

# Thinking Straight and Talking Straight: Problems of Intelligence Analysis

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The vital mission of supplying accurate and actionable intelligence for the 'global war on terror' is threatened by a convergence of societal and governmental trends that make it extremely difficult to hire the right people, train them or allow them to collaborate effectively. Moreover, none of the current efforts to reform the US intelligence community addresses these virtually intractable pedagogical, cultural and organisational challenges. However, there are some possible, albeit partial, remedies to these weaknesses. Emerging information technology, already being adopted by commercial and non-governmental enterprises, has the potential to address key aspects of the structural problems plaguing the intelligence community.

The emergence of the jihad confronts US intelligence services with multiple challenges. Many of these have been considered in substantial detail by the 9/11 Commission<sup>1</sup> and the Robb/Silverman Commission<sup>2</sup> as well as myriad commentators and policy analysts. For the most part, the problems and their proposed, or legislated, remedies have focused on the organisation of the intelligence community and how it collects information. Thus, the community now has a new chief, in the form of a director of national intelligence, who possesses a degree of budget authority over the diverse elements of the community that his predecessors never enjoyed. The community also now has another member, responsible for the coordination of intelligence relating to terrorism, called the National Counterterrorism Center (NCTC), which grew out of the Terrorist Threat Integration Center. This was the organisation created in the wake of the 11 September 2001 attacks that was supposed to connect the dots that the

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FBI and CIA had failed to connect in the months before the assault. The post-11 September impulse also led to a reconsideration of budget allocations for human intelligence and various kinds of technical collection, as well as a surge in recruiting. The focus of change has been the knitting together of the intelligence services along the lines of the 1986 Goldwater–Nichols Act, which created the joint staff for the uniformed services and made the prospect of truly multi-service operations a reality.

The restructuring of the intelligence community is meant to ensure that domestic information of the kind largely gathered by federal law enforcement authorities is effectively and swiftly meshed with foreign intelligence gathered by the CIA and other agencies, particularly the National Security Agency (NSA) and space-based reconnaissance organisations that have gone by a number of names in recent years. Americans have long been enamoured of organisational remedies to complicated problems revealed by traumatic events. In effect, reorganisation is the default solution, especially when political pressures for rapid response in a crisis push decision-makers toward options that can be implemented quickly and without arousing an entrenched opposition.<sup>3</sup> This new and massive undertaking is like pyramid building in ancient Egypt. It will take years to produce results.

While the construction process is underway, the community will face another set of challenges not directly addressed by the Intelligence Reform and Terrorism Prevention Act of 2004, which governs much of this vast reorganisation. The intelligence problem posed by Islamic militancy is profound. It is driven, enabled and accelerated by interlocking social, economic and religious concerns that are difficult to separate and are mutually reinforcing. The values underlying the jihad are those of social justice, individual and group identity, and the appropriate relationship between man and god. Its emotive quotient is high, fuelled by feelings of humiliation and deprivation on the one hand and convictions of entitlement, superiority and retributive authority on the other. The jihad is unified by a shared sense of constructed community, what the French sociologist Olivier Roy calls participation in the new *umma*, an imagined and deterritorialised entity that confers purpose and dignity on its flesh and blood members.

At the same time, the jihad is distributed locally and is therefore shaped by proximate factors that run counter to, or alongside, the imperative of the new *umma*. Individuals attracted to this community and the jihad share a rhetoric and corpus of texts, but they speak different languages among themselves and have diverse histories. Coming to grips, in analytical terms, with a phenomenon that is at once local and global, unified and splintered is a daunting task. The fact that jihadists piggyback on informal networks that developed to enable the urban poor in the Middle East and their diasporas in Europe to obtain social

services and economic goods that government bureaucracies could not provide – either at all, or without some risk to the petitioner – further burdens the analyst seeking to map the pathways of the insurgency and identify targets.

To decode these complex patterns of organisation, operation and motivation, the intelligence community requires analysts who are extremely culturally and psychologically aware, and self-aware, have a command of one or more foreign languages, have experienced life overseas, and possess the methodological skills to structure logical arguments based on transparent premises, while making legitimate use of the available facts, and accounting for their personal biases. Unfortunately, as a statistical proposition, such analysts do not exist. To be sure, the intelligence community continues to attract some of the minds it needs and some new recruits whose intellects are unformed at the outset of their careers blossom over time. This, however, is a numbers game and such individuals, counted against the vastness of the recruiting pool, are so few in number as to have only episodic impact. If the choice of an appropriate strategy hinges on knowing thine enemy, as well as thyself, then the pervasive defects in reasoning skills, cultural and historical knowledge and analytical self-consciousness are a serious impediment to success.

### **The recruiting challenge**

The intelligence community is saddled with large numbers of new recruits who are, on average, ill equipped to manage the complex analytical demands posed by a new, highly distributed and strongly motivated adversary operating within a framework of values, beliefs and experiences alien to the average American. The aetiology of these intellectual shortfalls is systemic, the product of broad social conditions that are probably irreversible, at least within the timeframe of the current struggle against Islamic extremism. The intelligence community itself is incapable, owing to a mix of programmatic, budgetary and cultural reasons, of compensating for the defects in its recruitment pool, especially when it needs to bring on analysts and others quickly and in large numbers.

This situation is the result of a confluence of broad social and specific pedagogical factors. The study of foreign languages, especially at an advanced level, conveys an important degree of understanding of the cultures that find expression in the languages being learned. This is not always the case, of course, as exemplified by the report of the British scholar who interviewed Iraqi Deputy Prime Minister and fluent English speaker Tariq Aziz before the recent Iraq war and described the latter's astonishment that Tony Blair did not withdraw his support for the United States upon learning of the Archbishop of Canterbury's opposition to military intervention.<sup>4</sup> Yet exposure to the literature, history and

cultural preferences that students get from foreign language study can still be significant. American students, however, do not concentrate on foreign languages in college. In fact, only 10% of enrolled students study a foreign language; a far smaller percentage concentrates in one. The top five choices are Spanish, French, German, Italian and American Sign Language, which now counts as a foreign language toward the requirements for graduation in many schools and is the fastest growing language of choice. Arabic ranks 12 out of 15, between ancient Greek and biblical Hebrew, but enjoyed nearly a 100% increase between 1998 and 2002.<sup>5</sup> Comparatively few American students spend extended periods living overseas. The probability, therefore, of even self-selected students with a strong interest in

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world affairs, the sort of young adult who would apply for a job in the analytical directorate of CIA, having the sort of nuanced cultural sensitivities that would be so useful in the current context is vanishingly small. The government is not in a position to inculcate this sort of knowledge. It takes 33 months of full-time instruction in a language not written in the Latin alphabet to bring the average student to a so-called 3.3 level, which reflects competence but not fluency. Part-time instruction drags this period out to 55 months.<sup>6</sup> There is no way that the intelligence community in present circumstances can afford to hire new analysts and not have them behind a desk for their first three years.<sup>7</sup>

The obstacles to cultural awareness are not confined to low rates of foreign language study:

According to a 2003 American Historical Association study, although the number of history majors in American undergraduate programmes began to rise in 1998 after years of shrinkage, the number of graduate-level history students has continued to contract. Moreover, the study noted the parochial tendencies of American history students, pointing out that history graduate programmes at all types of institutions are prone to ignore large areas of the world in their course offerings. More than half of the history graduate programmes do not offer graduate-level courses in fields outside of the United States and Europe.<sup>8</sup>

Given the salience of Muslim attitudes in the current struggle against extremism, which themselves are highly diverse, the relative absence of these topics from the curriculum is unsettling.

