



IMPROVING THE THINKING SIDE OF KM

APQC 2012 Annual KM Conference

April 26, 2012



- Introductions
- Point of View & Research Findings
- Eight Techniques
- NSRDEC Organizational Background & Context
- The KM Journey & Selected Techniques
 - Mentoring
 - Master Class
 - Strategic Perspective
 - Network Mapping
- Summary
- Q&A

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- KM has made capturing, sharing and organizing knowledge visible and important
- But... What if we took a different starting point:
How professionals use knowledge to think?



In a knowledge-saturated world, thinking, not knowledge, is most professionals' and many organizations' key competitive advantage

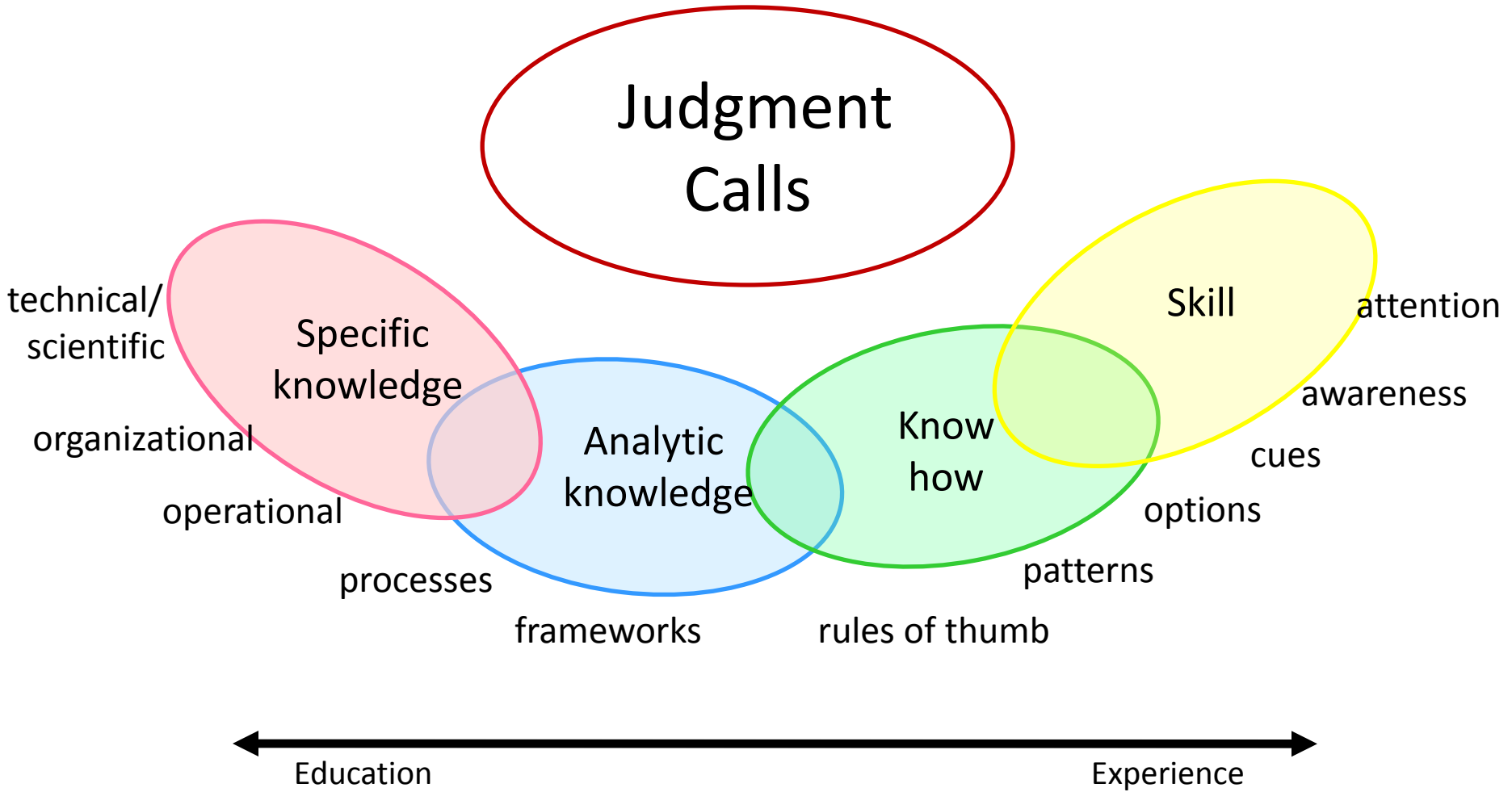
- **Interesting factoids**
 - Experts think differently
 - It takes about 10 years to develop expertise, about the same amount of time as mastering a musical instrument
 - Practice improves expertise
 - KM systems are often designed for novices

