8 Investigating the Online Trade of Illicit Antiquities

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Democratization of the Antiquities Trade

The internet has democratized the antiquities trade in a way that was unimaginable in the 20th century. Online platforms and payment systems have developed in recent decades and reshaped how global commerce takes place in many markets, cultural artifacts included. While it is difficult to assess the overall value of the antiquities trade, the democratization caused by digital technology brought with it a distinct shift from low volumes of high value objects to a flooding of online platforms with a plethora of often small, low value items such as ancient coins. This shift in trade brings new possibilities but also new challenges for tracking and monitoring sales and the movement of goods. Collecting artifacts using digital channels affords anonymity, convenience and the ability to locate hard-to-find objects. This chapter seeks to provide a generalizable model for investigating online activities related to antiquities trafficking and other forms of illicit trade. By developing new tools for online monitoring and investigations, the authors seek to improve upon existing methods and approaches employed to combat illicit trade and transnational crime.

The internet and other digital technology have transformed international trade. Specific to antiquities, development of software, tools and other technological innovations have led to a democratization of the market, allowing any individual with an interest in antiquities to obtain information on the topic. With the establishment of online payment systems, hobbyists are not only able to obtain information on antiquities but can also bid on and purchase the objects themselves. As this chapter explains, the democratization of the antiquities market benefits some actors and provides various market advantages, but it has also led to an increasingly criminalized market flooded with looted, smuggled, and counterfeit goods.

Monitoring Methodology

Online monitoring for the Countering the Looting of Antiquities in Syria and Iraq (CLASI) project took place over the course of approximately 14

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months between September 2017 and November 2018. The CLASI project was run by the Terrorism, Transnational Crime and Corruption Center (TraCCC) at George Mason University and was funded by the United States Department of State, Bureau of Counterterrorism. Searches were conducted in seven languages: English, Arabic, Kurdish, Farsi/Persian, Italian, German and French. The online monitoring team initially examined over 120 sites on the open and dark web in North America and Europe for coins and cuneiform objects (Table 8.1).

The process for conducting regular monitoring of sites offering cuneiform and numismatic objects for sale involved using search terms such as 'coins' or 'cuneiform' within the sites of interest and recording the monitoring information in Table 8.1 where possible.

The 'dark web' is so called because it consists of sites which are not indexed by the usual search engines such as Google and are only accessible via anonymizing software such as The Onion Router (TOR). They are expected to be used by those who want to hide their identity for benign or nefarious purposes and, as such, can be fruitful venues to check for evidence of criminal activity. Because the dark web masks the personal identifying information of the user, dark web marketplaces have become key venues to conduct illicit activities such as drug sales or human trafficking. Despite the

Table 8.1 Monitoring overview

Site Type	*Examples*
General auction sites	eBay
Antique auction sites	Sixbid, Trocadero, Liveauctioneers
Physical and online antiquities stores	Barakat Gallery
General shopping platforms and marketplaces	Amazon, Alibaba
For sale listings by individuals type sites	Craigslist, Gumtree
Social media sites	Facebook, Twitter, Instagram, Youtube
Darknet markets	Dream Market, Hansa, White Shadow auctions, Silk Road 3, Tochka, WallStreet Market, AlphaBay, Crypto Market, Valhalla
Monitoring Information	
Website (URL/hyperlink)	
Auction or sales ID/number	
Seller ID	
Seller contact details	
Geographical location	
Advert description	
Start price	
Sold price	
Date discovered	
Images of interest	
Stated artifact provenance	

shutdown of several dark web markets such as Silk Road, new markets are quickly established to replace deactivated markets, allowing dealers to continue conducting business (Popper 2019). Because the dark web is known to have illicit activity, researchers monitored several dark web marketplaces for signs of looted or illicit antiquities trade. The dark web markets examined included Dream Market, Hansa, White Shadow auctions, Silk Road 3, Tochka, WallStreet Market, AlphaBay, Crypto Market and Valhalla. Further forensic investigation of sellers and sites on these market platforms did not take place during the project as no antiquities were found to be for sale.

Dark web monitoring was conducted through both manual and automated searches. The analyses used alternative search engines, as the indexing of these marketplaces are limited to the website hosting the content and are not indexed like open websites are by Google. Various software programs were used, including Butler[1] (a prototype application developed by Jataware Corp under DARPA's Memex program) and ShadowDragon's OI Monitor.[2] These tools allowed for the establishment of specific, regularized and iterated queries for terms such as antiquities, ancient coins, cuneiform, Syria, Iraq and other key terms of interest. What was useful about software such as OI Monitor is that it made it easier for the end user to obtain a general overview of darknet activity related to antiquities without having to directly access to the darknet via onion router browsers. Manual dark web searches took the form of visiting various directories of popular onion markets and using these to springboard to those darknet markets that were live and working at the time. During the research period, not all of these market sites were available because of network and site issues. The main focus of the online monitoring were online stores and marketplaces which had previously advertised coins and cuneiform with a higher frequency. Table 8.2 provides an overview of the websites and marketplaces monitored.