There is another, more fundamental issue. Students graduating from four-year institutions of higher education in the United States are not well equipped for critical thinking. Critical thinking is a term used to refer to those kinds of

mental activity that are clear, precise and purposeful. It is typically associated with solving complex real-world problems, generating multiple – or creative – solutions to a problem, drawing inferences, synthesising and integrating information, distinguishing between fact and opinion, or estimating potential outcomes, but it can also refer to the process of evaluating the quality of one's own thinking. Among the incapacities of these students is, astonishingly, the failure to understand the nature of different kinds of correlation, for example that causation and correlation are differentiated. Lurking variables are not easily identified. Students are prey to the fallacy of suppressed evidence, whereby data that conflict with arguments they favour are ignored (not a shortcoming of American college students only). This is problematic, especially insofar as it suggests a lack of self-consciousness, or obliviousness to their biases.

A second common fallacy observed by education experts is that of hasty conclusion, whereby the number of examples adduced in support of an argument is too small, or of the wrong kind. That is to say, students do not recognise when samples are insufficient or unrepresentative. More generally, students appear to find it hard to recognise an argument when they see one. Thus, they fail to identify premises and in consequence cannot separate conclusions from the assumptions that undergird them. It is difficult for many students, therefore, to grasp the point a writer or speaker is striving to make, let alone the logical structure of the underlying case. The result is that it is difficult for American college students to evaluate an argument, identify its strengths and weaknesses and ask whether an author's assertions are really true. According to Professor Patricia King of the University of Michigan, who has been studying critical thinking among college students for 25 years, 'even four years of college only brings traditional-age college students to a very low level of critical thinking and judgments'.<sup>9</sup> These intellectual weaknesses are a serious problem in the pool from which the intelligence community must draw its cadre of analysts. They are especially troubling given the prominence of inference in the production of intelligence estimates regarding a range of threats. The community's misjudgement regarding the presence of chemical, biological or nuclear weapons in Iraq, which reportedly stemmed at least in part from pressure exerted by an administration determined to go to war, was also the result of poor argumentation and analysis within the intelligence directorate.<sup>10</sup> The CIA has lately developed an interest in critical thinking, but according to an official responsible for developing curricular options and recommendations for enhancing this attribute of analytical work, research on the matter has only just begun.<sup>11</sup>

Seasoned observers attribute this state of affairs to several relatively recent developments. First is the transformation of students into consumers, or, as they are now called on some campuses, clients. (The term was once enveloped by

quotation marks; no longer.) This trend is intertwined with a commoditisation of education. The college experience is purchased by the student so that he or she can hurdle the barriers to entry for his or her chosen field. Thus, many states assess the performance of their educational systems by how well they prepare students for various licensure examinations. In a crowded and competitive marketplace, students qua consumers can demand high grades. Predictably, grade inflation has become endemic. Some universities, Princeton for example, no longer give grades, conceding defeat in the battle for meaningful grading. In this environment, nationwide standardised testing has become the sine qua non for the transition of students from college to professional school, or in some instances, directly into professional life. In addition to high grades, students naturally demand adequate preparation for these examinations. Faculties comply. Yet the more intensively colleges teach toward standardised examinations, the less they can do to inculcate critical-thinking skills in their students. This yields a perverse outcome, explained by one of the few things that are comparatively clear about the way in which values are transmitted. Seminar-style instruction, which is characterised by a high level of interaction and argumentation, tends to develop critical thinking better than structured, lecture-style teaching that prepares students for standardised tests. From the perspective of students in this market, the benefit to them of critical-thinking skills must be compared to the economic advantage they are likely to accrue by performing well on standardised tests and by limiting classroom risk via carefully judged responses formulated to give the teacher what he or she is presumed to want to hear. Hence, as things now stand, the incentive structure reduces the space for critical thinking.

Other contributing factors are somewhat more difficult to pin down. A broader cultural paradigm now regulates intellectual discourse in the United States. As has happened periodically in the American historical experience, the boundaries of permissible debate have shrunk, as the centre of gravity of public discourse has shifted to the right. As Richard Hofstadter argued in 1962, there has long been an anti-intellectual current in American life.<sup>12</sup> It ebbs and flows. Hofstadter argued that anti-intellectualism was a function of three conditions: the rise of evangelical religion, the emergence of business-oriented education, and the periodic prominence of the populist political style. Religion condemned relativism, business disdained regulatory expertise, populism derided the idea that specialised knowledge merited respect. He concluded that 'anti-intellectualism is, in fact, older than our national identity ... Regard for intellectuals in the United States has not moved steadily downward ... but is subject to cyclical fluctuations.'<sup>13</sup> By some measures, the United States is now subject to such a cyclical fluctuation. Indeed, the conditions that Hofstadter believed to favour anti-intellectualism might be

said to constitute the prevailing zeitgeist in America today. The broader cultural scene probably interacts with the incentives described above to further discourage an interest in critical thinking in colleges and universities.

Another relevant dimension is the increasing prominence of religion in American public life. This phenomenon coincides with, but is not the same as, a greater prevalence of spirituality or religious devotion as an attribute of private life. For the most part, this trend is reflected in a popular desire to see religious values reflected in public policy. A number of practical implications flow from this desire: in domestic policy terms, opposition to abortion, attempts to outlaw same-sex marriage, prohibition of stem-cell research, and support for school vouchers; in the domain of foreign policy, there has been pressure on the administration to act on human slavery, relieve suffering in the Sudan, and castigate countries, like Saudi Arabia, that discriminate against Christians.

There is yet another focus for religious activism – the classroom. Two concerns animate strong feeling. First, many Americans are dismayed by the constitutional ban on prayer in schools. According to Pew Foundation surveys, a significant majority believes that the government ‘has gone too far’ and that some form of daily prayer ought to be permitted, even if only an allegedly non-sectarian moment of silence. The second issue pertains to the teaching of creationism, or ‘intelligent design’, which amount to the biblical narrative regarding the origin of life and especially the human species. About half of all Americans would like to see this cosmological account either replace or be taught alongside the theory of evolution.

While religious faith and critical thinking are not irreconcilable – and, in fact, explorations of their interaction have produced some of the greatest works of theology<sup>14</sup> – religious discourse based solely on literal interpretation of sacred texts runs counter to the demands of critical thinking and undermines the space for it in the school environment. This is important within the framework of a discussion of American education, because faith-based knowledge derived from fundamentalist hermeneutics is not what the intelligence community needs.

