VIMY PAPER

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THWARTING WESTERN
METADATA COLLECTION
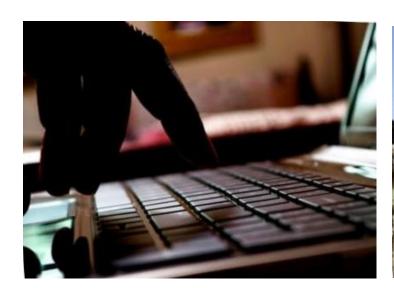EFFORTS

By Rachel Babins

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HIDDEN: A STUDY OF THE ISLAMIC STATE'S INTERNET CONTROLS AIMED AT THWARTING WESTERN METADATA COLLECTION EFFORTS

By Rachel Babins

In 2015, General Hawk Carlisle, a United States (US) air commander, gave an interview to CNN about an incident in which data collected from Twitter led to the aerial bombing of the Islamic State of Iraq and al- Sham's (ISIS) headquarters within the span of 22 hours.[1] By the end of that year, ISIS had

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[1] Walbert Castillo, "Air Force intel uses ISIS 'moron' post to track fighters," *CNN*, June 5, 2015, https://www.cnn.com/2015/06/05/politics/air-force-isis-moron-twitter/index.html.

published three comprehensive internet bans for its followers living within its self-proclaimed state. From 2015 onwards, ISIS leadership became paranoid that its citizens were intentionally sending data to foreign intelligence agencies and human rights organizations through social media.

This study argues that the increase in general public awareness of global intelligence collection programs, particularly since the Snowden disclosures, scared ISIS leadership. As a result, the most technologically advanced terrorist group in history began rolling back its online presence. To its detriment, ISIS changed its recruitment methods as well as increased control on the use of the internet for personal purposes within its territory.

A. A History of ISIS and the 'Cyber-Caliphate'

History and Organization

In 2004, the radical Sunni militant group named Al Qaeda in Iraq (AQI), later changed to Islamic State in Iraq (ISI), was founded by Abu Musab al-Zarqawi. Al- Zarqawi was a student of Osama bin Laden, but ideologically differed from bin-Laden in his will to carry out terrorist attacks that targeted Shiite Muslims and non- practicing people of Muslim origin. ISI was famous for its brutal killing of Muslims across Iraq through targeted bombings in mosques and heritage sites. In 2006, Zarqawi was killed in a US airstrike.[2]

In 2014, ISI was officially disavowed from Al Qaeda Central (AQC), and became known as Islamic State of Iraq and al- Sham (ISIS) under the leadership of Abu Bakr al-Baghdadi.[3] Within ISIS, it is believed that al-Baghdadi is believed to be a descendent of the former Muslim prophet Mohamad, and thus anything he declares is seen as equal to religious law.[4]

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[2] Bobby Ghosh, "ISIS: A Short History," *The Atlantic,* 14 August 2014,
 https://www.theatlantic.com/international/archive/2014/08/isis-a-short-history/376030/.
[3] Martha Crenshaw and Gary LaFree, "Countering Terrorism," *Brookings Institution Press*, (2017): 10-12.
[4] Ghosh, "ISIS: A Short History."

ISIS's ultimate goal is the restoration of modern Islam to its practice in the first century by the Prophet Mohamed within an Islamic Caliphate. Yale Professor Graeme Wood found through his multiple interviews with members of ISIS that the group's foremost aim is to "purify the world" by killing the vast majority of Muslims who do not adhere to ISIS's interpretation of Islam.[5]

In its heyday, approximately 10 million people were living under ISIS-controlled territory.[6] The estimated size of ISIS's self-proclaimed caliphate in 2014 varied widely by report but was projected to be from 12,000 to 35,000 square miles. Its territory was mostly situated in Iraq, with a substantial strip of land stretching from the Iraqi-Syrian border to Syria's border with Turkey. The Syrian city of Raqqa functioned as ISIS's de-facto capital city.[7] However, on 17 October 2017, ISIS was officially driven out of Raqqa.[8] A few weeks later on 3 November 2017, Syrian government forces declared that ISIS had been officially dismantled within the country.[9] Finally on 9 December 2017, the Iraqi military declared that Iraq was fully liberated from ISIS's rule.[10]

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[5] Graeme Wood, "What ISIS Really Wants,*" The Atlantic,* March 2015, https://www.theatlantic.com/magazine/archive/2015/03/what-isis-really-wants/384980/.

