



Decision Making Under Pressure!

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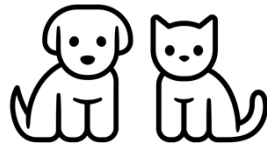
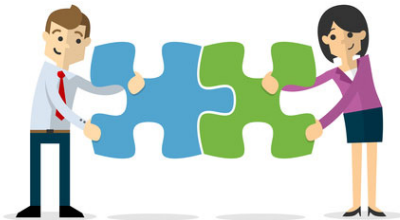
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Housekeeping



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Introductions!



- Your Name
- Where you are from, or which Uni you represent today
- Your subject of study, or department in which you work
- Something that you do for fun!

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Agenda



- Definition of the term Decision Making
- Decision Making Models and Methods
- Limitation of our working memory
- An understanding of component skills and different modes
- Workplace factors affecting decision-making
- Using examples for students to practice identifying

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Decision Making



- The Dictionary defines **Decision Making** as:
- The act or **process** of **making choices** as an individual or with a group of people

Source: <https://www.dictionary.com/browse/>

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Decision Making Inputs



- The problem needs to be **identified**
- A **response** and **timeline** decided on
- **Implementation** of the action
- The **outcomes** must be **monitored and reviewed** to improve and/or **optimise** decision making in the future

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What influences Decision Making?

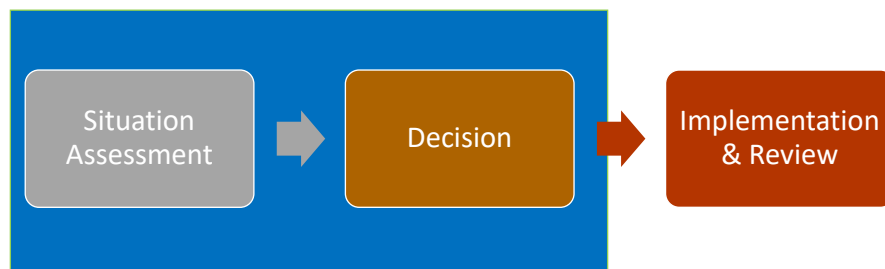


- Situational Awareness
 - Information and interpretation of the information
- Individual/Group Experience
 - Familiarity with similar situations
- Social Aspects
 - Pressure, Personnel's culture and Institutional culture
- Situational Limitations
 - Physiological and psychological, such as, fatigue, stress and time

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Three Stage Process



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Lost on the Moon - Part 1

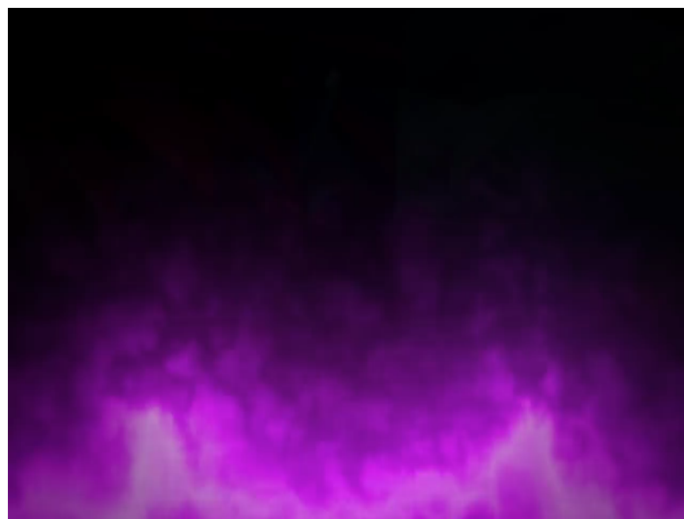
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Lost on the Moon - Part 1

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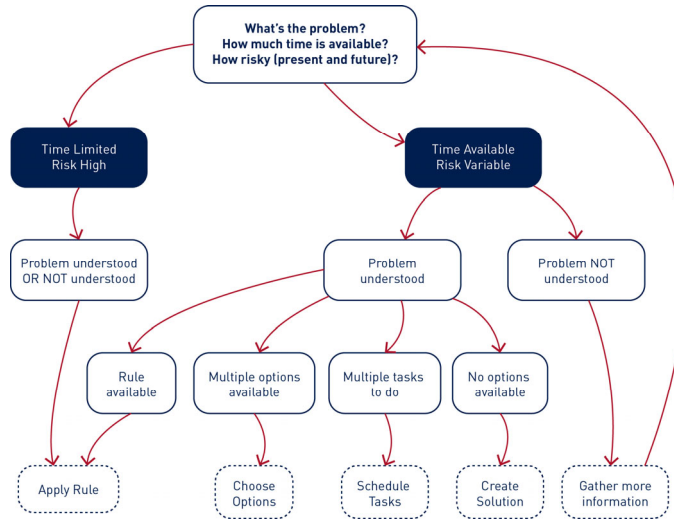
Decision Making Methods