This influence of fundamentalist doctrine on curriculum development is not confined to the secondary level. As the overall rise in religious commitment would suggest, Christian colleges hold increasing appeal for prospective students in the education market. Enrollments are on the upswing. Indeed, this is the fastest-growing sector of the education market.<sup>15</sup> Of the 4,200 degree-granting institutions of higher learning in the United States, 900, or a bit over one out of five, are religiously affiliated.<sup>16</sup> This segment of the demand curve is differentiated by its promise of credentialing, communitarianism and spiritual fulfilment. Faith-based scholarship, according to Notre Dame historian George M. Marsden,

owes its current popularity to the dwindling prestige of 'progressive secular humanism'. Marsden notes that the approach to teaching and research at these colleges does not rely solely on Scripture, but rather retains accepted scientific methods of inquiry, while informing the interpretation of facts and events with the faith of the believer.<sup>17</sup> Yet it is difficult to see how this style of instruction can cultivate the sort of critical-thinking skills that are crucial to analysis of the current threat environment. At the same time, it is plausible to assume that as enrolment increases, graduates of these colleges and universities will grow as a proportion of the recruitment pool for intelligence agencies' analytical arms.

Additional obstacles to recruitment and intellectual development of new analysts that are peculiar to the intelligence community complicate an already compromised enterprise. With few exceptions, direct hires as well as those seconded to intelligence agencies and with access to their computer systems must pass a polygraph examination in addition to a full background investigation.

Polygraph examinations fall into two basic categories. The one that applies to

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new hires is the so-called 'lifestyle poly', which confronts the examinee with a series of intrusive questions designed to elicit emotional reactions that reveal patterns of deception. A variation on trial by ordeal, the test is inevitably harder on applicants with vivid imaginations, greater than average tendency toward introspection and self-consciousness, and an ability to think quickly and systematically through the manifold implications of every response they provide to the examiner. The polygraph therefore weeds out some, though certainly not all, of precisely those intellects most needed for analytical functions. This, too, is not subject to

change. The polygraph is a right of passage and a mark of fellowship within the community, whatever its value as a counter-intelligence tool; it is analogous to jumping out of airplanes for recruits in the XVIII Airborne Corps, at a time when very few military strategists believe that large-scale parachute drops are feasible in combat.

Although these problems are widespread, they do not affect every bit of the sprawling US intelligence structure. For example, the Bureau of Intelligence and Research (INR) at the Department of State has proved to be relatively immune because it is staffed largely by foreign service officers, who, as a practical matter, have extensive experience overseas and a command of one or more foreign languages, are selected for their ability to think critically about what other people are saying, are relatively mature and understand the policy context of intelligence requirements. They are also situated in a smaller bureaucracy and think

of themselves as the 'Team B' of the broader community. Yet INR is the exception that proves the rule. The ability of the CIA alone, which is only one component of a far larger intelligence community, to deploy standards that are remotely near those intrinsic to INR, is nil. The CIA, responding to post-11 September presidential guidance to increase its staff by 50%, is hiring an estimated 2,000 individuals per year, through a system of 800 recruitment events nationwide per year, as well as an online recruiting system.<sup>18</sup> At this rate of growth, George Tenet's 2002 forecast that by 2005, 30–40% of CIA personnel will have been on the job five years or less, will prove to be understated.<sup>19</sup> The size of the influx and ratio of experienced officers to novitiates militates against the hiring or cultivation of culturally aware critical thinkers.

It could be argued that none of this really matters. Intelligence assessments that have had the most profound effects on foreign policy, especially those that proved wrong, were shaped by political and ideological forces that transcended the skills and abilities of individual analysts, especially those of new recruits. Examples are legion. Consider the judgement regarding Soviet nuclear capabilities that failed to account for the enemy's penetration of Los Alamos; the failure to detect the Sino-Soviet split because of a conviction that all communists shared the same strategic interests; the miscalculation regarding Soviet missiles in Cuba that precipitated the worst crisis of the post-war period; the ideologically driven dispute in the 1980s regarding Soviet military power that led to the brief experiment with Team B analysis and a massive upsurge in defence spending; the misjudgement of Saddam Hussein's intentions in 1990, which necessitated an intervention that most analysts link to the rise of al-Qaeda; the tussle over the speed with which North Korea would obtain medium-range ballistic missiles in the mid-1990s; or finally the faulty assessments of Iraq's chemical, biological and nuclear weapons holdings and links between Saddam's regime and al-Qaeda.

The role of ideology and party politics in the creation of intelligence estimates on broadly gauged, highly charged strategic questions will always be a factor in national security policy. Yet many of these estimates, good or bad, were based on counting things or mirror imaging, which do not always result in bad analytical outcomes if the adversary is a bureaucratic national security state with centralised decision-making. With an adversary like jihadists, counting pieces of hardware or anticipating the choices of utility maximisers that resemble us are no longer relevant tools or cognitive approaches. The very foreignness of this partly leaderless resistance, which frames its cause in religious terms, requires the sorts of tools – critical thinking and cultural awareness – that are most scarce. That some intelligence outcomes are driven by our own ideological lenses does not change this fact.

### The culture challenge

A system of mentoring might offset some of the gaps in critical-thinking capacity and subject-matter knowledge. New recruits to the analytical ranks might arrive with undeveloped critical-thinking skills and appreciation of other cultures, but senior analysts who take them under their collective wing could foster these qualities while ensuring that the analysis provided by new recruits is leavened by their own knowledge and experience. In an interview with a former deputy

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director of central intelligence, the issue of mentoring came up. The interviewee averred that mentoring had lapsed at the CIA, but that there was a vigorous effort underway to revive it. It was not until he was midway through describing the new mentoring programme that it became clear that it did not relate to intellectual development, but rather aimed to help new recruits navigate the shoals of careerism within the agency. When asked about mentoring to foster critical-thinking skills and substantive knowledge, he waved his hand and said

‘that they get on the job’. Even if the intelligence community were to conclude that this alternative form of mentoring would be of some benefit, the combination of large-scale hiring and community-wide management requirements will have reduced the ratio of potential mentors to new hires to an unworkably low level.

And precisely what do junior analysts learn through on-the-job training? The bulk of their time is consumed by ‘current reporting’. This process boils down to providing a classified clipping service for intelligence consumers that summarises recent intelligence gathered on a particular issue. The resulting textual documents (either hardcopy or digital) are essentially running summaries of what has happened, with very little emphasis upon plausible future extrapolations concerning threat behaviour, strengths and weaknesses. The whole process of current reporting resembles nothing so much as monks in the Middle Ages extracting and copying (or epitomising, as it was called) portions of manuscripts written earlier by scholars in antiquity.

