

The Future of Analysis

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The field of intelligence analysis is at an inflection point. Behind us, several decades of accomplishment and innovation, chastened at times by errors and shaped by cautious incrementalism. Ahead, a future—as in all knowledge industries—still coming into view but shaped by the powerful and potentially disruptive effects of artificial intelligence, big data, and machine learning on what has long been an intimately scaled human endeavor, often more art than science, and dependent on individual insights and reputations.

Over the past 30 years I have been involved in writing, leading, and teaching analysis. To be sure, analysis is a craft that has not been fixed in amber, but at no time in my intelligence career have we faced a more fluid analytic landscape. Navigating it will be challenging, and in the face of such a challenge knowing where we started is key to charting the future.

Where We Began

This starts with the namesake of CIA's Sherman Kent School for Intelligence Analysis, where I served as the dean for nearly three years. Creating the school nearly 20 years ago was among the most consequential investments CIA ever made in analysis, and naming it after Sherman Kent was a fitting tribute. Even so, Kent's importance as a founding

father of Allied intelligence analysis is not well understood by many of today's practitioners. Whenever I met with new analysts at the Kent School, I would ask, "Who here has read Sherman Kent?" I would be greeted by very few, if any, raised hands. I liken Kent's writings on intelligence analysis to Machiavelli's *The Prince* or Sun Tzu's *The Art of War*. A lot more people talk about these works than have actually read them.

This is to our detriment, because intelligence analysis is fundamentally about providing an advantage in the planning and execution of national security strategy. At its best, it gives decisionmakers from the Oval Office to the battlefield the time, knowledge, and space to act in defense of the nation. Kent was, and is, central to that objective.

Kent envisioned what he called "an elevated debate," that is, the finest minds engaged in a serious endeavor, steeped in a profound understanding of world history and current events, and organized around a shared foundation of the analytic process. In a collection of Kent's essays on the Board of National Estimates (BNE), collected and published by the Center for the Study of Intelligence in 1994, he articulated a vision that resonates even now:

- I see a Major X write an essay on the theory of indicators and print it

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and have it circulated. I see a Mr. B brood over this essay and write a review of it. I see a Commander C reading both the preceding documents and reviewing them both. . . . I see another man coming forward to produce an original synthesis of all that has gone before. . . . Now if all this sounds ponderous and a drain on time, I can only suggest that, so far, we of the Western tradition have found no faster or more economical way of advancing our understanding.^a

Kent's work on confidence, probability, estimative statements, and dissents still underpin all-source intelligence analysis today. Even if Kent is no longer as widely read by practitioners, intelligence analysis is still shaped by his approach to the craft. It is threaded through the foundational training offered at the Kent School, in the same way that Machiavelli's observations still permeate the conduct of statecraft.

During my time as director of the *President's Daily Brief Staff* and as vice chairman of the National Intelligence Council (NIC), whenever I faced a challenge of policy or tradecraft, I looked first to Kent's essays for guidance. In many respects, they remain timeless. I have wondered then, what would happen if Kent were somehow to return and rejoin our ranks? There would be much for him to learn, of course, but

fundamentally, I argue that in many corners of the Intelligence Community, the contours of our analytic work would be familiar to him.

Read Stuff, Write Stuff

That is because much of what we have done over the years, and in many cases still do, comes down to this: read stuff, write stuff. I do not mean that dismissively. And I realize many readers are already thinking about how the sophisticated fusion of collection and analysis happening in their communities contradicts what I just said. I will return to that later.

For now, I will contend that, as in Kent's day, a significant portion of intelligence analysis still consists of sense-making, the cognitive shortcut of putting new developments into a heuristic framework that we all use to categorize events and anticipate the future. Kent was a gifted thinker and writer, and he surrounded himself with men of similar backgrounds, from a handful of prestigious universities and shaped by the seminal events of the early 20th century. All of them were very good at the same thing: reading stuff, writing stuff.

To be sure, Kent has his critics. He had them at the time, for example in his disagreements with contemporaries about the appropriate distance between policy formulation and intelligence analysis. Kent also tussled, as

would his successors, over proximity to the director of central intelligence and the independence of the Board of National Estimates. Most damning, though, are the criticisms aimed at Kent then and now for a signature failing: the 1962 Special National Intelligence Estimate that concluded the Soviet Union would not place strategic weapons in Cuba. Kent was catastrophically wrong, of course, but he consistently defended the estimate, writing in 1964:

No estimating process can be expected to divine exactly when the enemy is about to make a dramatically wrong decision. We were not brought up to underestimate our enemies.^b

In other words, Kent was arguing we weren't wrong, the Russians were wrong. If the Cuba NIE were a one-off mistake, we might take Kent's defense at face value. But it was not, and we know the elevated debate that Kent envisioned has repeatedly proven itself inadequate to the task. In every decade since the modern Allied intelligence community was developed after World War Two, perceived failures of analysis—many so well autopsied that they are popularly shorthanded as “the fall of the Shah” or “collapse of the Soviet Union” or “weapons of mass destruction” and the like—have highlighted the inherent weakness of simply relying on very smart (and very similar) people to read a lot of reports and make accurate assessments.