- The appropriateness of a given decision-making method depends on:
 - The level of expertise of the decision-maker,
 - Time pressure,
 - Risk level,
 - Collegial support and resources.
- The reasons for the choice of the decision-making method are:
 - Is the decision-maker an expert or novice?
 - Are there rules that can be applied?
 - Is the situation novel or familiar/routine?
 - How much time is available?
 - What is the level of risk?

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Errors in Decision Making



Source: Orasanu (1995)

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Decision Making Methods



- Analytical – choice of solutions
- Rule-based – apply procedure/rules
- Intuitive (Recognition-Primed decision) – remember action to take (gut feel)
- Creative – devise new solution(s)

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Comparison of Methods



- Analytical and Creative methods are more likely to be used when stress and fatigue is minimal and the decision maker has time to develop solutions for the problem.
- Therefore, in the field environment, Rule Based and Recognition Primed decision making methods, or a combination of these is preferable.
- The quality of decision making can be influenced by a number of factors:
 - *Personal factors* (stress, fatigue, attitude, risk perception, expertise/experience, individual biases);
 - *Workplace stressors* (distraction, noise, work load, safety goals versus productivity); and
 - *Group thinking biases*

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Personal Factors



- Attitude, risk perception, expertise/experience, individual biases, stress and fatigue
- These factors impact an individuals' situational awareness and information processing capacity, which can result in flawed decision-making.
 - A *stressed* individual will favour short-term decisions that may be detrimental to the decision-making process.
 - A tired individual tends to be *fixated* on a specific piece of information and will ignore certain other information (tunnel vision).
 - The individual may *underestimate the risk* because a previous similar situation was successfully managed.
 - Experience/expertise plays an important role in stress management, situational awareness and decision-making.

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Confirmation Bias



- Confirmation bias can be defined as the process of actively seeking out information that reaffirms our past choices and discounts information that contradicts them
- Example of confirmation bias from the Macondo Incident
 - The return of cement and the inflow test completed on the well clearly indicated that the cement had not been placed and set correctly,
 - Experienced members of the rig crew attributed the increasing pressure to the “bladder effect”, which was accepted as a plausible explanation.

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Task Fixation



- Task fixation is a product of a individual using early, first received information as the basis for decision making, regardless of new and contradictory information.
- Example of task fixation from the Macondo Incident
 - The cement design was changed to ensure that there were no losses, by reducing the volumes, foaming the system and dropping the pump rate, without a full risk assessment of the possible outcomes of failure.
 - The float auto-fill tube pump out procedure didn't go according to plan, with a possible rupture of the string occurring, leaving the status of the float and the string in ambiguity.
 - The volume of mud pumped ahead of the cement was reduced and the pressures seen during bottoms up were much lower than calculated
 - No one stopped the job at any of these stages, as they were all focused on pumping the cement and getting on with the next stage.

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Individual Attitudes



Attitude	Recognising the Attitude	Applying
Invulnerability / Overly Protective	"It could never happen to me!"	Remember everyone makes mistakes, conduct a risk assessment.
Hasty/Impulsiveness	"I don't need to think about them."	Be well prepared for every task.
Complacency / Contentment	"We don't need to worry about anything right now!"	Be alert and ready to act; understand the risk of even routine tasks.
Machismo / Overly domineering and reckless	"I'm in Charge!"	Consider team members be mutually respectful to input. Work as a member of the team.
Anti-authority	"Don't tell me!"	Communicate concerns and suggestions through the appropriate channels. Follow SOP's.
Helplessness / Resignation	"Nothing else can be done."	You can always contribute; comment or ask a question

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Workplace Stressors



- Decision making quality deteriorates during
 - Stressful high workload conditions
 - Distractions, and
 - Noisy and extreme weather environments
- Effects
 - Reduced attention span
 - Working memory reduction
 - Tunnel vision
 - Failure to recall complex information