[6] "Islamic State and the crisis in Iraq and Syria in maps," *BBC,* 28 November 2017, https://www.bbc.com/news/world-middle-east-27838034.

[7] Kathy Gilsinan, "The Many Ways to Map the Islamic 'State,'" *The Atlantic,* 27 August 2014, https://www.theatlantic.com/international/archive/2014/08/the-many-ways-to-map-the-islamic-state/379196/https://www.theatlantic.com/international/archive/2014/08/the-many-ways-to-map-the-islamic-state/379196/.

[8] John Davidson, "Raqqa: Isis completely driven out of Syria 'capital' by US-backed forces," *The Independent,* 17 October 2017, https://www.independent.co.uk/news/world/middle-east/raqqa-isis-battle-syria-defeat-latest-lost-us-sdf-rebel-monitoring-group-a8004581.html.

[9] Chris Baynes, "Isis driven out of final city stronghold in Syria," *The Independent,* 3 November 2017, https://www.independent.co.uk/news/world/asia/isis-syria-war-defeat-final-stronghold-deir-ezzor-assad-army-latest-a8035606.html.

[10] Eric Levenson and Jomana Karadsheh, "Iraq is 'fully liberated' from ISIS, its military says," *CNN,* 9 December 2017, https://www.cnn.com/2017/12/09/middleeast/iraq-isis-military-liberated/index.html.

As of 23 March 2019, ISIS has lost all of its territory. This past February, four-star General Joseph Votel, who oversees US military operations in the Middle East, estimated there remained between 20,000 to 30,000 ISIS fighters in Iraq and Syria.[11]

The Cyber-Caliphate

Beginning in 2003, leadership within AQC began preparations for the use of cyberspace as a new platform for recruitment, military operations, and the circulation of media content. AQC was inspired to use the internet as a base for recruitment because of the increased cyber-literacy that youth in Europe, Asia, and the Middle East were accruing through the mass production of mobile phones. Cyber-literate men in the Middle East were suddenly able to watch pornography on their devices through applications that evaded the national security services in countries where pornography was forbidden. They created chatrooms through WhatsApp where likeminded individuals could meet online and exchange pornographic videos. AQC saw the potential in this global exchange of web-content and was the first terrorist organization to open a cyber-literate wing of their organization that could use new media to produce and transmit video content and recruitment materials to a global audience.[12]

Al-Baghdadi believed that the future ISIS caliphate could not be built unless all Muslims had access to his lectures and materials. In 2011, he created a 'media revolution' through which he accelerated the AQC model of cyber-jihad. Al-Baghdadi built a hierarchy of ISIS's Media Networks that encompassed five distinct cyber operational units: The Media Propagation Teams, Cyber Communications Squad, Functionaries, Recruiter Brothers and Sisters, and Hackers.[13]

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[11] Barbara Starr, "ISIS fighters have been fleeing from Syria into Iraq, perhaps with millions of dollars in tow," *CNN,* 18 February 2018, https://www.cnn.com/2019/02/17/middleeast/isis-fighter-flee-syria-millions-cash/index.html.

[12] Malcolm Nance and Chris Sampson, *Hacking ISIS: How to Destroy the Cyber Jihad* (New York: Skyhorse Publishing, 2017), 23-25.

[13] Ibid., 32-33.

a) **The Media Propagation Teams** oversaw the production and distribution of ISIS propaganda such as video content and audio lectures.[14]

b) **The Cyber Communications Squad** consisted of members both inside and outside of Syria and Iraq, who set up channels of communication between ISIS leadership and the outside world. They established channels of communication from Raqqa to Europe, Asia, North America and elsewhere in the Middle East using applications such as Telegram and WhatsApp.[15]

c) **The Functionaries** administered and collected payment and held all of the administrative files used by the government.[16]

d) **The Recruiter Brothers and Sisters** were in charge of globally recruiting thousands of men and women to come to Raqqa and join ISIS.[17]

e) **The Hackers** consisted of volunteers who hacked Western media.[18]

These five units made ISIS the most cyber-literate and technologically advanced terrorist group to date. This study will focus on the Media Propagation Teams and the role they played in disseminating ISIS propaganda through Twitter.

