Transforming Intelligence Production Through Lean Start-up Methods

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The changing commercial and technological landscape is creating a fundamental challenge to IC analysis that we have not faced since the creation of the US Intelligence Community after World War II.

IC analysis is at risk of obsolescence. Trends in data, software, and customers require new ways of doing business in the face of a new trend—the democratization of intelligence. This article offers a new, team-based "agile" analytic framework leveraging developments in software development and the commercial start-up community. I outline a seven-step process for finished intelligence production that combines all-source and collection expertise with data engineering and software development, and then I propose opportunities for experimentation as a way forward.

Reinventing Analysis, Again

Few professions seem as prone to self-reflection as intelligence. Scholars and practitioners inside and outside the profession have regularly called for reinventing intelligence analysis, often in the wake of intelligence failures or in reaction to advances in information technology. The topic has appeared regularly in these pages. Some prefer a return to the "glory days" of Sherman Kent, while others see opportunities in the changing technological environment. In some way this debate is evergreen—analysis seems always on the table for discussion, and we always wonder whether we have to rethink our capabilities and what makes us special as a community. I recognize that there are Cassandras who often say that doom is imminent, even when it is not. But the changing commercial and technological landscape is creating a fundamental challenge to IC analysis that we have not faced since the creation of the US Intelligence Community after World War II.

Commercial + Technological = Existential Crisis

The IC has profound organizational and cultural incentives to avoid transforming its analytic production processes or delivery systems.[1] It has been, to date, both a monopoly and a monopsony—the sole provider to a sole consumer locked into its access.[2] Yet both ends of this spectrum are breaking down, and scholars of entrepreneurship have made clear that institutions lacking disruptive innovation in their investment portfolio are doomed to eventual obsolescence when the commercial and technological landscape around them change.[3]

Why this is happening is what many have dubbed the "democratization of intelligence." Collection has already radically shifted. Commercial geospatial-intelligence (GEOINT) exploitation led the way on public discussions of Russia's preparations for its 2022 invasion of Ukraine, and now firms can even conduct signals intelligence collection from space

for commercial clients.[a] Commercial and leaked data are revealing the infrastructure that enables intelligence operations around the world.[4] Analysis is starting to change as well. Private-sector intelligence analysts are fielding network tools to target malign actors.[5] The recent emergence of large language models (LLMs) has raised more fundamental questions about the future of analysis.[6]

The IC has taken some steps to remedy this situation. DIA incorporated lean start-up insights in the development of MARS—the Machine-Assisted Analytic Rapid Repository System—and into other innovative programs.[7] CIA created the Directorate of Digital Innovation. These are important innovations for the development of capability and collection, but they have not fundamentally changed how the IC produces finished or current analysis.

The commercial sector, particularly the software industry, shows the changes that IC all-source analysis must consider lest it become irrelevant to policy customers in the future. As Marc Andreessen famously quipped over a decade ago, "Software is eating the world."[8] By this he meant that anything that *can* become software *will* become software. The ubiquity of "big data" amplifies these trends, creating a situation of dominance for those who can harness it by bringing software to bear for analytic purposes, and irrelevance for those who cannot.[9]

Beyond this, what Azeem Azhar describes as the "exponential age" goes to an additional important truth.[10] Obsolescence today is like Ernest Hemingway's observation about bankruptcy—it happens "gradually, then suddenly."[b] Under the complex conditions that define contemporary global geopolitics, surprise happens quickly, and organizations unprepared for it risk their relevance—or worse.[c,11] And commercial entities have learned the lesson of scaling quickly to gain monopoly power in the market, meaning that competitors are almost certainly eyeing IC analysis as a domain to outflank.[12]

What does this mean? A future of writing papers, be they *President's Daily Briefings* or long assessments, will be obsolete before we know it. And we are unlikely to be able to survive as an analytic ecosystem living in this past, with customers increasingly demanding different kinds of solutions and competitors providing it. However, the best of what we bring to bear as an analytic community is not in our written product. It is in the special intersection of expertise and creativity that make our minds, when harnessed properly, a national strategic asset.[13]

In the next sections, I offer a proposal to take advantage of the revolutions occurring in the software industry in particular to transform analysis. We can do so—moving from static documents like papers and briefing slides into software—in line with Andreeseen's vision, developed with commercial best practices, and consistent with DNI policy guidance including ICD-208.[d] And I believe this is our best chance to protect our analytic value-added for the future to come.

