

The Human Trafficking Kill Chain

A Guide to Systematic Disruption

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Abstract

This paper will discuss the underlying causes of human trafficking that present challenges to both modeling and counter-trafficking efforts and conduct a literature review of previous kill chain and trafficking modeling efforts. It will also set forth areas for future research. Primarily, this paper presents a novel way of thinking about human trafficking, both a formal and informal tool to discover traffickers' actions, predict future events, maximize intelligence opportunities, and pursue both traffickers and victims over time and geography. This model also lays the foundation for a mathematical framework by which adversarial decision-making theories and models may be applied in a formal manner which allows for testable hypotheses and metrics of effectiveness.

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December 2017

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18 USC § 1582 (Vessels for Slave Trade)

18 USC § 1583 (Enticement into Slavery)

18 USC § 1584 (Involuntary Servitude)

18 USC § 1585 (Seizure, Detention, Transportation or Sale of Slaves)

18 USC § 1586 (Service on Vessels in Slave Trade)

18 USC § 1587 (Possession of Slaves Aboard Vessel)

18 USC § 1588 (Transportation of Slaves from United States)

18 USC § 1589 (Forced Labor)

18 USC § 1590 (Trafficking with Respect to Peonage, Slavery, Involuntary Servitude, or Forced Labor)

18 USC § 1591 (Sex Trafficking of Children or by Force, Fraud, or Coercion)

18 USC § 1592 (Unlawful Conduct with Respect to Documents in Furtherance of Trafficking, Peonage, Slavery, Involuntary Servitude, or Forced Labor)

18 USC § 1593 (Mandatory Restitution)

18 USC § 1594 (Attempt and Forfeiture)

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“KILL CHAIN ANALYSIS IS A GUIDE FOR
ANALYSTS TO UNDERSTAND WHAT
INFORMATION IS, AND MAY BE, AVAILABLE
FOR DEFENSIVE COURSES OF ACTION.”
-LOCKHEED MARTIN

1 INTRODUCTION

Human trafficking is the world’s fastest growing criminal economy and the third largest overall. Estimates suggest that between 20 million and 45 million people are currently enslaved around the world. Survey methodologies are inconsistent at best, rely on willing participants, and systematically underestimate the affected population. Counter-trafficking efforts have remained largely unchanged and the ability to modernize the effort lie within a fractured stakeholder community. Law enforcement, government agencies, nonprofit organizations, technology companies, and commercial enterprises all have relevant data and skills that could drastically increase the number of victims identified and rescued as well provide evidence to secure traffickers’ convictions.

Trafficking in all its forms represents a massive challenge to these counter-trafficking stakeholders. In the digital age, human trafficking has evolved into a complex system that leverages the power of technology to build supply chains, create sophisticated communication techniques, and protect criminals from scrutiny, particularly online. In parallel, these systems rely upon non-digital channels of communication, transportation, and recruitment that have been continuously refined over centuries, and intentionally exploit the fractured flow of information and investigations. A coordinated, holistic approach that ultimately raises risk and cost to traffickers to unacceptable levels is critical. The key to this multi-pronged approach is uniting stakeholders and their datasets behind an analytic framework to affect maximum disruption.

The power of the human trafficking kill chain is using the knowledge gained through analysis to automate as many courses of action as possible. It is easier in some phases of the kill chain than others to deploy automated collection, analytics, and programs. By automating these otherwise lengthy manual processes, we allow technology to be a force multiplier for good and reduce the time it takes to find victims and stop traffickers. To the millions of victims worldwide, that time may equal their lives.

The United Nations Protocol to Prevent, Suppress, and Punish Trafficking in Persons, Supplementing the United Nations Convention Against Transnational Organized Crime defines trafficking as:

“...THE RECRUITMENT, TRANSPORTATION, TRANSFER, HARBOURING OR RECEIPT OF PERSONS, BY MEANS OF THE THREAT OR USE OF FORCE OR OTHER FORMS OF COERCION, OF ABDUCTION, OF FRAUD, OF DECEPTION, OF THE ABUSE OF POWER OR OF A POSITION OF VULNERABILITY OR OF THE GIVING OR RECEIVING OF PAYMENTS OR BENEFITS TO ACHIEVE THE CONSENT OF A PERSON HAVING CONTROL OVER ANOTHER PERSON, FOR THE PURPOSE OF EXPLOITATION. EXPLOITATION SHALL INCLUDE, AT A MINIMUM, THE EXPLOITATION OF THE PROSTITUTION OF OTHERS OR OTHER FORMS OF SEXUAL EXPLOITATION, FORCED LABOUR OR SERVICES, SLAVERY OR PRACTICES SIMILAR TO SLAVERY, SERVITUDE OR THE REMOVAL OF ORGANS...”
(UNITED NATIONS, 2000)

The United States’ Trafficking Victims Protection Act, and its subsequent Reauthorizations, defines severe forms of trafficking in persons as the following:

“...THE TERM ‘SEVERE FORMS OF TRAFFICKING IN PERSONS’ MEANS—(A) SEX TRAFFICKING IN WHICH A COMMERCIAL SEX ACT IS INDUCED BY FORCE, FRAUD, OR COERCION, OR IN WHICH THE PERSON INDUCED TO PERFORM SUCH ACT HAS NOT ATTAINED 18 YEARS OF AGE; OR (B) THE RECRUITMENT, HARBORING, TRANSPORTATION, PROVISION, OR OBTAINING OF A PERSON FOR LABOR OR SERVICES, THROUGH THE USE OF FORCE, FRAUD, OR COERCION FOR THE PURPOSES OF SUBJECTION TO INVOLUNTARY SERVITUDE, PEONAGE, DEBT BONDAGE, OR SLAVERY...” (UNITED STATES CONGRESS, 2000)