Table 8.2 Online sales monitoring list

Multi-seller Platforms	*Social Media*	*Galleries and Auctions*	*Dark Web Marketplaces*
Ebay (US, Canada, UK)	Facebook	http://www.ancientresource.com	Dream Market
LiveAuctioneers	Instagram	http://www.sadighgallery.com	Hansa
Catawiki	Twitter	https://www.sandsoftimedc.com	White Shadow
rocadero		http://www.apoloniagallery.com	Auctions
Sixbid		http://www.ancient-art.co.uk	Silk Road 3
VCoins		http://www.charlesede.com	Tochka
		https://timelineauctions.com	WallStreet Market
		http://antiquities.co.uk	AlphaBay
		http://www.artancient.com	Crypto Market
		http://www.pegasusgallery.co.uk	Valhalla
		http://www.medusa-art.com	
		http://www.griffingallery.net	
		http://www.barakatgallery.com	
		http://baidun.com	
		https://www.aphroditeancientart.com	
		https://nyshowplace.com	
		http://www.palmyraheritagegallery.com	
		https://phoenixancientart.com	

It should be noted that of the listed social media platforms, only Facebook was monitored heavily, with the other sites given more cursory attention. As explained in the following section, collected monitoring data was entered into spreadsheets which were then analyzed for suspicious or illicit activity by subject matter experts. Store websites such as the above did not normally show a high rate of sales advertisements, so it was common to find that a long time (many weeks or months) elapsed before a new artifact was advertised on their website. As noted in Chapter 7, there were also difficulties determining which objects had actually been sold. It is extremely difficult to determine the overall value of the antiquities market, but analysis of specific artifact values helps to get a partial understanding of the potential value. Through the monitoring of listings data, we were able to evaluate the average advertised price for cuneiform artifacts and coins. Our monitoring provided very different values for the antiquities market than other sources that omit the sale of ancient coins, which represent a large share of the market.

Marketplace Data Collection

The monitoring of sites was conducted first by manually collecting data from several prominent online sales platforms on the worldwide web (Ebay, Sixbid, VCoins, etc.). This method proved inefficient and time consuming, motivating researchers to shift to using web scrapers to quickly and efficiently collect listings data for analysis by subject matter experts (SMEs). Web scraping (sometimes called web harvesting, web spidering or web crawling) is a technique employed to extract large amounts of data from websites. The data can then be saved to a file or to a database in table or spreadsheet format. The use of web scrapers allowed researchers to focus resources where needed and to automate aspects of the online marketplace monitoring that did not require human analysis or processing. For example, web scrapers were used to collect basic listing information including but not limited to object ID, listing price, description and number of bids.[3]

Tools capable of scraping deep web social media sites such as Twitter and Facebook were evaluated in the hopes that there could be an automated (and therefore more efficient) equivalent of the manual checks of these sites that were conducted. At the time, none of these tools were found to meet the project's purposes, mainly because of their limited feature sets and in some cases because of the high cost of purchasing a license. Palantir and Datawalk were two such tools falling into the latter category. Shadow Dragon, Analyst Notebook (with the SMC4 plugin), Butler, Tableau Web Connector and Maltego did not offer the ability to scrape Facebook user profiles. Some of the software and tools offered useful visual insights into user connections, allowing for analysis of trade networks through social media data.[4] Because no single tool met the project's research needs, the team began developing its own specialized online investigation tool. This custom tool for Facebook and open source intelligence (OSINT) investigations is explained later in the chapter.

Social Media and Online Forums

Through primary investigation of online discussions related to antiquities sales, it was discovered that several online forums, such as Yahoo Groups, were used by members of the antiquities community. These fora were used to post questions and discuss object identification, appraisal and sales. While the final point of sale often occurred outside of or separate from these venues through private person-to-person encrypted messaging, these fora provide valuable information about antiquities sales and the actors involved in the trade. Likewise, social media platforms such as Facebook and Instagram also facilitate a similar method of buying and selling of objects, where the public can see a post about an object for sale and then communicate privately with the seller to complete the transaction. As explained in this chapter, developments in communication technology have facilitated information sharing and bolstered connectivity among members of transnational antiquities networks, allowing looters in source countries quick and easy access to interested buyers in destination countries.

Blended Sites – Combining Features of Social Media and Listings Websites

Blended websites and online marketplaces such as eBay provide particular market advantages for both buyers and sellers. These platforms often have extremely low barriers to entry, allowing nearly anyone to create an account capable of purchasing or selling antiquities. Any user with a valid email address and the other minimal required credentials is able to make an account and bid on a platform like eBay. This is in stark contrast to larger auction sites where a vendor must be vetted by the host or domain administrator before being able to sell. This democratization of the market has led to increased turn-over and a shift from trade in high-value large objects to low-value smaller items such as coins, which are easier to conceal and transport. The shift to online markets also demonstrates the tremendous adaptability of sellers. If a vendor is banned or removed from a particular platform, they can quickly create a different account on the same platform or move to another venue to re-establish their business and continue sales.

Buyer feedback on sites allows for the vetting of sellers and provides quick access to a seller score or other measurement of individual seller reliability. User feedback on these websites provides valuable data to understand the structure of the market. Users often examine previous feedback when making decisions and these reviews can change purchasing behavior. Buyer feedback sections with ranking systems provide detailed information about the reliability of sellers and facilitate a buyer's vetting of individual vendors. eBay even offers a star rating for vendors, providing a quick visual representation of each individual seller's reputation. At the same time, sellers are known for falsely inflating their online reputations through fabricated

positive reviews, a problem that exists in many online markets and is not confined to the antiquities trade. There is evidence of some sellers creating intentionally false positive feedback on their pages. This can occur because feedback fora are open response, so they are often not an actual indicator of the vendors' reputation or integrity. Various fora publicly publish lists of 'bad' vendors known for conducting suspicious transactions. Several online fora have compiled lists of suspicious or fake antiquities dealers (Augustus Coins 2020; Coin Talk 2016; Forum Ancient Coins 2005). User feedback also provides an advantage for researchers, allowing them to conduct online ethnography and monitoring.