Step 1: From Analytic Production to Analytic Project Management

Reimagining finished intelligence through commercial best practices first requires a paradigm shift: thinking of analytic production as project management to produce analysis as software. Over the past 15 years, software development has shifted to flexible, team-based methodologies by leveraging agile and lean start-up methodologies developed by manufacturing firms like Toyota, Silicon Valley innovators, and software successes that now span industries.[14]

A software-centric analytic approach adds machine learning and AI to substantive expertise.[15] Advanced analytics show the "patterns of life" on topics to determine if events are deviations from "normal" in ways that human intuition cannot. As software-based solutions, analytic results are more transparent than a footnoted paper, despite concerns about machine learning's black-box effect.[16]

A move to agile, lean start-up project management yields changes to the existing analytic production process: a move away from

a. Examples of this include the social media feed of Michael Kofman (https://twitter.com/kofmanmichael/ and the work of the Institute for the Study of War, whose interactive map is available at https://storymaps.arcgis.com/stories/36a7f6a6f5a9448496de641cf64bd375. On commercial SIGINT from space, see https://www.he360.com/

b. *The Sun Also Rises* (Scribner's, 1926)

c. Adam Tooze famously describes this as a "polycrisis," borrowing from a body of work dating back over the past few years.

d. ICD-208 states analytic organizations "shall produce products in a format customers can easily discover, access, use, and disseminate to facilitate mission requirements."

Agile Analysis: Select Resources

The concept of agile analysis fits into a conversation on the future of analysis that includes, among a great many others, the following publications:

- Zachery Tyson Brown, "The US Intelligence Community Is Being Disrupted," *Defense One* (blog), June 23, 2020, https://www.defenseone.com/ideas/2020/06/us-intel-community-being-disrupted/166372/.
- Committee on a Decadal Survey of Social and Behavioral Sciences and for Applications to National Security, "A Decadal Survey of the Social and Behavioral Sciences: A Research Agenda for Advancing Intelligence Analysis," Consensus Study Report (National Academies of Sciences, Engineering, and Medicine, 2019).
- Joseph W. Gartin, "The Future of Analysis," *Studies in Intelligence* 63, no. 2 (June 2019).
- Josh Kerbel and Anthony Olcott, "Synthesizing with Clients, Not Analyzing For Customers," *Studies in Intelligence* 54, no. 4 (December 2010.
- John S. Mohr, "A Call for More Humility in Intelligence Analysis," *Studies in Intelligence* 61, no. 4 (December 2017).

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On changes in the technological landscape, see:

- Aaron F. Brantly, "When Everything Becomes Intelligence: Machine Learning and the Connected World," *Intelligence and National Security* 33, no. 4 (2018): 562–73;
- Christopher Eldridge, Christopher Hobbs, and Matthew Moran, "Fusing Algorithms and Analysts: Open-Source Intelligence in the Age of 'Big Data,'" *Intelligence and National Security* 33, no. 3 (2018)
- Aaron Frank, "Computational Social Science and Intelligence Analysis," *Intelligence and National Security* 32, no. 5 (2017)
- Kwasi Mitchell, et al., "The Future of Intelligence Analysis: A Task Level View of the Impact of Artificial Intelligence on Intel Analysis," *Deloitte Insights* (Deloitte Center for Government Insights, December 11, 2019).

For information on agile, lean start-up efforts, The definitive work on lean start-up efforts is Steve Blank and Bob Dorf, *The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company*; an exemplar of agile and scrum methodologies can be found on the website of Mountain Goat Software, a leading developer of these capabilities and methods.

an author-contributors setup to a cross-functional team; prioritizing customer and source discovery; shifting from conceptualization and research to development "sprints"; from drafting product to fielding minimum viable products (MVPs); from formal review to customer-based feedback and pivots; from one-time publication to continuous analytic delivery; and from rewriting products to reviewing and refreshing existing analytics.

Step 2: From Author and Contributors to Cross-Functional Team

Analytic production shifts from a single author collaborating with occasional contributors to a cross-functional team led by an all-source analyst. The all-source analyst becomes what agile software development calls a "product owner" who drives the effort and determines what is important.[17] Product owners do not conduct research alone or in a small group of fellow analysts, bringing in collaborators for an occasional brainstorming session, then sharing a drafted piece for coordination. They serve as project managers on their all-source "accounts," be that a global coverage or hard-target question in any IC all-source analytic agency.

