Situation Handling

A 2002 Short Note from *Knowledge Research Institute, Inc.*

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Decision making has been studied by many researchers during the last 50 years. However, decision making is only one of several tasks that are performed when a person (an agent) is confronted with situations that require interventions such as management, internal adaptation, or avoidance such as flights. Situation handling is a process where a person receives information about the situation, identifies what it is about, finds a way to deal with it, deals with it, and ascertains that it is done satisfactorily. We say that people engage in *situation-handling*. In all areas of life, situation-handling is important. During a normal workday, people engage in hundreds or even thousands of individual situation-handling sessions, most requiring less than six seconds. In order to achieve good enterprise performance, these individual sessions must be as effective as possible.

Understanding personal and organizational situation-handling – including decision-making – is important to manage knowledge successfully and therefore becomes an integral part of competent knowledge management (KM). This understanding requires insights into areas as diverse as situation-handling practices, cognitive sciences, knowledge transfer methods, and supporting information technology. The insight is required to diagnose knowledge-related operations, conceptualize initiatives, implement capabilities, and assess and monitor utilization of knowledge-related resources and practices.

People handle situations to satisfy goals, to gain advantage. They may attempt to manage or influence, i.e., change the situation outright when that is possible, adapt to it when it is not, or pursue a combination of adaptation and external change – interventions – to move conditions in the desired direction. We divide situation-handling into four primary tasks: ***Sensemaking; Decision-making and Problem-solving; Implementation;*** and ***Monitoring.*** A schematic overview of the relationships between these four tasks is indicated in Figure 1 with indications of the nature of connecting variables and how information and knowledge enter the process. The figure also indicates the functional capabilities needed to operationalize each task: Situational Awareness; Action Space; Execution Capability; and Governance Competence.

The concept of "Situational Awareness" initially originated with the evaluation and characterization of fighter pilots.[1] The concept of "Action Space" as used here originated with the work of Dr. Ragnhild Sohlberg of the chemical and energy company Norsk Hydro ASA in Norway.[2] The work on tacit and explicit decision making that supports discussions below is reported by Bechara *et alia* on work performed in Dr. Antonio Damasio's group at University of Iowa[3] and by Professor Klein at Harvard University.[4] Given these and other sources, we can explain the four primary tasks and their functional capabilities as follows.

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[1] See for example Christopher Wickens (2002) "Situation Awareness and Workload in Aviation." in **Current Directions in Psychological Science**, Vol. 11, No. 4, pp. 128-133.
[2] Ragnhild Sohlberg, personal communication (2000).
[3] See Bechara, Antoine; Damasio, Hanna; Tranel, Daniel; & Damasio, Antonio R. (1997) "Deciding Advantageously Before Knowing the Advantageous Strategy." **SCIENCE, 275**, 1293-5.)
[4] See Gary Klein (1998) **Sources of Power: How people make decisions**. Cambridge: MIT Press.)

Sensemaking and Situational Awareness. Any time a person encounters a situation, she observes it by receiving and accepting information about it and uses her knowledge to make sense of the situation from the accepted information. She may already have an understanding of the general context. During the sensemaking task, she uses her *à priori* **situational awareness** to understand the situation. Situational awareness denotes the extent to which the current situation, its context and environment are first observed and then perceived and the accuracy with which the resulting perception – the understanding of the situation – mirrors reality. Without appropriate situational awareness a person does not have sufficient understanding of the situation and its context and cannot make proper sense of it. Situational awareness can limit the ability to both observe and perceive the situation adequately and in such cases becomes a sensemaking constraint.
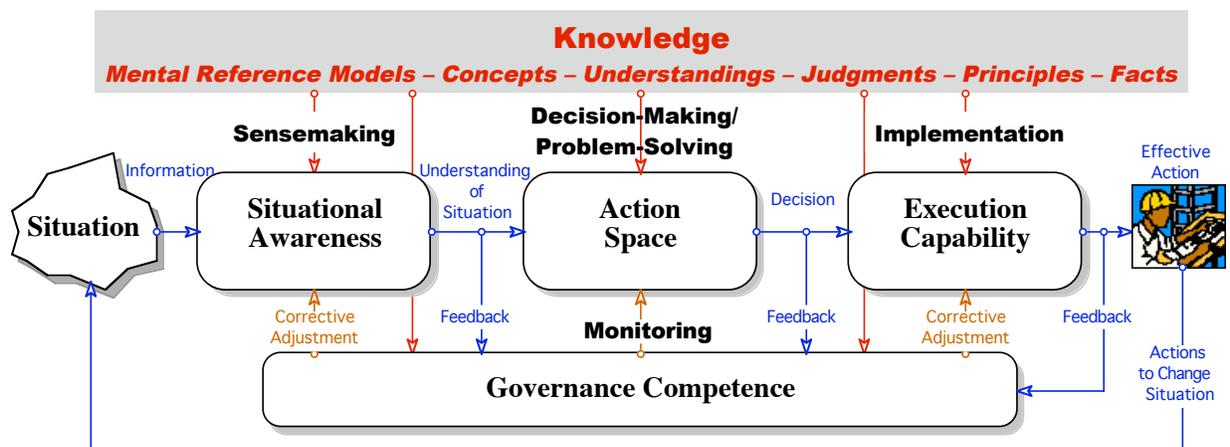
Figure 1. Personal Situation-Handling – from Sensemaking to Effective Action. A Model of the Four Situation-Handling Tasks of Sensemaking; Decision-Making/Problem-Solving; Implementation; and Monitoring.

In part, the sensemaking task relies on knowledge often in the form of "Situation Recognition Models". In people, these models are primarily mental reference models. For organizations, the structural knowledge can be shared beliefs, stories, or even embedded knowledge in organized systems and procedures.