This paper will discuss the underlying causes of human trafficking that present challenges to both modeling and counter-trafficking efforts and conduct a literature review of previous kill chain and trafficking modeling efforts. It will also set forth areas for future research. Primarily, this paper presents a novel way of thinking about human trafficking, both a formal and informal tool to discover traffickers’ actions, predict future events, maximize intelligence opportunities, and

pursue both traffickers and victims over time and geography. This model also lays the foundation for a mathematical framework by which adversarial decision-making theories and models may be applied in a formal manner which allows for testable hypotheses and metrics of efficiency.

Underlying Causes of Trafficking

Both push and pull factors create the conditions for human trafficking on which traffickers rely. Whilst many of these factors are surmised in anecdotal reports, few have stood up to rigorous statistical testing (described later). These factors include conflict, statelessness, refugees, religious minorities, poverty, LGBTQ identification, disabilities, runaway youth, and indigenous populations. These largely nebulous factors must nonetheless be considered by policymakers and survivor service providers.

CONFLICT

It is well documented by the United Nations and other international monitoring organizations that people fleeing from domestic and regional conflict are especially vulnerable to exploitation. These people often pay for criminal organizations to smuggle them across a border and are subsequently sold into slavery, particularly when the individual is unable to pay the steep smuggling fees demanded by their handlers.

REFUGEES

The United Nations High Commissioner for Refugees (UNHCR) estimates that one in every 113 people, equal to 65.3 million people, is now either an asylum seeker, internally displaced, or a refugee. Approximately 21.3 million of those individuals are refugees with over half being under the age of 18. (United Nations High Commissioner for Refugees, 2016) These figures include 16.1 million people under UNHCR mandate and an additional 5.2 million Palestinian refugees registered under United Nations Relief and Works Agency (UNRWA). Refugees often pay smugglers to bring them into one country and are then subjected to trafficking in a third country. Camps for refugees provide the sort of concentration of vulnerable, displaced people in which traffickers and smugglers thrive. The combined lack of security, available services, and oversight typically found in these camps allow for traffickers and smugglers to build relationships with corrupt camp officials and jointly establish trafficking and/or smuggling rings. The 2016 Trafficking in Persons Report mentions several such cases, including one woman who was recruited to leave her home country of Syria to travel to Lebanon for work in the restaurant and hotel industry. Once she arrived, she was subjected to sex trafficking with more than 70 other women and girls, many of whom were

also Syrian. (United States Department of State Office to Monitor and Combat Trafficking in Persons, 2016)

STATELESSNESS

The UNHCR estimates there are currently 10 million stateless people around the globe, approximately a third of which are children. Because stateless individuals lack identity documents, they are denied access to education and economic opportunities. These individuals are forced to find work with unscrupulous employers and often find themselves in debt bondage. Some governments also impose travel restrictions on stateless people which forces them to hire smuggling services when they need to migrate for work. For example, Burma denies citizenship to an estimated 810,000 men, women, and children, most of whom are ethnic Rohingya living in Rakhine. Many have fled with the aid of smugglers only to be subjected to forced labor in agriculture, fishing, and domestic work. (Ibid)

RELIGIOUS MINORITIES

Religious minorities are increasingly vulnerable to trafficking. They are more likely to be forced into religious conversions and marriage in which they may be subjected to domestic or social servitude. Religious minorities are also frequently discriminated against in job markets which makes them susceptible to fraudulent employment offers.

Da'esh publicly released guidelines on how to capture, smuggle, forcibly hold, and sexually abuse female slaves, particularly garnered from the Yezidi refugee population. In 2014 and 2015, Da'esh abducted thousands of Yezidi women and girls and sold them in Syria in human trafficking rings or to provide to fighters in forced marriage and domestic servitude. These women and girls often underwent virginity tests before being traded in slave bazaars. (Orphan Secure, 2016)

POVERTY

The Institute for Trafficked, Exploited & Missing Persons (ITEMP) conducted a statistical study in 2011 which they argue conclusively ties poverty to human trafficking. For every USD\$1000 rise in a country's GDP, they are 10% more likely to be a destination country. The reverse is also true: for every USD\$1000 drop in GDP, a country is 12% more likely to be a source country. (Institute for Trafficked, Exploited, and Missing Persons, 2011) Anecdotally, researchers have been suggesting the same for years. The United Nations writes:

“THESE FACTORS [INCLUDING POVERTY] TEND TO EXERT PRESSURES ON VICTIMS THAT “PUSH” THEM INTO MIGRATION AND HENCE INTO THE CONTROL OF TRAFFICKERS, BUT OTHER FACTORS THAT TEND TO “PULL”

POTENTIAL VICTIMS CAN ALSO BE SIGNIFICANT. POVERTY AND WEALTH ARE RELATIVE CONCEPTS WHICH LEAD TO BOTH MIGRATION AND TRAFFICKING PATTERNS IN WHICH VICTIMS MOVE FROM CONDITIONS OF EXTREME POVERTY TO CONDITIONS OF LESS-EXTREME POVERTY. IN THAT CONTEXT, THE RAPID EXPANSION OF BROADCAST AND TELECOMMUNICATION MEDIA, INCLUDING THE INTERNET, ACROSS THE DEVELOPING WORLD MAY HAVE INCREASED THE DESIRE TO MIGRATE TO DEVELOPED COUNTRIES AND, WITH IT, THE VULNERABILITY OF WOULD-BE MIGRANTS TO TRAFFICKERS.” (UNITED NATIONS OFFICE ON DRUGS AND CRIME, 2005)

Poverty likewise motivates people to willingly put themselves in the hands of smugglers in the search for economic opportunity and better living conditions.

