

# SPECIES OF COMPETENCIES FOR INTELLIGENCE ANALYSIS

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## THE PURPOSE OF INTELLIGENCE

*'Intelligence' refers to both skill and end-product.*

— William Millward

Intelligence may be defined as the skilled analysis of facts and inferences. This disaggregation and synthesis of collected and created evidence includes “sorting out [the] significant from [the] insignificant, assessing them severally and jointly, and arriving at a conclusion by the exercise of judgment: part induction, part deduction,” and part abduction.<sup>2</sup> Intelligence also may be defined as a timely, actionable product that helps policymakers, decisionmakers, and military leaders perform their national security functions. To these leaders, intelligence aids in the development of policies

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<sup>1</sup> The views expressed in this article are those of the author and do not reflect the official policy or position of the National Security Agency, the Department of Defense, or the U.S. Government.

<sup>2</sup> William Millward, “Life in and out of Hut 3,” in F. H. Hinsley and Alan Stripp, *Codebreakers: The Inside Story of Bletchley Park* (Oxford, UK: Oxford University Press, 1993), 17. For a discussion of abductive reasoning in intelligence, see David T. Moore, *Creating Intelligence: Evidence and Inference in the Analysis Process*, MSSI Thesis (Washington DC: Joint Military Intelligence College, July 2002). Cited hereafter as Moore, *Creating Intelligence*.

and strategies that preserve the security of the nation. The professionals who create intelligence by transforming myriad bits of evidence and resulting inference into tailored products for these customers are known as analysts.

The intelligence business itself is about competencies, what John Gannon, former Chairman of the National Intelligence Council refers to as “skills and expertise.” He notes that “this means people—people in whom we will need to invest more to deal with the array of complex challenges we face over the next generation.”<sup>3</sup> President Bush’s 2001 directive ordering a comprehensive review of U.S. intelligence begins “[current] and accurate foreign intelligence is essential to the success of our foreign policy, law enforcement, and defense strategies and is critical to protecting and advancing America’s vital interests.”<sup>4</sup> The order acknowledges that the 21st Century is filled with complex, rapidly changing intelligence problems. It presumes that new paradigms for intelligence are needed if contemporary intelligence agencies are to keep pace with 21<sup>st</sup> Century foes, much less defeat them.

These new paradigms presume analysts come equipped with a set of basic analytic competencies. Analysts must have certain learned knowledge, acquired skills, and inherent abilities in order to perform their tasks. But what kinds of

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<sup>3</sup> Director of Central Intelligence National Security Advisory Panel, *Strategic Investment Plan for Intelligence Community Analysis*, (Washington DC: Central Intelligence Agency, 2000) URL: [www.cia.gov/cia/publications/unclasssip/index.html](http://www.cia.gov/cia/publications/unclasssip/index.html), last accessed 1 September 2001, 11. Cited hereafter as DCI NSAP, *Strategic Investment*.

<sup>4</sup> George W. Bush, “National Security Presidential Directive 5,” May 9, 2001. This directive instructs the Director of Central Intelligence to conduct a comprehensive review of U.S. intelligence. The order gives the DCI a broad mandate to “challenge the status quo.”

analysis are required of these professionals? What competencies are required for their analysis? What levels of those competencies are necessary for the different kinds of analysis they must perform? Mapping the types of intelligence analysis to the competencies required for the different kinds of analysis answers these questions. It reveals that while having all the competencies is desirable, mastery of all the competencies is not required for some types of analysis. Further, analysts can perform certain types of analysis with less than the full set of competencies. The details of this mapping, the species of competencies needed for intelligence analysis, are the subject of this article. Before the mapping is discussed, a review of the nature of intelligence analysis, and the core competencies themselves is made. The article concludes with a brief examination of the implications of the mapping and some comments on how they may be applied.

## THE NATURE OF INTELLIGENCE ANALYSIS

Analysis is the process by which people transform evidence into intelligence. The results of analysis typically fall into one of four general categories of intelligence. At the basic level, the analysis process “fully [describes] the phenomenon under study, accounting for as many relevant variables as possible.”<sup>5</sup> At the next level, analysis reaches beyond the descriptive to explain fully the

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<sup>5</sup> Lisa Krizan, *Intelligence Essentials for Everyone*, Occasional Paper Number Six (Washington DC: Joint Military Intelligence College, 1999), 29. Cited hereafter as Krizan, *Intelligence*.

phenomenon. At the next level analysis goes past explanation to interpretation. Ultimately analysis leads to “synthesis and effective persuasion, often referred to as estimation.”<sup>6</sup>

At their broadest level, an analyst’s information sources are twofold: classified and unclassified. This distinction between classified and unclassified sources and the value of each is not a new phenomenon. Allen Dulles, writing in the 1940s noted that while classified sources are vital in time of war, “in time of peace the bulk of intelligence can be obtained through overt channels.”<sup>7</sup> Both of these sources can consist of intercepted signals, collected imagery, human activity, and measured emanations. Commonly known in the classified arena as SIGINT, IMINT, HUMINT, MASINT, none of these, despite the fact that they all share an “INT” suffix, meaning “intelligence,” really represent intelligence. Rather they are raw materials for the analyst. It is through the analysis, synthesis, and interpretation of evidence, preferably in collaborative, multiple-source combinations, and in response to customers’ requirements, that analysts create intelligence. In so doing, the analyst

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<sup>6</sup> Krizan, *Intelligence*, 29.

<sup>7</sup> Allen W. Dulles, Memorandum Respecting the Bill to Provide for a National Defense Establishment to Senate Armed Services Committee, April 25, 1947. Dulles Files, Box 1, Central Intelligence Agency. Quoted in James Srodes, *Allen Dulles: Master Spy* (Washington DC: Regnery Publishing, Inc., 1999), 382-383.

has two tasks: “Correctly assemble the pieces of the puzzle and, since all of the pieces of the puzzle are never there, correctly guess what the picture is.”<sup>8</sup>

Since the advent of the Information Age, “[collecting] information is less of a problem and verifying is more of one.”<sup>9</sup> Indeed, as Aris Pappas and James Simon writing in *Studies in Intelligence* comment, “[the] physics of national intelligence is such that collection is not a major issue. In fact, we generally collect as much in as many places now as before September 11, [2001].”<sup>10</sup> However, as the supply of information available to customers from every type of source, proven and unproven, multiplies exponentially, there is a “new dynamic now in play...[which] focuses on processing, explanation, and rigorous analysis.”<sup>11</sup> Intelligence analysts are the critical element of this dynamic. They are more than merely information professionals, more than collectors and couriers of information to customers. Intelligence analysts select and filter information; they interpret the resulting evidence, put it in context,

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<sup>8</sup> Kristan J. Wheaton, *The Warning Solution: Intelligence Analysis in the Age of Information Overload* (Fairfax, VA: AFCEA International Press, 2001), 10.