a. Sherman Kent, “The Need for an Intelligence Literature,” in *Studies in Intelligence* 1, no. 1 (1955), 1-11.

b. Sherman Kent, “Cuban Missile Crisis: A Crucial Estimate Relived,” in *Studies in Intelligence* 35, No. 4 (December 1991)

Where We Are

This leads us to the discussion of where we are. In his landmark 2005 book, *Analytic Culture in the US Intelligence Community*, Dr. Rob Johnston observed:

As it is now practiced, intelligence analysis is art, tradecraft, and science. There are specific tools and techniques to help perform the tasks, but, in the end, it is left to individuals to use their best judgment in making decisions.^a

Those judgments were shaped by a fin-de-siècle codification of what I think of broadly as the “style of analysis,” that is, the rules of logic, argumentation, and evidence, but also the presentation and prose of all-source intelligence analysis produced by nearly all intelligence agencies. The emergence of more uniform approaches to hiring, analytic training, editorial review, and publication further reinforced the dominant analytic culture. Some of this occurred organically, some was accelerated by the creation in 2005 of the Office of the Director of National Intelligence; regardless, there is today a high degree of commonality across analytic producers.

No culture or industry is fully insulated from change, however, and nearly 15 years on from Johnston’s assessment, it is clear the business of analysis is in flux. It is impossible to reprise every factor that has contributed, but I will highlight five key drivers that emerged somewhat

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- 1. *Structured analytic techniques*, or SATs, intended to counteract biases that cloud our perceptions and warp our predictions, as in the Cuba NIE, have become commonplace. Many have written on this subject, but the late Richards Heuer’s *Psychology of Intelligence Analysis*, published in 1999, remains the benchmark. Heuer observed, “Intelligence analysts should be self-conscious about their reasoning processes. They should think about how they make judgments and reach conclusions, not just about the judgments and conclusions themselves.”^b
- 2. *Advances in cognitive sciences* and fields like behavioral economics have shed new light on the complexities of human behavior. For intelligence analysts, we better understand how actors make decisions, how badly humans gauge risk and reward, and how we conflate probability with confidence.
- 3. Improvements in quantitative approaches to forecasting, as in Philip Tetlock’s *Expert Political Judgment*, showed the limits of expertise and the need for structured forecasting tools like the IC Prediction Market.^c As applied to intelligence analysis, Tetlock and his colleagues argue, with
- 4. Counterterrorism analysis, collection, and operations since 11 September 2001 created a new demand for dynamic, hyper-specific analysis to detect and disrupt individuals or networks. The subject’s vast domain, demonstrable life-and-death importance, and expansive set of practitioners—international, federal, state, local, tribal, private sector, law enforcement, and public institutions—give it an outsized impact on our craft.
- 5. The explosion of data has increased the complexity of an analyst’s job, but likewise potentially increased the fidelity of many assessments. We are awash in ones and zeroes that can be linked, analyzed, and leveraged, if we ask the right questions of the right data sets.

Taken together, these drivers have reshaped the analytic profession and democratized the number of actors producing high-quality analysis outside of government. As a University of Pennsylvania study of global knowledge trends noted, “new technologies have leveled the global playing field in a way that challenges established powers and elite institutions around the world.”^d In addition

a. Rob Johnston, *Analytic Culture in the US Intelligence Community*, (CIA, Center for the Study of Intelligence, 2005)

b. Richards J. Heuer, *Psychology of Intelligence Analysis* (CIA, Center for the Study of Intelligence, 1999).

c. Philip Tetlock, *Expert Political Judgment: How Good Is It, How Can We Know?* (Princeton University Press, 2005)

d. James McGann, *Global Go-To Think Tank Index Report* (University of Pennsylvania Scholarly Commons, 2015)

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to the sense-making that Kent would recognize, analysis today encompasses targeting, full-motion remote sensing, financial intelligence, identity intelligence, structured observation management, prediction markets, financial intelligence, activity-based intelligence, data analysis, object-based production, cyber forensics, social media analysis, and more. The list is dizzying.

The next question we must ask is whether all of this has the potential to cohere into a new kind of analysis, one that better realizes Johnston's notion of art, science, and tradecraft but responds to the criticisms of Tetlock and others. What then is the elevated debate of the future?

Looking Out to 2030

To explore this question, it is useful to extend our horizon out toward 2030. This helps us avoid the forecaster's trap of predicting the present without reaching so far as to be in fantasy. So let me describe a future, not the only future but certainly a plausible version, and then talk about how we get there.

