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Evaluating Intelligence and Information Sharing Networks:
Examples from a Study of the National Network of Fusion Centers

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I. Introduction

In the weeks and months following the 2013 Boston Marathon bombing, Congress and the media asked why the intelligence and law enforcement communities had failed to intercept the Tsarnaev brothers, who were known to the Federal Bureau of Investigation (FBI) prior to the attack. The national conversation also focused on the Boston Regional Intelligence Center (BRIC), the city's fusion center.¹ In general this coverage was fraught with common misconceptions, including that fusion centers are owned and operated by DHS. Even local Boston news outlets questioned the return on investment in Boston and elsewhere.² One report hastily labeled fusion centers a "flop."³

Within the domestic intelligence community, however, experts were quick to point out that fusion centers are not designed or equipped to serve the same purposes or perform the same functions as national security intelligence agencies. Others noted the role of the BRIC in supporting investigations after the attacks, which quickly led law enforcement to the bombers.⁴ Congressional hearings further revealed that the BRIC had not received vital information from the FBI's Joint Terrorism Task Force (JTTF) in the Boston area, which had conducted an investigation of Tamerlan Tsarnaev prior to the attack—hardly a failing of the BRIC, and further evidence that federal agencies are still struggling to coordinate with state and local partners.⁵

Framed by the Boston tragedy, several important questions still remain unanswered. Have fusion centers been a worthwhile investment? If some fusion centers are performing at a higher level than others, why? And perhaps the most critical question for practitioners and policymakers alike: how should the value added by fusion centers be measured?

Across the national network of fusion centers there is increasing evidence to suggest that these organizations are adding value within their jurisdictions. For example, a

¹ According to *Implementing Recommendations of the 9/11 Commission Act of 2007 (Pub. L. 110-53)* fusion centers are a "collaborative effort of 2 or more Federal, State, local, or tribal government agencies that combine resources, expertise, and information with the goal of maximizing the ability of such agencies to detect, prevent, investigate, apprehend, and respond to criminal and terrorist activity."

² Curran, K. (2013). Effectiveness of fusion centers questioned. WCVB Boston.

³ Ward, K. (2013, May 23). How 'Fusion Center' flopped in Boston Marathon bombing. Examiner.com.

⁴ Sena, M. (2013a, April 26). Fusion center staff in Boston and across the country tirelessly support Boston investigation. Information Sharing Environment Blog.

⁵ Bender, B., Schworm, P., Kranish, M., & Viser, M. (2013, April 26). Mass. antiterror units were unaware of FBI probe of Tamerlan Tsarnaev. The Boston Globe.

recent report found that states are spending a higher proportion of their own money to maintain fusion centers as federal grant funding becomes increasingly scarce, indicating these organizations are a priority for state and local officials.⁶ For the past several years the Department of Homeland Security (DHS) Office of Intelligence and Analysis (I&A) has captured a comprehensive set of output- and outcome-based measures through a rigorous assessment process that is based on the widely accepted Logic Model. The results show that fusion centers have made progress in capability development in recent years.⁷ Despite this growing body of evidence, the fusion center community struggles to demonstrate its value added, especially in the wake of high profile events, negative reports and academic papers, and incomplete media coverage.

This paper summarizes the findings of multi-year academic research examining several key factors contributing to observed results at the organizational (fusion center) level. The findings point to the critical importance of examining fusion centers for what they are—key nodes within a complex network whose primary strength is found in the relationships they build and maintain with key partners. The findings also open possible pathways for measuring the true value added by individual fusion centers and the national network moving forward.

II. What are Fusion Centers?

Fusion centers are physical locations maintained by states and major urban areas, and typically consist of at least two “Federal, State, local, or tribal government agencies that combine resources, expertise, and information with the goal of maximizing the ability of such agencies to detect, prevent, investigate, apprehend, and respond to criminal and terrorist activity.”⁸ The Department of Homeland Security describes fusion centers as contributors to the Information Sharing Environment (ISE) that receive, analyze, and disseminate threat information, as well as process tips, leads, and suspicious activity reports (SARs).

As of this writing, the national network of fusion centers consists of 78 federally recognized organizations. Although each fusion center has its own unique characteristics, all fusion centers simultaneously serve their parent agencies, multiple sectors, state and local officials, and are accountable to the public. They may also support criminal investigations, emergency management operations, conduct strategic analysis and threat assessments, and respond to requests for information from their clients. A fusion center’s products typically consist of notifications to police, threat assessments for pre-planned events, or reports that synthesize sensitive data.

⁶ Heaton, B. (2014, October 23). Fusion centers: Have they found their sweet spot? *Government Technology*.