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Example

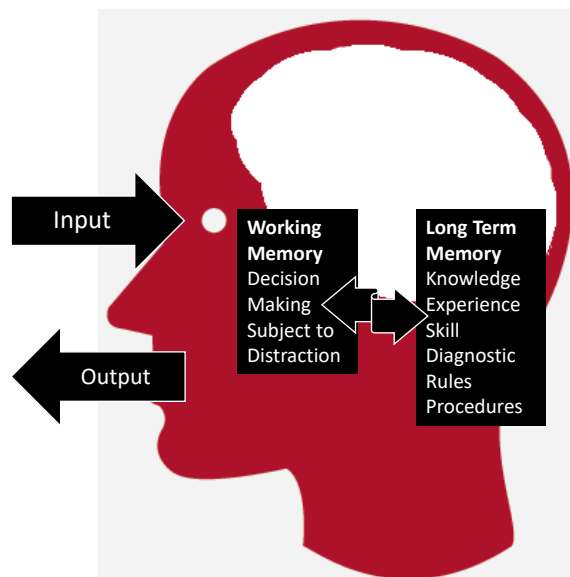


- An employee is in the middle of counting a large number of papers and is interrupted by someone asking them a question
- The employee will be distracted from their task to talk to the second person
- The information regarding the number of papers in the employee's working memory will be replaced and when returning to the task, they will find that they have to start over again!

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Working Memory



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Effective Individual Decision Making



- Critical factors

- Human memory attributes of attention and perception
- Accurate interpretation/situation assessment
- Relevant experience to recognise signals associated with a specific course of action
- Appropriate estimation of risks
- Safety goals preferred over productivity, mission completion
- Adequate anticipation and evaluation of consequences

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Lost on the Moon - Part 2

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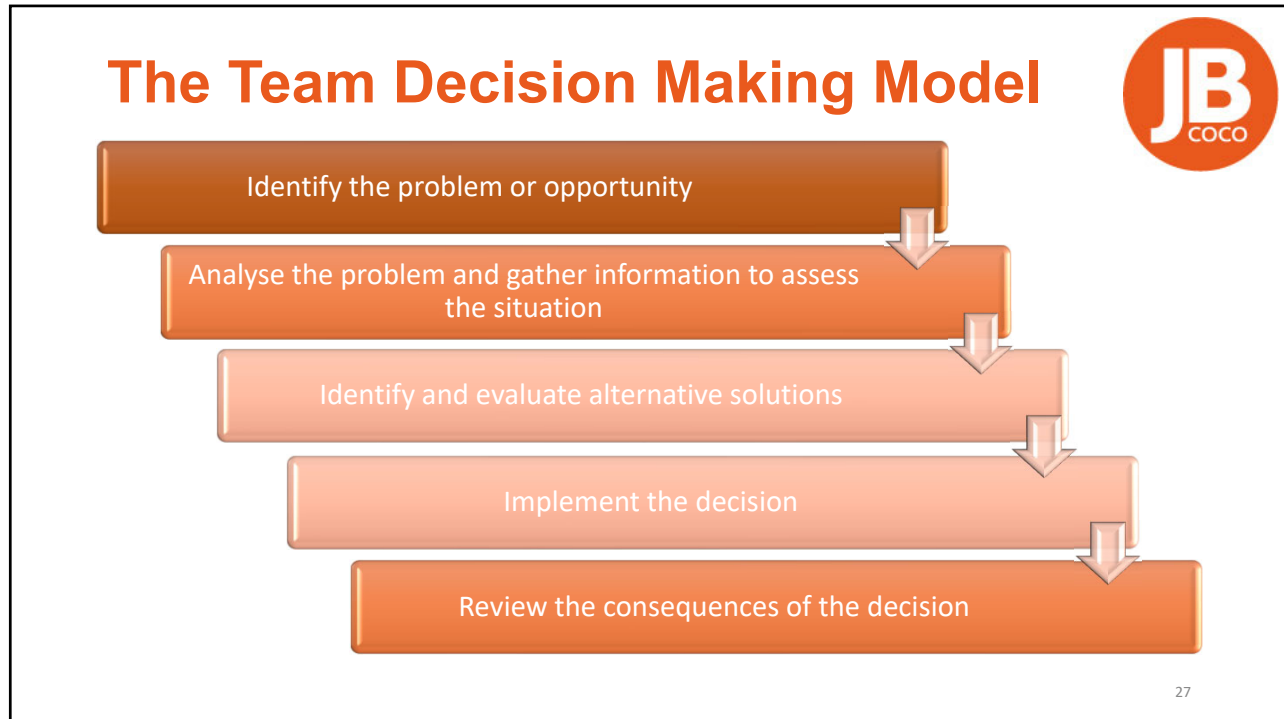