<sup>9</sup> Gregory Treverton, *Reshaping National Intelligence for an Age of Information*, (Cambridge: Cambridge University Press, 2001) 10. Cited hereafter as Treverton, *Reshaping*.

<sup>10</sup> Aris A. Pappas and James M. Simon, Jr., “The Intelligence Community: 2001-2015 – Daunting Challenges, Hard Decisions,” *Studies in Intelligence*, vol.46, no 1 (2002), 41. Cited hereafter as Pappas and Simon, “Intelligence.”

<sup>11</sup> Pappas and Simon, “Intelligence,” 41.

and tailor it to meet their policy-making customers' needs.<sup>12</sup> In short, analysts and analysts only, create 'intelligence.'

Defining four levels of intelligence analysis—descriptive, explanatory, interpretive, and estimative—raises the question “Who can perform what level?” Even if hiring is based on a common set of characteristics, all analysts are not equipped with the same abilities, skills, and knowledge. Differences in natural endowment, training, and experience also mean that some analysts are better suited for certain levels of analysis than others. Assigning analysts work commensurate with their knowledge, skills, and abilities can only enhance the success of intelligence.

Staffers need to know who the intelligence analysts in the workforce are, and what assets they bring to the mission. Staffers also need to know what the mission requires in order to maintain the agility, and flexibility needed to respond to diverse transnational threats. For example, a corporate understanding of “who is suited to work what” is needed as Intelligence Community members such as the National Security Agency (NSA) employ an organizational model that places all intelligence analysts under the purview of an analytic deployment service, from which individuals are assigned to specific production lines based on the capabilities of the former and

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<sup>12</sup> Such tailoring is not a politicization of intelligence. Rather it is a process of ensuring the intelligence is presented in the most effective manner for the individual customer.

the needs of the latter.<sup>13</sup> NSA's new paradigm for intelligence analysis and production begins with assigning the appropriate analysts to the appropriate tasks.

## CORE COMPETENCIES FOR INTELLIGENCE ANALYSIS<sup>14</sup>

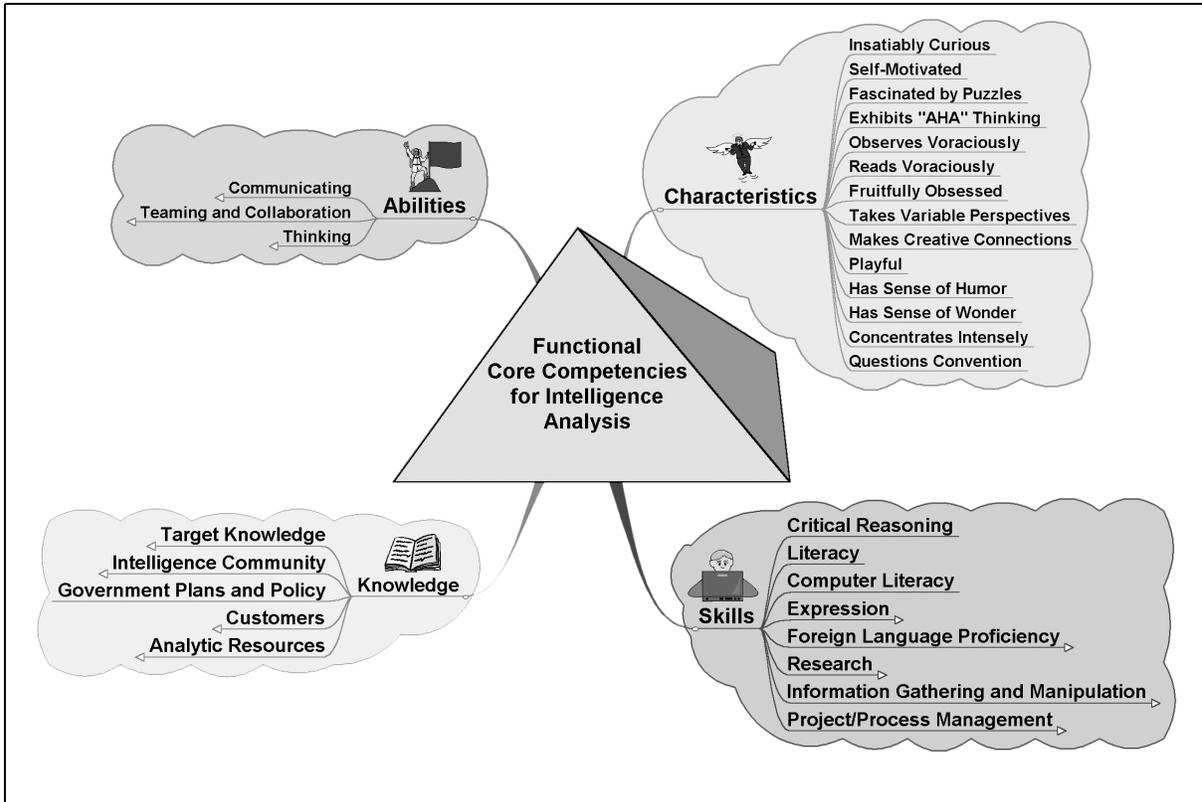
The paradigm for intelligence analysis used in this article assumes three sets of overlapping core competencies and a set of accompanying analyst characteristics developed by NSA analysts David Moore and Lisa Krizan, shown in Figure 1.<sup>15</sup> Moore and Krizan developed these criteria as starting points for answering the fundamental questions about who intelligence professionals are and the knowledge, skills and abilities they need to be successful.

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<sup>13</sup> David Moore and Lisa Krizan, "Intelligence Analysis: Does NSA Have What it Takes," reprint, *Cryptologic Quarterly*, Vol. 20, no 2 (Summer/Fall 2001), 27. Cited hereafter as Moore and Krizan, "Intelligence Analysis."