How to Think Like an Expert

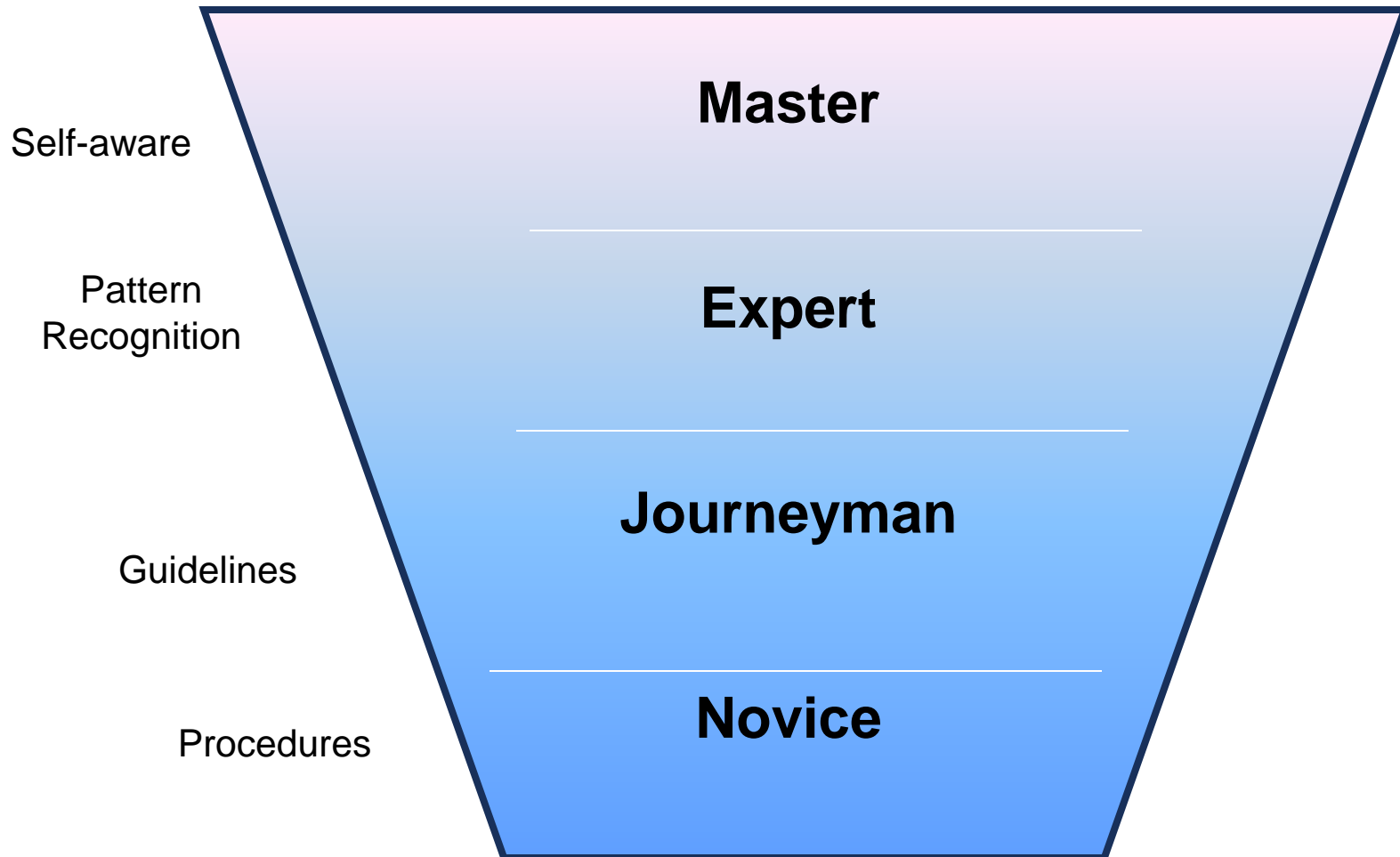
Richard McDermott

(Harvard Business School Press, forthcoming)

