

Strategic Knowledge Solutions

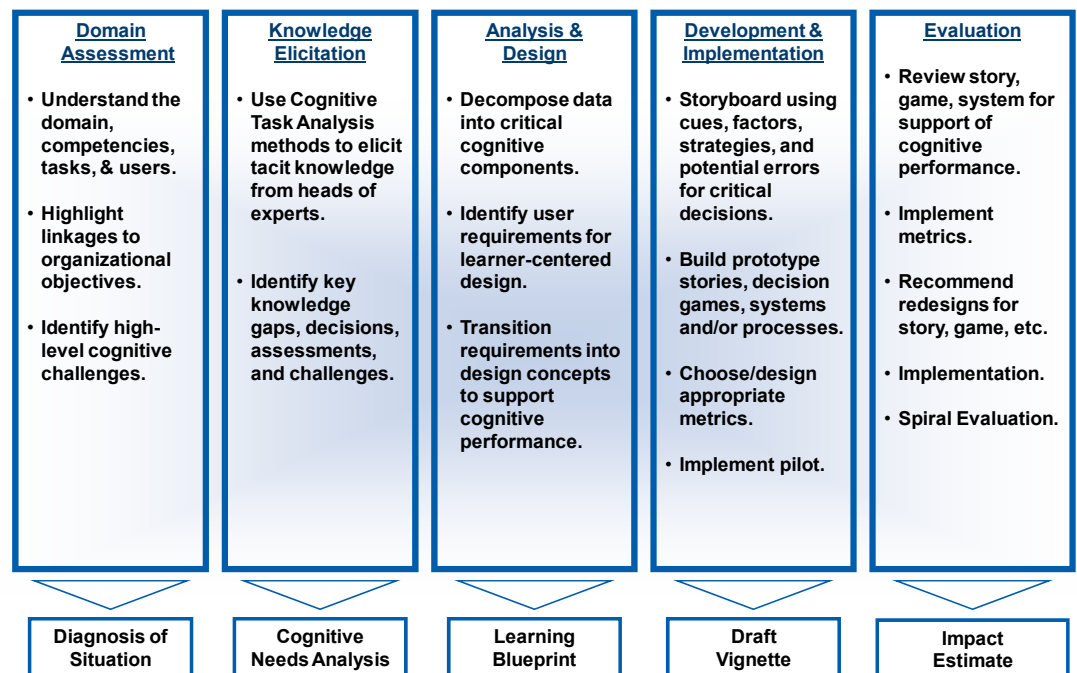
Collaborate... Educate... Innovate...

Cognitive Task Analysis

Cognitive Task Analysis (CTA) is a method SKS uses to help capture experiential and tacit knowledge. We have successfully used this methodology to develop education and training tools and products, graphical interface designs (dashboards and websites), design and conduct assessments, facilitate Communities of Practice, and perform organizational redesigns. CTA improves your ability to uncover and understand expertise and communicate it in clear and concise ways.

SKS uses CTA to help you understand the cognitive challenges and skills in complex performance. We use it to understand how experts actually perform in the field in a wide range of domains. We capture their critical decisions and assessments; the cognitive challenges to performance; and how experts conceptualize situations using their knowledge, cues, factors, and strategies. CTA allows us to understand not just *what* tasks are performed, but *how* cognitive skills such as judgment, decision making, and sensemaking are performed. We are particularly interested in performance in complex, time-pressured, uncertain, high-stakes, and dynamic environments.

The Cognitive Task Analysis Process



Examples

Some of the domains where we have successfully applied CTA to create decision-centered solutions include Tactical Thinking, Instructional Design, Systems Engineering, Decision Support, and Process and Product Design and Improvement.



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PO Box 896

Leavenworth, KS 66048

www.StrategicKnowledgeSolutions.com

SKS is a consulting firm focused on expertise development, organizational learning, and knowledge management practices and application. Our proven learning approaches produce immediate benefits by applying key experiential learning and knowledge-based strategies to improve individual, team, and organizational learning and performance.

Cognitive Task Analysis Methods

CTA knowledge elicitation methods can be applied to individuals or teams through interviews and observations. Interview methods include the Critical Decision Method (CDM), Knowledge Audit, Task Diagram, Concept Mapping, and Simulation Interviews, to name a few.

- **The CDM interview** is grounded in recalling a real-lived incident as its starting point. It is a semi-structured interview with specific, focused probes designed to elicit particular types of information, including goals considered during the incident; options generated, evaluated, and eventually chosen; cue usage; and contextual factors involved in particular decisions. CDM protocols provide detailed records of the information gathering, judgments, interventions, and outcomes surrounding problem solving, judgment, and decision making in a particular task or domain.
- **The Knowledge Audit** is designed to survey various aspects of expertise efficiently. The method is organized around knowledge and skill categories that characterize expertise, such as perceptual skills, declarative knowledge, mental models, analogues, and a sense of typicality and anomalies. The audit employs a set of probes designed to describe the type of knowledge or skill used and elicit examples of it in a particular domain.
- **Task Diagrams and Concept Mapping** provide a visual depiction of what a practitioner understands about a task and how that knowledge is cognitively organized. One of the advantages of such representations is that they allow information to be elicited and displayed in non-linear, non-hierarchical ways during the interview. They provide insight into “side-channels” and multiple connections across task elements and can vary widely in detail and complexity.
- **Simulation Interviews** pair knowledge elicitation methods with vignette-based scenarios and simulation technologies. Simulation-based methods can be especially useful in studies of expert-novice differences as they provide direct comparison of the perceptual judgments and decisions of each level. The researcher is able to identify gaps in understanding and critical skill to focus subsequent training interventions in these areas.

Workshops

- **Introduction to Cognitive Task Analysis**—This one-day workshop offers an overview of what cognitive task analysis is as well as discussing two methods for CTA analysis: the Task Diagram and Building Expertise.
- **Cognitive Task Analysis for Instructional Design**—Three-day workshop that covers what CTA is and how it can be used to improve instructional design. The workshop will teach you four methods for conducting CTA (Task Diagram, Continuum, Decision Requirements Interview, and Building Expertise), one analysis method, and tips for incorporating analysis into instructional design.
- **Cognitive Task Analysis for Vignette Development**—Three-day workshop that covers what CTA is and how it can be used to build expertise using vignettes and digital stories. The workshop will teach you four methods for conducting CTA (Task Diagram, Continuum, Critical Decision Method, and Building Expertise), one analysis method, and instructions on how to build, evaluate, and alter the difficulty level of vignettes.
- **Cognitive Task Analysis for System Design**—Three-day workshop that covers what CTA is and how it can be used to improve system design. The workshop will teach you four methods for conducting CTA (Task Diagram, Decision Requirements Interview, Building Expertise, and Critical Decision Method), one analysis method, and tips for incorporating analysis into system design.
- **Cognitive Approach to Risk Management**—This two-day workshop takes a different approach to risk management by focusing on the human side of risk and how to manage it. The workshop will cover different ways the human side of risk can affect a project and offer multiple tools and techniques for managing it.
- **Developing Expertise**—This one-day workshop offer 12 ways an individual can build expertise. During this workshop, we cover the basis of expertise, as well as numerous methods for improving individual and team decision making.



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For information about how SKS can help you with your Cognitive Task Analysis needs, contact:

Holly Baxter, Ph.D.

937.654.8444

holly@strategicKS.com