Airlines
  - Capt. slept for over 90 minutes during the flight; possible effects: disorientation, sleep inertia
  - Co-pilot said to have warned his Commander more than once to go around instead of landing; this warning had come at a height of 800 feet (240 m), well before the aircraft made a touch down
  - Touched down at the 4,638 feet (1,414 m) mark on the runway instead of the 1,000 feet (300 m) mark (runway length: 8,033 feet {2,448 m})
  - Too late “go around” attempt, after landing—800 feet runway left

Fatal "Expert" Errors at Decisive Moments: Intuition?

- At both Tenerife and Mangalore, in-command pilots ignored warnings and pressed on
- Let's think "Why?" from inside their minds
- Seems they were not open to "discordant signals" as they went about their tasks, using their judgment
  - System1 and system 2 interactions!

What are the lessons in it for us?

- Crises in complex systems can emerge from small actions
- If things don't make sense, SPEAK UP
  - To help control "pluralistic ignorance"
- Watch for loss of cognitive efficiency due to autonomic arousal in face of stress / interruptions
- "Controllability" makes a difference
  - Discretion must be generously distributed throughout the system

What makes Organizations more resilient?

- Improvisation and Bricolage: remaining creative under pressure; finding solutions with whatever is at hand; pulling order out of chaotic situations
- Virtual Role Systems: ability to think and understand what others may be or are doing
- The attitude of Wisdom: realization that knowledge and ignorance grow together; curiosity, openness and complex sensing
- Respectful Interaction: trust, honesty and self-respect, with social support

Communicating Intuition-1

- When using intuition, it is quite likely that others don't understand "WHY"!
  - Or, even, "WHAT" is expected of them

Communicating Intuition-2

- When using intuition, it is important to communicate it to the followers, who otherwise are likely to misinterpret the leader's intent.

Communicating Intuition-3

- Five steps to communicating intent:
  - Here's what I think we face
  - Here's what I think we should do
  - Here's why
  - Here's what we should keep our eye on
  - Now, talk to me

Weick & Sutcliffe (2001)

Sources of Intuition

- The two approaches share the assumption that intuitive judgments and preferences are
  - automatic, arise effortlessly, and often come to mind without immediate justification
- But differ in their perception about the sources
  - NDM looks at intuitive judgments arising from experience and manifest skill
  - In contrast, HB researchers mainly concerned with intuitive judgments that arise from simplifying heuristics, not from specific experience

[Kahneman & Klein, 2009]

Conditions for Development of Skills

- Model of Intuition as “Recognition”
- “Intuition is nothing more and nothing less than recognition” Simon (1992)
- Two ESSENTIAL conditions:
  - High-validity environments
  - Opportunities for learning (relevant cues)
    - whether decision makers have a chance to get feedback on their judgments, so that they can strengthen them and gain expertise

[Kahneman & Klein, 2009]

Spot-quiz

A ball and a bat together cost Rs 2,100/-. The bat costs Rs 2,000/- more than the ball. How much does the ball cost?

a) Rs 100/-

b) Rs 75/-

c) Rs 50/-

If you answered (a), you are in select company—don't worry!

[Kahneman & Klein, 2009]

Flaws in Intuitive Judgments

- Adopting intuitively compelling response without verifying
- Anchoring
- Attribute substitution

[Kahneman & Klein, 2009]

Honing Your Intuition

- Check for Contextual Validity
- Seek Opportunities for Learning
- Test your Assumptions
- Seek Feedback

[Kahneman & Klein, 2009]

Thank you, all

Questions, comments, suggestions…

rsbangari@yahoo.com