Professional Judgment Calls

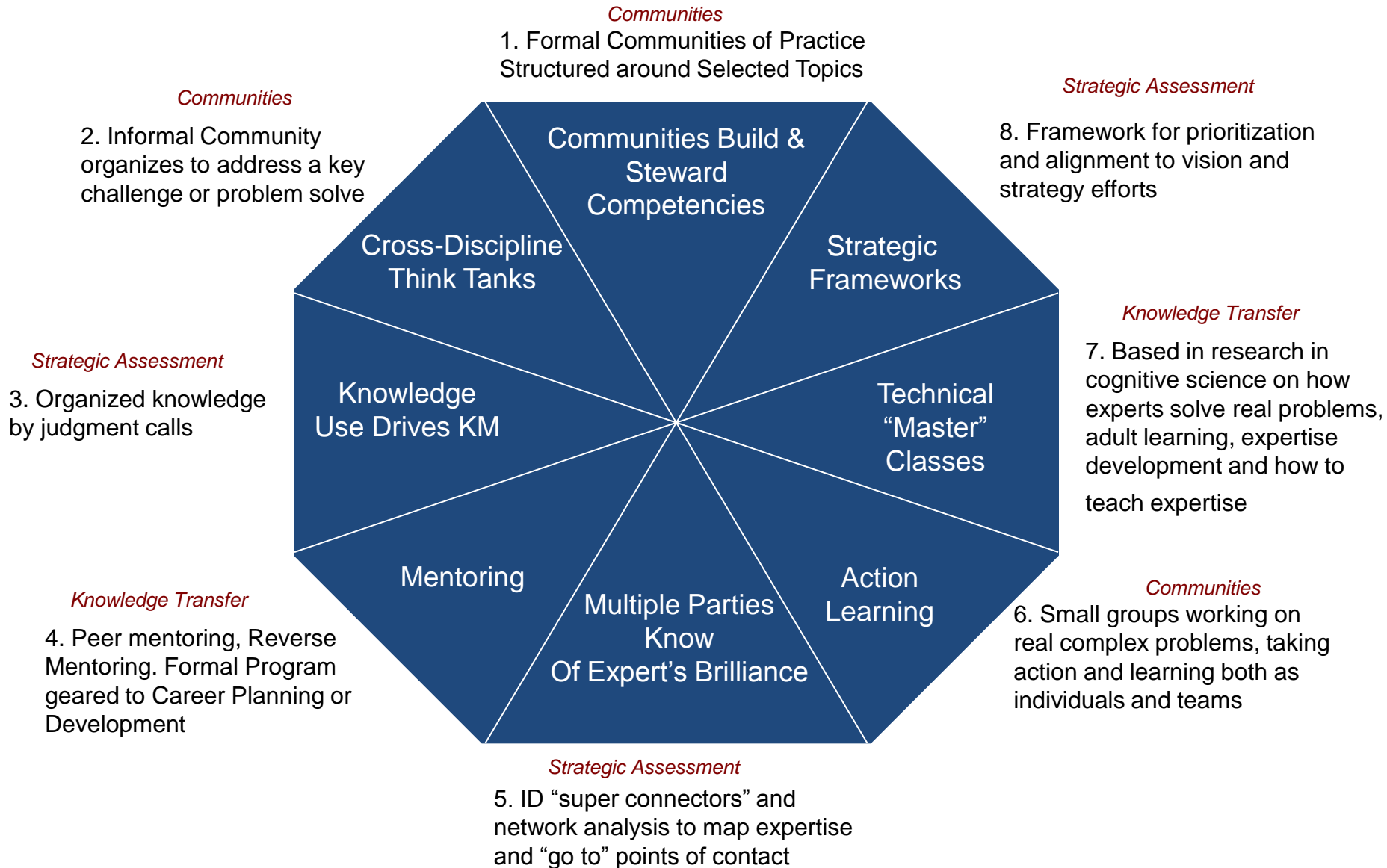


Developing Expertise is a Shift in Seeing



- Curiosity
- Close Observation
- Look at things from different points of view
- Understand how the system works
- Risk taking
- Practice