Lost on the Moon - Part 2

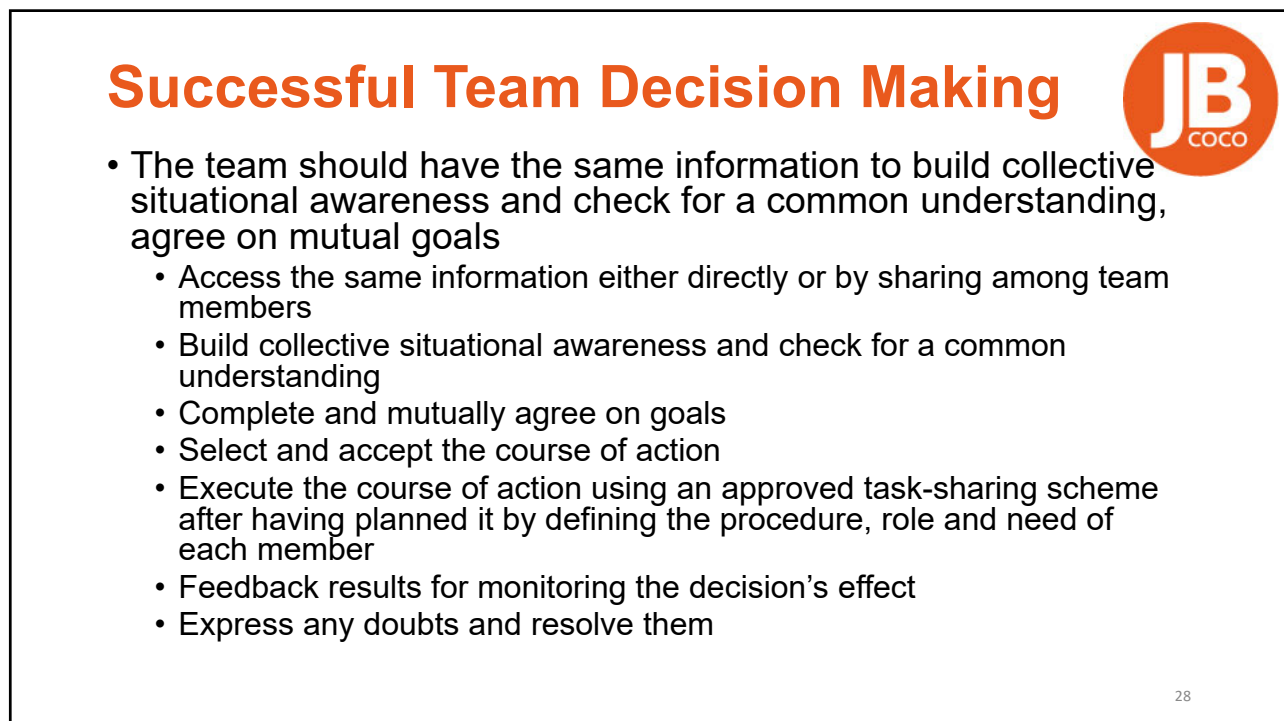
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Team Decision Making Challenges



- Lack of organisation or clearly defined roles and responsibilities
- Interpersonal issues
- Systematic bias in information
- Unconscious mechanisms
- Unproductive roles
- Non-cooperation with outsiders
- Groupthink behaviour - Groups generate pressures to conform, and that they impede rather than encourage the healthy exchange of views

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Groupthink Behaviour



- Over-estimate group's might and right
 - Excessive optimism that blinded to danger warnings
 - Fail to consider ethical consequences of decisions
- Close-minded
 - Ignores information that suggests the need to rethink the decision
- Suffers from pressures towards uniformity
 - Conformity pressure to avoid group displeasure
 - Fail to mention any doubts
 - Withhold information that may challenge the wisdom of the decision
 - Mistakenly believe that they are all in total agreement

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Team Decision Making Factors



- Factors that Affect Collective Decision Making
 - Group thinking bias
 - Time stress
 - Workload
 - Style of leadership
 - Personality and mood of team members
 - Ability, experience and stature or reputation of the team members
 - Confidence and the social dynamic among team members

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Group Think Bias



- When we are in a group, we are also prone to biases, that is, we make decisions that fit in with the group consensus
- These biases are born from our own individual culture as well as the workplace culture
 - Obedience
 - Majority rule
 - Desire to please

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Managing Group Think Bias



- Group leader should explain Group Think Bias
 - How to identify it & manage it
- Be impartial
- Ask everyone to evaluate critically
- Encourage objections and doubts
- Refrains from expressing opinions and views until the group has had a chance to consider all alternatives
- Assign Devil's Advocate to raise objections and identify potential problems

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Group Decision Making Techniques



- Brainstorming
- Nominal Group Technique
- Benchmarking
- Empowered Work Teams

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Lessons Learned



- What are some situations you have seen in your workplace where Group Think Bias has been seen?

