

# **Transnational Threat Indications and Warning: The Utility of Network Analysis**

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## **Abstract**

This paper uses the case of the Japanese cult Aum Shinrikyo to illustrate how network constructions can aid in the development of indications and warning for transnational threats. Following a brief primer on Aum, the paper describes Aum's organizational and transactional networks, and examines how analysts could have used these representations to generate indications and warnings. The main conclusions are that link analysis can create organizational and transactional network representations that are well suited to develop indications and warning for transnational threats, and that the Aum Shinrikyo case can suggest useful points of departure for link analysis.

## **Introduction**

On [20 March 1995], at the height of the morning rush hour, several members of a religious cult which preached Armageddon between the United States and Japan unleashed a sarin gas attack on the innocent civilian riders of the Tokyo subway system... Twelve persons were killed and over 5,000 were injured... The cult, known as Aum Shinrikyo, thus gained the distinction of becoming the first group, other than a nation during wartime, to use chemical weapons on a major scale. I believe this attack signals the world has entered into a new era (US Senate 1995).

The new era that Senator Sam Nunn spoke of in 1995 is materializing in the form of five growing challenges to national security—organized crime, narcotics trafficking, terrorism, information warfare, and weapons of mass destruction (WMD) proliferation—that the US government refers to as “transnational threats.” Aum Shinrikyo, acting simultaneously as a transnational criminal organization (TCO), a WMD proliferant, and a postmodern terrorist group, proved to be the prototype of a transnational threat entity.

Using Aum Shinrikyo, a prototype for the transnational threats that post-Cold War policymakers are currently addressing, as an example, this paper suggests that the cult can help illustrate how link analysis, by creating both organizational and transactional network constructions, can aid analysts in the development of indications and warning for transnational threats. To accomplish this, the paper first briefly touches upon the belief structure, scope, and activities of the cult. The next section demonstrates how link analysis, as the basis for developing network representations, can use the information in the primer to develop examples of the cult's organizational and transactional networks. The transactional networks prove particularly helpful in this regard because they allow analysts to uncover the motives driving an entity's activity and behavior. The final section suggests how analysts can use these network representations to develop indications and warnings for transnational threats, and how detailed case studies, like the Aum Shinrikyo case, can help lay the foundation for these network constructions.

## **Aum Shinrikyo Primer**

Aum Shinrikyo has generated much interest from policymakers addressing the threats emerging from the end of the Cold War. Aum was a non-state actor that posed a significant challenge to Japan and other states through its activities and operations in areas like organized crime, narcotics trafficking, terrorism, and WMD proliferation. Shoko Asahara established Aum Shinrikyo in 1987 and the Tokyo Municipal Government recognized it as an official religion in 1989. During the early 1990s, Asahara ingrained an apocalyptic vision into the cult that underwrote the cult's massive shift in focus on WMD production and militarization. By the end of 1995, the cult was responsible for over 30 murders and achieved notoriety as the first non-state actor to use WMD. The

underlying factors that fueled these activities are the cult's belief structure and Aum's wealth of resources.

Shoko Asahara, Aum's supreme leader, guided the formation of the belief structure through a series of writings and teachings that he disseminated to a worldwide audience using modern communications technologies like the Internet. Aum's belief structure rested upon two pillars, the first of which borrowed selected tenets from some of the world's major religions. Asahara broadly based the religious pillar of Aum on prayers to *Shiva*, the Hindu god of destruction, along with more specific ideas from other major religions of the world, such as Armageddon (US Senate 1995). Consequently, the cult's beliefs rested more on the common idea of the end of the world by divine intervention than on any particular religious teaching. Asahara derived the other pillar of belief from science fiction. Drawing an analogy between his growing cult and the secret society of elite humans in the *Foundation* trilogy of Isaac Asimov, Asahara stated that Aum would found a new and more enlightened society following a cataclysmic war between the US and Japan. Asahara preached that Aum must prepare itself to survive this Armageddon and found the new society afterwards. He asserted that only he had the power to predict the date of the coming apocalypse, although he frequently changed it as he descended into an increasingly paranoid and deluded state of mind. In the end, Aum's belief structure and the paranoia it generated translated into its efforts to militarize and lash out at society.