⁷ For example, see 2014 National Network of Fusion Centers Final Report, available at http://www.dhs.gov/sites/default/files/publications/2014%20National%20Network%20of%20Fusion%20Centers%20Final%20Report_1.pdf

⁸ Implementing Recommendations of the 9/11 Commission Act of 2007 (Pub. L. 110-53)

Although fusion centers are not federal assets, they do receive technical assistance and grant funding from federal agencies. Despite the fact that DHS I&A's ability to actually determine fusion center outcomes is limited, it does provide various kinds of support including personnel, access to shared information databases, and connections to other federal agencies. In addition, DHS I&A conducts the annual assessment that tracks performance and capability development across the network, as noted above. This activity falls under the Fusion Center Performance Program (FCPP), which is also tasked with conducting exercises to test capabilities, and mitigating identified gaps to improve or sustain fusion center operations.

The FBI also plays an important role by providing liaisons and access to FBI data streams. Other federal agencies work with fusion centers on a case by case basis. These include the Department of Defense (DoD), the United States Secret Service (USSS), the Department of the Treasury (DoT), Customs and Border Protection (CBP), Immigration and Customs Enforcement (ICE), and the Transportation Security Administration (TSA), among others. The strength and nature of the relationships with federal agencies varies from fusion center to fusion center based largely on the jurisdiction.

III. Stakeholder Perception and the Configurations of Conditions Within the National Network of Fusion Centers

The research informing this paper examined the organizational mechanics of fusion centers in order to better understand why outcomes vary across the network. Why, for example, might a fusion center have a better reputation and deliver superior intelligence products when compared with another fusion center in a neighboring jurisdiction? One answer to this question may seem fairly obvious—fusion center outcomes vary because all fusion centers are different, and some have more resources than others. But upon careful examination of individual fusion centers the answer appears far more complex. Some fusion centers may have abundant resources yet be perceived as less effective by stakeholders, whereas a poorly funded fusion center might enjoy national notoriety or produce excellent products and services. It is also possible, and perhaps even likely that all high performing fusion centers have important similarities, just as less effective organizations are also likely to share certain traits.

In order to unpack some of this complexity, the research began by asking stakeholders to identify the most effective fusion centers from a sample of 18 primary and recognized fusion centers.⁹ A total of 43 internal and external stakeholders answered a questionnaire pertaining to the products and services provided by these 18 fusion centers.¹⁰ Additional questions asked these same

⁹ For a list of all primary and recognized fusion centers, visit <http://www.dhs.gov/fusion-center-locations-and-contact-information>

¹⁰ Internal stakeholders included those individuals who were directly employed by one of the 18 fusion centers in the sample. External stakeholders were current and former fusion center directors and analysts from outside the sample, federal employees who worked closely with the national network, subject matter experts, academics, congressional staffers, and liaison officers at the state and local levels.

stakeholders to identify the most and least reputable organizations from within the sample. This data produced an effectiveness score on a scale of 0–100 for each organization, as well as a numerical reputation score. The reputation score was used to validate the effectiveness score: if organizations were both effective and reputable above a pre-determined threshold (the mean), they were identified as highly effective. Fusion centers failing to meet the thresholds for effectiveness and reputation were identified as being less effective.¹¹

After determining the scores for each fusion center, personnel from all 18 organizations were invited to participate in a series of questionnaires. Eleven of these fusion centers fully participated by completing questionnaires that gathered information on organizational capacity, analysts' skills, traits, roles, and responsibilities, and finally the relationships maintained by the analysts. In addition to the questionnaires, the data collection process included a series of interviews with current and former fusion center directors, supervisors, and analysts, as well as federal officials and subject matter experts.

After the data had been gathered, the individual cases (each participating fusion center) were analyzed using the comparative method and a configurational approach based on set theory. Specifically, crisp-set qualitative comparative analysis (csQCA) was conducted to identify specific configurations of conditions in each set. These sets were distinguished by the observed outcome. The final analysis revealed a series of observations or “recipes” shared by organizations with the same outcome.

IV. Observations and Findings

The analysis led to four overarching findings relevant to practitioners in the fusion center community.

A. Variation in Outcomes and Organizational Levels

Outcomes appear to vary because factors within each fusion center vary across three specific levels of analysis: the organizational, analyst, and network levels (see Table 1.1). The organizational level was captured the organization's characteristics, including its capacity. The most effective organizations in the research sample possess sufficient resources and capabilities at the organizational level to do their job effectively. Sufficiency is simply defined as the ability to perform several basic functions, such as producing a regular product line.