What makes popular sales websites like eBay and Etsy unique is that they combine features and characteristics of more traditional gallery or auction sales platforms and social media sites intended for networking. Platforms commonly used for the sale and purchase of hobby or craft goods, such as Etsy, have been used to trade antiquities that could be counterfeits or have questionable provenance. As noted in Chapter 7, illicit antiquities advertised on these sites are often misrepresented as craft materials or falsely described in order to avoid detection. Objects are often cross listed on various websites, some of which are not traditionally used for antiquities sales, making these sales difficult to monitor. This decentralized and small-scale antiquities market also reflects the democratization of the trade.

The monitoring of online marketplaces comes with several limitations. Content on social media sites is often entirely user generated, which means there is a possibility that information is false or misleading. Given the commercial nature of social media sites, it is also possible that content might be automatically (or bot) generated. Researchers are often unable to safely and ethically access private groups on Facebook and other platforms which have been proven to facilitate illicit antiquities sales (Al-Azm and Paul 2018). Finally, though critical to contemporary investigations, the value of social media as data for investigations should not be overemphasized. While social media investigations are helpful, online behavior represents only a part of the supply chain and OSINT findings should be used along with other investigative methods.[5] As regulations are passed to prevent the sale of illicit antiquities on open web platforms such as Facebook, special attention must be paid to record retention and sharing as the data from these online transactions are critical for criminal and financial investigations. Additionally, as policies are established to combat this trade, dealers may shift to tactics and venues more commonly used by other criminal networks, such as the dark web.

Tools for Online Investigations of Trafficking Networks

Various tools mentioned above were used during online monitoring including social network analysis (SNA) and other investigative software. Generally, the tools mine data from open sources using a visual interface to facilitate the analysis of connections among different entities and provide leads to

potential suspects based on the relationships, locations and other key features. During the monitoring period, the research team made extensive use of software including Butler and a variety of tools available from Shadow Dragon. Butler is a Know Your Customer (KYM) tool developed by Jataware and funded by DARPA's Memex. The tool allowed the monitoring team to investigate individuals of interest by name, phone number, or other identifying information and provided a concise dossier of the individuals affiliations, businesses and other data. One major advantage of Butler was that it allowed researchers to investigate the activity and associations of individuals of interest on both the surface and the dark web without the need to use anonymizing applications such as The Onion Router (TOR). The use of sophisticated software allowed researchers to automate the slow process of manually searching for individual vendors on the dark web.

Other tools used for monitoring both the open and dark web for antiquities activity included Maltego by Paterva and OI Monitor and SocialNet by ShadowDragon. OI Monitor customizes and automates intelligence gathering across multiple sources in the open and dark net, allowing researchers to conduct targeted investigations based on the specific research parameters of the project's research. SocialNet is a Maltego (Maltego XL, Maltego Classic) commercial transform package that can be integrated into other platforms using Rest API. The tools mine data from open sources using a visual interface to facilitate the analysis of connections between different entities. The software captures the social media and digital tracks of individuals of interest and maps the aliases and connections of entities in near real time, allowing for a network investigation of criminal and illicit trade supply chains. While many of these tools were useful and helped guide the research, no single tool was able to achieve the full spectrum of tasks required for our project's purposes. As a result, developers from the team began to develop a custom-designed software intended to detect and monitor illicit activity and behavior.

Dark Web Monitoring

The presence of much illicit online activity on the darknet motivated examination of darknet marketplaces for illicit antiquities sales. Darknet market sites are not as easily accessible to most customers compared to websites on the open web. Dark web transactions are based on trust, which takes time to build. It appears that now, as was the case many years before, that dark net markets are where popular but illegal commodities and services such as drugs are traded. In 2017 approximately 80 percent of annual darknet sales revenues came from drugs (Denton 2017). Illegal here appears to mean anything that is not considered the worst on the scale of terrible crimes. Most markets do not appear to offer goods and services that would attract the most animosity - even from other criminals. Wildlife trafficking (including trade in ivory) and child pornography (including child abuse) are widely

advertised on both the open and dark web by taking advantage of bulletproof hosting, a service that allows customers considerable leniency in the kinds of material they upload and distribute, allowing users to bypass internet regulations and terms of service (Noroozian et al. 2019). Many of the most popular bulletproof hosts and payment processors are located in China and Russia and tailor their services to protect their merchants and prevent them from being discovered (Tian et al. 2018, Krebs 2019).

Antiquities and counterfeit goods are considered victimless crimes and, along with even some wildlife products such as ivory, can be legitimate. For instance, an ancient cylinder seal which was bought before the 1970s and has proper provenance information can be legitimately traded on eBay and other markets (Paul 2018). An additional obstacle of dark web trade is the level of technical skill needed to access and enter these closed communities where the illicit trade occurs (Shelley 2018: 141–142). Because they are used for illicit activity, these marketplaces often go offline either temporarily or permanently, and because they are not indexed in the same way as open web search engines, once the website or its content is taken down, it is often difficult to retrieve retroactively. Despite these limitations, attempts have been made to index the dark web for analysis. Darknet Market Archives (2013–2015) is a project that scraped historic data from approximately 90 Tor-Bitcoin darknet markets and forums and related material from 2011–2015. "This uniquely comprehensive collection is now publicly released as a 50GB (~1.6TB uncompressed) collection covering 89 DNMs and 37+ related forums, representing <4,438 mirrors, and is available for any research." (Branwen 2013). A similar study examined the content of nearly 3,000 dark web sites and found that 57% hosted illicit content such as drugs or child pornography (Whitwam 2016). As noted earlier, in 2017 approximately 80 percent of annual darknet sales revenues came from drugs (Denton 2017), showing a marked increase in the use of darknet marketplaces for conducting illicit trade.