<sup>14</sup> This description of the core competencies for intelligence analysis is summarized (with additions) from Moore and Krizan, "Intelligence Analysis," and from David Moore and Lisa Krizan, "Core Competencies for Intelligence Analysis at the National Security Agency," in Russell Swenson, ed., *Bringing Intelligence About: Adding Value to Information in the U.S. Intelligence Community*, (Washington DC: Joint Military Intelligence College, 2002): 81-113.

<sup>15</sup> See as Moore and Krizan, "Intelligence Analysis."



**Figure 1.** Moore and Krizan’s Functional Core Competencies for Intelligence Analysis

Previous paradigms for intelligence analysis, derived from reviews of how intelligence should be produced, directed considerable attention at intelligence as an activity, process, or organization. To date, however, scant attention has been focused on the essential element of intelligence production, the analyst, and the core competencies required by that analyst in order to be successful.<sup>16</sup> Such an analyst-centric focus is essential because, as has been noted, analysts, and analysts alone create intelligence. Thus assigning analysts to work commensurate with their abilities, skills, and knowledge is a vital part of a rigorous intelligence reform

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<sup>16</sup> See Moore, *Creating Intelligence*, Chapters 1 and 3 for a synopsis of past efforts to improve intelligence analysis.

strategy. The characteristics of successful analysts; and the sets of abilities, skills, and knowledge developed by Moore and Krizan are a first step of this reformation process.

### Characteristics

In exploring the core competencies for successful intelligence analysis, Moore and Krizan observed that there are characteristics associated with analysts considered to be the most successful at their trade. The representative superset Moore and Krizan developed was observed to be shared in unequal measures by different analysts.<sup>17</sup>

Moore and Krizan also noted that the characteristics of successful analysts are descriptors of the values, standards, and beliefs of a dynamic, living, analytic culture. As such, these criteria formed preliminary indicators that could be useful during the hiring process to identify prospective employees. It was observed that a person with many of these characteristics would be predisposed to being a successful analyst, if the appropriate skills, abilities, and necessary knowledge to perform the work also were present.

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<sup>17</sup> Moore and Krizan, *Intelligence*, 8.

## Abilities

Moore and Krizan wrote that “abilities arise from aptitudes that have developed from innate, natural characteristics or talents.”<sup>18</sup> Moore and Krizan indicated that while a person’s genetic background determines their aptitudes, these aptitudes may be enhanced through training. Three basic abilities were identified as necessary for intelligence analysis: communicating, teaming and collaboration, and thinking.

## Skills

Whereas aptitudes and their related abilities stemmed from an analyst’s genetic makeup, a skill was identified as representing a learned expertise or proficiency.<sup>19</sup> At least eight types of skills, were identified as necessary for successful intelligence analysis: critical reasoning, literacy, computer literacy, foreign language proficiency, research, and information gathering and manipulation.

## Knowledge

Knowledge consists of familiarities, awareness, or understanding gained through experience or study; it includes both empirical material and that derived by inference or interpretation.<sup>20</sup> Depending on the specific intelligence target, the

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<sup>18</sup> Moore and Krizan, *Intelligence*, 11.

<sup>19</sup> Moore and Krizan, *Intelligence*, 14.

<sup>20</sup> John Seely Brown and Paul Duguid, *The Social Life of Information* (Boston: Harvard Business School Press, 2000), 1-2.

knowledge required can vary widely. The essential subset consists of knowledge of the target, the Intelligence Community, government plans and policy, the customers for the analysis, and the analytic resources, known and unknown.

## TOWARDS A SPECIATION OF INTELLIGENCE ANALYSIS

Ideally, every analyst performing every different level of intelligence analysis will be an expert in all of the competencies identified above. Practically, it is possible to perform successful intelligence analysis with less than masterful expertise. Indeed, much of currently produced intelligence is created by analysts with less than mastery in some or even all of the competencies. A question arises, then, “Why do analysts need to master all the competencies?”

The answer to this question lies in the mandates of the Congress and the White House: Analysis must be improved. In order for this to happen, analysts themselves must be better educated and trained. The core competencies summarize what the analyst needs to be and to know. Analysts ensure they are best prepared for 21<sup>st</sup> Century intelligence analysis by applying them to their target sets and mastering them.

What specific competencies need mastering can be determined by matching the competencies to the levels of analysis. Such a matching reveals for all four types of analysis—descriptive, explanatory, interpretive, and estimative—both the levels of mastery needed for all the competencies, and the minimum essential competencies themselves. It is worth noting that this speciation creates two sets of results. These

are complementary, not contradictory and arise from the different ways the answers to the questions posed at the beginning of this article are framed.

### Species of Competency

How does one determine what levels of mastery are required for what levels of analysis? This is accomplished by matching the competencies against the four types of analysis to produce a matrix of competencies for each of the four levels, as shown in Table 1. While mastery of some competencies—such as those of the Skills set—is necessary regardless of the type of analysis being performed, lesser degrees of expertise may be adequate for other competencies required for different levels of analysis. It is assumed that these lesser degrees of competency are starting points for analysts and that greater expertise will be sought as a matter of course through education, training, and experience. Indeed, Table 1 also provides a general career path for analysts seeking to move from descriptive analysis to estimative analysis. Finally, analysts who continue their professional development should find their mastery continues to increase over the span of their entire career.

Competency			Type of Analysis			
			Desc.	Expl.	Intrp.	Est.
Abilities	Communicating					
	Thinking	Information Ordering				
		Reasoning				
		Pattern Recognition				
Teaming & Collaboration						
Skills	Critical Reasoning					
	Basic Literacy					
	Computer Literacy					
	Expression	Speaking				
		Storytelling				
		Writing				
	Foreign Language Proficiency					
	Research					
	Information Gathering & Manipulation					
	Project/Process Management					
Knowledge	Target	Associated Culture				
		Context of Language				
		Economics				
		Geography				
		Governmental Structure				
		History				
		Military				
	Technology					
	Intelligence Community					
	Government Plans and Policies					
	Customer Requirements					
	Analytic Resources					

**Table 1:** Degree of Core Competencies Required for Different Levels of Analysis. (Lighter hues of colors represent lesser degrees of acceptable competency).

It is also worth noting that “mastery” of a competency is subjective. Common standards of analyst excellence and expertise do not currently exist across the Intelligence Community although, some members, such as NSA have developed peer-based standards that measure the levels of analyst competencies.