Selected 4 topic areas for deeper dive sharing and discussion
2 Strategic and 2 Knowledge Transfer



U.S. Army Natick Soldier Research Development and Engineering Center (NSRDEC) Natick, MA



**In operation
since
1954**

Infrastructure

78 Acres

459 K Sq. Ft. of Lab Space

Mission:

- RD&E To Maximize the Warfighter's Survivability, Sustainability, Mobility, Combat Effectiveness and Field Quality of Life by Treating the Warfighter as a System
- **Adding Value Through:**
 - Basic Science
 - Technology Generation, Application, and Transition Enabling Rapid Fielding of the Right Equipment
 - Soldier Systems Technology Integration and Transition
 - Solving Field Problems Rapidly

Vision:

- To be the Recognized Center for Warfighter and Homeland Defender Research, Technologies and Systems

Support the Current Fight while Transforming to Future Force with Soldier as the Decisive Edge



Positioning for the future:

strategically build and retain core competencies and capabilities

- Feeling the effects of previous hiring gaps
- Loss of expertise due to potential retirements
- Building backup for employees with singular knowledge
- Unique Skills
- Recent hiring restrictions

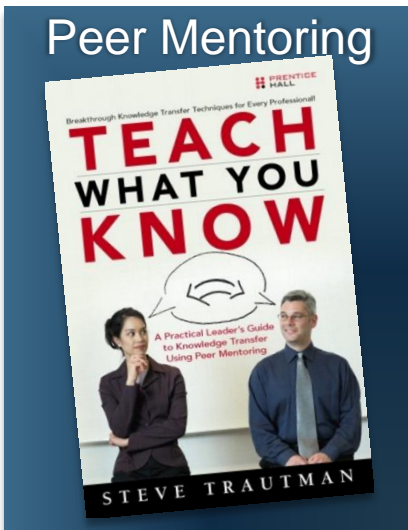


Bridging the generation gap

- Engaging and retaining younger employees
- Energizing mid-career employees

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Peer Mentoring



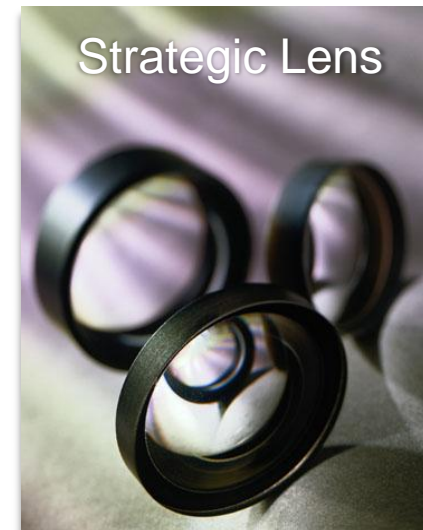
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Assessments



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Strategic Lens

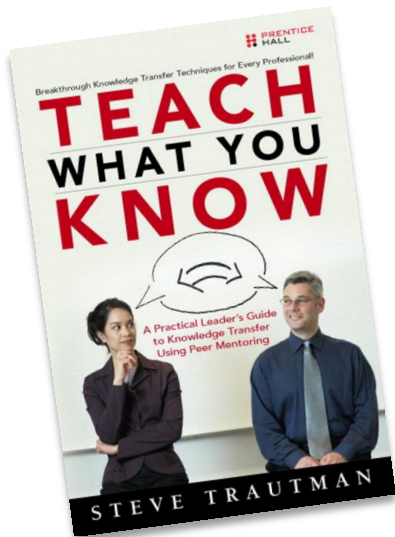


Chemical Technology Team Mentoring Pilot: 2006 – 2007

- **Goal:** Demonstrate the effectiveness of **peer mentoring** as a tool to **transfer critical knowledge** to Chemical Technology Team (CTT) members