During June 2019, approximately 20 of the main dark net markets plus additional darknet fora were analyzed with the goal of finding illicit antiquities and other contraband for sale. Various sites' listing categories were browsed and key word searches established. Without exception, the vast majority of goods for sale on these markets were drugs. In one forum a user advertised the sourcing of rhino horn, ivory and exotic pets. There was no evidence of illicit antiquities trade on the dark web.

There are a variety of possible reasons for the lack of evidence of ancient cuneiform and coin sales on the dark web. First, antiquities collecting is largely seen as a legal activity. Most such goods can be easily advertised and purchased on the open web with little risk to buyers or sellers. In contrast, darknet markets usually advertise explicitly illegal items such as weapons, narcotics and child pornography (Sullivan and Satter 2019; Whitehouse 2019). As previously mentioned, not all collectors have the necessary technical knowledge to access darknet markets. Buyers expect higher value items to be associated with a brick and mortar store and are reluctant to purchase these items online. The anonymity of

darknet purchasing methods may not inspire buyer confidence. Finally, antiquities vendors want to reach the largest possible audience which is why they often use the open web rather than the dark web.

Many of the dark web marketplaces had various counterfeit goods on offer. Counterfeit clothing, jewelry and other high-end luxury goods such as Apple products comprised the highest proportion of advertisements. Other popular counterfeit good included false documents such as fake driving licenses or passports (McCoy 2018). The project also investigated the use of cryptocurrencies, another element often associated with illicit trade, for completing antiquities transactions. While many online marketplaces and dealers monitored typically accepted traditional payment methods (bank transfer, credit card, etc.), there were some platforms that accepted Bitcoin and other cryptocurrency as a form of payment. It is likely that dealers and buyers use the electronic payment methods readily available on platforms such as Facebook or cash transfer apps like Venmo and Paypal to complete transactions. Similar to the lack of a need to sell on the dark web, the grey antiquities market does not require the anonymity of cryptocurrencies. As financial investigations continue, the anonymity provided by cryptocurrencies may be used by antiquities smugglers and looters as they are by other criminal networks in order to avoid detection. Major measures were adopted by the US Congress in late 2020 as part of the National Defense Authorization Act expanding the Bank Secrecy Act to introduce financial transparency measures to the arts and antiquities market (Small 2021). As additional regulations are developed to prohibit and prevent the sale of illicit antiquities on the open web, some dealers will likely shift to using cryptocurrencies and other encrypted and anonymous communication and payment processes, including the use of bulletproof hosting and dark web marketplaces.

Explaining the Average Antiquities Sale

The supply chains for antiquities are comprised of several stages. While the most visible stage often resembles the supply chains of legal commodities, the stages close to the source are much more clandestine and mimic the trading practices of illicit commodities. Once an item is looted or trafficked, advertisement of the object typically begins with a public post, often on a social media or blended site as discussed earlier, in order to reach the widest possible audience. After initial marketing, dealers will often invite only those individuals interested in making a purchase to private groups or encrypted communication channels. The actors will then continue to negotiate and complete the transaction using private person-to-person encrypted messaging such as Telegram or Whatsapp. Shipping is often fulfilled by third parties including international carriers that deliver the item to destination countries via land, air or maritime routes. The documents accompanying the artifact (e.g., provenance, authenticity, etc.) are often falsified or strategically misrepresent the contents of the package in order to avoid detection by law enforcement and customs officials (Halperin 2017, Gerstenblith 2019, Pryor 2020).

As seen from the steps involved in a typical sale, despite beginning on public platforms, the trade quickly shifts to private and encrypted messaging after initial contact. In a similar way, sellers constantly modify their behavior and practices in order to avoid detection, strategically offering false or misrepresented descriptions of objects (ex. being careful not to label something as explicitly 'Syrian' or 'Iraqi'). These findings led to shifting the monitoring research to a focus on individuals of interest rather than an examination of general online activity on fora and social media content of antiquities networks. With a goal of tracking trade from source to transit and ultimately destination countries, the team partnered with Sayari[6], a global corporate data provider and commercial intelligence platform, other data analysts and subject matter experts to map the networks involved in the antiquities trade. A summary of the findings regarding the countries involved in the trade is presented in Table 8.3.

Results From Antiquities Monitoring on eBay – 2014–2017

Over a three-year period from mid-2014 to mid-2017, listings of antiquities on eBay that mentioned 'cuneiform' were recorded. Artifacts bearing cuneiform inscriptions were chosen to be monitored because ancient writing is harder to falsify, making it easier to determine whether a particular object was genuine. Additionally, most cuneiform-bearing objects come from MENA countries which have been the site of war, looting and internal conflict. And lastly, if the object was found the be genuine, then the presence of writing could place the source location and date of creation of the object with greater accuracy. In Q3 and Q4 of 2014 there were 30 relevant auction listings with the highest number of listings in June and July. In 2015, there were 85 relevant auction listings, with the highest numbers occurring in February and April. In 2016 there were 13 relevant auctions, of which most were in September and October. Finally, in Q1, Q2 and Q3 of 2017 there were 13 relevant auctions, of which most occurred in January, July and October. The average price of these listings was $605. Some of the cuneiform artifact auction listings did not specifically use the word 'cuneiform' in the description, which meant that the listing was not flagged. Additionally, some listings were relisted objects. While the monitoring of cuneiform fluctuated during this period, the volume of low-value items such as coins has seen a dramatic rise with the democratization of the market resulting from the shift

Table 8.3 Marketplace countries

Source	*Transit*	*Destination*
Iraq Syria Other conflict/crisis countries	Turkey Iran Free trade zones	US Western Europe (UK, Germany, Italy) Canada

to online marketplaces. Similar to the CLASI monitoring, the data outlined in Table 8.2 on objects bearing cuneiform were recorded, both to give a snapshot of results and to refine monitoring going forward.