As the Intelligence Community strives to improve analysis, perhaps the time has come for common standards. As these standards are developed, agreements at the community level about what constitutes a novice or a master analyst will of necessity be made. Such agreements on competencies could enable analysts to be

assigned across the community commensurate with their knowledge, skills, and abilities. True experts could be readily identified, facilitating the creation of interagency teams to counter the most difficult intelligence problems.

### Species of Analysis

Another means by which the species of competencies for intelligence analysis can be determined is to begin with the four types of analysis themselves. The minimum sets of competencies are then determined for those types. Additionally, elements from the NSA-developed Pyramid of Excellence for Intelligence Analysis can be included, as can the measures for success of intelligence analysis developed by Moore and Krizan from the work of Air Force Captain William Brei.<sup>21</sup>

**Descriptive Intelligence.** Description is a process that reports an event, person, place, or thing. Descriptive Intelligence is a reactive, event-driven process closely linked to a particular information source. Based on measurable facts, or the characteristics of facts, it reports evidence by describing specific events or characteristics. Because other information sources may duplicate the described information, a certain degree of redundancy and overlap of disseminated intelligence

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<sup>21</sup> For a description of the Pyramid of Excellence and its components, see Alison Edwards, "The Pyramid of Excellence for Intelligence Analysis and Production: A Maturity Model," reprint, *Cryptologic Quarterly*, vol. 20, no. 2 (Summer/Fall 2001), 33-37. Dr. Edwards' article captures the results of efforts by the NSA Analytic Services organization to develop an rigorous analytic model for analysis. For the measures of success, see Moore and Krizan, "Intelligence Analysis," 5-8. See also William S. Brei, Captain, USAF, *Getting Intelligence Right: The Power of Logical Procedure* Occasional Paper Number Two, (Washington DC: Joint Military Intelligence College, 1996). Cited hereafter as Brei, *Getting*.

is expected. The customer is left to resolve differences between these different sources. A summary of the Minimum Competencies for Descriptive Intelligence is shown in Table 2.

Analysis Type	Description and Requirements		Measures of Success			
Descriptive	Reactive Analytic Process	Event Driven	Meets or Anticipates Customer Needs	Readiness		
		INT-centered		Timeliness		
		Internal and External Redundancies and Overlap		Accuracy		
	Reports Information	Fact Based		Conveys Intelligence	Objectivity	
		Describes Verified Events			Usability	
		Based on Measured Characteristics			Relevance	
	Skills	Information Gathering and Manipulation			Decision Points	
		Foreign Language Proficiency				
		Expression				
		Research				
		Critical Reasoning				
		Project/Process Management				
		Basic Literacy				
		Computer Literacy				
	Abilities	Communicating				
		Thinking				
		Teaming and Collaboration				
	Knowledge	Target				
		Customer Requirements and Limitations				
	Analyst Characteristics	Self-Motivated				
		Observant				
		Intensely Concentrates				
	Assistive Technology	Allows User to Perform Basic Tasks More Easily				

**Table 2:** The Minimum Competencies for Descriptive Intelligence Analysis.

Analysts who are successful at this type of analysis are expert at gathering and manipulating information to reveal the facts they report. Mastery of critical reasoning skills, coupled with mastery of information ordering, and lesser competency in pattern recognition abilities allows the selection, weighting, and manipulation of pertinent evidence. When the raw information is non-English these analysts draw on their mastery of foreign languages to describe what is being said. Project and process management skills enable them to organize their work environment to make best use of their time. Knowledge of the target and the

customer's requirements facilitates the inclusion or exclusion of specific details. When possible, assistive technology generates statistics and reports that facilitate the description of the subject of the analysis. Successful analysts are expert at manipulating this information.

The results of descriptive intelligence analysis convey decision points to the customer. Mastery of presentation skills helps ensure that descriptive intelligence products containing these decision points are the most effective. Success is measured in terms of how the description and any associated decision points meet or anticipates the customer's intelligence requirements. Questions associated with measuring success include: "Was the intelligence timely and accurate?" and "Was the intelligence relevant to the issues at hand and was it useful in solving them?"

Producing this type of analysis successfully requires analysts to be highly self-motivated. While the process of describing phenomenon can be tedious, if the analyst is a good observer, who with intense concentration ensures details are not missed, the intelligence produced can be of great value.

**Explanatory Intelligence.** Explanation reveals why something is so. Explanatory Intelligence is the result of a rationalized analytic process that employs methods of reasoning to reveal contexts for facts and inferences, "including observations about patterns or changes in observed behavior."<sup>22</sup> Analysts performing this type of analysis draw on catalogued best analytic practices in a collaborative

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<sup>22</sup> Edwards, "Pyramid," 35.

environment that reduces or minimizes redundant efforts. Well-developed communicating, thinking, and collaborative abilities as well as knowledge of who plays with whom in the Intelligence Community enhances this collaboration. By making clear the motives and rationale of the subject of the analysis, their work adds value to the evidence reported to the customer as intelligence. The Minimum Competencies for Explanatory Intelligence Analysis are shown in Table 3.

Analysis Type	Description and Requirements		Measures of Success	
Explanatory	Rationalized Analytic Process	Employs Catalogued Best Practices	Meets or Anticipates Customer Needs	Readiness
		Collaboration Eliminates Redundancies		Timeliness
		Metrics Quantify Success		Accuracy
	Uses Methods of Reasoning to Explain Information	Abduction/Induction/Deduction		Objectivity
		Insight		Usability
		Pattern Recognition/Information Ordering		Relevance
	Skills	Information Gathering and Manipulation	Conveys Intelligence	Analytic Conclusion
		Foreign Language Proficiency		
		Expression		
		Research		
		Critical Reasoning		
		Project/Process Management		
		Basic Literacy		
	Abilities	Computer Literacy	Decision Points	
		Communicating		
		Thinking		
	Knowledge	Teaming and Collaboration	Rigorous Analysis	Competitive
		Target		
		Intelligence Community Resources		
		Government Plans and Policies		
Customer Requirements and Limitations				
Analyst Characteristics	Available Analytic Resources	Adds Value		
	Self-Motivated			
	Observant			
	Intensely Concentrates			
Interactive Technology	Questions Convention			
	Manipulates and Displays Information Enabling Novel Analytic Explanations			

**Table 3:** The Minimum Competencies for Explanatory Intelligence Analysis

Analysts who are successful at producing explanatory intelligence are expert at reasoning. They combine a mastery of deductive, inductive, and abductive abilities with intuition, to masterfully order evidence, seeking patterns that may explain its

context. Both collaboration and critical reasoning skills help ensure the work is minimally affected by corporate and cultural biases.