The analytical tyranny of a current-reporting culture within the intelligence community is not news. Four days after 11 September, Rob Johnston, an anthropologist working for the Institute for Defense Analyses, began a Director of Central Intelligence postdoctoral two-year research fellowship with the Center for the Study of Intelligence. Johnston’s charter was ‘to identify and describe conditions and variables that negatively affect intelligence analysis’ and ‘to investigate analytic culture, methodology, error, and failure within the intelligence community’. Johnston’s study included

four hundred and forty interviews with intelligence professionals, academics, and researchers throughout the intelligence community, participation in intelligence training programs, workshops, and focus groups, direct observation of intelligence analysts performing their duties, and participant observation in a variety of analytic tasks.<sup>20</sup>

Johnston found that the analytical culture of the intelligence community is a serious impediment to detecting threats, especially of the asymmetric sort, and providing timely and specific warning. He describes a type of classified newsroom where attempts to project threats are unrewarded, even punished. In-depth speculative research is impossible due to the tempo of current reporting and discouraged because incentives are structured by results that are easy to quantify, such as the number of reports that analysts produce. In short, the intelligence community accrues social capital through current reporting, while avoiding riskier, inference-based analytical product that might lead to dreaded intelligence failures.

Johnston's findings are corroborated by Carl Ford, a former CIA analyst and chief of the State Department's Bureau of Intelligence and Research: 'If I had to point to one specific problem that explains why we are doing such a bad job on intelligence, it is the almost single minded focus on current reporting. Analysts today are looking at intelligence coming in and then writing what they think about it, but they have no depth of knowledge to determine whether the current intelligence is correct. There are very few people left in the intelligence community who even remember how to do basic research.' Ford estimates that over three-and-a-half decades the CIA switched from 70% to 80% of the analytical work force conducting long-term research to 90% of all analysts focused exclusively on current reporting.<sup>21</sup>

Thus, the current remedial actions underway in the intelligence community – organisational restructuring, additional personnel and increased resources – do not adequately address the problems of the analytical culture that spawned the recent intelligence failures. As long as analysts are trained and rewarded for collecting and reporting rather than probing and predicting, the probability of catastrophic strategic asymmetric surprise will remain high.

### **Are we speaking the same language?**

Even as the intelligence community must manage the problems of poorly prepared recruits and a dysfunctional analytical culture, it must support an intricate national security strategy intended to counter the ideational component of the threat and court allies in the struggle, while destroying the adversary's networks, taking individual terrorists off the street, and disrupting efforts to penetrate

US defences and strike Americans within their borders. The NCTC, the new intelligence organisation charged with selecting and assembling threat-related information both to warn and inform government action, will likely be designated as the coordinating body for a new 'national implementation plan'. This plan is to be predicated on a forthcoming National Security Policy Directive (NSPD) that will set the stage for the 'war on terror' through the end of the current administration. Although the broad outlines of the NSPD were completed almost a year ago, skirmishing among agencies

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over lead responsibilities for the many missions specified by the multifaceted strategy has kept the document from reaching the president's desk for signature.

This delay is emblematic of the challenge that awaits the NCTC staff in winning the cooperation of disparate agencies, including the Departments of Homeland

Security, Justice and Defense, among others. Comity within the intelligence community itself is not a sure thing, given the internecine animosities stirred up by the creation of the NCTC and its rivalry with the Counterterrorism Center lodged in the CIA. The successful coordination of an implementation plan will depend largely on the direct involvement of John Negroponte, the director for national intelligence, with the active support of the White House.

Nevertheless, the effort will not produce lasting results unless the many agencies involved understand each others' terms and policymakers understand the analytical process informing options and recommendations advanced by the intelligence community. The obstacles to mutual understanding are profound. Among agencies, managers and action officers use vocabularies that are specific to their own organisations. The same term often means different things to users in separate organisations. An old Pentagon canard illustrates the point: to the Marine Corps, 'securing' an objective entails destroying it; to the Air Force, it means that acquisition paperwork has been completed and conforms to the Uniform Code of Commercial Practice. More to the point, 'target', as a verb, can mean to acquire an object in order to destroy it, or to single out for purposes of surveillance or intensive study.

The basic problem stems from moving knowledge created using evidence and analysis in one group or organisation into another. This is not a trivial undertaking, because the process, language and ultimate purpose of the created knowledge often differ radically between the originating and receiving organisations. Commercial enterprises have long been aware of similar knowledge-transfer pitfalls. Using automobile industry case studies, Paul Carlile has demonstrated that 'knowledge boundaries' exist on at least two levels.<sup>22</sup> In the

first, interpretations and meanings are different on either side of the boundary. Despite the fact that two groups are dealing with the same basic subject matter, their frames of reference are different enough to make effective communication difficult. Furthermore, the more specialised the knowledge the more difficult it is to move across this type of boundary. For example, analyses involving jihadist perceptions or technical details concerning chemical, biological or nuclear weapons can often generate interpretive or semantic differences between originating and receiving organisations as to what a word, measurement or outcome actually means. Overcoming this barrier requires the active working out of shared meanings through a series of dialogues – questions and answers that lead to a common, agreed-upon language. Commercial enterprises have addressed this challenge through the creation of shared meaning, making tacit specialised knowledge explicit by bringing the disparate team members together and having them create a common language. The analytical community has few opportunities for forging such a common language.

The second level of potential misunderstanding is even more difficult to cross. Differences and dependencies on either side of the boundary generate barriers that protect one side or the other from the bureaucratic ramifications that could result from cooperation. Thus, the boundary between the intelligence and the policy communities manifests itself in the role that intelligence plays in policy formation and the constant tension between delivering objective intelligence to the policymakers and tailoring intelligence to support preferred policy initiatives. Policymakers often suspect that the assessments proffered by intelligence analysts conceal more than they reveal and are constructed so as to subtly constrain or channel policy options. Intelligence analysts can feel as though their conclusions are manipulated by policymakers in a way that subverts the judgement of the community. As a result, policymakers, especially those at senior levels with access to raw intelligence data, try to be their own intelligence analysts, while the intelligence community hedges its bets. To short-circuit this dynamic, policymakers need a window onto the analytical process that they do not now enjoy. Again, there are few mechanisms in place between the intelligence and policy communities to support such dialogues.

### **How information technology might help**

The three burdens sketched out thus far – a workforce with limited critical-thinking skills, a dysfunctional workplace culture and organisations working toward a common purpose, but, as Winston Churchill described the United States and Great Britain, separated by a common language – have long been a feature of corporate life. One way firms have tried to alleviate these problems

involves software tools that provide incentives for collaboration while inculcating argumentation skills and rendering the logic of one person's arguments transparent to his peers.<sup>23</sup>

Information technology is not a panacea for the intelligence community's ills. It will not stem, much less reverse, the societal and governmental trends that supply the fundamental constraints to meeting the jihadist challenge. Yet recent software advances can provide partial solutions to junior analysts' critical-thinking shortfalls, the dysfunctional analytical culture of current reporting, and the knowledge boundaries (barriers) within the intelligence community and between the intelligence and policy communities.