The Media Propagation Teams

One of the earliest phases of ISIS's Twitter strategy came with the creation of the Twitter app called 'The Dawn of Glad Tidings.' The app was created by a Palestinian man publicly known as 'J' who is believed to have worked for ISIS from his home in Gaza.[19] Any individual could download 'The Dawn of Glad Tidings' from Google Play when it first came online in April 2014. JM Berger, a researcher of ISIS terrorism, explained 'The Dawn of Glad Tidings.' app as follows,

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[14] Ibid., 35.

[15] Ibid., 35.
[16] Ibid., 35.
[17] Ibid., 35.
[18] Ibid., 35.
[19] J.M. Berger and Jessica Stern, *ISIS: The State of Terror*, (New York: HarperCollins Publishers, 2015), 148.

"Once you sign up, the app will post tweets to your account—the content of which is decided by someone in ISIS's social-media operation. The tweets include links, hashtags, and images, and the same content is also tweeted by the accounts of everyone else who has signed up for the app, spaced out to avoid triggering Twitter's spam-detection algorithms. Your Twitter account functions normally the rest of the time, allowing you to go about your business."[20]

Ultimately, Twitter and Google suspended 'The Dawn of Glad Tidings' app just a few months after its creation. Subsequently, however, many other apps that functioned in the same fashion were created in its place.[21]

In addition to the app world, ISIS also had an official Twitter account in which it utilized a distinctive social media strategy. In October 2013, the Media Propagation Teams launched ISIS's first official account called *al I'tisaamm,* which roughly translates to 'the sit-in' or 'the protest.' The Media Propagation teams developed a number of handles affiliated with the account such as @e3tasimo, @reyadiraq, and @dawlh_i_sh, all of which independently accrued tens of thousands of followers.[22] Overtime, information scientists that were observing ISIS's Twitter presence noticed its retweet strategy:

"After being posted and authenticated by official ISIS members, a second- tier group of several dozen online activists would retweet the link with a hashtag, then retweet each other's tweets and write new tweets, all using the same hashtag. Other activists would upload the release to multiple platforms, so that it could be found even when internet providers pulled the content

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[20] J.M Berger, "How ISIS Games Twitter." *The Atlantic.*16 June 2014, https://www.theatlantic.com/international/archive/2014/06/isis-iraq-twitter-social-media-strategy/372856/.

[21] Berger and Stern, *ISIS: The State of Terror*, 148-150.

[22] Ibid., 153-154.

down. After that, a third tier—the *asnar muwahideen* (general supporters) —would repeat the process on a larger scale."[23]

In both of these models— Twitter applications and the retweet strategy from the official ISIS account — individuals associated with ISIS are required to publicly affiliate with the organization through posts and sharing of content on their Twitter page. Researchers at the Brookings Institute found that from September to December 2014, roughly 46,000 Twitter accounts were used by ISIS supporters, mostly located within ISIS-controlled territory. Hundreds of these tweets were sent with embedded location metadata, which was capable of being tracked by NGOs such as The Brookings Institute. Ultimately, Twitter served as an essential chokepoint for government officials to collect metadata so that they could monitor and launch attacks against individuals associated with ISIS. [24]

B. Metadata, the Snowden Disclosures, & Bombing Campaigns

One of the major emerging trends of the past decade has been collection of 'big data.' In his paper, *The Geopolitics of Cyberspace After Snowden,* Professor Ron Deibert defines 'big data' as the use of innovative technologies such as social media, mobile connectivity, and cloud computing to create a "trail of digital exhaust wherever we go" because of the voluntary sharing of personal information with "entities separate from the individuals with whom the information applies," such as privately owned companies.[25] Metadata is the qualitative component within 'big data' that comprises data that answers the 'who,' 'when,' and 'where' of a communication, rather than the 'what.' Simply put, "metadata is the context, not the content of a communication."[26]

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[23] Ibid., 155.