Analysts producing explanatory intelligence require the same mastery of skills as do those producing descriptive intelligence. Project/process management skills help ensure the work is timely. Highly effective at communication, these analysts draw on expert-level expression and presentation skills to ensure their explanations are the most effective. Explanatory intelligence requires greater knowledge of a target than does description and therefore analysts producing this type of intelligence have a deep knowledge of their targets that is enhanced by their mastery of target languages.

Assistive technology manipulates and displays information and evidence enabling novel analytic explanations. Inference networks generated by analysts using such assistive technology are but one example of how evidence can be used to provide explanations.<sup>23</sup>

Analysts best suited for this type of analysis are both highly self-motivated and observant. They are also highly critical, frequently questioning conventional

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<sup>23</sup> Inference networks were originally invented by American jurist J. H. Wigmore and subsequently were developed by Terence Anderson, David Schum, and William Twining. See Terence Anderson and William Twining, *Analysis of Evidence: How to do things with Facts based on Wigmore's Science of Judicial Proof* (Evanston IL: Northwestern University Press, 1991); and David A Schum, *Evidential Foundations of Probabilistic Reasoning*. (New York, NY: John Wiley & Sons, Inc., 1994), and *Evidence and Inference for the Intelligence Analyst*, 2 Volumes, (Lanham, MD: University Press of America, 1987). For a discussion of the use of inference networks in intelligence analysis see Moore, *Creating Intelligence*, Chapters 5-6.

wisdom about why something is so. This is a necessary part of the process to ensure that correct explanations are made.

Success for this type of intelligence is measured by a series of metrics including whether or not the intelligence product meets or anticipates the needs of the customer, whether it conveys intelligence, and whether it is the result of rigorous analysis. Whether or not it meets or anticipates customer needs is measured by its readiness, timeliness, accuracy, objectivity, usability, and relevance.<sup>24</sup> Mastery of government plans and policies as they apply to the issue being analyzed also helps ensure this is so. The conveyance of intelligence is determined both by the decision points provided to the customer and the analytic conclusions that support them, adding value beyond the facts themselves.

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<sup>24</sup> For an in depth discussion of these attributes see Brei, *Getting*. Also, see Moore and Krizan, "Intelligence Analysis," 5-8.

Analysis Type	Description and Requirements		Measures of Success			
Interpretive	Adaptive Analytic Process	Agile Flexible System Responsive to Change	Meets or Anticipates Customer Need	Readiness		
		Integrates Analytic Processes		Timeliness		
		Employs Technology and Target Forecasting		Accuracy		
	Uses Methods and Techniques of Analysis to Interpret Evidence	Evidentiary Inference		Objectivity		
		Analysis of Competing Hypotheses		Usability		
		Opportunity Analysis		Relevance		
		Linchpin Analysis				
		Statistical Analysis				
		Matrix Analysis				
		Skills		Link Analysis	Conveys Intelligence	Analytic Conclusions
				Information Gathering and Manipulation		
	Foreign Language Proficiency					
	Expression					
	Research		Decision Points			
	Critical Reasoning					
	Project/Process Management					
	Basic Literacy					
	Abilities	Computer Literacy	Rigorous Analysis	Competitive		
		Communicating				
		Thinking		Adds Value		
	Knowledge	Teaming and Collaboration			Collaborative	
		Target				
		Intelligence Community Resources				
		Government Plans and Policies				
	Analyst Characteristics	Customer Requirements and Limitations		Rigorous Analysis		Competitive
		Available Analytic Resources				
		Exhibits a Sense of Wonder				
		Self-Motivated				
		Fascinated with Puzzles				
		Exhibits A-ha Thinking				
		Observant	Adds Value			
		Reads				
Fruitfully Obsessed						
Intensely Concentrates						
Takes Variable Perspectives						
Makes Creative Connections						
Collaborative Technology	Questions Convention	Collaborative				
	Exhibits a Sense of Humor					
	Playful					
Collaborative Technology	Enables Easy Sharing of Information	Collaborative				
	Tracks Analyst's Needs and Preferences					
	Directs to New Opportunities					

**Table 4:** The Minimum Competencies for Interpretive Intelligence Analysis

**Interpretive Intelligence.** While in some instances, distinctions between explanatory and interpretive intelligence may blur, interpretive intelligence really deals with “the significance of observed phenomenon [and makes] judgments about

what has happened.”<sup>25</sup> Thus, interpretive intelligence analysis is an adaptive process that uses both structured methods of analysis and analysts’ intuition to interpret information. Analysts apply structured methods such as evidentiary inference, analysis of competing hypotheses, and scenario development. They employ techniques such as opportunity analysis, linchpin analysis, and matrix analysis to make sense out of events and their associated evidence. Table 4 summarizes the Minimum Competencies for Interpretive Intelligence Analysis.

Collaboration is essential for successful interpretive analysis. Intelligence issues requiring such analysis are rarely clear. Biases often interfere and threaten to cloud judgments. So practitioners of interpretive analysis are masters at teaming and collaboration, known means of assuring complex issues are adequately dealt with. Multiple, possible interpretations are examined fairly and the less plausible ones eliminated. Such analysis is, of necessity, a highly-intellectual endeavor and so fully developed communicating and thinking abilities also are necessary. As was the case with descriptive and explanatory analysis, mastery of reasoning, expression, and information processing skills ensure evidence is most effectively manipulated and the results of analysis most persuasively disseminated. A very deep understanding of the target and the pertinent resources both within the Intelligence Community, and elsewhere, guarantee much appropriate evidence as possible is considered. Expert knowledge about government plans and policies as well as customer requirements

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<sup>25</sup> Edwards, “Pyramid,” 35.

ensures resulting end-products properly are tailored to meet the needs of the customer.

Analysts producing interpretive intelligence make use of collaborative technologies that enable easy sharing of information, track their needs and preferences, and direct them to new opportunities. These same technologies also assist in the ordering and presentation of evidence and allow such presentations to be included in finished intelligence products.

Again, success for this type of intelligence is measured by metrics. To the set of metrics employed to evaluate explanatory intelligence is added the evaluation of how collaborative was the process. Since accuracy depends on a more thorough examination than one person is capable of, the measurement of the degree of collaboration by analysts, possibly also involving the customer is an important measure of success..