Two factors argue in favour of using information technology to augment and strengthen the on-going reorganisation and recruiting campaigns. First, intelligence analysts already use computer-based analytical tools to support their day-to-day activities. This makes the introduction of additional software applications into the workplace far easier than would be the case for organisations with no automated support tools in their analytical environments. Unfortunately, these tools are, for the most part, limited to e-mail, instant messaging, shared white boards, word processing and graphical presentation packages – the same technology that underpins the operations of contemporary news organisations. This match is no accident; intelligence analysts spend the bulk of their time producing current reporting documents. Fortunately, the widespread introduction and use of even this limited information technology by the analytical cadre has created conditions for the successful introduction, with the proper training and incentives, of software applications that could help analysts provide timely warning or project the plausible evolution of emerging threats.

A second factor favouring new information technology stems from the fact that the intelligence community recruiting pool represents the most computer-literate generation in history. Potential recruits have been using computers at home from the time they could wield a mouse and in the classroom from the start of their formal education.<sup>24</sup> They are fearless in their adoption of new ideas, patient when software does not perform as expected, and accustomed to relying on software tools to perform a variety of tasks, from participating in the collective environment for massive multi-user games<sup>25</sup> to compiling sophisticated music videos. In other words, information technology and digital media are already in place and broadening their reach in the culture at large where traditional methods and expectations for education are in eclipse. New intelligence recruits, educated through web research in a universe of hypertextuality, are not afraid of using advanced software solutions in their professional environments. But where are the tools to help?

## Structured arguments and dialogues

The intelligence community's term of art for critical thinking is 'tradecraft',<sup>26</sup> which, as suggested, junior analysts are supposed to pick up through on-the-job training. Unfortunately, not only is tradecraft inextricably linked to current reporting,<sup>27</sup> but, even worse, the current analytical culture operates in such a way that the critical thinking which underpins analysis often remains hidden from the intended consumers, summarised and sanitised into written documents that often constitute rote recapitulation of previous 'official' positions. What is required is an analytical environment that is fundamentally different, where the process as well as the product of the analysis is explicitly captured in structures that are made available for all (other analysts and policymakers alike) to see, review, share and discuss. Such an environment would open up a computer-assisted dialogue where people could find explicit answers to questions such as 'what was your line of reasoning', 'what were the dissenting opinions' and 'what was the evidence you used to support this assertion?'.

The analytical environment being proposed would have a dual purpose. First, it would encourage the use of software tools to capture and expose the formal structure of the underlying arguments.<sup>28</sup> Rather than simply producing a document entitled 'Suspected Iraqi WMD Holdings' and then listing the locations of the stockpiles, a formal structure would capture the thought process that led to this conclusion in such a way that others can review, explore, question and leverage the underlying ideas. Such tools greatly supplement the document as the fundamental analytical product with an argument framework composed of explicit assumptions, options and conclusions all tied to relevant and accessible evidence. Such structures can serve as the basis for comparing dissenting views, forming collaborative teams and even generating reports tailored to specific consumer requests for information. Thus, the current-reporting function is not lost by employing argument frameworks and dialogues; rather, it becomes one of several capabilities enabled by the new software.

Secondly, the proposed analytical environment would support communication among analysts or outside experts and help create multi-disciplinary appreciations of an enemy's intent (e.g., the evolution of the jihad from a centralised al-Qaeda-led operation to 'self-starters' that are influenced but not directed by al-Qaeda leadership) and processes (e.g., the cooperation of terrorist and transnational criminal organisations in the illegal movement of weapons and people), without the constraints imposed by current-reporting formats and deadlines. Coupling structured arguments with dialogues provides the framework for developing analytical structures that make the components of critical thinking explicit from the outset in terms of evidence assessment, information fusion and inferential reasoning.

Why are tools that promote dialogue important? First, they encourage analysts from differing backgrounds to develop a common language and to thereby minimise misunderstandings based on differing vocabularies. Secondly, they encourage the sharing and expression of multiple points of view, reducing chances that non-conforming opinions would be ignored. And as in an effective verbal conversation, a positive feedback loop would be created as analysts share, listen to, discuss and learn from the various expressed points of view. From this shared feedback loop, critical thinking could evolve at both the individual and collective levels.

Adopting structured arguments and dialogues would make fulfilling the NCTC's mission significantly easier. First, selecting and assembling threat-related information to warn and inform government action could occur by one analyst putting together an argument structure that could then be shared with

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others. At the same time, the analyst could be reviewing formal structures published by others and adopting useful portions. The result would be a combined argument structure that contains more detail and diversity of opinion than any of the individual ones. Secondly, analysts could use threaded discussions and web logs, or 'blogs', throughout the publishing and appropriation process to promote dialogues and develop critical shared language and concepts.

Novice analysts would benefit from structures constructed by experts, and critical thinking in general would benefit from the collective's scrutiny of individual assertions and proffered evidence.

How would all of this appear to a newly minted analyst? Rather than starting her day by passively reading through reams of cables, news reports and intelligence summaries identified for her by a 'profile', preset parameters for requested information that are difficult to change and therefore quickly outdated, she might begin instead by reviewing what changes have been made overnight to the variety of analytical products to which she subscribes – formal argument structures that are constantly being built and maintained by other analysts with whom she is collaborating. She could review new findings, assertions, assumptions and evidence that have been made since she was last on-line. She might see one argument to which she takes exception and might then begin a dialogue with this colleague via email, or, even better, through a threaded discussion that could be carried on over time and posted for others to see. She would be able to appropriate, or 'adopt', portions directly into her own argument structures, saving the time and effort of duplicating work. And changes that she might make to her arguments would be automatically posted for others, policymakers for example, to benefit

from. She might end the day by setting up special alerts to automatically inform her of updates to portions of others' work of particular interest. These would be ready on her computer the next day when she came into work.

### **Collaboration is not a dirty word**

The 9/11 Commission Report, the 9/11 Joint Congressional Inquiry Report,<sup>29</sup> and other reports have cited the lack of collaboration within and among organisations as one of the reasons for recent intelligence failures. For example, the Congressional report states:

Witnesses described a lack of collaboration among analysts within the Intelligence Community. Terrorist-related intelligence often consists of small fragments of seemingly disparate information. Capitalizing on the analytical strengths of each intelligence agency to understand the terrorist threat from different angles should be paramount.<sup>30</sup>

Critical thinking can be enabled by collaboration, especially when it involves compiling, evaluating and combining multi-disciplinary perspectives on complex problems. Effective collaboration, however, is possible only when analysts can generate and evaluate alternative and competing positions, views, hypotheses and ideas.

Enforced consensus relegating alternative assessments to footnotes – for example, in documents like the National Intelligence Estimates – has been a disincentive to collaboration within the intelligence community's analytical corps. In addition, collaboration and sharing generally require extra work that competes with time spent on individual assignments. Interim and final analytical products have to be recast in a format that is accessible to all members of a collaborative team as well as compatible with their individual toolsets. What is needed are tools that encourage the blending of the personal and the collective through shared access by allowing analysts to easily shift focus within a common context from individual work to work being done by others, and by making the work of others directly available for 'adoption'. As a result, analysts, especially junior analysts, would be able to generate and evaluate alternative and competing ideas, avoid groupthink, and reach consensus while making use of all available analytic assets. This process would be akin to seminar-style education in that it fosters interaction, exchange and close evidential scrutiny. In other words, what we are describing is a 'society' of analysts that makes use of the work performed by individuals, even when the work is separate from or tangential to a collaborative effort.