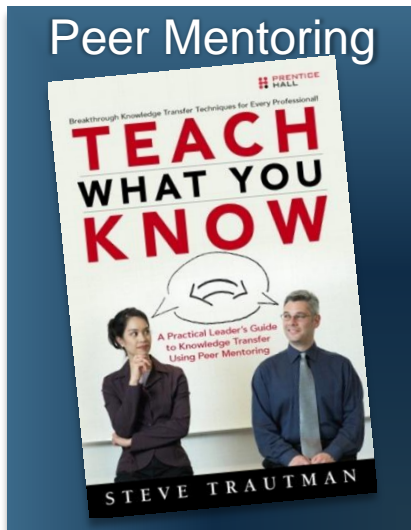
- **Knowledge Transfer Results:**

- ✓ Quicker transition for younger team members to take on project leadership roles
- ✓ Built redundant capability for key skills (particularly unique testing)
- ✓ Former apprentices now mentoring new team members
- ✓ More informal mentoring
- ✓ Culture Change
- ✓ Expanded to additional team knowledge areas
- ✓ Other teams adopted approach



Lesson Number	Order	Skill	Lesson Content	Resources	Assessments to explain:	
1	1	Identify when MIST is appropriate	History of MIST Testing. What are the major pros and cons of MIST testing including limitations	Week of Feb 12 Paper - NRC Report - Tech Assessment of MIST Test Program	List 3 key items in the development of MIST testing	
	1.1				Able to list 3 major limitations of Natick MIST chamber and Dugway full scale chamber	
2	2	Read the requirements document	Details of what the MIST testing is being used for	MIST and Aerosol Top	The top 3 reasons to conduct a MIST test	
	2.1				Three key items that must be discussed in a requirements document	
3	3	Choose between human and mankin test	What are the reasons for choosing mankin testing over human testing	Week of Feb 20	Data characteristics produced by using human subjects	
	3.1				Data characteristics produced by using mankin testing	
4	3.2			Week of Feb 20	Three key points used to decide which method to use	
	4	Choose the simulant concentration for the test	Role that correct simulant concentration use is vital in the correct testing and interpretation of testing		Two major points that must be considered in choice of concentration	
5	4.1			Week of Feb 26	How simulant concentration relates to ability to draw conclusions	
	5	Analyze prior test results (the development test results)	What the relationship is between previous results and planned testing		2 most common statistical analysis procedures used in analysis of MIST data	
5	5.1			Week of Mar 19	What are the usual range of test results	
	5.2				What problems result from extreme data values	
	5.3	Conduct basic statistical analysis			1) EXCEL macros for basic statistics	Basic Statistics - Central Tendency - Mean & Median
	5.4				2) The Cartoon Guide To Statistics	Basic Statistics - Variability - Variance & Standard Deviation
	5.5					Basic Statistics - Hypothesis Testing
	5.6					Basic Statistics - 1 sample tests
	5.7					Basic Statistics - 2 sample tests