This result is intuitive—it is more difficult to be effective without the necessary resources and the capabilities to direct those resources. These resources may take

¹¹ It should be noted that effectiveness is not an absolute measure, and is based purely on stakeholder perception. It is possible that some fusion centers not meeting the “highly effective” criteria in this sample might meet the criteria in a larger or smaller sample. The measure was simply meant to distinguish between the participating fusion centers for the purposes of conducting the research into the individual organizations.

various forms, such as a sufficient number of personnel cleared at the Top Secret level, an intern cadre to relieve the workload on the analyst corps, or access to federal agency intelligence and information-sharing databases.

The second level consisted of the analysts' traits and characteristics. Analysts employed by the most effective fusion centers consistently prioritized intelligence analysis, information analysis, verbal communication, database access and utilization, and research skills.¹² On the other hand, analysts in less effective organizations only prioritized information analysis and open source data collection. Beyond skills, analysts' traits and characteristics were varied and revealed few patterns within the limited data set.

Table 1.1 Observed Organizational, Analyst, and Network Level Conditions
Conditions of Highly Effective Fusion Centers

Organizational Level (Capacities)	Strong liaison officer cadre
	Interns
	At least one analyst with Top Secret clearance
	Adequate personnel
Analyst Level (Proficiency in Skills)	Intelligence analysis
	Information analysis
	Verbal communication
	Data entry
	Writing
Network Level (Relationships)	Multiple strong ties within fusion center
	Multiple strong ties with law enforcement
	Multiple strong ties with other fusion centers
<i>Conditions of Less Effective Fusion Centers</i>	
Organizational Level (Capacities)	Weak/small liaison officer cadres
	Overtaxed personnel
	Few information/intelligence products
Analyst Level (Proficiency in Skills)	Information analysis
	Open source research
Network Level (Relationships)	Few ties within fusion center
	Few ties with law enforcement
	Few ties with other fusion centers

The third level examined the structure of the network, defined as the relationships or ties maintained by analysts. Ties are critical in networks because they form the linkages between nodes. Nodes might be individuals, groups, task forces, or other organizations. Without relationships, these nodes exist in isolation void of any functioning network. Network analysis enables researchers and practitioners to

¹² It should be noted that these skill categories were arbitrary and designed to determine whether that presented with a list, analysts in effective fusion centers would prioritize different types and levels of skills than those analysts in less effective fusion centers.

better understand the ties existing within a network, especially characteristics like tie strength and elasticity.

The findings showed that analysts in the most effective organizations maintain at least one of two types of relationships: interpersonal ties to individuals inside and outside the jurisdiction (having both types of contacts was essential) or organizational level ties such as those maintained with liaison officer cadres. In fact, the key distinguishing factor between the most effective and least effective fusion centers in the sample was the types of relationships maintained by the analysts with various communities of practice.

Together, these conditions at all three levels of analysis form the distinct configurations that are present in the most effective and least effective organizations (see Table 1.1). The findings demonstrate that the most effective organizations are successful because they leverage resources and conditions at each level, whereas less effective fusion centers are missing some or all of these critical components at one or more levels.

B. The Importance of Relationships for Intelligence and Information Sharing in the Fusion Center Context

Relationships, or ties, are characterized by the position and role of the individual analysts within the network, and the strength of the linkage(s) between people and organizations. This is what forms the structure of the network. Fusion center directors, analysts, and liaison officers closely resemble inter-organizational boundary spanners. Boundary spanners are individuals who connect organizations or entities through functions in the network. It is intuitive to assume that boundary spanners are most effective when they are spanning boundaries between organizations that can share valuable resources, such as technology, information, best practices, or even personnel.

Analysts in the most effective organizations appear to be spanning boundaries with strong ties to individuals in their own organizations, with the law enforcement community, with other fusion centers from across the network, and with their fusion center's Terrorism Liaison Officer (TLO) cadre. In fact, the findings indicated that in order for a fusion center to be highly effective, there had to be either a strong TLO cadre or strong ties between analysts and specific communities of practice, including law enforcement and other fusion centers.

In addition to the configurational results a basic network map developed using social network analysis (SNA) techniques indicated that analysts in the most effective fusion centers maintain a greater number of different connections to communities of practice than those analysts in less effective fusion centers. Not all of these connections need be formal—informal ties can be just as valuable. This is consistent with the observation that analysts serve as boundary spanners.

In fact, informal ties have been associated with positive outcomes in a variety of networks. Although it may seem counter-intuitive, these informal ties are less costly and easier to maintain than formal ties. While the most effective fusion centers certainly need strong ties, they must also possess weaker informal ties that can be leveraged when circumstances call for closer engagement with individuals and organizations on the periphery of the network. These ties can be easily maintained and nurtured through even infrequent joint exercises or training, conferences, or information sharing activities.