[24] J.M. Berger and Jonathon Morgan, "The ISIS Twitter Consensus: The Brookings Project on U.S. Relations with the Islamic World," *Centre for Middle East Policy, The Brookings Institute* 20 (March 2015): 7-8.

[25] Ron Deibert, "The Geopolitics of Cyberspace After Snowden." *Current History* (January 2015): 9.

[26] "Metadata and our Mandate." Communications Security Establishment, Government of Canada, Date Accessed: 21 July 2019, https://www.cse-cst.gc.ca/en/inside-interieur/metadata-metadonnees.

The collection of metadata can offer much insight into a person's life. Simply put, it provides the context for everything a person does. Scientists at Stanford University collected metadata on 500 individuals over the course of a few months to see how much information could be inferred from metadata alone. They found that by observing metadata, they could discover predictable patterns of behavior from which political beliefs, medical conditions, and other very intrusive data could be gathered.[27]

On June 2013, former US National Security Agency (NSA) contractor Edward Snowden released documents revealing that the US and other Western government's global surveillance programs use metadata as a main source of intelligence. Since this time, it has become public information that foreign governments, NGOs, and hackers have used metadata collection to successfully identify ISIS militant social media profiles online.[28]

Additionally, metadata has been instructive in the bombing of key members of ISIS leadership and facilities. For instance, as mentioned above, in 2015, General Hawk Carlisle, a commander of the US Air Combat Command, gave an interview to CNN about a specific incident in which data collected from Twitter led to an aerial bombing of ISIS's headquarters within the span of 22 hours. This information is significant because it provides US official testimony that the US relies on metadata collected from Twitter to inform its military operations against the Islamic State.[29]

C. Impact: Information Controls in the Islamic State

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[27] Laura K. Donohue, "The Future of Foreign Intelligence: Privacy and Surveillance in a Digital Age," *Oxford University Press*, (2016): 40.

[28] Berger and Morgan, "The ISIS Twitter Consensus: The Brookings Project on U.S. Relations with the Islamic World"; Rick Gladstone, "Activist Links More Than 26,000 Twitter Accounts to ISIS," *The New York Times,* 31 March 2015, https://www.nytimes.com/2015/04/01/world/middleeast/activist-links-more-than-26000-twitter-accounts-to-isis.html; Walbert Castillo, "Air Force intel uses ISIS 'moron' post to track fighters," CNN, 5 June 2015, https://www.cnn.com/2015/06/05/politics/air-force-isis-moron-twitter/index.html.

[29] Castillo, "Air Force intel uses ISIS 'moron' post to track fighters."

The Immediate Aftermath of the

Snowden Disclosures

In the years following the release of the Snowden disclosures and subsequent increase in public awareness regarding the US collection of metadata, ISIS fundamentally altered its existence in cyberspace. At first, ISIS government officials released information in an effort to educate its citizens about the Snowden revelations, with instructions on how to use the internet responsibly. An ISIS manual entitled, "How to Tweet Safely, Without Giving out your location to NSA" asked its affiliates to take precautions on Twitter such as ceasing to share pictures.[30] The manual urged that safe tweeting is important because current use of Twitter "[has] benefited the enemy and [has] helped expose the identities of some brothers or identify some sites used by the *mujahideen* with ease…"[31] Publications such as these, point to the fact that ISIS leadership became aware of the metadata ISIS affiliates supply to intelligence agencies when they use Twitter.

Additionally, the Media Propagation teams went on to write Facebook posts, articles in magazines, and eBooks that discuss ways in which ISIS allies and militants may camouflage themselves on the internet so that they are not detected by foreign intelligence agencies. [32] One post read:

"…instead of assuming that most of us aren't spies assume the opposite, that most of us ARE spies [for Western intelligence agencies] or undercover. Ans *(sic)* as with a real agent you would never share:

- Your name

- Pictures of yourself

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[30] Johnlee Varghese, "ISIS Releases Training Guide on 'How to Tweet Safely, Without Giving out Your Location to NSA," *International Business Times,* 19 October 2014, https://www.ibtimes.co.in/isis-releases-training-guide-how-tweet-safely-without-giving-out-your-location-nsa-611734.