The growth in membership and resources that Aum Shinrikyo managed to achieve in the early 1990s is truly impressive. The cult established offices or owned property in over 11 prefectures of Japan, including a massive compound at the foot of Mount Fuji and an office tower in downtown Tokyo (Kaplan and Marshall 1996). Aum also benefited immensely from its large membership, estimated to have exceeded 50,000 members, and its assets of over \$1 billion (US Senate 1995). The large membership was surprisingly talented and skilled, and included scores of professionals, academics, government officials, businesspersons, and scientists. Aum had a strong international presence, with offices or property in the US, Sri Lanka, Germany, Australia, Taiwan, and Russia (US Senate 1995). Asahara used a strategy that identified and leveraged weaknesses in societal structures to attain this massive growth in such a short period. For example, the cult focused efforts on the technically or scientifically gifted social outcasts of Japanese society known as *otaku* and capitalized on the religious vacuum within Russia following the collapse of the Soviet Union to recruit talented new members (Kaplan and Marshall 1996). Aum used the promise of financial investment to establish facilities and gain access to top leaders in Russia (US Senate 1995). The cult also used a Japanese law protecting

registered religions organizations to underwrite its rapid financial growth (Kaplan and Marshall 1996). Thus, Aum's substantial, rapid growth and ability to exploit societal weaknesses provided many options to attaining its goals.

Aum's licit activities revolved around business transactions whose purpose was to create revenue and mislead investigators. Aum owned a large chain of yoga studios, computer stores, and Internet Service Providers (ISPs) that generated legitimate sources of income for the cult (Kaplan and Marshall 1996). The cult also ran a series of clinics that created public relations opportunities for the cult while providing a convenient cover when ordering biology- or chemistry-related equipment (Kaplan and Marshall 1996). The sale of religious equipment, such as electrode-laden helmets that purportedly synchronized the brain waves of members with those of Asahara, garnered the cult profits in the millions of dollars (Kaplan and Marshall 1996). Aum's licit activities generated large sums of revenue, but their real significance is found in their potential for deception and disinformation.

Aum's deceptive use of licit activities deflected attention from its illicit activities and masked its criminal behaviors. Aum engineered a series of criminal acts that paralleled those of the Japanese crime families—the *yakuza*. For example, the cult took on the *yakuza* head-to-head in one of its most lucrative rackets, debt collection, and competed with Japanese narcotics syndicates for business (Kaplan and Marshall 1996). Over a span of five years in the early 1990s, Aum committed criminal offenses like theft, fraud, murder, extortion, espionage, smuggling, and bribery (Kaplan and Marshall 1996). Aum exhibited many of the behaviors associated with TCOs, such as leveraging jurisdictional and state boundaries, using violence to attain goals, employing shell companies and deception for risk management, and co-opting hostile elements through bribery or extortion (Kaplan and Marshall 1996). For example, Aum used fraudulent front companies on numerous occasions, including one transaction that acquired advanced genetic modeling software from a US company to advance its biological weapons program (Kaplan and Marshall 1996). These criminal activities were crucial to obtaining the supplies and resources that Aum required to undertake other activities, especially within their WMD program.

Asahara's apocalyptic vision was the driver of the most important illicit activity of Aum Shinrikyo: the production and deployment of WMD. Asahara's visions of the final day of humanity, which hinged on a nuclear exchange between the US and Japan, eventually evolved into the notion that Aum must trigger Armageddon with a WMD strike of its own. Consequently, Aum poured resources and manpower into a WMD production effort designed to produce many WMD agents. Aum's most successful

chemical agent was sarin, an extremely lethal nerve toxin that Aum deployed in Tokyo, killing 12 and injuring over a thousand, and earlier in the small Japanese city of Matsumoto, killing seven and injuring over 500 (Kaplan and Marshall 1996). Aum also successfully deployed a weaponized version of VX, another deadly nerve toxin similar to sarin (Croddy 1995). Thankfully, the cult enjoyed less success with biological agents, though it did weaponize and unsuccessfully deploy such agents as anthrax and botulism. The cult also had active radiological, nuclear, seismographic, and laser weapon production efforts (US Senate 1995). In the end, the robust and successful nature of the Aum WMD program enabled the cult to become a serious post-Cold War threat.

With vast resources at its disposal and motivated by an extreme sense of paranoia, the cult carried out a devastating series of terrorist attacks. While Aum firmly established its identity as a terrorist group with the Tokyo subway attack, the cult conducted many terrorist acts in Japan and elsewhere before the Tokyo incident that fit a postmodern terrorist paradigm (Laqueur 1996). The traditional terrorist paradigm centers on the use of measured violence designed to create maximum media exposure without heavy casualties to attain mostly state-centric goals. The postmodern terrorist paradigm, in contrast, involves the use of transnational connections to finance and implement violent attacks designed to maximize casualties to attain religious or ideological goals (Juergensmeyer 1996). Aum is a prime example of the latter because of its religious orientation and its use of WMD to attain its goals through the infliction of large casualties. The cult committed at least five separate WMD terrorist attacks in Japan in the early 1990s, demonstrating to the world the horror postmodern terrorism holds for the post-Cold War era (Kaplan and Marshall 1996).