Although it was not an initial focus of the research, another important role was observed: the network facilitator. DHS I&A deploys Intelligence Officers (IOs) to fusion centers. Until recently these IOs have not performed analytical or other technical functions, and instead were tasked with building and maintaining trust relationships between people and organizations, and reinforcing perceptions. Network facilitators play a critical role in a network designed to share intelligence and information across geographic and institutional boundaries. Although liaisons from other federal agencies may also perform the role of network facilitator depending upon the jurisdiction, DHS IOs emerged as the key network facilitators in the sample, and may also play an important boundary spanning role as discussed above.

C. The Multiple Paths to Observed Outcomes

The results demonstrate that fusion centers can achieve the same outcomes by taking different paths to those outcomes. For example, two fusion centers might not employ the same number of personnel, produce the same number of intelligence reports, or operate within similar jurisdictions, but may share a highly effective outcome as determined by their stakeholders.

This multiple path phenomena, also known as equifinality, was observed across the sample for both the most highly effective and less effective fusion centers. This finding is important for practitioners and evaluators to consider because standard models or minimum/maximum thresholds could encourage some organizations to abandon what works, or conversely, encourage other organizations to pursue goals or standards that do not ultimately enhance their value to their primary stakeholders.

D. Organizational Reputation as an Indicator of Performance

Finally, a fusion center's reputation matters and is quantifiable. The questionnaires asked respondents to determine the effectiveness of organizations based on their products and services. The questionnaires also asked specific questions about each fusion center's organizational reputation. The findings showed that effective organizations can lack positive reputations, and, conversely, that highly reputable organizations could be less effective. However, all of the most highly effective fusion centers had the most positive reputations within the sample.

Upon closer examination, including interviews with personnel from reputable fusion centers, a positive reputation appears to be very useful. Some directors associated their organization's visibility and reputation with increased resources and opportunities. Because interactions between organizations in the network are voluntary, fusion centers are more likely to engage with other reputable fusion centers.

Reputation metrics may correlate with higher effectiveness scores, but evaluators should exercise caution because reputational data by itself can be dangerously misleading. Many of the more effective organizations have well-known advocates or visible persons who champion their capabilities and accomplishments on the national stage. These individuals may hold positions in member associations, attend national conferences, testify before Congress, or publish articles. It is possible that an advocate or an elevated profile—due perhaps to an incident or high profile arrest, for example—could lead to a positive reputation for an organization that is actually less effective in terms of its products and services.

V. Looking Ahead: Considerations for Policy and Practice

The complexities of intelligence and information sharing in the United States make even the most basic measurement of a value-based outcome like effectiveness a difficult task, but not an impossible one. By carefully examining the network—and treating it like a network, meaning a focus on the relationships that link people and their organizations—it is possible to learn a great deal more about fusion centers, their outputs, and perhaps even their outcomes.

Based solely on the findings discussed in this paper, at least some fusion centers appear to be providing valuable products and services within their jurisdictions, and this value can be quantified through collections of outputs and stakeholder satisfaction surveys. More importantly, the findings indicate that it is possible to measure and analyze the ways in which these organizations provide value, both within their jurisdictions and within the broader national network by engaging a rich cross-section of stakeholders. In light of these findings, practitioners in the fusion center community should consider three things.

First, in both the questionnaire responses and supporting interviews, fusion center directors and analysts overwhelmingly agreed that they want to be evaluated based on the value-added they deliver within their jurisdiction, as opposed a purely “cookie-cutter” national standard or template that does not account for their jurisdiction's unique contexts. The findings also suggest that stakeholder perceptions can provide meaningful insights into the value added by fusion centers within their own jurisdictions, as well as comparison between organizations across the network. In the most basic sense, fusion centers are effective if they are providing value to their stakeholders who may be tasked with preventing terrorism, responding to natural disasters, or solving crimes. However, due to the inherent

complexities and biases of stakeholder perceptions, evaluators must use caution by including stakeholder perception and should look to couple it with other metrics and approaches.

Second, the internal structural challenges facing the national network of fusion centers are not unique. Rigorous network analysis can reveal a great deal about the network's strengths and weaknesses, and provide some empirical data for exploring other important questions about the value-added by individual fusion centers and individual analysts. In fact, network analysis could represent a major advance in the measurement of organizational and network performance when coupled with other metrics. In order to fully comprehend the network, evaluators should re-calibrate to include network properties in performance assessments.

Finally, the practitioner community and policymakers must recognize that the quality and strength of relationships are directly related to the quality of products and services provided by fusion centers. Although more research is needed to determine the direction and weight of the relationships between the network's structural properties and its outputs, this may in fact represent the most direct path to determining what are the most important outcomes for individual fusion centers, and the entire national network of fusion centers, both now and in the future.

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