LGBTQ

In the United States, LGBTQ youth are over-represented in runaway and homeless populations, two groups with heightened vulnerability to trafficking. Due to social biases, LGBTQ trafficking victims are also more likely to be penalized for acts committed as a result of being trafficked, despite vacatur laws. (United States Department of State Office to Monitor and Combat Trafficking in Persons, 2016)

The US Department of State writes:

“...GOVERNMENTS AND NGOS HAVE MADE PROGRESS IN IDENTIFYING LGBT TRAFFICKING VICTIMS AND HIGHLIGHTING THE VULNERABILITY OF LGBT PERSONS TO CRIMES SUCH AS HUMAN TRAFFICKING. FOR EXAMPLE, IN 2013, NGOS WORKING ON LGBT ISSUES IN ARGENTINA IDENTIFIED TRAFFICKERS WHO PROMISED TRANSGENDER WOMEN JOB OPPORTUNITIES IN EUROPE, BUT INSTEAD CONFISCATED THEIR PASSPORTS AND FORCED THEM INTO PROSTITUTION. POLICE IN THE PHILIPPINES HAVE IDENTIFIED LGBT TRAFFICKING VICTIMS DURING ANTI-TRAFFICKING OPERATIONS. CIVIL SOCIETY IN SOUTH AFRICA HAS IDENTIFIED INSTANCES OF TRAFFICKERS COERCING LGBT YOUTH TO REMAIN IN PROSTITUTION UNDER THREAT OF DISCLOSING THEIR SEXUAL ORIENTATION OR GENDER IDENTITY TO THEIR FAMILIES. AS PART OF THE *FEDERAL STRATEGIC ACTION PLAN ON SERVICES FOR VICTIMS OF TRAFFICKING IN THE UNITED STATES 2013-2017*, U.S. AGENCIES HAVE COMMITTED TO GATHERING INFORMATION ON THE NEEDS OF LGBT VICTIMS OF HUMAN TRAFFICKING. NGOS IN THE UNITED STATES ESTIMATE LGBT HOMELESS YOUTH COMPRISE 20 TO 40 PERCENT OF THE HOMELESS YOUTH POPULATION; THESE YOUTH ARE AT PARTICULARLY HIGH RISK OF BEING FORCED INTO PROSTITUTION.”

DISABILITIES

Children with disabilities are frequent targets of traffickers and smugglers. After entering a country, they have been forced to beg because their disabilities, especially if highly visible, draw sympathy and larger charitable donations. In societies where these children are not accepted in school, communities are more likely to pay these street children little notice. The IKR has been documented as recruiting mentally disabled children, smuggling them across borders, and using them in armed conflict. One such boy was just 8 years old. (United States Department of State Office to Monitor and Combat Trafficking in Persons, 2016)

RUNAWAY MINORS

Domestically, the Runaway and Homeless Youth Act recognizes the vulnerability of runaway and homeless youth to the perils of trafficking. One national group targeting this population states that 28% of youth living on the streets and 10% of youth living in shelters have exchanged sex for money. They cite many cases in which these relationships have turned into trafficking scenarios. International organizations see similar trends in runaway and homeless youth and note that they sometimes hire smugglers to bring them across borders. (National Network for Youth, 2015)

INDIGENOUS POPULATION

The United States Department of State Office to Monitor and Combat Trafficking in Persons recognizes the plight of indigenous populations and their vulnerability to trafficking. Much like refugees or people experiencing statelessness, many seek to be smuggled out of their homeland and end up victimized by their handlers or sold to traffickers. The State Department writes:

“WORLDWIDE, INDIGENOUS PERSONS ARE OFTEN ECONOMICALLY AND POLITICALLY MARGINALIZED AND ARE DISPROPORTIONATELY AFFECTED BY ENVIRONMENTAL DEGRADATION AND ARMED CONFLICT. THEY MAY LACK CITIZENSHIP AND ACCESS TO BASIC SERVICES, SOMETIMES INCLUDING EDUCATION. THESE FACTORS MAKE INDIGENOUS PEOPLES PARTICULARLY VULNERABLE TO BOTH SEX TRAFFICKING AND FORCED LABOR. FOR EXAMPLE, CHILDREN FROM HILL TRIBES IN NORTHERN THAILAND SEEKING EMPLOYMENT OPPORTUNITIES HAVE BEEN FOUND IN COMMERCIAL SEXUAL EXPLOITATION, INCLUDING SEX TRAFFICKING, IN BARS IN MAJOR CITIES WITHIN THE COUNTRY. IN NORTH AMERICA, GOVERNMENT OFFICIALS AND NGOS ALIKE HAVE IDENTIFIED ABORIGINAL CANADIAN AND AMERICAN INDIAN WOMEN AND GIRLS AS PARTICULARLY VULNERABLE TO SEX TRAFFICKING. IN LATIN AMERICA, MEMBERS OF INDIGENOUS COMMUNITIES ARE OFTEN MORE VULNERABLE

TO BOTH SEX AND LABOR TRAFFICKING THAN OTHER SEGMENTS OF LOCAL SOCIETY; IN BOTH PERU AND COLOMBIA, THEY HAVE BEEN FORCIBLY RECRUITED BY ILLEGAL ARMED GROUPS. IN REMOTE AREAS OF THE DEMOCRATIC REPUBLIC OF THE CONGO, MEMBERS OF BATWA, OR PYGMY GROUPS, ARE SUBJECTED TO CONDITIONS OF FORCED LABOR IN AGRICULTURE, MINING, MECHANICS, AND DOMESTIC SERVICE. SAN WOMEN AND BOYS IN NAMIBIA ARE EXPLOITED IN DOMESTIC SERVITUDE AND FORCED CATTLE HERDING, WHILE SAN GIRLS ARE VULNERABLE TO SEX TRAFFICKING.”