Most of the items for sale had no stated, or very vague, provenance. This did not necessarily mean that the item was fake or stolen. If provenance evidence was mentioned in the sale advertisement, this was often in the form of a letter or email, a certificate of authenticity or purchase receipts. Some advertisements had vague references to either unnamed or named private collections and acquisition dates. The artifacts of interest were mostly tablets, seals and cones made from clay, followed by limestone, hematite, bronze, chalcedony and stone. These advertisements generally claimed a date for the object offered for sale between 2500 to 1500 BC and had an average price range of $150–$900.

The greatest activity was seen on eBay (UK, US and Canada) and Timeline Auctions. Between February to March 2018, the highest value item was $40,000, followed by $25,000 – all from USA-based stores. All these stores had an online presence and some, but not all, had physical brick and mortar stores. From March to April 2018 the highest value item was $17,000 (Timeline Auctions), followed by $4,000 on eBay USA. The top sale locations were found to be the USA (California, New York, Washington DC, Colorado and Arizona), UK (London, Essex and Surrey), then Germany, Denmark, France and Israel. The majority of the cuneiform items for sale were advertised by a store based in Los Angeles, one of the largest cuneiform dealers, and were found to be genuine. Conversely, a high proportion of the artifacts on sale with another major dealer based in New York were found to be fake by consulting the subject matter experts involved in the project. Fakes can usually be discerned from inaccuracies with the cuneiform symbols, poor quality artwork (both two- and three-dimensional), evidence of modern tools used to manufacture the object and inconsistencies with the date and place the object is purported to be from with what the object looks like. Additionally, the likelihood that a particular seller is offering fake goods for sale is increased by analysing feedback from previous sales, price and frequency that the same item is being offered for sale (which is indicative of mass production). Lastly, it was found that some dealers owned homes of high value ($750,000 to $1.5 million), which suggests that they are gaining financially from the antiquities trade. Dealer home value was obtained from publicly available property prices and sales data.[7] Many of these high-end dealers were found to have direct and indirect connections to individuals in source countries.

Using Data to Detect Online Illicit Trade Networks

The above section demonstrated the importance and relevance of public data and OSINT to track illicit trade. Another promising route is to monitor and investigate the broader networks that move objects transnationally from source to destination countries. Mapping of social media networks of top dealers allows for important insights into the connections between dealers

and their networks and provides important data for financial and criminal investigations. Social network analysis (SNA) is a useful methodology for examining group interactions and relationships. SNA characterizes network structures in terms of nodes (individual actors or entities) and the ties, edges or links (relationships or interactions) that connect them. An example network might consist of individual Facebook users as nodes and the links or edges between users could be following relationships (friends) or interactions (comments, likes, etc.). Another possible link between users could be that they are members of the same Facebook group or like the same page. Because SNA considers the relationship between users, it is able to provide a holistic perspective that allows for deeper analysis that goes beyond listings monitoring by analyzing the relationship among network actors. Using this method, it is easier to follow flows of information, goods and finances. The use of SNA software such as SocialNet (ShadowDragon) and Gephi (Open Source) allow for the mapping of the social network connections of users, allowing for an analysis of the affiliations of entities of interest. Through the analysis of affiliates and other connections, the team was able to map both the physical and online networks of dealers and other actors associated with the antiquities trade. Using this method, it was possible to track the location of individuals of interest and hypothesize possible routes for transporting cultural artifacts through online sales and to triangulate this data with findings on the use of various trade routes as presented by Dr. Mahmut Cengiz in Chapter 4 of this volume.

Filling the Gap Through Application Development: The Facebook Profile Intel Tool

The future of investigating the trafficking of antiquities requires approaches that take into consideration the creativity and innovation involved in online illicit trade. Computer-assisted automated approaches facilitate sifting through the vast amount of information currently available. Through a blended approach, the proposed software permits investigators to scrape and analyze the profiles of individuals of interest, combining features of computer programming with the subject matter expertise of law enforcement, archeologists and other researchers. This multidisciplinary approach allows for efficient use of subject matter expertise while processing large amounts of data and providing insights that would likely be overlooked by siloed investigations.

Because no existing software met the CLASI team's research needs, members created a customized OSINT tool specific to tracking and disrupting illicit supply chains that is currently in development. The Facebook Profile Intel Tool (FPIT) is a program that automates scraping a user's profile to allow an at-a-glance view of the profile's contacts, likes, interests, images, videos etc. The tool facilitates collecting intelligence on suspects who may be engaged in illegal activities such as illicit trade, terrorism, money laundering

and fraud. FPIT allows for the investigation of existing suspects and the identification of new leads in an efficient and automated fashion. The program can be configured to adjust the parameters in a profile that should be scraped (ex. photos, videos, timeline comments, etc.), the number of friends to scrape and the timing of tool actions. When the program has finished running, a folder is created with the name of the target profile. The folder contains hypertext markup language (.html), the standard language for creating web pages, files containing the results which enable easy visual analysis and key word searches. The target profile results file contains thumbnail images of profile photos and likes. The user name of anyone who has made a comment, reaction and likes is recorded. Another results file outputs thumbnail images and requested content from the target's profile and that of their friends. Future versions of the tool seek to improve speed and offer enhancements such as automatic language translation, quantifying how many times a particular profile has been added as a friend, image recognition and mapping the location of the contacts scraped. The example scenarios below demonstrate how such social media and network analysis can greatly assist in the investigation of the illicit antiquities trade.