- The all-source analytic product owner leads a cross-functional team—consistent with agile principles—to generate tailored analysis on their account. This paper proposes a cross-functional

team of five full-time members and two part-time members:

- An all-source collection strategist compiles the full range of intelligence that could answer questions on the product owner's account. This includes both an understanding of all the "INTs" and the nature of potential and actual collection streams, such as the range of open-source and commercially available data; liaison services or unilateral sources providing human intelligence; or the relative value of different forms of technical collection. This allows the team to understand the implications of the collection enterprise on a topic and its gaps.
- A data engineer and integrator structures and analyzes data feeds on the team's account as defined by the product owner and her management. Feeds range from standing reporting fed into enterprise databases to automated reporting from national agencies or commercial sources. The data engineer and integrator would curate feeds to ensure they are analyzable, as well as creating the analytics to assess trends over time.
- A programmer and developer write code to deliver analysis through dashboards, other front-end interfaces, scripts and algorithms that auto-generate email updates on changes in patterns relevant to customers.
- A security and standards expert in the team ensures that the project is built consistent with security standards for websites, for the handling of intelligence streams, and with analytic standards like ICD-203. This team member also mobilizes structured analytic techniques and other ICD-203-consistent tools to help the project in development, building on continuous integration principles from the DevSecOps model.[18]
- Senior analysts bring analytic concepts and insights from previous production into the project to consider how it should fit with or diverge from analytic lines.[19] They also support coordination and equity checks with other stakeholders in an agency or across the IC. Finally, they serve as adversaries or devil's advocates to stress-test the effort and ensure it is the best possible work. Such an individual could support multiple projects, leveraging insights from multiple projects to generate analytic synergies.
- A facilitator coordinates the team's work through daily and biweekly meetings, potentially participating in multiple parallel analytic efforts at once.[20] In agile terms, this individual serves as a scrum master, bringing both specific training and an understanding of structured analytic techniques to the project.

Step 3: Putting Customer and Source Discovery First

Agile analysis puts a premium on understanding and responding to customers' ongoing feedback. The team therefore starts by applying the product owner's focus to two parallel tasks: customer and source discovery.[21]

- The product owner, senior analyst, and programmer/developer focus on a diverse range of policy and operational customers for the product owner's account.[22] They identify specific, concrete insight needs from those policy and operational customers and learn through a series of structured conversations the best ways to deliver those insights.[23] This discovery process generates users for initial MVPs the team will later field.[24]
- The collection strategist, data engineer, and security/standards expert focus on the full range of collection sources. They focus on what is being collected and exploited, what could be collected or exploited, and potential biases in collection. The data engineer/integrator ensures the appropriate structure of data feeds, while the security/standards expert manages access to compartmented collection.

Step 4: From Conceptualization and Drafting to Sprints

The team builds a flexible plan for how to provide analysis. This is similar to the way in which today's analytic organizations conceptualize finished intelligence production, providing managers an opportunity to review and approve the flow of analytic work. Unlike the current approach, which focuses on the "why" of analytic work and yields a static document, an agile analytic plan focuses on the "how" and changes over time.

The team manages its work using agile's scrum methodology, where it meets daily to collaborate on what to do that day, reviewing the overall state of the project every two weeks in a "sprint review".[25] Analytic

managers participate in sprint reviews to understand the arc of the effort and provide feedback, and the product owner uses reviews to determine the priority for delivery and development. Priorities are generated using "user stories," short examples of desired capabilities derived from customer and source discovery.[26] As discovery continues, these biweekly meetings allow the team to change its plan and pursue new capabilities.

Day to day work is integrated, collaborative, and colocated.[27] The product owner helps the data engineer/integrator shape analytics, tests software with the programmer/developer, and answers questions as a subject matter expert for the team. The data engineer/integrator creates analytics leveraging other team members' collection, code, security, standards and tradecraft expertise. The programmer/developer develops user interfaces and application programming interfaces for the product owner to test, as well as scripts and other automation solutions to integrate the data engineer's analytics into those interfaces. The security/standards expert engages with all team members to maintain compliance, and the senior analyst ensures that outside and divergent perspectives are considered. The facilitator keeps the team on track, running daily and biweekly meetings.[a]

Step 5: From Coordination to MVPs

Rather than waiting to provide a polished, final product, the team quickly fields initial insights through MVPs and shares them with policy and operational customers to get feedback on the analytic project and consider possible changes.[28] Analytic MVPs may be preliminary analytic insights or mock-ups of finished production in different formats, letting the team beta-test functionality. MVPs are important to the analytic process because market research indicates that customers, whether of software or of analysis, do not know what they really want and need until they can touch and feel a prototype and react to it.[29]

MVPs can also improve coordination within the IC by enabling stakeholders to stress-test a potential solution and consider whether it is consistent with best practices and existing analytic lines. That said, coordination cannot replace customer insights, as policy and operational requirements supersede the views of fellow analysts.

Step 6: From Review to Pivots

Agile teams "pivot" their efforts in response to interim customer feedback rather than waiting for post-production responses, adapting plans in sprint reviews and delivering new increments of analysis over time.[30] Pivots can range from developing a new user interface to focusing on different elements of an account or topic. This model eliminates the existing analytic review process, because thanks to MVPs, the team regularly releases interim analytic results directly to customers and adapts to feedback. Agile and lean start-up methods eschew detailed review processes because they find that whatever they may add in rigor, they reduce timeliness to the point that they render products irrelevant. This echoes the analytic IC's classic dilemma—beautifully written consensus text delivered too late to help customers with their problems.[b]

Openness to customer feedback can be a double-edged sword, as the product owner, senior analyst, and security/standards expert must guard against pivots turning into politicization or otherwise contaminating analytic objectivity.[31] The senior analyst and security/standards expert reinforce a product owner who could face politicization pressures.