### **Organizational and Transactional Networks**

A network is a group of nodes connected with linkages. The nodes can be people, organizations, computers, and other physical entities. Linkages usually connect nodes through either a communication or a transfer of some tangible item. Many contemporary transnational entities have adopted networks for both organizational structure and transactions to improve risk management, bureaucratic streamlining, and durability. While analysts often focus on network structures to identify and understand the organizations of entities, one can also apply the concept to the networks that these entities develop to conduct transactions. Transactional networks allow analysts the opportunity to develop ideas about the entity's underlying motivations, which are important in determining future transnational threat activities. Illustrating organizational

and transactional network structures using examples from Aum Shinrikyo can aid in the development of observables that analysts can then use to derive indications and warning for transnational threats.

### **Aum Shinrikyo's Organizational Network**

Phil Williams used the organizational networks of drug trafficking syndicates to derive attributes of a generic transnational organizational network. He states that this generic organizational network:

... will have both a core and a periphery. The core is likely to consist of dense network connections among a group of individuals or small organizations that provide the steering mechanism and sense of direction for the entire network. The core members will also have bonding mechanisms that afford a high degree of trust and cohesion in their relationships. Bonding can be achieved through a variety of means—common ethnicity, tribal connections, family or lineage, common experience in youth gangs or prison—but is critical to the network core. The periphery is likely to be less dense, with somewhat looser relationships in which the bonding mechanisms are not as strong (Williams 1998).

Aum's organizational structure eventually fit this type of construction. Until 1993, the cult was a relatively small and loosely structured group. When Asahara's paranoia prompted him to revise the date for the coming apocalypse from 2000 to 1996, the leader also proclaimed that Aum was woefully unprepared for the future. In order to survive the coming cataclysm, the cult had to restructure itself and increase its efforts to meet the coming conflict. Asahara reorganized Aum to create a parallel government ready to assume leadership of the Japanese state.

A group of high officials and the leader, Shoko Asahara, formed the core Aum Shinrikyo's organizational network. These officials were talented and trusted advisors charged to carry out Asahara's plans within the cult. His most trusted advisor, Hideo Murai, held a Ph.D. in astrophysics and oversaw all of Aum's WMD programs (US Senate 1995). Kiyohide Hayakawa, a talented civil engineer, managed the physical growth of Aum and led the conventional weapons development (US Senate 1995). Other members of the core included an intelligence officer, an internal security chief, a medical official, a *yakuza* family head, and lead scientists for both the biological and chemical weapons programs. Asahara relied on the intelligence and judgement of these men, who were all Japanese and almost all long-time members of Aum, but only to a degree. For example, while most of the core were either present or informed of the decision to attack the Tokyo subway system in 1995 with sarin, Asahara rejected

the rational arguments made against such a move (Kaplan and Marshall 1996).

The rest of the cult's membership constituted the periphery, which managed Aum's operations throughout Japan and the world. The periphery's diversity that resulted from Aum's recruitment strategy provided the cult a measure of flexibility in selecting its operations. While the periphery supplied manpower to the cult's various enterprises, such as computer stores, medical clinics, public relations, WMD development, narcotics trafficking, and small arms production lines, many members lived and worked outside of the cult's compound. The cult used these members on several occasions to obtain raw materials or, more importantly, intelligence. For example, the cult reportedly gained advance knowledge of police searches from members that worked within Japanese law enforcement agencies (Kaplan and Marshall 1996). To maintain risk control, Aum compartmented the membership within the ministries and enforced strict internal security measures to ensure that members did not know the operations of the cult beyond their specific tasks. In the end, the combined talents of the periphery and the cult's vast resources best explain the cult's impressive record of accomplishments.

The Aum case suggests that aggregating the observables from communications and transfers between nodes within either the core, the periphery, or between the two can allow the analyst to construct a better picture of an entity. Despite the cult's efforts to limit observables through strong internal security measures, Aum's large geographic extent and bureaucratic size created a series of faxes, telephone records, and other observables that analysts could have exploited using link analysis. By collating these kinds of observables, analysts could have identified the more important, or core, nodes using center of gravity techniques like traffic analysis, which equates a node's importance with the amount of linkages it supports. Comparing those observables with intelligence information or criminal dossiers, moreover, could have allowed analysts to determine the importance of a node within an organizational network. Improving understanding of the organizational and decisionmaking structure of an entity is crucial to developing indications and warning of future threat activity.