**Estimative Intelligence.** Estimative intelligence reveals, in the words of Sherman Kent, what the nation’s leaders must know

in order to be foresighted—what [they] must know about the future stature of other separate sovereign states, the courses of action they are likely to initiate themselves, and the courses of action they are likely to take up in response to some outside stimulus.<sup>26</sup>

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<sup>26</sup> Sherman Kent, *Strategic Intelligence for American World Policy* (Princeton, NJ: Princeton University Press, 1949), 39.

Kent's description is important. As head of the Office of Regional Estimates in the fledgling CIA, Kent helped established the basis for modern estimative intelligence analysis. His mandate that it be of the highest level possible remains valid.

Today, estimative intelligence analysis then is a proactive process that predicts based on analysts' experience, knowledge, and modeling of evidence. The anticipatory products created from this type of analysis are the results of applying such methods as Bayesian analysis, evidentiary inference, trend analysis, and various forms of systems analysis. The development of scenarios also plays a key role in the holistic production of estimative intelligence. The Minimum Competencies for Estimative Intelligence Analysis are shown in Table 5.

It should be evident that analysts engaging in this sort of analysis are the masters of their craft. Collaboration with other analysts and the customer to the point that they function as a team is presumed. However, there are dangers in having experts working together. Too much expertise can yield an insidious form of bias—that of the expert who is blinded by his or her own expertise. Groups also can impose a 'consensus' decision on its members that may be incorrect. Working too closely with the customer also may influence the accuracy of the outcome, threatening accurate estimation. Analysts less experienced in the target, topic, or issue, but possessing strong reasoning and other analytic abilities perform an essential task of critically reviewing resultant products. They perform a reality check for validity and accuracy. Sherman Kent employed an external 'board' of reviewers

to compensate for these dangers to accurate estimation; such a notion still has merit.

There is a similar role for reviewers from academia or business.

Analysis Type	Description and Requirements		Measures of Success		
Estimative	Proactive Analytic Processes	Anticipatory	Meets or Anticipates Customer Need	Readiness	
		Holistic Approach		Timeliness	
		Synergistic and interdependent environment		Accuracy	
		Analyst and Customer act as team		Objectivity	
	Predicts Based on Experience, Knowledge, and Modeling of Information	Evidentiary Inference		Usability	
		Trend Analysis		Relevance	
		Systems Analysis		Conveys Intelligence	Analytic Conclusions
		Game Theory			Decision Points
		Bayesian Analysis			Implications of Choices
	Skills	Information Gathering and Manipulation			Rigorous Analysis
		Foreign Language Proficiency	Competitive		
		Expression	Adds Value		
		Research	Highest Level Possible		
		Critical Reasoning	Collaborative		
		Project/Process Management			
		Basic Literacy			
		Computer Literacy			
		Communicating			
		Thinking			
	Abilities	Teaming and Collaboration			
		Target			
		Intelligence Community Resources			
	Knowledge	Government Plans and Policies			
		Customer Requirements and Limitations			
		Available Analytic Resources			
		Curious			
	Analyst Characteristics	Exhibits a Sense of Wonder			
		Self-Motivated			
		Fascinated with Puzzles			
		Exhibits A-Ha Thinking			
		Observant			
		Reads			
		Fruitfully Obsessed			
		Intensely Concentrates			
		Takes Variable Perspectives			
		Makes Creative Connections			
		Questions Convention			
		Exhibits a Sense of Humor			
		Playful			
	Integrated Technology	Extension of Analysts			
Anticipates Analysts' Wants and Needs					
Acts in Analysts' Interests					
Proposes Analytic Conclusions					

**Table 5:** The Minimum Components of Estimative Intelligence Analysis

The estimative process requires technology that is an extension of the analyst. Based on modeling the analysts' behaviors, such technology would anticipate their wants and needs, suggesting new sources of evidence. Ongoing projects such as ARDA's NIMD hope to play a critical role in making such technology available.

The most successful estimates accurately predict the behaviors of adversaries. Their analytic conclusions provide decision points and the implications of the choices they suggest. This is a competitive process that when successful, provides the highest possible level of intelligence to the customer. All the measures of success already discussed thus apply to the evaluation of estimative intelligence.

## GETTING THERE FROM HERE

The different levels of competency required for the different levels of analysis have profound implications in the hiring and retention of analysts. Not everyone is suited for intelligence analysis despite his or her background. Becoming a successful intelligence analyst requires more than desire. Nor can the field of intelligence analysis be a catchall for employees transferring from other downsized career fields.<sup>27</sup> As the Intelligence Community strengthens its analytic workforce in the wake of changes mandated both before and after 11 September 2001, it must have the best personnel possible. These people are needed against more than just the war against terror. What former General Kenneth A. Minihan, former Director, NSA

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<sup>27</sup> Moore and Krizan, "Intelligence Analysis," 26.

noted about his own agency is also true for the larger Intelligence Community: “If we don’t win the talent war, it doesn’t matter if we invest in the infrastructure.”<sup>28</sup>

Developing a hiring program based on the levels of core competencies presented in this article is one way this talent war can be won. Candidates for analyst positions must be literate both in the general sense of the term and with regards to computer systems they will use before employment. They should also have mastered the skills of critical reasoning, information manipulation, and expression. While some knowledge of targets and issues may be presupposed prior to hiring, the deep knowledge of the specifics of the target or issue, need to be imparted. Continuing education augmented with aggressive mentoring programs can bring this about.

Where foreign languages are required—and it is recognized that not all analysis may require the knowledge of non-English languages—again mastery is a prerequisite for analysis. Admittedly this poses challenges as learning a language is not a rapid task and opportunities for learning lower density languages are limited. Further, anticipation of which lower density languages may be required in the next crisis is extremely difficult.<sup>29</sup>

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<sup>28</sup> Quoted in Robert K. Ackerman, “Security Agency Transitions from Backer to Participant,” *Signal*, 53, no. 2 (October 1998), 23.

<sup>29</sup> Indeed, it epitomizes the complexity and difficulty of estimative intelligence as described above.