It is Monday morning. The analyst checks in with her digital assistant. Maybe the analyst is at home, or in the office, or on vacation. It doesn't matter where, because we have solved the secure-mobile problem. In 2030, we depend on analysts as we always have, but far fewer of them. Ever-smarter algorithms mean analysts are focused on work that is consistently higher on the value

chain. Artificial intelligence sifts data, spots discontinuities, and synthesizes results; analysts provide theory and structure. As Nate Silver observed in his *The Signal and the Noise*, "Statistical inferences are much stronger when backed up by theory or at least some deeper thinking about their root causes."^a

But beyond just data, the information technology ecosystem our analyst is experiencing knows much more: her past analytic lines, sources of information, competing hypotheses, and alternative views. It also knows how good she is at her job. The digital assistant offers this advice:

You last wrote about political stability in Farlandia six months ago. At that time, you judged the prime minister's coalition government was at risk of fracturing because of public dissatisfaction with the economy, a corruption scandal involving her husband, and wrangling among coalition partners over ministerial positions.

You said Farlandia's tipping into recession would be a precipitating factor in calling for new elections.

Yesterday the economics ministry released GDP figures showing a 2-percent decline over the previous quarter, the third quarterly drop. Farlandia is now in recession.

The prediction market rates the prime minister's chance of dissolving parliament by the end of 2030 at 63 percent, compared to 44 percent last week.

Our Embassy is reporting the prime minister's husband has expatriated \$137 million and is preparing to flee the country.

Sentiment analysis shows a 27-percent increase in negative comments across all social media platforms.

Would you like to update your analysis? Okay, let's get started. I recommend you use structured analytic techniques to test your assumptions and array the variables first.

In addition, consider that the global base rate for a no-confidence vote in similar situations over the past 40 years is 67 percent, slightly above the prediction market.

There is new sensitive compartmented reporting relevant to your account. You need to contact a control officer to gain access.

One report you cited in your previous update has been recalled because the source is now known to be a fabricator. You had made his information a linchpin in your previous assessment. You should revisit your assumptions.

There are 34 other analysts in the Intelligence Community that work on Farlandia. You can find their accuracy ratings on the Analyst Box Scores. I have created a collaboration page and sent invitations to all relevant offices.

Warning. Your personal accuracy rating has fallen three points to 47 percent. Your projections are now slightly worse than flipping a coin. You are currently ineligible for a performance bonus. Improve your score by reviewing this course on the fundamentals of prediction markets.

Is that disturbing? Maybe a little, but we must acknowledge this is a plausible future. Artificial intelligence (AI) and machine learning are fast becoming essential parts of analytic processes. Generative Adversarial Networks—networked systems competing with each other to learn faster—are enabling computers to perform tasks that just a few years

a. Nate Silver, *The Signal and the Noise: Why So Many Predictions Fail—and Some Don't* (Penguin, 2012)

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ago seemed profoundly, even exclusively, human, like playing complex board games or recognizing faces. Analysis will not be immune.

Knowledge work, from medicine to law to journalism, is already being outsourced to algorithms, not overseas workers or robots. Oxford University researchers Carl Frye and Michael Osborne in 2013 concluded nearly half of all American jobs were at high risk of being automated within 20 years.^a These include the kind of jobs many intelligence analysts have, the kind where you read stuff and write stuff. Even if their predictions are overwrought, as some have argued, Kent's confidence in 1980 that "the game still swings on the educated, thoughtful man, not on gadgetry" rings ever more distant.^b

To be sure, the path toward this future will be uneven. There will be hype and disappointment, and early-adopters will occasionally end up in technology cul-de-sacs. The Silicon Valley mantra of "fail-fast, fail-often" works best with someone else's money; government investments necessarily need to be more

deliberate. But there are things we can do today to help us shape the future of analysis. Here are five suggestions:

- Embrace data-driven analysis as mainstream analysis. There can no longer be a difference between the two. Not every analyst needs to be a data scientist, but every analyst needs to know how to leverage data science.
- Ensure structured analytic techniques and other qualitative tools deliver quantitative improvements. Blind faith in SATs is no more redemptive than any other blind faith.
- Shorten the feedback loop to improve analytic outcomes. In fields from health care to agriculture to manufacturing, data are continuously evaluated and fed back into production cycles. We need to do the same.
- Measure and reward accuracy. In our business, sometimes it is okay to be wrong for the right reasons, but we need dynamic assessments

of analytic accuracy at the lowest organizational level possible.

- Hire, develop, and keep agile talent, and deliver continuous learning opportunities throughout their careers. The jobs of the future may not exist yet, but the workforce of the future is already here.

After more than 30 years, I remain fundamentally optimistic that CIA and the broader Intelligence Community will evolve and thrive. Analysts of every stripe are preternaturally inclined to embrace new sources of information and new ways to improve the quality and relevance of their insights. Collectors everywhere look for every new data source that could close intelligence gaps. Technologists seek the latest and greatest tool in every domain. Leaders at every level want the advantage that data can provide, but so too the multiple viewpoints of a diverse and inclusive workforce. Most importantly, as former NIC Chairman Greg Treverton regularly observed to me, we are in the client-services business. This relentless focus on our client, from the White House to the warfighter, will continue to be our greatest inspiration for innovation and adaptation.



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a. Carl Frey and Michael Osborne, *The Future of Employment* (Oxford University Press, 2013)

b. Harold P. Ford, "A Tribute to Sherman Kent" in *Studies in Intelligence* 24, No. 3 (September 1980)