Understanding these and other underlying causes to human trafficking provides the foundation upon which more complex cognitive models can be designed and tested.

2 PREVIOUS WORK

In 2007, the United States Department of Defense described the process by which the military seeks to outmaneuver their adversaries. (DOD) The military kill chain includes the steps of reconnaissance, weaponization, delivery, exploitation, command and control (C2), and actions on objective. The model is employed to analyze, detect, and synthesize battlefield operations and make quick but rational decisions.

Similarly, Lockheed Martin asserted the existence of the Cyber Kill Chain in the seminal piece entitled *Intelligence-Driven Computer Network Defense Informed by Analysis of Adversary Campaigns and Intrusion Kill Chains* (Lockheed). The Cyber Kill Chain extends the battlefield paradigm into the cyber world and applies it to advanced persistent threats. In the following chart, Lockheed illustrates how each phase of an operation from reconnaissance to actions on objective can be assessed for available options to detect, deny, disrupt, degrade, deceive, or destroy an adversaries’ capabilities and assets.

Table 1: Courses of Action Matrix

Phase	Detect	Deny	Disrupt	Degrade	Deceive	Destroy
Reconnaissance	Web analytics	Firewall ACL				
Weaponization	NIDS	NIPS				
Delivery	Vigilant user	Proxy filter	In-line AV	Queuing		
Exploitation	HIDS	Patch	DEP			
Installation	HIDS	“chroot” jail	AV			
C2	NIDS	Firewall ACL	NIPS	Tarpit	DNS redirect	
Actions on Objectives	Audit log			Quality of Service	Honeypot	

Figure 1: Lockheed Martin's Cyber Kill Chain

Seo-Young Cho used extreme bound analysis (EBA) to account for push and pull factors of human trafficking in destination and origin countries in “Modeling for Determinants of Human Trafficking: An Empirical Analysis” and found difficulty in identifying robust variables and reliable, empirical data. This study both statistically corroborates and refutes several of the potential underlying causes of human trafficking mentioned above. Nonetheless, this represents the first and only attempt to statistically model and predict factors of human trafficking.

3 TRAFFICKING KILL CHAIN

The human trafficking kill chain presented below organizes a complex, multidimensional crime into a linear cognitive model. Breaking down the trafficking kill chain into its constituent parts better empowers counter-trafficking stakeholders to meet their adversaries with equal or greater resources and strategy. It allows analysts and stakeholders to make full use of current and future information to increase their defensive and offensive options. The human trafficking kill chain is comprised of six main elements: **recruitment, transportation, entrapment, brokering, delivery, and exploitation.**

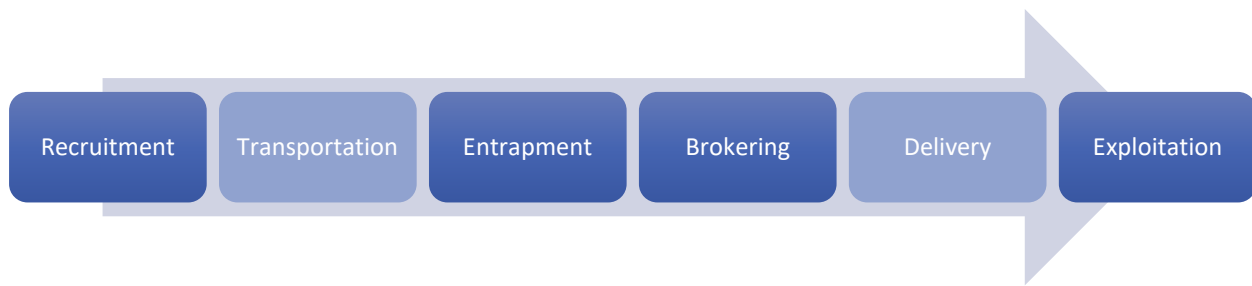


Figure 2: The Human Trafficking Kill Chain

We can break down each of these components to better understand their application and inclusion.

Recruitment

Recruitment is a key component of human trafficking and one of the pillars of the legal definition. Although this phase often includes in-person networking or online activities like ads and conversations over social media, recruitment can also be described more broadly as the targeting of an individual to be trafficked. For the purposes of the trafficking kill chain, kidnapping is considered recruitment.