[31] Ibid.

[32] Laura Scaife, *Social Networks as the New Frontier of Terrorism: #Terror.* (New York: Routledge, 2017), 132.

- Pictures of people close to you (including cute babies or pets)

- Pictures that in any can *(sic)* be linked to the real you

- Your country

- Yor *(sic)* city

- Avoid talkingin *(sic)* DM too much where you might say some personal things

- Don't share IS mocements *(sic)* if you have knowledge

- Don't share unknown military capabiliries *(sic)* (like saying IS has AA missiles in a location)

- There is other stud *(sic)* that I haven't covered, but you can figure it out. Be quite *(sic)* and be safe" [33]

The Recruiter Brothers and Sisters also increased their use of certain applications so as to recruit more discreetly. They believed that by using encrypted applications such as Telegram, Kik, and Wickr, they could escape the surveillance tactics of Western intelligence agencies.[34]

The ramifications for these measures were twofold. Importantly, several individuals within five-eyes intelligence agencies argued that the Snowden disclosures significantly harmed their ability to monitor ISIS leadership and institutions because members within ISIS and Al Qaeda began using encryption technologies to evade detection.[35] However, ISIS's rollback on its internet usage also harmed the group's capacity for cyber-recruitment and promotion of propaganda online. One study by the Combating Terrorism Centre at the US Military Academy analyzed 9000 pieces of ISIS propaganda to determine trends in the media efforts of the Islamic State, finding that its media releases have significantly declined since late 2015 "…to the point where less than 200 products were released in August 2016.[36] Evidently, ISIS's media presence has decreased as ISIS government officials began urging their allies to exercise caution on the internet. [37]

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[33] Ibid., 132.

[34] Ibid., 131.

[35] Steven Stalinsky and R. Sosnow, "Al-Qaeda's Embrace of Encryption Technology – Part II: 2011-2014, And the Impact of Edward Snowden," *MEMRI Cyber and Jihad Lab*, (28 April 2014).

[36] Daniel Milton, "Communicative Breakdown: Unravelling the Islamic State's Media Efforts." *Combating Terrorism Centre*, United States Military Academy at West Point, (October 2016).

[37] Milton, "Communicative Breakdown: Unravelling the Islamic State's Media Efforts."

Over time, the Islamic State became increasingly fearful that its citizens were intentionally sending data to foreign intelligence agencies and human rights organizations.[38] As a result, there was a steady increase in information controls, particularly through banning of social media and Wi-Fi, and the heavy monitoring of public internet cafes. Four increasingly harsh information control orders were put into place by the Islamic State between 27 January 2015[39] and 17 May 2017, which will be examined momentarily.[40] By 2017, ISIS government officials had substantially increased the number of public killings of suspected spies to deter their citizens from defecting.[41] The following paragraphs will highlight the information control orders that have been put into place by the Islamic State, and then analyze the ways in these information control orders have impacted civil society in ISIS controlled territory.

Information Control Orders

Four bans were published by ISIS government officials between 2015 to 2017 that restricted internet access for individuals living within the Islamic State.

In 2015, a new law was distributed to internet cafes that forbade them from using signal boosters or privately-owned Wi-Fi routers. The law aimed to deter activists and spies by making it harder for them to privately access the internet through Wi-Fi networks.[42] Following this ban, ISIS militants would drive around cities within its controlled territory to see if any private Wi-Fi networks could be located.

[38] Lizzie Dearden, "ISIS bans fighters from using social media amid paranoia over spying and dissent," *The Independent*, 22 June 2017, https://www.independent.co.uk/news/world/middle-east/isis-ban-facebook-youtube-twitter-instagram-social-media-fighters-spying-dissent-islamic-state-a7803406.html.