### **Aum Shinrikyo's Transactional Networks**

Combining the concepts of nodes and linkages with process steps creates a different network construction known as a transactional network. In this representation, an interconnected series of intermediary and supplier nodes feed goods and services via linkages to sequentially-ordered process steps to complete a

transaction. The supplier nodes either produce or provide goods or services for the transaction, while the intermediary nodes transfer these goods or services from the supplier nodes into the process steps. A process step is one of a succession of sequential actions that combine to form a transaction, while a subprocess step is one of a succession of sequential actions that combine to form a process step. The most detailed subprocess steps act as consumer nodes, acquiring products or services necessary to complete a process step and thus creating the link between nodes and process steps. In a transactional network representation, linkages connect nodes to other nodes and to subprocess steps, thus creating another large information space for analysts to collect observables and develop network representations.

The Aum case can be used to detail two transactional networks in the cult's sarin production network. Aum's sarin program was a series of subprocess steps and intermediary and supplier nodes that produced a large number of observables. Figure 1 shows a network diagram of the supplier (S) and intermediary (I) nodes that combined to satisfy a subprocess or consumer node—the initial acquisition of gas masks for the cult's scientists from an American company, RothCo. After meeting representatives of RothCo at a trade show in Las Vegas, Aum representatives placed the initial order through Devenir Millionaire (I2), a Taiwanese firm owned by the cult, creating a receipt and a sales record. Devenir deposited money into its Bank of Tokyo account (I2 to I3) to pay for the transaction, creating bank records and a receipt, and then sent a fax (I2 to S1) asking RothCo to change the recipient of the order to Maha Posya—another Aum firm in Japan. Following a wire-transfer payment (I3 to I4), which left a wire transfer order form, RothCo shipped the order to Japan using a US-based shipper, Everswift (S1 to I5 to I1), creating bills of lading and other shipping records. This transaction occurred during late 1994 and early 1995, just months before the Tokyo sarin attack. It is interesting to note that in this case, the cult made no effort to mask or hide its dealings in the above network, and thus it is possible that analysts could have detected this subprocess network as it developed.