Step 7: From Publication to Continuous Analytic Delivery

Agile analysis delivers an analytic program on an account with multiple delivery options instead of a single printed or published document. Delivery options include dashboards, advanced analytics for use in legacy printed production, scripts for the automatic delivery of analysis via email, or other software-based solutions.[32] Solutions the team develops ingest data from collection agencies and update themselves using a combination of machine learning and all-source human insight, eliminating the existing problem of intelligence cutoff dates and obsolete analysis. Programming audit trails, versioning, and cheap cloud storage allow the team to save analytics over time to show the "arc" of a story, including through the use of

a. This differs from the role of analytic facilitators, who typically are only brought in for a specific brainstorming or group activity at an early stage in finished intelligence production.

b. Every policy customer complains about this tension between timeliness and "perfection." I did when supporting policy on rotation to the National Security Council and and defense policy staffs, 2009–12.

large language models. Direct customer engagement through briefers, dashboards, and other software platforms provide a range of feedback for future analytic efforts.

Step 8: From Rewriting to Review and Refresh

Analytic solutions provided through the agile process will remain relevant for longer than traditional printed products. At a certain point, the product owner and her analytic management will determine that the solutions are stable enough that the team can disband from its active efforts and move the capability into a reserve or maintenance status. Team members other than the product owner would join other agile analytic efforts, while the product owner would move into an "offline" status, monitoring the analytic capabilities while conducting training or other professional development and continuing education activities. The product owner monitors whether analytics are getting stale or an adversary is applying denial-and-deception techniques to spoof pattern-of-life tracking, and works with management to quickly update and rework existing analytic capabilities.[33] Management creates a "review and refresh" cycle based on the President's Intelligence Priorities framework to determine how often an analytic capability requires a minor update or a complete rebuild.[34]

Four Implications of Agile Analysis

Agile analysis would, if fully implemented, have significant human capital, expertise, integration, and trust implications.

- All-source analysts can focus on creativity, thinking, and leading teams, which they consider rich, rewarding work where they can avoid the drudgery of filling out routine responses to taskers.[35] Rather than making analysts obsolete, agile analytics improve retention and analytic quality of life.
- The "online-offline" model, where analysts focus on building capabilities then go into maintenance with time for professional development, offers enhanced opportunities to build domain and regional expertise. [36]
- Cross-functional integration lets all-source analysts continue to lead analytic production but gives other components of the production process an equal voice in the team.
- The iterative nature of the new production process builds trust between analysts and customers and between analysts and their managers. Biweekly sprint reviews with managers allow those managers, over time, to delegate an increasing proportion of decisions to product owners, while MVPs and pivots let customers see that the team is responsive to their feedback. Agile and lean start-up methods make clear that significant management interference in the work of cross-functional teams will lead to mission failure.

What are We Waiting For?

In 2000, the consulting firm McKinsey developed the Three Horizons Model for growth investments. The model recognized that a majority of a firm's investments need to remain in current operations, but a healthy firm needs to invest some resources in incremental innovation to allow for changes to current practices, and a capability for truly disruptive innovation that would allow for game changing breakthroughs.[37] Firms from Amazon to TSMC, from Microsoft to Apple have done just this. A volatile, complex world makes these sorts of "hedge investments" even more critical.

Where are these for IC analysis? We have tended to focus on the areas where we are comfortable—writing, briefing, thinking, talking to policy customers or liaison partners. We need the space for disruptive innovation in analysis. Wherever it is—whichever agency, or for that matter whichever private-sector partner—decides to build out a capability like that described above may have a significant competitive advantage in the years and decades to come. Regardless of whether this specific pathway is the right answer, pursuing a portfolio of pathways is indispensable if we want IC analysis to matter for customers, and for that matter for the American people, in this era of technological change and strategic competition.

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36. See Gary Klein, *Seeing What Others Don't: The Remarkable Ways We Gain Insights* (PublicAffairs, 2013); Rob Johnston, *Analytic Culture in the US Intelligence Community: An Ethnographic Study* (Central Intelligence Agency, 2005), 61–68.
37. Steve Blank criticized the Three Horizons Model for presuming that there is a luxury of time in disruptive innovation. I agree with his approach. See Blank, "McKinsey's Three Horizons Model Defined Innovation for Years. Here's Why It No Longer Applies," *Harvard Business Review* (February 1, 2019).

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