[39] "Statement for Distribution: Further Notice on Media Production," Islamic State General Supervisory Committee, 26 September 2015 published by Al-Tamimi, Aymenn Jawad, "Archive of Islamic State Administrative Documents" 27 January 2015.

[40] "Social Media Ban 2017," Islamic State Delegated Committee, 14 May 2017 published by al-`Ubaydi, Muhammad and Bryan Price, "The Islamic State's Internal Rifts and Social Media Ban." CTC Perspectives, Combating Terrorism Centre, United States Military Academy at West Point, 21 June 2017.

[41] Dugald McConnell, Mohammed Tawfeeq, and Brian Todd, "ISIS executes accused spies; rights group says," *CNN*, 6 June 2016, https://www.cnn.com/2016/06/06/us/isis-executes-accused-spies/index.html.

[42] "ISIS Steps Up Information Control in Raqqa and Deir Ezzor." Report. Salamatech, The SecDev Foundation. Vol. 5. Ottawa. August 5. 2015.

If one was found, it was assumed that a spy or activist was using it. For this reason, the person using the Wi- Fi signal would be subsequently arrested and interrogated.

On 27 January 2015, the ISIS government put forward an order that banned individuals from using photography during 'expeditions and what concerns battles… in order to prevent unregulated efforts." The order suggests that photographs posted online have caused a security breach for the state.[43]

On 26 September 2015, ISIS published a statement that contained the first comprehensive list of bans that relate to the internet. First, it banned individuals within the Islamic state from making statements online on behalf of ISIS or speaking to any media organizations. ISIS also banned local government officials and soldiers from having personal social media profiles in which they publicly declare that they are part of ISIS.[44]

On 17 May 2017, ISIS published an official social media ban. It stated that the enemies of the Islamic State track the social media profiles of Islamic State citizens and fighters. As such, ISIS now forbade the use of social media within the Islamic State.[45] Subsequently, ISIS released a 12-page document drawing on the Quran to argue that it is against Islam to question the state and that all individuals within the state must obey and trust their government.[46] This document suggests that ISIS

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[43] "Order from General Committee on media production from battles and expeditions" Islamic State General Supervisory Committee, 10 September 2014. translated by Al-Tamimi, Aymenn Jawad, "Archive of Islamic State Administrative Documents" 27 January 2015.

[44] "Statement for Distribution: Further Notice on Media Production," Islamic State General Supervisory Committee, 26 September 2015 published by Al-Tamimi, Aymenn Jawad, "Archive of Islamic State Administrative Documents" 27 January 2015.

[45] "Social Media Ban 2017."

[46] That Those Who Perish Would Perish Upon Proof and Those Who Live Would Live Upon Proof," Islamic State Delegated Committee, 17 May 2017 published by al-`Ubaydi, Muhammad and Bryan Price, "The Islamic State's Internal Rifts and Social Media Ban." CTC Perspectives, Combating Terrorism Centre, United States Military Academy at West Point, 21 June 2017.

state officials had become increasingly paranoid that their own population would conspire against them.[47]

Impact on Civil Society

The aforementioned information control orders came into place as ISIS government officials became more paranoid that their citizens, soldiers, and allies were seeking to defect. The orders ultimately carried several extreme consequences for civil society.

First, internet cafes became the only place where individuals living within the Islamic State were able to access the internet. [48] However, even here, users could not access the internet freely as they were required to register using their names and identification. Further, at various times during the day, ISIS militants circulated internet cafés and forced everyone to put their hands up, while they walked around and looked at each person's internet history.[49] New laws from 2017 also required three surveillance cameras to be stationed at every internet café. Additionally, internet cafes were forced to give their DVR box key to ISIS officials.[50] This demonstrated a high degree of suspicion towards the state's own citizens and underscores that there was no internet privacy for individuals living in ISIS's controlled territory. As a result of these impositions, citizens were deterred from looking at banned websites due to fear of being searched and jailed at any moment.

Following the May 2017 ISIS administrative publications that banned all ISIS soldiers and affiliates from using social media and Wi-Fi, various ISIS magazines began to warn soldiers against gossiping

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[47] Ibid.