Corporate training programs, perhaps with components at the community level are one way essential knowledge can be uniformly imparted. Programs such as the Alternate Analysis Course at the CIA's Sherman Kent School offer other means by which analytic thinking abilities and their associated reasoning skills can be honed. Similarly, NSA's National Cryptologic School (NCS) also provides courses that challenge analytic thinking—mostly with a cryptologic focus. The NCS also serves a vital role as a center of excellence for foreign language instruction. Finally, the Joint Military Intelligence College (JMIC) and the Joint Military Intelligence Training Center (JMITC) offer programs that educate and train personnel in both analysis and in strategic intelligence studies. The college also confers degrees at the baccalaureate and masters levels.

Since each program is specialized, one model for Intelligence Community-wide professional analyst development would be to place all analytic education at the Sherman Kent School, language and specialized cryptologic education at the NCS, and the leadership, area studies, related educational offerings at both the JMITC and the JMIC as appropriate. The degree programs also would stay at the JMIC. Each institution could then focus on what it does best. Analysts, regardless of their parent agencies, would train together at these institutions as necessary. This would have the added benefit of introducing analysts with similar interests from various agencies and encouraging collaboration beyond the classroom. As already has been noted, collaboration is deemed essential for successful 21<sup>st</sup> Century intelligence analysis.

Dealing with personnel already working in analyst positions poses other challenges. Given the difficulty and possible undesirability of removing personnel who are inadequate at analysis—what they lack in skills and abilities may be compensated for by extensive target knowledge—opportunities for training, both remedial and new, are essential. Making developing analytic competencies a significant portion of the personnel review process, and tying its successful completion to compensation is one way that such professional development can be encouraged.

Asking employees to change presupposes corporate cultures must also change. Business/cultural anthropologist Alexandra Hamlet has documented a novel way that this corporate change can be hastened. Her work demonstrates that

[cultural] anthropology provides a comprehensive set of broad concepts that unites the understanding and inter-workings of cultures and their behaviors and beliefs and [provides] a long-standing system to map and organize this information.<sup>30</sup>

By mapping corporate culture, specific effective means of necessary change are discovered. Such an understanding of corporate culture also allows changes to occur with a less accompanying stress and disruption. The Intelligence Community cannot afford to have its mission disrupted as it transforms itself.

Hamlet also believes that mapping corporate cultures creates way to the workforce to willingly change and transform. This means more of the workforce is

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<sup>30</sup> Alexandra Hamlet, “White Paper: Cultural Anthropology...A decision Method for Anti-terrorism and Related national Emergencies,” information paper, n.p., March 2002, provided on 22 July 2002 by Alexandra Hamlet, Hamlet International Inc, Fairfax, VA..

likely to embrace the necessary changes that better analysis requires.<sup>31</sup> Finally, mapping corporate cultures may reveal that many analysts already engage in high-quality analysis. By focusing on strengths and encouraging augmentation, these analysts too can be encouraged to change and their expertise retained. Retention of expertise is important as analysis must continue even in the face of dramatic changes.

Ultimately, however, hard decisions about analysts who remain unable or unwilling to improve or change may need to be made. The mandate of 11 September 2001 is clear: the nation cannot tolerate mediocrity in its Intelligence Community's analytic workforce.

## GOING THE NEXT STEP

Excellence is needed within the Intelligence Community. Repeated guidance from both the White House and Congress make this clear: The Intelligence Community must improve intelligence. However, many of the reforms already begun focus on the corporations and their structure, as well as on collection, rather than on analysis itself and the analysts who produce intelligence. This is consistent with a trend observed about organizations in change, "most restructuring is on the

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<sup>31</sup> Alexandra Hamlet, "Cultural Anthropology and Corporate Change," briefing presented at the National Security Agency, Fort Meade, MD, 22 July 2002. Cited hereafter as Hamlet, briefing, 22 July 2002.

operations side, not on the human side.”<sup>32</sup> Yet, as has been noted, it is analysis alone that leads to the creation of intelligence.

The species of competencies outlined in this article provide a means of transforming the human side of the Intelligence Community. They offer a means of moving analysis towards the excellence required in order to keep ahead of the shifting adversaries of the 21<sup>st</sup> Century. Within government, knowing what competencies are needed for different kinds of analysis can guide hiring programs, stimulate community-wide education and training opportunities, and inspire the professional development of the Intelligence Community’s most valuable asset, its analytic workforce.<sup>33</sup>

Improved analysis *is* possible and current analysts *can* change to perform better. This was made clear by Air Force MSGT Robert Folker’s field experiments at the Joint Intelligence Centers (JICs). In four experiments, Folker trained analysts in a structured method, the Analysis of Competing Hypotheses, He then presented them with two realistic scenarios requiring analytic judgments and conclusions. Folker found a significantly greater number of the newly trained analysts derived the correct

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<sup>32</sup> Hamlet, briefing, 22 July 2002.

<sup>33</sup> It should be noted that externally, these same competencies also provide a guide to the university-level intelligence studies programs whose aim it is to provide entry-level analysts to government (and business). Such programs can ensure that the some of the skills needed at all four levels of analysis already are mastered prior to hiring. Indeed, many of these same skills also are required for sound scholarship.

answers to the scenarios than did analysts in a control group that used purely non-structured methods.<sup>34</sup>

However, a word of caution is necessary. While enhancing analysts' knowledge, skills, and abilities offer a means by which intelligence can be improved, it is not, as retired CIA analyst Richards Heuer notes, a guarantee that

accurate conclusions will be drawn from the incomplete and ambiguous information that intelligence analysts typically work with. Occasional intelligence failures must be expected.<sup>35</sup>

However, improving analysis will increase the likelihood that such conclusions are accurate.

As the Intelligence Community continues its transformation, the time has come to implement analysts' hiring, education, and work assignments based on the species of competencies for intelligence analysis presented in this article. Other means of transformation already tried have not succeeded. Intelligence remains broken—and it must be fixed. Unless analysts' competencies are considered and improved, intelligence will remain broken. However, the species of competencies for analysis presented here provides a means by which intelligence can be improved.

President George W. Bush commented in December 2001, that “to reach decisions, a President needs more than data and information; a President needs real

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<sup>34</sup> See MSgt Robert D. Folker, Jr., USAF, *Intelligence Analysis in Theater Joint Intelligence Centers: An Experiment in Applying Structured Methods*, Occasional Paper Number Seven, (Washington DC: Joint Military Intelligence College, 2000).