News articles, survivor interviews, trafficker interviews, case law, and more suggest multiple avenues and methods of recruitment. Some of these include:

- Social media, such as Facebook, Twitter, Kik, and Snapchat
- Job advertisements, such as those for modeling or farm labor
- Romantic pursuits, often called the boyfriend or Romeo model
- Drug use, particularly at social events
- Prison
- Psychological manipulation or grooming, including befriending and social isolation
- In-person promises for education, travel, or dream job
- Refugees looking to be smuggled out of conflict zones or humanitarian crises

Transportation

Transportation is another key pillar of the legal trafficking definition, and includes transport, transfer, and harboring of victims. Although there are cases where victims are not removed from their home environments, such as sexual exploitation via online cams, victims are usually relocated either willingly or forcibly. Some of the modes of transportation include:

- Commercial or private aircraft

- Public transport, such as buses and the subway
- Privately-owned vehicles
- Taxi services, including app-based services such as Lyft and Uber
- Trains
- Boats, both private and commercial

Entrapment

Entrapment is one of the most important aspects of the trafficking kill chain, and perhaps the most difficult to disrupt. Startlingly, few survivors of human trafficking self-identify as victims. Many turn away help or opportunities to escape when they present themselves. The entrapment process is as much psychological as it is physical. Some methods include:

- Locked rooms or buildings
- Physical violence, including sexual assault
- Drug addiction
- Threats of harm or outing to family, friends, and employers
- Religious rites
- Confiscated travel and identity documents
- Debt bondage
- Remote locations

Brokering

Brokering is the act of connecting the victim to the buyer. In some cases, the victim may self-broker, such as in a child who is forced to hold a sign and beg for money at a public intersection.

Brokering may take the form of the following:

- Advertisements placed on public boards or online
- Orphanages
- Fliers, such as those for massage parlors or brothels
- Websites, such as review forums or chat rooms
- In-person connections with potential buyers
- Business fronts, including hotels, restaurants, and labor contractors

Delivery

Victims are generally moved from their holding location to the place of exploitation. In some cases, exploitation takes place on-premise. The methods utilized for delivery are often the same as those listed above for transportation. However, delivery can take place remotely, especially in the case of online exploitation. Some additional methods of delivery in those cases can include:

- Password authenticated websites
- Transmission via app, email, or URL of content

Exploitation

Exploitation is the actual exchange of money or other benefit between the broker and buyer in which the victim is required to do or be something to benefit the buyer. Examples of exploitation include:

- Sexual acts, including pornography and remote camera acts
- Forced labor of any kind
- Forced Adoptions
- Forced marriage
- Forced begging
- Soldiering
- Prison labor (in some cases)

It is important to note not all elements of the kill chain will be present in every trafficking event or campaign. The kill chain may also repeat itself; after initial exploitation, a victim will continue to be moved, entrapped, advertised, and exploited. There is anecdotal evidence as well as case law that illustrate the victim-trafficker paradigm wherein a victim recruits new victims into the scheme to secure their own freedom or a higher position within the organization.

4 APPLYING THE KILL CHAIN

FROM SEX TRAFFICKING WITHIN ESCORT SERVICES TO LABOR TRAFFICKING OF FARMWORKERS, THE WAYS HUMANS ARE EXPLOITED DIFFER GREATLY. EACH TYPE HAS UNIQUE STRATEGIES FOR RECRUITING AND CONTROLLING VICTIMS, AND CONCEALING THE CRIME. (POLARIS PROJECT, 2017)

As Polaris Project notes in *The Typology of Modern Slavery*, there are many distinct forms of human trafficking, each requiring a unique model for adversarial decision making. Although Polaris Project groups these forms into 25 separate types of trafficking, I argue there are three main categories: sex trafficking, labor trafficking, and other forms of trafficking. We can apply the following grid to each case we analyze and then conduct gap analysis afterward to gather intelligence requirements and potential sources for further collection.

This chart uses the terms detect, deny, disrupt, degrade, deceive, and destroy to differentiate between possible options to weaken or destroy the adversary's ability to carry out their operations. It is important to note that these are ordered by the strength of the action and the amount of time the action has an impact on the adversary. A brief description and course of action for each is found below:

Detect: discover or identify the presence or existence of something. In tactical operations, detection is the perception of an object of possible military interest but unconfirmed by recognition. Similarly, in surveillance, detection is the determination and transmission by a surveillance system that an event has occurred.

Example: Run analytics on scraped posts advertising massage parlor jobs

Deny: refuse to give or grant something to someone. A denial measure is an action to block the adversary's use of something necessary for operations.

Example: Block credit card purchases

Disrupt: to interrupt an event, activity, or process by causing a disturbance or problem. By disrupting an adversary's operations, one creates a short-term stoppage.

Example: ban a contractor on H1-B visa applications for labor violations

Degrade: to lower the character or quality of something or someone, to break down or deteriorate; to reduce in amount, strength, or intensity. By degrading an adversary's capabilities, one may also reduce their freedom of movement.

Example: flood trafficking pages with false ads

Deceive: to cause someone to believe something that is not true, typically to gain an offensive or defensive advantage.

Example: understate your technological capabilities during a public interview

Destroy: to put an end to the existence of something or someone by damaging or attacking it. To destroy, one creates a situation whereby the adversary has no means of recovery for a long period of time.