Mapping and Visualizing Networks

Once social networks involved in the online trade have been detected, they are mapped to show the network structure of groups involved. Research was conducted to investigate the Facebook connections of the high-end coin and cuneiform dealers and explore their direct and indirect connections to individuals in source countries both manually and using the software mentioned above. Geospatial mapping allowed for a visual analysis of galleries and individuals of interest along with their network ties. Most dealers based in the west have direct and indirect connections to multiple individuals based in the Middle East who are connected to the antiquities trade, including archaeologists, archaeological site workers, metal detecting enthusiasts, coin collectors, antiquities dealers, grave and other site diggers and local law enforcement officials.

During the monitoring period, the Facebook contacts of known dealers (normally based in Europe or North America) were analyzed and the chain of contacts was followed to profiles based in the Middle East. A representative supply chain might include the following example: Lenny has an antiques store in the USA but is it suspected that he obtains artifacts from the Middle East. Lenny has a contact on Facebook, Maria Bloggs, who runs a shipping and storage company in France. Although we cannot see who Lenny's Facebook contacts are, Maria was identified via a comment on one of Lenny's photos. A key word search on Maria's Facebook profile shows that she has a connection to a Zaf Bloggs who lives in Turkey. There are many antiquities and metal detecting equipment images on Zaf's profile. This points to the theory that Lenny buys artifacts from Zaf via Maria.

Contacts of interest could be obtained from the friends list by looking at the profile photo and other user information. This was the best way of finding useful leads owing to the limited resources and time available as it could afford a relatively quick surface analysis. This automated approach provided valuable data for investigation and proved to be less time consuming. Investigating social media connections and network activity has proven useful in discovering the potential path of object source to the final sales destination and tracking those who may be responsible for illegally obtaining objects of interest and their potential links with terrorist activity. As noted earlier, social media and open source investigations only provide partial information about illicit networks and should be used in conjunction with traditional investigative methods.

Investigative Tools: Limits and Possibilities

Links between antiquities trafficking and terrorist activity can be established through the investigation of the online profiles of dealers, purchasers and others involved in the trade. The scenarios below explain how the Facebook tool would facilitate investigation of criminal networks involved in antiquities trafficking.

Scenario 1

- Mike Doe is suspected of receiving stolen antiquities to sell on to customers via his high-end antique shop in New York.
- Mike Doe's name is searched using either manual or automated methods and his 1st, 2nd and 3rd level friends are selected as part of this search.
- A map view of results shows that Mike has many 3rd level friends based in Turkey and Egypt.
- It is found that there is a Bob Smith based in Rome who has been added as a friend more times than any other name within the results.
- A search of Bob Smith along with a key-word search of 'statue' and 'coin' reveal that he has many 1st level friends who are based in two particular towns in Turkey. Further searches of the Facebook comments of these friends reveal that they are offering antiquities for sale.

Scenario 2

- Janet Doe lives in Egypt as an archaeologist and it is suspected that she may have links with middle-man traders of stolen antiquities. Her Facebook settings have been configured to prevent her non-friends from viewing her friends list.
- A search of her name produces a list of 30 Facebook names who have made comments on her Facebook profile.

- A further search of these comments reveals that there is a user, Jerry Green based in Munich who owns a freight and storage company.
- A search of Jerry shows that he has many 1st and 2nd level friends who are antiquities dealers based in Europe.

Investigation of these scenarios through analysis of social media data can reveal the supply chain from where an artifact is removed from the original site (museum, archaeological site, collection, etc.) to the final end-user customer who is normally based in Europe or North America, showing the connections along key trade routes. In addition to increasing our understanding of the key players in this market and their methods, this data can also provide leads to potential suspects of other criminal activity which may occur alongside other illicit activity such as the trafficking in weapons, humans or narcotics.

Establishing Links to Terrorist Financing

To establish links between online sales and terrorist activity, researchers examined user profiles, timelines and photographs for suspicious activity related to terrorist funding (e.g., jihadist imagery, violence, armed weapons, etc.). Various social media accounts reviewed during the monitoring project showed photographs and videos of kidnappings, violent killings and weapons, along with discussions of glorifying the murder of key political figures. Whilst information on those accounts showing evidence of extremist propaganda would be of interest to specific law enforcement departments, it is relevant that these accounts had connections to antiquities collectors and dealers in the Middle East, and in turn to connections to the high-end dealers in the west.

Reports reveal that these organized crime networks are more sophisticated and strategic than previously assumed. For example, while ISIS militants posted videos of their destruction of statues and idols in Iraq's Mosul Museum and other sites, Westcott reveals that these viral videos might have served as part of the terrorist group's social media smokescreen for terrorist financing. While some artifacts and sites were indeed destroyed, ISIS members also demonstrate sophisticated knowledge about specific artifacts and archeological equipment as they carefully and strategically removed high value objects behind the camera while displaying an outward appearance of knowing little about these objects and claiming that they simply want to destroy them (Westcott, 2020).