Such societies, or collectives of users with a shared interest, are spontaneously springing up on the Internet where users no longer simply passively

review web pages built by others, but group together to build their own Internet content by sharing personal products. Flickr.com is an example of this type of spontaneous collaboration. Anybody can submit digital pictures to flickr.com and make those pictures available to family and friends. Although the contribution is made for the personal benefit of the photographer and not for other members of flickr.com in general, the society does benefit. As a result, a search for the tag 'Iraq' on flickr.com in January 2006 resulted in over 16,000 photographs, with more being added and shared daily. Flickr.com is fundamentally different from other websites, such as wikipedia.com, because the sharing of information is a byproduct of the personal activity and not explicitly collaborative. Analysts could greatly benefit from the formation of such societies based on the publishing of their personal analytical products in general and structured arguments in particular.

Social bookmarking,<sup>31</sup> or tagging material posted to a shared web site, is another technique for gathering a community around a specific interest through sharing work. In the past, the analyst simply would have captured a particular page in his local browser as a bookmark or favourite and then used this bookmark to regain access to the page at a later time. Storing it locally, however, means that others, especially novice analysts, will not be able to benefit from his expertise. Social bookmarking makes this expertise available to the community. For example, an analyst might perform a search on the Internet or Intelink (the intelligence community's intranet) and find useful information in the form of a web page. He would then capture the page and post it to a common repository on the web, tagging the material with the vocabulary of his particular expertise. That material would become available to other members of the 'society' interested in that subject matter, who would be drawn to it by the analyst's tag. But by putting the page in a common repository and thus making it available to a society of the interested, junior analysts or outside experts would be able to identify the tag as indicative of useful material and then more easily locate a possible wealth of information that would benefit their own projects. And the entire process is has not cost the bookmarking analyst any extra work. The opportunities for collaboration do not stop there, however. Since every bookmark captured includes information (e.g. e-mail addresses) about the analyst who made the posting, others can find and initiate a dialogue with members of the society who have common interests.

An analyst at the NCTC might determine that he needs more information on the order of battle for Iraqi insurgents in specific provinces. Searching the hypothetical Intel.icio.us<sup>32</sup> website, he would discover 518 web page bookmarks that have been tagged with both 'Iraqi' and 'insurgents'. Looking through the list, he might see that several tags came from organisations responsible for publish-

ing order-of-battle information in the theatre of operations, so he would review each until he found the one with the detailed information of interest. He also might see that many of these bookmarks had been contributed by a military intelligence analyst working for the Coalition forces in Baghdad. Though he has never worked with or met her, the NCTC analyst might find many more of her bookmarks of interest and decide that he has a great deal in common with her concerning mission, evidence and product. He would then send her e-mail to initiate a dialogue.

### **Capture diversity, facilitate consensus**

When different points of view are flattened by forced consensus, it is very difficult for analysts, especially junior analysts, to generate and evaluate alternative or competing ideas, avoid groupthink and reach informed consensus, even while taking advantage of all available analytic assets. Current collaboration tools, which allow an individual's work to be erased, modified or overwritten by someone else, reflect this dysfunctional process.

It is important for analysts, collectively, to be able to state *multiple* positions that address an issue from potentially conflicting, multi-disciplinary perspectives. A shared context is thus required that allows analysts addressing a common issue to see and interact with each other's work via formally structured dialogues. These collectively embody a broader diversity of expertise, analytic approaches and connections to relevant materials. Broader exposure to diverse analytic contexts enhances and enriches analysts' insight and understanding, which in turn improves their analysis, which feeds back to the larger group, and so on in a virtuous cycle.

Of equal importance is the matter of consensus. Tools that support diverse points of view *while* encouraging consensus formation might also offer a way to surmount political barriers. They would provide both intelligence producers and policy consumers with a view into the methodologies and associated evidence used to produce analytical product, effectively creating a common language that might help move knowledge across organisational barriers without loss of accuracy or relevance.

Tools that promote both consensus and diversity are rare, but the process of tagging social bookmarks (adding keywords to the web-based bookmarks) illustrates how a software tool might provide one opportunity for a group of analysts to express diversity while reaching consensus. Every time an individual adds a bookmark, he is faced with the choice of ignoring everyone else's tags and simply making up new ones, or using someone else's tag that is already in place. Social

*Tools that promote both consensus and diversity are rare*

bookmarks do not force the choice, leaving an individual free to diverge from the majority. There may be instances, however, where a contributor could ask himself the question, 'what did that person mean when she assigned the tag "WMD smuggling" to a website describing the geographical footprint of the Chechen diaspora in Europe and North America?' He may well use this opportunity to begin a dialogue with another contributor, potentially expanding his network of contacts. As a result, a group engaged in tagging might more easily develop a form of consensual language, that is, a consensus regarding the set of tags and to what sorts of content the tags are applied. As a group works together – with individuals deciding to what extent they will tailor their tags for the group, versus tailoring for their own use – a shared language could emerge.

Social bookmarking could well reinforce and accelerate an important aspect of analytical behaviour long present in the intelligence community. Working-level analysts have always sought escape from management, organisation and security-imposed strictures by forming networks with peers in other departments or agencies, or even the intelligence services of allied countries. The resulting informal networks, however, have always been weak and inefficient: first because their members generally are known to each other a priori (e.g., one's opposite number in another agency), thus minimising the opportunities to acquire genuinely alternative or, perhaps more importantly, tangential perspectives on a problem; and second, because information exchange is usually limited to more traditional techniques such as the telephone or face-to-face meetings in order to avoid organisational penalties for going outside channels. Social bookmarking and other state-of-the-art software applications could help produce larger and more effective collaborative efforts between organisations and disciplines.

Blogs offer another form of software tool supporting the dual task of capturing diversity and encouraging consensus formation.<sup>33</sup> The need for individual expression and active dialogue with others who have shared interests has caused an explosion of blogs on the Internet. The Pew Internet Study<sup>34</sup> estimates that about 11% of Internet users, or about 50 million people, are regular blog readers. Technorati,<sup>35</sup> a self-styled authority on blogs, is currently tracking 24.9m blogs and estimates that there are about 70,000 new blogs added each day. And the trend is growing. Estimates indicate that the number of blogs on the Internet is doubling every five months. There are now even blogs that point you to other blogs of interest.<sup>36</sup> Although many of these are ephemeral, there are still a lot of busy people out there voicing their opinions with an estimated 700,000 new entries daily (about 29,100 blog updates each hour). There is evidence to show that more and more people are also turning to blogs for news and views thought to be more accurate or revealing than conventional news sources.<sup>37</sup>

If you have not heard of blogs, you are not alone. A CNN/USA Today/Gallup Poll taken in March 2005 found that 56% of those interviewed had never heard of a web log.<sup>38</sup> It turns out that it is the intelligence community's recruiting pool that is taking advantage of this new form of communication: 44% of on-line Americans aged 18–29 said that they read them often. And this is the age group that is also the most likely to contribute to blogs.<sup>39</sup>

The adoption of blogging within the intelligence community could exploit this phenomenon in important ways. Current reporting procedures within the intelligence community enforce a hierarchical organisational structure in which information flows up and decisions flow down. Blogs, on the other hand, produce communities of interest in which power is manifested through the number of individual connections within a network, rather than through an individual's position with respect to reporting chains. These networks are key to emergent or new types of critical thinking amongst the analytical population. In other words, blogs might well be a means for individual analysts to express dissenting opinions that are not subject to official censorship.