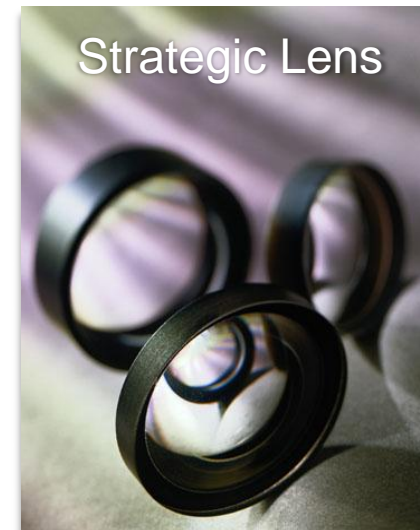
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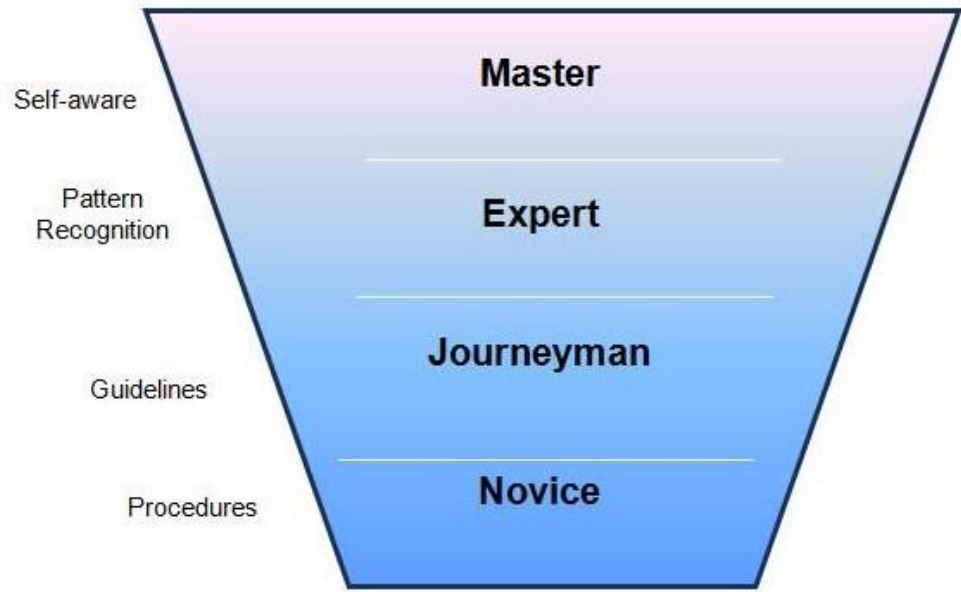
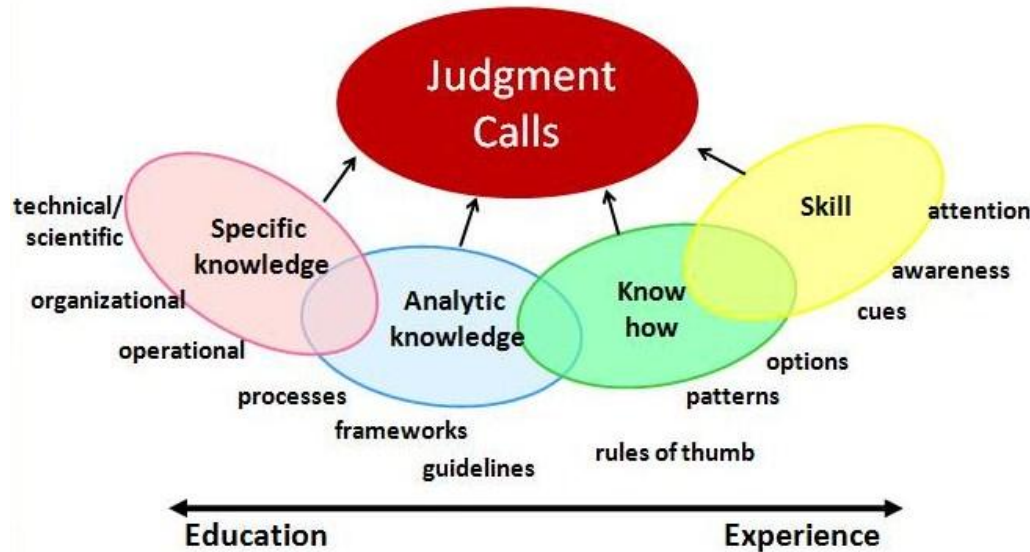


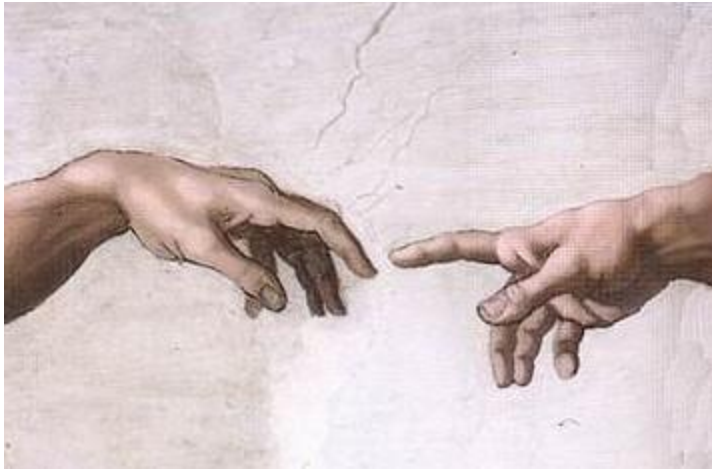
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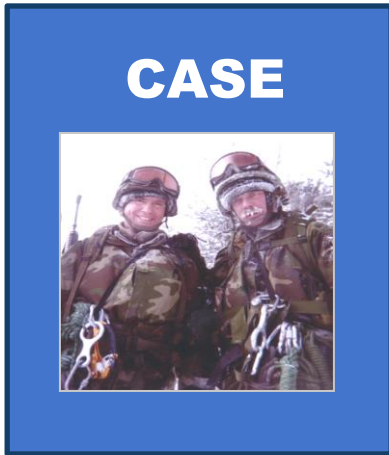
“If people knew how hard I worked to get my mastery, it wouldn't seem so wonderful after all.” -Michelangelo