This pattern of publicized destruction while strategically preserving certain items to place for sale did not continue. According to an account from a knowledgeable source within Hayat Tahrir al-Sham (HTS),

> …no Salafist or Islamist group in the region has officially called for the destruction of certain types of pre-Islamic artifact or monuments, at

> least not in the very public way that IS did at the zenith of its power in 2015.
>
> (Moos 2020: 6)

These studies reveal that antiquities trafficking by terrorists and other organized criminal groups is often strategic and carried out by sophisticated transnational networks that now use communication technology such as Facebook, WhatsApp and Telegram to conduct their illicit activities. There is evidence of terrorist groups "looting to order" – where buyers will post requests for objects they are interested in purchasing and connect with looters on the ground willing to find the requested object (Kantchev 2017) though some have disputed these claims, pointing out that there is no evidence of these loot to order transactions being fulfilled (Sargent et al. 2020). These links to terrorist financing and the funding of violence and conflict demonstrate the need to prevent the looting and trafficking of antiquities rather than focusing on the return of artifacts to their country of origin.

The Antiquities Trafficking and Heritage Anthropology Research (ATHAR) Project is an investigative group led by a collection of anthropologists and heritage experts who examine transnational trafficking, terrorism financing, and organized crime online. According to the organization's 2019 report, "Facebook's Black Market in Antiquities: Trafficking, Terrorism, and War Crimes," "Violent extremists currently include individuals associated with Syrian-based groups like Hay'at Tahrir Al Sham (HTS), Hurras Al-Din, the Zinki Brigade and other non-Syrian based Al-Qaeda or Islamic State in Iraq and Syria (ISIS) affiliates. All of these groups are using Facebook as a platform for antiquities trafficking, whether through direct interaction with buyers and sellers or through the use of middlemen who facilitate transactions between the general public and terrorist groups." The report also reveals how private Facebook groups are being used to share information on how to loot antiquities, posting instructions in Arabic on how to extract artifacts from the ground (Al-Azm and Paul 2019: 3).

In reaction to reports by ATHAR, CLASI and others which exposed the widespread illicit antiquities trade occurring on the platform, in June 2020 Facebook announced an update to its community standards to add the category of historical artifacts to its list of prohibited goods. While this ban is an important first step to regulating the online antiquities trade on social media platforms, Facebook has released very few details about the updated Community Standards, leaving several concerns about proper implementation of the new policy which will require extensive resources of Facebook and the input of subject matter experts. Detecting and disrupting online antiquities networks requires subject matter and language expertise. While Facebook released a vague report outlining how the platform would partner with academics and NGOs to implement its historical artifacts policy, it provides no details on how it intends to implement these plans, nor does it seem to have key personnel assigned to this effort.

Despite this announcement, Facebook's current Community Standards also fail to provide the means to report and remove pages that engage in the trafficking of cultural property that may be thought to be illegal. This problem also exists for other prohibited goods on Facebook, such as endangered wildlife as determined by the Convention on International Trade in Endangered Species (CITES). Buyers and sellers can flout this ban on Facebook via the use of public and private groups. As a result, terrorist and extremist groups are able to profit from the sale of trafficking goods on Facebook with impunity (Fernholz 2019). Studies of wildlife trade on Facebook in specific countries showed that lions, chimpanzees, bears, cheetahs, elephants and other international wildlife prohibited red-list creatures were advertised for sale in Facebook groups. A 2019 study conducted by one of the authors of the illicit wildlife trade in Jordan also led to information about sales of CITES-prohibited wildlife in other countries. Given that Facebook is not properly enforcing CITES standards as illicit wildlife trafficking persists on the platform despite a ban, it is unlikely that they will be able to properly enforce similar regulations for antiquities (Aung 2020, Ebersole 2020).

Like other forms of transnational crime and illicit activity, antiquities sales will likely continue, but simply no longer on Facebook. Now that the sale and advertisement of historical artifacts is banned on the platform, sellers will likely move their business to other venues, perhaps using encrypted channels or even shifting to the dark web or websites hosted in other countries that are not so vigilant in policing and regulating content, such as has occurred with the online sex trade. Criminals are experts at exploiting loopholes and finding work arounds (Europol 2015). Dealers are incredibly adaptable and due to the illicit nature of their activity, they are prepared to pack up shop quickly if necessary. Thus, while the new policy may result in a decrease of antiquities sales on Facebook, it is ultimately unlikely to disrupt the trade long term.

Perhaps the most pressing concern is that it seems the ban entails Facebook deleting or filtering content related to antiquities. The negative consequences of this data deletion cannot be overstated. Social media data related to online antiquities sales are extremely valuable and should be provided to financial and legal investigators to document and analyze this conflict-driven criminal activity. Assuming that dealers will remain active on the platform but simply move to private or encrypted channels, flagged content should be preserved and archived for evaluation by law enforcement and researchers, not deleted or kept for sole use by Facebook (Swann 2019, Hekking 2020).

Conclusions for the Investigation of the Illicit Antiquities Trade

The trade in looted and counterfeit artifacts appears to be of a lower volume than originally predicted (see Brodie Chapter 1). It is critical to consider the overlaps and differences in physical and online markets.

It is quite likely that items which were advertised for sale in brick-and-mortar stores were also being advertised online. Many items were sourced

months or years in the past and stored in warehouses before being sold, which suggests that there is a low turnover of such artifacts. Artifacts available in brick and mortar stores are often of higher value than items advertised on social media or online platforms such as eBay, where, whilst artifacts are lower in value, there is a higher turnover.