Blogs can encourage critical thinking by placing bloggers in an informal and wide-reaching context of peer review that is not easily censored by management. Furthermore, a blog might be linked to structured arguments as evidence of the thought process that went into the argument. Alternatively, blogs, especially those espousing contrarian positions, could be linked to structured arguments as a means of safeguarding against analytical bias and its collective equivalent, groupthink. Blogs might also operate as digital dissent channels out of the glare of a stifling official context.

How might analytical blogs operate in practice? For her first major assignment a novice NCTC analyst might take several days to build a detailed argument. She would use her personal blog as a repository for interim results captured from other sources and post requests for information to the community at large, providing a context for the requests through the blog entries. A veteran NSA analyst might also be interested in the subject and may have set up an alert in his own blog where he is notified of entries made relating to that subject. He would also be able to see how the argument was shaping up by tracking it back to links in the junior analyst's formal argument structures. The NSA analyst would have access to evidence that the NCTC analyst had not yet seen, but should, so he could begin a dialogue to exchange this information. He could also share elements of own formal argument structures from which he thought the novice NCTC analyst might benefit. While the two analysts might well disagree at this stage about conclusions that the NCTC product contains, both continue to monitor the other's progress and share findings in a collaborative effort to resolve their differences.

\* \* \*

Politics and ideological impulses can and do distort intelligence analysis, but there remains nevertheless an urgent need for clear, systematic thinking that is transparent to intelligence producers and consumers alike. Changes in the deeper structures of American society mean that the educational system on which the intelligence community relies for recruits will produce fewer such intellects. This does not mean a rising tide of stupidity is going to engulf us. It does mean that specific skills will need to be inculcated in young Americans who volunteer to serve their country as intelligence analysts. Fortunately, there are software tools that might help do this, while improving, if perhaps only on the margin, the integrity of the policymaking process. These tools have two dramatic properties. First, they represent the wave of the future. Interaction with computers and elaborate programs is already second nature to the current generation of college-age students. The nature and intensity of this interaction is certain to grow. Indeed, this is happening on a minute-by-minute basis. The old ways of apprehending and interpreting the world are fading. The tools under development for the intelligence community will at the least mesh the gears of contemporary ways of reasoning with the task of intelligence analysis.

Secondly, and equally important, is the way this new approach has shaped the operations of our adversary. Jihadists have already formed their Internet-linked community, where networks coalesce in chatrooms, forums and blogs. In this virtual world, the avatars of the jihad create their own models of their strategic environment, borrow from one another, and function collaboratively, while preserving a degree of diversity. More broadly, this new approach to the creation of knowledge communities has enabled the eruption of knowledge from below, through the brittle crust of authority, into the open. This is precisely what the tools under discussion would bring to a hierarchical and consensus-driven intelligence community. It is also why such tools are likely to be resisted in the near term, even if they are ultimately embraced in the fullness of time, as the current generation of senior managers retires and the youths that developed intellectually in cyberspace take their place. In a war with a committed, networked adversary, however, it would be unwise to wait for such a paradigm change.

### **Acknowledgement**

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## Notes

- 1 National Commission on Terrorist Attacks upon the United States, *The 9/11 Commission Report*, 22 July 2004, <http://www.9-11commission.gov/report/911Report.pdf>.
- 2 Commission on the Intelligence Capabilities of the United States Regarding Weapons of Mass Destruction, *Report to the President of the United States*, 31 March 2005, [http://www.wmd.gov/report/wmd\\_report.pdf](http://www.wmd.gov/report/wmd_report.pdf).
- 3 The creation of the Department of Homeland Security in the wake of 11 September is another example of this reorganisation reflex. In that case, the key agency, the FBI, was excluded from the new department because removing it from the Department of Justice would have provoked a political backlash.
- 4 Toby Dodge, personal communication.
- 5 Elizabeth B. Welles, 'Foreign Language Enrollments in United States Institutions of Higher Education, Fall 2002', *ADFL Bulletin*, vol. 35, nos. 2–3, Winter–Spring 2004, pp. 7–26.
- 6 Author conversation with former senior CIA official.
- 7 President Bush apparently understands the gravity of the problem; he told 100 college and university presidents gathered at a State Department conference, 'In order to convince people we care about them, we've got to understand their culture and show them we care about their culture ... You know, when somebody comes to me and speaks Texan, I know they appreciate the Texas culture. When somebody takes time to figure out how to speak Arabic, it means they're interested in somebody else's culture.' Michael Janofsky, 'More Money Sought to Teach Languages', *The New York Times*, 6 January 2006, <http://www.ihl.com/articles/2006/01/06/news/speak.php>.
- 8 Steven Simon and Jonathan Stevenson, 'Thinking Outside the Tank', *The National Interest*, Winter 2004/05, pp. 90–98. The Defense Department faces the same deficit of culturally aware personnel. Molngomery McFate, a cultural anthropologist who works with the US military to strengthen its capacities in this area, quotes one Special Forces colonel assigned to the Under Secretary of Defense for Intelligence as saying, 'We literally don't know where to go for information on what makes other societies tick, so we use Google to make policy.' See Montgomery McFate, 'The Military Utility of Understanding Adversary Culture', *Joint Force Quarterly*, issue 38, 3rd quarter 2005, pp. 42–8, [http://www.dtic.mil/doctrine/jel/jfq\\_pubs/cvr38.pdf](http://www.dtic.mil/doctrine/jel/jfq_pubs/cvr38.pdf). I am indebted to Professor Jonathan Stevenson, US Navy War College, for pointing this out to me.
- 9 Mark Clayton, 'Rethinking Thinking', *The Christian Science Monitor*, 14 October 2003. Other experts believe that, in some respects, college students are averse to critical thinking; see Peter A. Facione et al., 'Are College Students Disposed to Think?', paper presented at the International Conference on Critical Thinking, Sonoma State University, August 1993.
- 10 On White House pressure placed on the intelligence community, see Daniel Benjamin and Steven Simon, *The Next Attack* (Henry Holt/Times Books, October 2005).
- 11 Private communication. The official indicated that there were as yet no