[48] John Hall, "ISIS bans private internet access in Raqqa in a crackdown on spies and activists revealing the terror group's daily atrocities," *Daily Mail Online,* 20 July 2015, https://www.dailymail.co.uk/news/article-3168451/ISIS-bans-private-internet-access-Raqqa-crackdown-spies-activists-revealing-terror-group-s-daily-atrocities.html.

[49] Pamala Engel, "How ISIS monitors and restricts internet access in the 'caliphate,'" *Business Insider*, 7 November 2015, https://www.businessinsider.com/how-isis-governs-its-caliphate-2015-11.

[50] "Instructions for the Internet cafes and shops owners to put surveillance cameras and hand over DVR box key to 'Security Bureau'" *Syrian Observatory for Human Rights.* 12 December 2016, http://www.syriahr.com/en/?p=56139.

about the Islamic State or talking to their wives about being dissatisfied with ISIS operations.[51] The punishments for allegedly misusing the internet for activism or espionage were severe. Individuals were jailed, tortured, raped, or killed in mass public shootings to humiliate them and deter others from defecting. In one instance, ISIS militants organized a mass killing of 21 ISIS soldiers following a US targeted airstrike that killed an ISIS commander named Abu Hayjaa al-Tunisi. [52] As ISIS lost territory in Iraq and Syria, their methods for controlling the population became more inhumane.

D. Conclusion

This study has two key findings. First, the Islamic State undoubtedly used strict information controls within their territory for the purpose of regulating the information citizens receive from outside sources, as well as information that is dispersed, such as geographic data.[53] The information controls are the result of fears of internal spies, as well as metadata collection that has led to the bombing of ISIS leadership and institutions by foreign governments.[54]

Second, this study demonstrates that ISIS's efforts to protect itself against foreign intelligence collection had an unexpected duel effect. On the one hand, the increase in ISIS's use of encryption

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[51] Lizzie Dearden, "ISIS bans fighters from using social media amid paranoia over spying and dissent," The Independent, 22 June 2017, https://www.independent.co.uk/news/world/middle-east/isis-ban-facebook-youtube-twitter-instagram-social-media-fighters-spying-dissent-islamic-state-a7803406.html.

[52] McConnell, Tawfeeq, andTodd, "ISIS executes accused spies; rights group says."

[53] "ISIS Steps Up Information Control in Raqqa and Deir Ezzor." Report. Salamatech, The SecDev Foundation. Vol. 5. Ottawa. 5 August 2015.

[54] Lizzie Dearden, "ISIS bans fighters from using social media amid paranoia over spying and dissent," *The Independent*, 22 June 2017, https://www.independent.co.uk/news/world/middle-east/isis-ban-facebook-youtube-twitter-instagram-social-media-fighters-spying-dissent-islamic-state-a7803406.html.

technologies made it more difficult for Western intelligence agencies to monitor their activities. However, on the other hand, the use of encryption technologies has also harmed the group's capacity for cyber-recruitment and incitement. As internet controls within ISIS territory increased, ISIS's cyber presence as well as its ability to actively recruit new members online decreased, contributing to the organization's decline. Thus, metadata intelligence collection has challenged terrorist organizations in an age of social media recruitment.

Looking forward, more research is needed on whether it is possible to discern similar behavioral patterns from other terrorist groups engaging in online recruitment in the US and Canada in an age of large government metadata collection efforts. For instance, Fascist Forge, an online neo-Nazi recruitment forum, was taken offline by DreamHost, the site registrar, this past February. When questioned, a spokesperson for DreamHost noted that they "…have zero tolerance for illegal content on our network, and work regularly with law enforcement to take action against sites that contain such content."[55] Undoubtedly, American and Canadian Neo Nazis that had relied on Fascist Forge will now have to resort to more discreet methods of recruitment. With any luck, the group's online recruitment will follow a pattern similar to that of ISIS.

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[55] Mack Lamoureux, "Fascist Forge, the Online Neo-Nazi Recruitment Forum, Is Down," *Vice,* 15 February 2019, https://www.vice.com/en_ca/article/43zn8j/fascist-forge-the-online-neo-nazi-recruitment-forum-is-down.

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