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Summary



- Decision-making in high stress environments is usually a Three stage process
 - Situational Assessment
 - Decision
 - Review of the decision and its impact, to change or confirm the outcome
- There are different methods of selecting a course of action
 - Recognition-primed, rule-based, choice or creative
 - Rule based and recognition-primed methods are more likely to be effective in high stress workplaces

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Summary



- The appropriateness of a given decision making method depends on
 - The level of expertise of the decision maker
 - Time pressure
 - Risk level
 - Collegial support and resources

- Decision Making quality can be influenced by many factors
 - *Personal factors* (stress, fatigue, attitudes, risk perception, expertise/experience, individual biases)
 - *Workplace stressors* (distraction, noise, temperature, work load)
 - Group thinking behaviours and biases

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Analytical Decision Making Method



- Decision Maker Defines the problem
 - Generates a number of possible courses of action from a variety of sources
 - Course of action are then compared to determine which one best fits the needs of the situation (process of elimination)
- Advantages
 - Higher likelihood of reaching an optimal solution
 - Techniques available to support the process, such as decision trees
 - Disadvantages
 - Requires time to get to the optimal options
 - Not suited to high stress, fatigue or overloaded environments

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Rule-based Decision Making Method

- After identifying the problem, the decision maker consults expert resources to identify rule/procedure that applies.
 - Printed and available SOP and checklists can replace having to recall them from memory
- Advantages
 - Good solution for people that are new to a job or location
 - Can be rapid and learnt
 - Gives a pre-agreed/decided course of action that has been developed by experts
- Disadvantages
 - There is a possibility of the SOP/Checklist being ignored
 - May be easy to miss steps
 - Personnel may not understand the reasons for each step
 - Incorrect procedure could be applied without additional consultation of the experts.

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Recognition Primed Decision Making Method

- Useful method for experts that work in relatively familiar or routine situations, under time constraints.
- Relies on the individual remembering the responses based on previous experience of the same situation.
- The response is immediate and required little conscious thought
- Advantages
 - Fast application of action
 - Useful in routine situations
 - Reasonably resistant to stress
- Disadvantages
 - Requires the user to be experienced
 - Decision errors occur when the situation is incorrectly identified and then the incorrect procedure is applied
 - Does not complete an MOC process with input from other experts.

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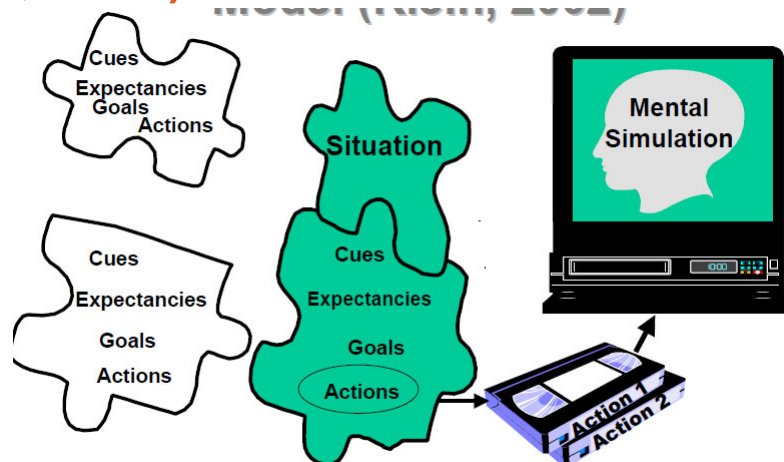
Recognition-Primed Decisions (Klein, 1986)



- Used by experts
- Focus on situation assessment
- Aim is to satisfice not optimise
- First option is usually workable
- Serial generation/evaluation of options
- Mental simulation
- Less use of working memory?

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Recognition-Primed Decision Model (Klein, 2002)



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Creative Decision Making Method



- This method is rarely used in high stress, high time pressured environments
- It requires devising a new solution for an unfamiliar problem.
- Advantages
 - Produce a new solution for an unknown problem
 - May invent a new solution
- Disadvantages
 - Time consuming
 - Untested solution
 - Challenging in noisy, distracting and stressful situations

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Q&A



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