Example: secure convictions and lengthy prison sentences for leaders of an international organization

See the chart below to understand the permanency of possible actions across the spectrum:

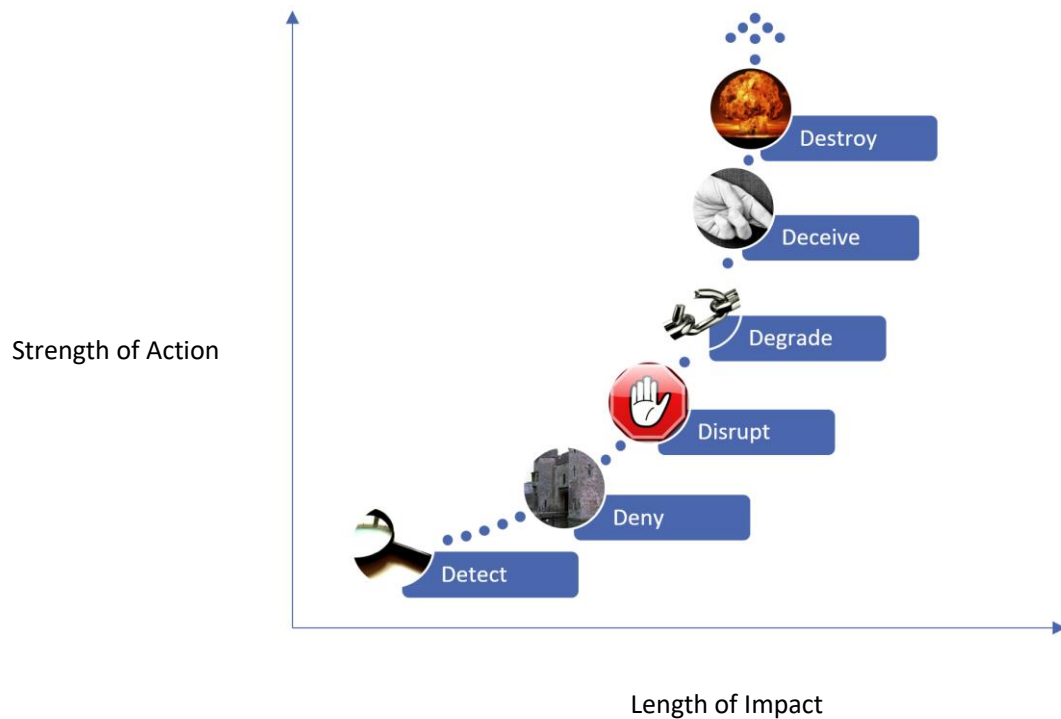


Figure 3: Action Longevity

With the understanding of both action longevity and process phases, one can document and consider counter-trafficking operations in a formal analytic manner. Additionally, consider the assets traffickers may use in each phase of the kill chain. Assets are what traffickers use throughout each phase of the kill chain to reach their end goal: money or other benefit. For simplicity, we have listed some assets here:

- Private vehicles
- Cell phones
- Internet connection
- Computers
- Cameras
- Social Media Apps
- Airplanes
- Taxis
- Health services
- Victims
- Recruiters
- Brokers
- Ad agencies
- Banks
- Cryptocurrency
- Credit cards
- Hotels
- Rental properties
- Videos
- Advertisements
- Websites
- Boats

Below is the human trafficking kill chain analysis grid we use to analyze human trafficking events and consider potential disruption opportunities. We will use three case examples representing different types of human trafficking to further illustrate the usefulness of the human trafficking kill chain analysis grid.

Phase	Detect	Deny	Disrupt	Degrade	Deceive	Destroy
Recruitment						
Transportation						
Entrapment						
Brokering						
Delivery						
Exploitation						

Figure 4: Human Trafficking Kill Chain Matrix

Case Study 1: Sex Trafficking in the United Kingdom

(Click [here](#) to see the original article)

50 women were trafficked from Hungary to the United Kingdom by a prostitution racket that set victims up in airport hotels, student accommodation, and private homes. Five members of the gang were convicted on trafficking offenses, four of whom were male Hungarians and one of whom was a British woman. These women had ads displayed on websites offering prostitution services and were thus “hired” to come to the UK. The gang operated a cell-phone based call center to arrange services between the victims and buyers. Exploitation took place in hotels or in

houses run by the Hungarians as brothels, although management of the gang took place out of an internet café based in Croydon.

To ensure the cooperation of the victims, the five traffickers and their accomplices chose women who were interested in living Hungary for financial reasons. They created a situation of debt bondage by paying for their flights and board, which was then held over the women who were forced to work as prostitutes for up to twelve hours per day. They were also threatened with violence to themselves and their families back in Hungary. The traffickers also threatened to expose the women as prostitutes back in their home country.

To begin our analysis, let's consider the known assets the traffickers employed and situations they exploited during each of the phases of the trafficking kill chain:

- Recruitment: prostitution websites, financial difficulties
- Transportation: commercial aircraft, debit/credit card(s)
- Entrapment: debt bondage, threats of violence to self and families, threats of outing to families
- Brokering: cell phones, computers, internet café, websites, web advertisements
- Delivery: Unknown mode(s) of physical transportation
- Exploitation: hotels, houses/brothels

Now let's think about how we can convert that knowledge to disruption opportunity along the longevity spectrum of detect, deny, disrupt, degrade, deceive, and destroy:

Phase	Detect	Deny	Disrupt	Degrade	Deceive	Destroy
Recruitment	- Collect prostitution advertisements in origin countries		- Shut down prostitution advertisement websites		- Place several false ads to make discovery difficult for traffickers	
Transportation	- Pass airfare purchases through known trafficker CC database	- Block purchases of airfare by known CC numbers				

Entrapment	- Reporting of large numbers of cash-only transactions at banks					
Brokering	- Collect prostitution advertisements in destination countries		- Shut down prostitution advertisement websites - Purchase ban on burner cell phones			
Delivery	- Pass transport purchases through known trafficker CC database					
Exploitation	- Pass hotel bookings through known trafficker CC database - Report multiple cash hotel bookings to counter-trafficking body					- Lengthy sentences for traffickers