- data on the critical-thinking skills of new analysts.
- 12 Richard Hofstadter, *Anti-Intellectualism in American Life* (New York: Vintage Books, 1962).
  - 13 *Ibid.*, p. 6.
  - 14 For Christianity these works would include those of Aquinas and Kant, for Judaism Maimonides and for Islam Ibn Sina or Ibn Khaldun.
  - 15 Jay Tolson, 'The New School Spirit', *US News and World Report*, 14 February 2005, <http://www.usnews.com/usnews/edu/articles/050214/14college.htm>.
  - 16 Data are from The US Department of Education, National Center for Education Statistics, Higher Education General Information Survey (HEGIS) and the Council for Christian Colleges and Universities.
  - 17 Beth McMurtrie, 'Future of Religious Colleges is Bright, Say Scholars and Officials', *The Chronicle of Higher Education*, 20 October 2000, p. A41.
  - 18 John Diamond, 'It's No Secret: CIA is Scouting for Recruits', *USA Today*, 22 November 2005.
  - 19 Tenet also said, 'I don't know about the rest of the community – I think they face the same problem we do – but over the next five to seven years we are losing a good portion of our expertise'. See S. Hrg. 107-597, 'Current And Projected National Security Threats To The United States', Hearing Before The Select Committee On Intelligence Of The United States Senate, One Hundred Seventh Congress Second Session, February 6, 2002, [http://www.fas.org/irp/congress/2002\\_hr/020602transcript.html](http://www.fas.org/irp/congress/2002_hr/020602transcript.html).
  - 20 Rob Johnston, *Analytic Culture in the U.S. Intelligence Community: An Ethnographic Study* (Washington, DC: The Central Intelligence Agency, 2005), p. xiii.
  - 21 *Ibid.*, p. 15; James Risen, *State of War* (New York: Free Press, 2006), p. 7
  - 22 See Paul R. Carlile, 'Transferring, Translating, and Transforming: An Integrative Framework for Managing Knowledge Across Boundaries', *Organization Science*, vol. 15, no. 5, September–October 2004, pp. 555–68.
  - 23 One example of such a tool is the very popular 'product life-cycle management' software. Current PLM software includes special modules that support collaboration between designers and managers. See 'Better by Design', *The Economist*, 15 September 2005. Another example is the new crop of tools that are helping businesses network. For more information see 'Networking: A Special Edition', *The New York Times*, 5 October 2005.
  - 24 The rise of computer use in US schools has been phenomenal over the last decade. According to the National Center for Education Statistics (<http://nces.ed.gov/surveys/frss/publications/2005015/2.asp#2b>) in 2003, the ratio of students to instructional computers with Internet access in public schools was 4.4 to 1, a decrease from the 12.1 to 1 ratio in 1998. Even more telling is the increase of access to the resources made available through the World Wide Web in the classroom where students use them every day. In 2003, 93% of public school instructional rooms had Internet access, compared with 3% in 1994. Computers and now laptops and handheld devices have become ubiquitous in the classroom. Similar increases have been found in computer use at home by children. A 2003 study showed that 88% of 8th-grade students (13–14-year-olds) in public schools use computers at home ([http://nces.ed.gov/pubs2005/native-trends/ind\\_6\\_1.asp](http://nces.ed.gov/pubs2005/native-trends/ind_6_1.asp)).
  - 25 *Ultima Online* is an excellent example of a Massively Multiplayer Online

- Role-Playing Game where hundreds of thousands of people co-inhabit a virtual world. See <http://www.uo.com/ageofshadows/viscent.html> for more information.
- <sup>26</sup> The term 'tradecraft' was invented by John Le Carré as the Circus's technical term for procedures and techniques related to the conduct of clandestine operations. Its adoption by the intelligence community shows how thoroughly and ironically life imitates art.
- <sup>27</sup> Johnston, *Analytic Culture*, pp. 17–21.
- <sup>28</sup> Tools that support structured arguments, also sometimes called models, are already popular among a certain class of analysts. For example, law-enforcement agencies use a general purpose tool called Analyst Notebook ([http://www.i2.co.uk/Products/Analysts\\_Notebook/default.asp](http://www.i2.co.uk/Products/Analysts_Notebook/default.asp)) to build a variety of structured arguments from terrorist intent to threat assessments. At the other end of the spectrum, the National Intelligence Council (NIC) has sponsored an extensive effort to build a special-purpose structured framework for predicting the future (see International Futures at <http://ifsmodel.org/>). Few, if any, of these tools, however, support collaboration or encourage dialogues among analysts.
- <sup>29</sup> House Permanent Select Committee on Intelligence and Senate Select Committee on Intelligence, *Joint Inquiry into Intelligence Community Activities before and after the Terrorist Attacks of September 11, 2001*, 20 December 2002, <http://www.gpoaccess.gov/serialset/creports/911.html>.
- <sup>30</sup> *Ibid.*, p. 342.
- <sup>31</sup> For more information on tagging websites see 'Websites of Mass Description', *The Economist*, 15 September 2005. An example of a social bookmark tagging system that is currently being used world-wide can be found at <http://del.icio.us>.
- <sup>32</sup> Intel.icio.us is a fictitious website, but the idea is that it would mimic the capabilities of the public <http://del.icio.us> website except focus on intelligence issues and only be available on a classified network.
- <sup>33</sup> A blog is a website for maintaining an on-line journal (thus a 'web log' or 'blog') taking the form of an extended conversation, and usually focusing on a particular topic area. The importance of blogs is illustrated by the US government's approach to the phenomenon, which is similar to that undertaken by industry over the last few years. The government is apparently in the process of establishing 'official' blogs in order to influence the evolution of the blogosphere amongst its millions of employees, while at the same seeking to define and enforce standards of behaviour for government bloggers. See, for example, John Hockenberry, 'The Blogs of War', *Wired*, vol. 13, no. 8, August 2005, [http://www.wired.com/wired/archive/13.08/milblogs.html?pg=1&to pic=milblogs&topic\\_set=](http://www.wired.com/wired/archive/13.08/milblogs.html?pg=1&to pic=milblogs&topic_set=).
- <sup>34</sup> Amanda Lenhart et al., 'Online Activities and Pursuits', Reports, Pew Internet and American Life Project, February 2004, [http://www.pewinternet.org/PPF/r/113/report\\_display.asp](http://www.pewinternet.org/PPF/r/113/report_display.asp).
- <sup>35</sup> More information about Technorati may be found at <http://www.technorati.com/about/>.
- <sup>36</sup> A good description of blogs about blogs may be found in Dan Mitchell, 'A Blog That Blogs Corporate Blogs', *NYTimes.com*, 7 January 2006.
- <sup>37</sup> 'Yesterday's Papers', *The Economist*, 21 April 2005.
- <sup>38</sup> 'Poll: Most Americans Unfamiliar with Blogs', *CNN.com Technology*, 3 March 2005, <http://www.cnn.com/2005/TECH/internet/03/03/poll.blogs/>.
- <sup>39</sup> The Pew Internet Study.