<sup>35</sup> Richards J. Heuer, Jr., *The Psychology of Intelligence Analysis* (Washington, DC: CIA Center for The Study of Intelligence, 1999), 184.

and current knowledge and analysis of the plans, intentions, and capabilities of our enemies.”<sup>36</sup> A professional intelligence analysis workforce built and transformed around these species can produce this needed intelligence; it successfully can meet the continuing and ongoing intelligence challenges of the 21<sup>st</sup> Century.

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<sup>36</sup> George W. Bush, 17 December 2001, 1775.

## BIBLIOGRAPHY

- Ackerman, Robert K. "Security Agency Transitions from Backer to Participant." *Signal* 53, no. 2 (October 1998): 23-25.
- Aid, Mathew M. "The Time of Troubles: The US National Security Agency in the Twenty-First Century." *Intelligence and National Security*, vol. 15, no.3 (Autumn 2000): 5-9.
- Berkowitz, Bruce D., and Allan E. Goodman. *Strategic Intelligence for American National Security*. Princeton, NJ: Princeton University Press, 1989.
- Brei, William S., Captain, USAF. *Getting Intelligence Right: The Power of Logical Procedure*, Occasional Paper Number Two. Washington DC: Joint Military Intelligence College, January 1996.
- Brown, John Seely, and Paul Duguid. *The Social Life of Information*. Boston: Harvard Business School Press, 2000.
- Bush, George W. "National Security Presidential Directive 5," May 9, 2001.
- \_\_\_\_\_. "Remarks at 'The World Will Always Remember September 11' Ceremony." *Weekly Compilation of Presidential Documents*, 37, no. 50 (17 December 2001): 1775.
- Director of Central Intelligence. *Strategic Intent for the United States Intelligence Community*. Washington DC: CIA, March 1999. Unclassified reference contained within a classified source.
- Director of Central Intelligence, National Security Advisory Panel. *Strategic Investment Plan for Intelligence Community Analysis*. Washington DC: Central Intelligence Agency, 2000. URL: [www.cia.gov/cia/publications/unclasssip/index.html](http://www.cia.gov/cia/publications/unclasssip/index.html), last accessed 11 September 2001.
- Dulles, Allen W. Memorandum Respecting the Bill to Provide for a National Defense Establishment to Senate Armed Services Committee, April 25, 1947. Dulles Files, Box 1, Central Intelligence Agency. Krizan, Lisa. *Intelligence Essentials for Everyone*. Joint Military College Occasional Papers Number 6. Washington DC: Joint Military Intelligence College, 1999.
- Edwards, Alison. "The Pyramid of Excellence for Intelligence Analysis and Production: A Maturity Model." Reprint. *Cryptologic Quarterly*, vol. 20, no. 2 (Summer/Fall 2001): 33-37

- Ember, Carol R. and Melvin Ember. *Anthropology*, 9<sup>th</sup> Edition. Upper Saddle River: Prentice Hall, 1999.
- Folker, Jr., Robert D., MSgt, USAF. *Intelligence Analysis in Theater Joint Intelligence Centers: An Experiment in Applying Structured Methods*. Occasional Paper Number Seven. Washington DC: Joint Military Intelligence College, 2000.
- Garst, Ronald D., and Max L. Gross. "On Becoming an Intelligence Analyst." *Defense Intelligence Journal*, vol. 6 no. 2 (Fall 1997): 47-60.
- Hamlet, Alexandra. "Cultural Anthropology and Corporate Change." Briefing presented at the National Security Agency. Fort Meade, MD, 22 July 2002.
- \_\_\_\_\_. "White Paper: Cultural Anthropology...A decision Method for Anti-terrorism and Related National Emergencies." Information paper, n.p., March 2002, provided on 22 July 2002 by Alexandra Hamlet, Hamlet International Inc, Fairfax, VA.
- Heuer, Richards J., Jr., *The Psychology of Intelligence Analysis*. Washington, DC: CIA Center for The Study of Intelligence, 1999.
- Kent, Sherman. *Strategic Intelligence for American World Policy*. Princeton, NJ: Princeton University Press, 1949.
- Lowenthal, Mark. *Intelligence: From Secrets to Policy*. Washington, DC: CQ Press, 1999.
- Millward, William. "Life in and out of Hut 3." In F. H. Hinsley and Alan Stripp, *Codebreakers: The Inside Story of Bletchley Park*. Oxford, UK: Oxford University Press, 1993.
- Moore, David T. *Creating Intelligence: Evidence and Inference in the Analysis Process*. MSSJ Thesis. Washington DC: Joint Military Intelligence College, July 2002.
- Moore, David T. and Lisa Krizan. "Intelligence Analysis: Does NSA Have What it Takes." Reprint. *Cryptologic Quarterly*, Vol. 20, no. 2 (Summer/Fall 2001): 1-33.
- Pappas Aris A., and James M. Simon, Jr. "The Intelligence Community: 2001-2015 – Daunting Challenges, Hard Decisions." *Studies in Intelligence*, vol.46, no 1 (2002): 39-47.
- Schum, David A. *Evidence and Inference for the Intelligence Analyst*, 2 Volumes. Lanham, MD: University Press of America, 1987.

- \_\_\_\_\_. *Evidential Foundations of Probabilistic Reasoning*. New York, NY: John Wiley & Sons, Inc., 1994.
- \_\_\_\_\_. "Species of Abductive Reasoning in Fact Investigation in Law." *Cardozo Law Review*, vol. 22, nos. 5-6 (July 2001): 1645-1681.
- Srodes, James. *Allen Dulles: Master Spy*. Washington DC: Regnery Publishing, Inc., 1999.
- Steele, Robert David "The New Craft of Intelligence: an Alternative Approach Oriented to the Public." Paper presented at the Conference on the Future of Intelligence in the 21st Century, 14-16 February 2001. Priverno Italy, Castello San Marco, 2001.
- Swenson, Russell, ed. *Bringing Intelligence About: Adding Value to Information in the U.S. Intelligence Community*. Washington DC: Joint Military Intelligence College, 2002): 81-113.
- Treverton, Gregory. *Reshaping National Intelligence for an Age of Information*. Cambridge: Cambridge University Press, 2001.
- Tufte, Edward. *Visual Explanations: Images and Quantities, Evidence and Narrative*. Cheshire, CT: Graphics Press, Inc, 1997.
- Wheaton, Kristan J. *The Warning Solution: Intelligence Analysis in the Age of Information Overload*. Fairfax, VA: AFCEA International Press, 2001.