Figure 5: Sex Trafficking Kill Chain Matrix

Case Study 2: Labor Trafficking in the United States

(Click [here](#) and [here](#) for the original articles)

In one recent case, the leaders of a human trafficking organization were convicted of trafficking Guatemalan teenagers through labor contracts with an Ohio, USA egg farm. The victims were recruited in Guatemala and promised good jobs and the ability to attend school in the US. The traffickers smuggled them into the United States and brought them to dilapidated trailers to live in while working up to twelve hour days at the Trillium Farms cleaning chicken coops, loading and unloading crates of chickens, and debeaking and vaccinating chickens. The money they received was transferred to the co-conspirators in Guatemala and elsewhere. To ensure compliance, the traffickers threatened violence, withheld food and heat, and punished the victims by forcing them

into the most squalid trailer. They also threatened the victims’ families with violence or death, even after the families signed over deeds to their properties to pay for their sons’ expenses.

Let’s again consider the known assets the traffickers employed during each of the phases of the trafficking kill chain in this scenario:

- Recruitment: In-person promises of good jobs and quality schooling
- Transportation: Identity documents (real or forged), assumed ground transport
- Entrapment: Threats of violence, withholding food and heat as punishment, property deeds, on-premise housing
- Brokering: Labor contracts, labor supply company formation
- Delivery: None assumed
- Exploitation: Farm, farm-owned housing, money transfers

Phase	Detect	Deny	Disrupt	Degrade	Deceive	Destroy
Recruitment	- Tip app in origin countries and languages		- Public awareness campaigns around TTPs	- Refuse entry to suspected traffickers into origin countries		
Transportation	- Analyze CCTV video and images at border	- Refuse entry to known traffickers - Block entry and hold minors traveling without legal guardian			- Sting operation booked around transport requests	- Lifetime ban on public transport options like Lyft, Uber, and Amtrak
Entrapment	- Mandatory abuse reports at health care facilities					

Brokering	- H1-B Visa blacklist analysis - Analyze business licenses for known traffickers	- Deny business license	- Ban H1-B visas by violating companies			
Delivery						
Exploitation	- Supply chain disclosures - Company owned housing inspections		- Seizure of assets			- Lengthy prison sentences for leaders

Figure 6: Labor Trafficking Kill Chain Matrix

Case Study 3: Other Forms of Trafficking - Forced Adoption in India

(Click [here](#) for original article)

Police halted a baby trafficking racket operating from Kolkata, India and two adjoining Parganas involving adoption centers and over fifty individual cases. Police describe several people involved in the process including nurses, staff, ambulance drivers, doctors, and foster parents, though some may have been unwilling participants in the scheme. Some residents interviewed in the case questioned a doctor with higher-than-average infant mortality and theft rates. The amount that families paid to adopt the infants was not disclosed publicly. One particularly gruesome case involved a man who killed his wife and the child was sent to the Special Adoption Agency. Without contacting family for following completing basic formalities, the child was put up for adoption. Police continue to investigate this case and follow new and promising leads.

Once again, let’s put this information on the human trafficking kill chain matrix after considering the assets traffickers used:

- Recruitment: hospitals, nursing homes, crime victims, ambulance staff
- Transportation: Unknown
- Entrapment: Position of vulnerability (infants), permanent relocation
- Brokering: Adoption Agencies
- Delivery: Unknown
- Exploitation: Payment by “adoptive” parents

Phase	Detect	Deny	Disrupt	Degrade	Deceive	Destroy
Recruitment	- Statistical analysis of infants missing or dead		- Suspend or revoke licenses for abnormal numbers	- Pay staff vulnerable to recruitment well enough to withstand bribes		
Transportation						
Entrapment				- Block int'l adoptions prior to two years old		
Brokering	- Annual Reports on Adoption Agencies - Process international adoptions through trafficking database	- Block adoptions by known traffickers		- Shut down adoption agencies with large number of complaints or offenses		
Delivery						
Exploitation	- Large bank transfers create alert		- Seize illicit assets	- Enact steep penalties for parents adopting trafficked babies		- Secure lengthy sentences of traffickers

Figure 7: Adoption Trafficking Kill Chain Matrix

5 DISRUPTION

“A KILL CHAIN IS A SYSTEMATIC PROCESS TO TARGET AND ENGAGE AN ADVERSARY TO CREATE DESIRED EFFECTS. U.S. MILITARY TARGETING DOCTRINE DEFINES THE STEPS OF THIS PROCESS AS FIND, FIX, TRACK, TARGET, ENGAGE, ASSESS (F2T2EA): FIND ADVERSARY TARGETS SUITABLE FOR ENGAGEMENT; FIX THEIR LOCATION;

TRACK AND OBSERVE; TARGET WITH SUITABLE WEAPON OR ASSET TO CREATE DESIRED EFFECTS; ENGAGE ADVERSARY; ASSESS EFFECTS.” -(U.S. DEPARTMENT OF DEFENSE, 2007).

The value of applying a kill chain approach to human trafficking is automating as much of the process as you can to reduce time to value. It also highlights potential disruption strategies and combinations of courses of action to have the strongest, longest-lasting effect. Potential disruption options also vary by stakeholder category. Stakeholders have counter-trafficking courses of action that are generally divided into three basic categories: hunt, respond, and prevent. These match up to phases in the kill chain. Hunt refers to targeting and finding persons and data of interest as well as deployment of technologies and analytics to do so (matches well with detect). Respond refers to actual operations, including blocking purchases, arresting traffickers, seizing assets, etc. (matches with deny, disrupt, degrade, deceive, destroy). Prevent is taking lessons learned from the hunt and respond actions to work to prevent similar actions from happening again in the future (matches with disrupt, degrade, and detect).