Other factors can affect sensemaking negatively. The person – or the enterprise – may refuse to accept information that for example describes a situation where the information is considered to be unbelievable for some reason or if it describes a threatening situation that the person will choose to avoid.[5]

Decision-Making, Problem-Solving and Action Space. Given an understanding of the situation, a person's ability to make decisions about how to handle it is guided by her *action space.* The action space denotes the realm – the "space" – within which she is willing,

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[5] See for example David Sherman & Geoffrey Cohen (2002) "Accepting Threatening Information: Self-Affirmation and the Reduction of Defensive Biases." in **Current Directions in Psychological Science**, Vol. 11, No. 4, pp. 119-123.

comfortable, or otherwise prepared to make decisions and act. The extent of the action space is a function of personal knowledge and as such, is determined by what she knows about how to handle situations the way she understands them. The action space is also a function of available resources and the authority and permissions that has been delegated by the enterprise. An action space that is more limited than the person's work responsibilities, reduces her operational effectiveness and becomes a constraint.

If a situation is understood to involve conditions beyond the person's, or organization's, experience and knowledge, it may not be possible to make regular decisions about how it should be handled. In these instances, what to do with the situation – deciding the desired action – is determined through problem-solving.

In part, the decision-making and problem-solving tasks rely on knowledge in the form of "Decision-Making Models" and "Problem-Solving Models". As indicated for sensemaking, in people, this knowledge primarily consists of mental models and for organizations, they can be shared beliefs, stories, or even structured systems and procedures.

Implementation and Execution Capability. Once a decision is made, it must be carried out – implemented – since in effective processes, decisions are expected to result in actions. If not acted upon, decision-making becomes a hypothetical exercise of no consequence. The effectiveness of implementation depends upon the *execution capability* which includes knowledge to understand the decision and its intents, concrete and abstract knowledge of how to implement actions implied by the decision, availability of resources, and many other factors. In many instances good decisions are not implemented properly as a result of limited execution capability and it then becomes a constraint. The effectiveness of the implementation task relies on knowledge in the form of "Execution Method Models".

Monitoring and Governance Competence. The situation-handling process is monitored throughout by an executive task which obtains feedback from sensemaking, decision-making and problem-solving, and implementation. It provides guidance for decisions and actions and delivers corrective adjustments when required. The effectiveness of the monitoring task is limited by *governance competence* which provides the ability to assess the performance of the primary tasks and provide corrective adjustments if needed. Figure 1 does not show the meta-monitoring functions that oversee and gauge the performance of all four tasks potentially to intervene in, or change the situation-handling process itself. The monitoring task relies on knowledge in the form of "Governance Approach Models".

In order to handle situations competently, people need good *topic domain knowledge* (knowledge about job-related tasks) to deal effectively and competently with work. When a person has extensive knowledge, she is able to deal effectively and routinely with many tasks. However, work is not always simple, routine, and repetitive. Most workers need to deal with tasks that can range in complexity from logical extensions and less common variations of routine situations, all the way to unusual challenges outside the scope of their normal jobs.[6] With

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[6] We distinguish between six categories of work complexity:
  1. Routine Situations (simple, repetitive, and well understood situations);
  2. Logical but less common variations (transformations) of Routine Situations;

increasing job complexity, it is difficult to prepare people in advance by providing them with topic domain knowledge for every possible situation. Instead, they can be provided with just-in-time knowledge if that is available for the situations with which they need to deal.[7] Another approach is to prepare people to tackle more complex work, first by providing them with abstract script and schema knowledge within the topic domain. Such knowledge becomes more general as the abstraction level increases from operational mental models, to scripts, to schemata, and lastly to general principles. Abstract knowledge of this kind prepares people to handle wide ranges of situations of increasing complexity. A further step is to provide people with teachable metaknowledge, particularly procedural metaknowledge and declarative metaknowledge that allows them to tackle very general situations and problems.

As indicated above, people possess most situation handling knowledge in the form of mental models. The four types of mental models are:

➢ **Situation Recognition Models** are used for Sensemaking and provide characterizations of memorized events and are recalled when comparable situations are perceived. People possess large libraries with tens of thousands of Situation Recognition Models that incorporate encoded information of situations they have encountered in their life.

➢ **Decision-Making and Problem-Solving Models**. This mental library of reference models covers a large domain and guides Decision-Making/Problem-Solving. These mental reference models range from quite concrete action models to abstract and metaknowledge models. They provide simple rules for handling of routine and well known situations by rote, to procedures for more complex Decision-Making which may need creation of innovative actions, to methodologies for novel Problem-Solving. Selection of which mental models that are called into action depends on the level of situation familiarity and understanding that resulted from Sensemaking.

➢ **Execution Method Models** are used for Implementation and provide guides to implement the desired action generated by Decision-Making/Problem-Solving. Many Execution Method Models are complicated and take into account trade-offs between available resources and decision objectives. Some also include aspects for how to deal with constraints of different kinds. All seem to provide dynamic perspectives on the evolving Implementation process.

➢ **Governance Approach Models** are used for Monitoring and provide both principles and guides for evaluating the situation-handling progress. These models contain goals and objectives for the particular situation that is handled. They also contain expectations and meta-methods for performing Sensemaking, Decision-Making/Problem-Solving and Implementation of desired actions. Beyond this, there are meta-monitoring models that govern the monitoring process itself.

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3. Complex, yet expected extensions of routines integrated with external factors;
4. Unexpected challenges (conditions), but with a mix of routines and external factors;
5. Totally unexpected situations and non-routine challenges, yet within the larger job scope;
6. Unusual challenges outside job scope.

[7] See Davenport, Thomas H. and Glaser, John (2002) "Just-in-Time Delivery Comes to Knowledge Management." **Harvard Business Review**, July 2002, pp. 105-111.