Objectives of the Master Class

- Learners see how experts think as they solve technical problems
- Guided facilitation allows experts to illuminate the subtle nuances in their thinking and decision making
- Experts learn how to mentor by coaching and thinking aloud rather than telling what they know
- Learners improve their skills in thinking like an expert through practice and expert feedback
- It is important to note the goal is not to teach the apprentices to think exactly like master, but rather challenge them to develop expert behaviors in making judgment calls.

“We can't all be right, can we?”

“Dig a Little Deeper”



Phil



Heidi



Master Class Organizational Value



- **Master Class technique is a concentrated effort to protect against the loss of core & unique knowledge/expertise**
- **Gave both new and seasoned scientist an opportunity peer into an expert's way of approaching data and evaluate how these lessons may apply in their own work**
 - **NOVICE:** Deepen or broaden the way a novice may approach their work; perhaps gain insight from the expert's ways of thinking that would've taken much longer to develop on their own
 - **JOURNEYMAN:** In addition to deepening or broadening approach; insight to the expert's knowledge could apply directly to work being done, thus providing immediately usable knowledge, mitigate rework and accelerate solutions
- **MC Pilot and Orientation provided an opportunity for other experts in the organization to see how a Master Class can augment knowledge transfer best practices**

How Experts Think

- Relentless curiosity
- Appear to be open to many possible solutions / paths (not pigeon-holed by hypothesis)
- Open to more than one “correct” answer
- Do not take data at face value (even when the data seems correct)
- Remain very close to the data and the process; personal connections with research (Soldier mission, field tests, etc.)
- Experts continue to ask themselves “what story is the data telling me?” and...
- “Is there more to this story?”

Making Judgment Calls

- Much of what the experts do when making judgment calls is unconscious
- Remain in-tune / connected enough to the data to detect subtle clues
- These clues lead them to make judgment calls that can be carried out by testing their hypothesis





Education:

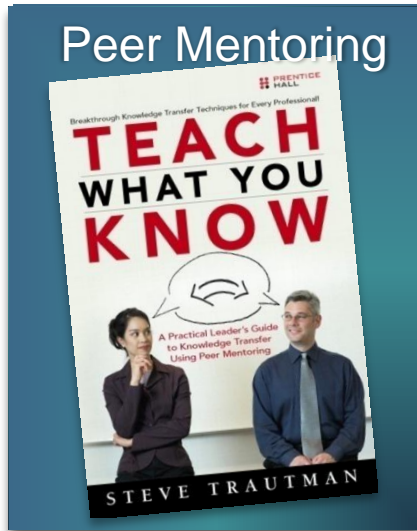
- Ph.D., Biological Anthropology, Northwestern University, 1982
- MS, Biostatistics, Harvard School of Public Health, 1990
- MA, Biological Anthropology, Northwestern University, 1977
- BS, Biology, University of Notre Dame, 1976

- 70+ Publications
- 70+ Technical Presentations
- 19 Technical Standards (co-authored and/or provided research data/analyses)
- 1 U.S. Patent for Multivariate Torso Manikins
- 2003-2011 DA Senior Professional Performance Awards
- 2008 Presidential Rank Award for Meritorious Senior Professionals
- 2008 Best Paper Prize, International Congress of Physiological Anthropology, Delft, The Netherlands
- Chair, International Standards Organization Technical Committee "Anthropometry"
- Adjunct Professor, Arizona State University School for Human Evolution and Social Change and Consortium for Science, Policy and Outcomes



Where we are today

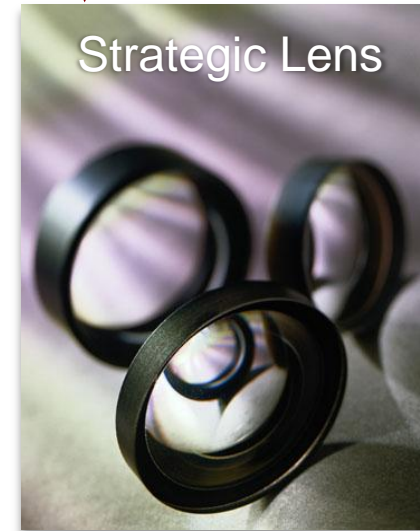
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Finding:

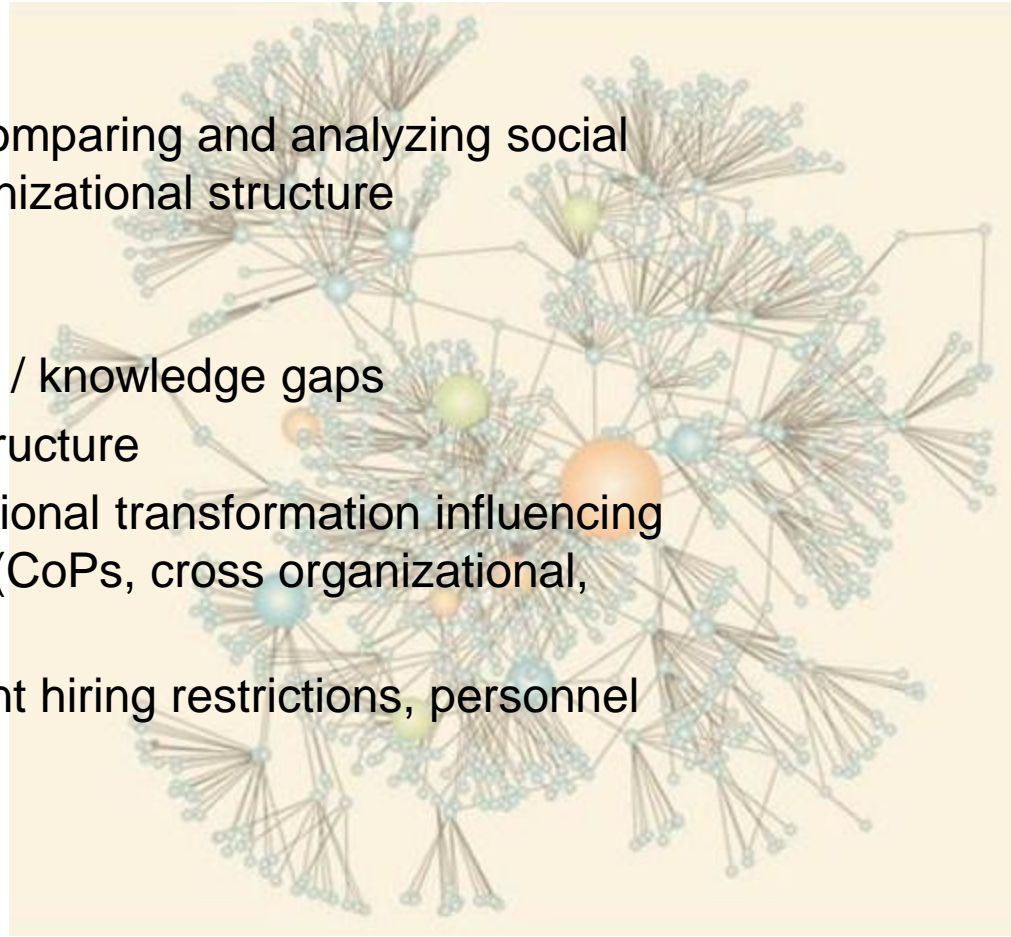
We started with a mentoring concept, then inventory and data gathering, but we need to step back and be strategic about our approach to ensure success

Research Intent: Explore the correlation between social networks, knowledge maps (competencies) and organizational structure (formal positions)

Goal: Establish a method (tool) for comparing and analyzing social networks, knowledge maps and organizational structure

Application:

- Risk reduction for knowledge loss / knowledge gaps
- Decision tool for organizational structure
- Monitor effectiveness of organizational transformation influencing culture change and collaboration (CoPs, cross organizational, external partners)
- Workforce optimization (i.e. current hiring restrictions, personnel workload)



- Alignment is Significant (people and strategic goals)
- Leadership engagement and commitment is essential
- Get your toolkit ready; pilot, tailor and adapt
- Consider what your infrastructure can support
- Match your approach to resources and culture
- Be sensitive to the organizational time commitments
- Information generated can potentially be used for multiple purposes