Key traders involved in marketing directly to consumers (mostly in the US, Europe and the West) appear to be well connected to individuals involved in obtaining artifacts in source countries, either directly or indirectly. This reflects the importance of monitoring social media connections and trade networks to understand the flow of goods. Tracking the flow of artifacts from source through transition and finally to destination countries reveals that illicit antiquities are often sold along the same trade routes used for other forms of illicit trade such as human or drug trafficking, though studies show little explicit evidence of this connection (Yates 2014). In Chapter 4, Mahmut Cengiz provides a detailed discussion addressing recent shifts in trade routes following the decreased presence of ISIS in the region. It is useful to have SMEs to verify, where possible, the authenticity of artifacts offered for sale online, although it should be remembered that even if fake artifacts are marketed as genuine, this is a crime in itself. These SMEs should have the necessary languages skills, cultural understanding and archeological expertise to conduct analysis in the regions of interest.

The most effective method of conducting social media research involves a mixture of both passive and active reconnaissance, ideally using a temporary account that does not have any connections to law enforcement agencies or research organizations. Passive research involves very low risk and allows for greater visibility of a wider scope of activity. Active research takes the form of having some interaction with suspects, usually with fake profiles. This affords greater insight into illicit activities at the cost of a higher risk to the investigator. Both methods, though, offer the chance to map the flow of illicit trade from source to destination countries whilst understanding socio-economic and cultural dynamics. Likewise, both automated and manual methods have their benefits. Blending of automated and manual methods allows for effective use of time and resources. Finally, such social media research helps illuminate other potential criminal activities which appear to be associated with the illicit antiquities trade such as the dissemination of extremist propaganda activities or exhibiting destruction and violence.

The antiquities trade is global, dynamic and diverse, making assessment or investigation of the overall market difficult. Consequently, the search criteria for future monitoring of online sales should be narrow, focusing attention only on specific dealers and marketplaces of interest. Otherwise, a great deal of time could be spent monitoring dealers and sites which do not produce any results or leads. The CLASI monitoring process conducted general initial investigations and then narrowed the monitoring scope to target specific individuals and networks of interest. Future research should also solicit the knowledge and experience of subject matter experts when developing

methodology. Gallery, auction and dealer listing monitoring using both automated and manual methods should be supplemented by social media investigations. Only a multidisciplinary and multipronged approach will allow for successful disruption of these elusive transnational supply chains.

Although open web markets and platforms remain popular and the predominant trade venues for certain illicit commodities such as antiquities, dark web markets should continue to be monitored. As discussed in this chapter, the absence of antiquities activity on the dark web can likely be explained by the fact that the sale of artifacts is not often seen as explicitly illegal, especially when the illegality of the object is obscured by false documentation and provenance. Therefore, there is no need for antiquities dealers to advertise on the darknet which is comprised of a much smaller customer base compared to the open web where they can currently conduct their business with impunity. However, as regulations and policies are developed and implemented to prevent and combat this type of trade, dealers may feel the pressure to move to tactics and venues more commonly used by other criminal networks, such as the dark web. Therefore, continued monitoring of the dark web for activity related to the illicit antiquities trade is critical. The monitoring of dark web marketplaces for illicit antiquities trade is even more pressing given that the recent banning of historical artifact sales on Facebook and Instagram may result in a shift of the trade to dark web marketplaces.

This chapter sought to provide a standardized and replicable model for investigating the online sale of antiquities. The authors hope that future studies will continue to build upon these OSINT methodologies and develop tools to successfully detect and disrupt illicit supply chains. Future studies must consider the tremendous adaptability and creativity of cybercriminals and use innovative and multidisciplinary approaches to collect and analyze empirical evidence on the trade. These cutting-edge approaches will facilitate efforts of law enforcement, policy makers, and investigators to prevent the looting and trafficking of cultural heritage from not only countries in crisis, but also to protect the multitude of historical artifacts which represent and provide knowledge of our common history and culture.

Notes

1 The Defense Advanced Research Projects Agency (DARPA) is a research and development agency of the United States Department of Defense responsible for the development of emerging technologies for use by the military. DARPA's MEMEX program used state of the art content indexing and web searching on the Internet to help law enforcement officers and others perform online investigations to hunt down human traffickers. Butler is a web-based Know Your Customer (KYC) application meant to assist in slot-filling an entity profile via human-in-the-loop feedback and a simple search query capable of hitting the open and dark web as well as enterprise search repositories. More information on Jataware Corp's Butler can be found at https://github.com/jgawrilo/butler_install.

2 For more on OI Monitor by ShadowDragon, see https://shadowdragon.io/oimonitor.
3 Through the use of web scrapers, large amounts of data related to online listings were populated into comma separated value spreadsheet files (with a.csv file extension) which could be easily analyzed by subject matter experts. This method allowed for efficient use of the time and expertise of SMEs and sped up the overall monitoring process.
4 Various software allows researchers to conduct visual and quantitative analysis of user connections and network relationships. For example, social network analysis (SNA) provides various centrality measures which allow for analysis of influence and importance of nodes within the network.
5 It should also be noted that there are several instances where antiquities are looted, trafficked and sold entirely offline through private and closed networks of collectors. This type of trade had been the precedent in previous decades and remains strong today. In these cases, OSINT investigations might produce few results.
6 For more on Sayari visit https://sayari.com/.
7 If a user's address is known, one can find how much they bought their house for and/or the current estimated value. One such site that does this: https://www.melissa.com.

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