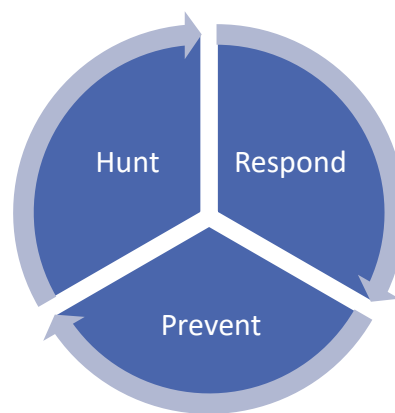


Figure 8: Operations Cycle

Let’s delve into stakeholder counter-trafficking options in this continuum a bit further with examples of possible action:

Law Enforcement and Justice (Hunt, Respond)

- Use automated detection tools to find persons of interest (H)
- Legal processes (i.e. subpoenas) to access revealing data sets (H)
- Conduct interviews of victims and traffickers (H)
- Conduct sting operations (R)
- Arrest traffickers (R)

- Require sex offender registration **(R)**
- Seize illicit assets **(R)**
- Shut down illegal websites **(R)**

Government (Prevent, Respond, Hunt)

- Use automated detection tools to find persons of interest **(H)**
- Enact strong counter-trafficking legislation around mandatory data sharing and supply chain disclosures **(P)**
- Enact steep penalties to deter traffickers **(P)**
- Suspend or revoke business licenses **(R)**
- Suspend or revoke visa sponsor applications **(R)**

NGO Efforts (Prevent, Respond, Hunt)

- Use automated detection tools to find persons of interest **(H)**
- Operate tip apps and phone lines **(H)**
- Public awareness campaigns **(P)**
- Victim rescues and services **(R)**

Commercial Enterprise (Prevent, Hunt, Respond)

- Use automated detection tools to find persons of interest **(H)**
- Block purchases using offenders' credit cards or cryptocurrency wallets **(R)**
- Denial of services **(R)**
- Refusal of underage access to products and services **(P)**

6 FUTURE WORK

The author and Dr. Eric Laber of North Carolina State University have partnered to statistically model the trafficking kill chain using trafficking data sets collected by Global Emancipation Network and other robust factors from publicly available data sets. Part of this effort will be in evaluating image and video analysis tools and techniques for accuracy and inclusion in the trafficking kill chain process. They will construct a comprehensive, rigorous, and scalable framework for real-time adaptive anti-trafficking strategies. The proposed framework uses a partially observable Markov game to model the interactions of traffickers and anti-traffickers. This framework can accommodate: (i) noisy, asynchronous, and incomplete data; (ii) high-dimensional

state and action spaces; (iii) heterogeneous and non-stationary trafficker behaviors; and (iv) evolving resource or logistical constraints on the actions of anti-traffickers. These models exist in a variety of environments and issue sets including combat, smuggling, weapons trafficking, drug trafficking, human trafficking, and more. We will identify and examine disruption opportunities and the likely outcome of each action. We will model mathematically and computationally each set of possible decisions and weigh likely outcomes. This knowledge would allow for more effective decisions while operating against an adversary and allow for preparation beforehand to mitigate the likely outcome. The technical description of these tools is available upon request.

Additional work needs to be done in the fields of image and video analysis, particularly with extracting text, emojis, filters, and Unicode from images and real-time processing of live video feeds. Further research on de-anonymizing cryptocurrency is important as well, following Rebecca Portnoff's work on Bitcoin usage on Backpage. Similar research can be done on the intelligence aspect of gathering additional resources such as these and pivoting amongst data points.

Most importantly, tools need to be developed to collect, analyze, and distribute information gleaned from the human trafficking kill chain to all relevant stakeholders. A global governance structure around mandatory information sharing, supply chain disclosure, and content classification pushes stakeholders in the right direction. The more we securely share relevant information with necessary partners, the greater the impact we will have on the global crime of human trafficking.

7 CONCLUSION

This paper extends the military and cyber kill chain into another criminal enterprise: human trafficking. The human trafficking kill chain represents a robust linear cognitive model for a complex, multidimensional crime to be used for effective decision-making in adversarial environments. The many stakeholders involved in counter-human trafficking efforts can benefit from applying this approach, ranging from law enforcement to commercial enterprises. A rigorous analytic framework such as the human trafficking kill chain enables users to recognize both data collection gaps and disruption opportunities that bring about the same end: increase the number of victims and traffickers identified and significantly decrease the amount of time it takes to do so. By automating much of the kill chain using analytics and other technologies, it frees up analysts to

focus on the necessary elements that humans must do such as public awareness campaigns, enacting legislation, and conducting victim and trafficker interviews.

The key elements of the human trafficking kill chain are recruitment, transportation, entrapment, brokering, delivery, and exploitation. We broke down three case examples representing different types of human trafficking to illustrate how the kill chain can be used to create a defender's advantage and highlight current or future options to counter the adversary. To ensure maximum visibility, it is critical to include all relevant data sets and consider all stakeholders' assets when conducting kill chain analysis. The kill chain is not guaranteed to fit every trafficking event, nor will every component of the chain be present in every situation. Most importantly, using this approach increases the number of victims and traffickers identified and minimizes the amount of time it takes to do so.

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