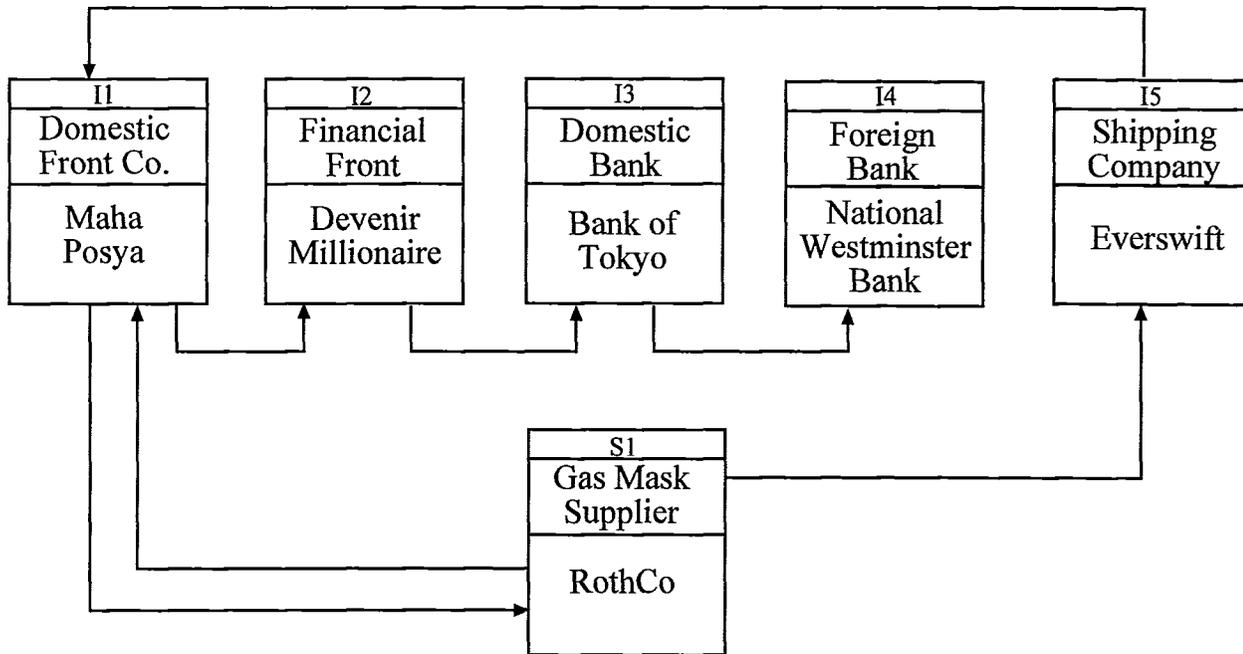


Figure 1: Acquire Gas Masks Network

The location of observables parallels the shift within international commerce from hard copy, paper-based to soft copy, electronic transactions. Though Aum Shinrikyo operated in a largely paper and fax machine environment during the early 1990s, the cult did use the Internet to collect information, to communicate, and to recruit. Figure 2 is an online transaction between the cult and Brookhaven National Laboratory (BNL) in New York. Using an unidentified ISP (I1) as an intermediary, a cult member

contacted the BNL's World Wide Web home page (S1) and located the Protein Database, a detailed listing of every identified amino acid chain in the world. The member then downloaded the full database (S1 to I1 to SP1) in order to support the research requirements of Aum's biological warfare program. Some of the potential observables found in this network include telephone records, web site "touches," and download records.

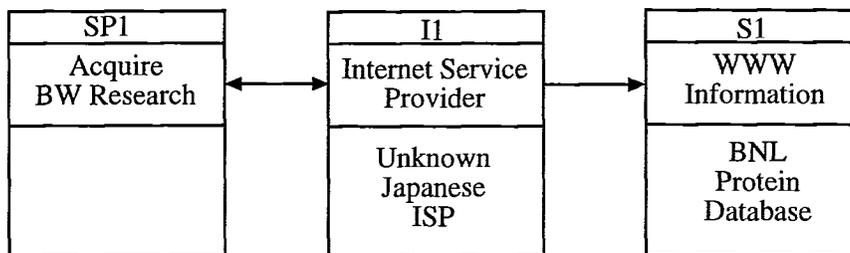


Figure 2: Acquire Biological Research Network

## Indications and Warning for Transnational Threats

The development of indications and warning is the lynchpin for any structure designed to prevent the activities of transnational threat entities. The US government recently recognized the need for prevention in the *International Criminal Control Strategy*, which stated that “our approach must be proactive where possible and reactive where necessary” to successfully counter transnational threats (US National Security Council 1998). Link analysis can enable analysts to develop indications and warning through the development of organizational and transactional network constructions—the basic tools for network analysis. Determining or narrowly defining the range of motivations behind a transnational entity’s activities can help analysts to develop ideas about future trends of the entity’s activity. For example, if analysts had identified the transactional network depicted in figure 1 and found a correlation between Maha Posya and the Aum cult, then they might well have asked what possible uses a Japanese religious cult had for gas masks. This could have led to a focus on the cult and its agenda that was lacking before the Tokyo sarin attacks.

Identifying the nodes, linkages, and transactions within transnational threat case studies can assist efforts to create foundations for link analysis, like templates, into which analysts can map current information. Aum Shinrikyo is a particularly strong candidate, given the extensive amount of available information detailing its organizational structure, decisionmaking processes, and scope of activity and the rich diversity of its activities across four transnational threat areas. These can provide analysts with observables, nodes, and linkages to seed networks. The Aum case study can serve as a starting point for analysts to develop a set of more generic indications and warning for this type of transnational threat.

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## References

- Croddy, E. 1995. Urban Terrorism—Chemical Warfare in Japan. *Jane’s Intelligence Review* 7(11): 520-523.
- Juergensmeyer, M. 1996. The Worldwide Rise of Religious Nationalism. *Journal of International Affairs* 50(1): 1-20.
- Kaplan, D. E., and Marshall, A. 1996. *The Cult at the End of the World*. New York, N.Y.: Crown Publishers.
- Laqueur, W. 1996. Postmodern Terrorism. *Foreign Affairs* 75(5): 24-36.
- US National Security Council. 1998. *The International Criminal Control Strategy*. Washington, D.C.: Government Printing Office.
- US Senate. 1996. *Global Proliferation of Weapons of Mass Destruction*. Washington, D.C.: US Government Printing Office.
- Williams, P. 1998. The Nature of Drug-Trafficking Networks. *Current History* 97(618): 154-159.