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**Analysing Radical Islamic Terrorist
Organisations as Anti-Fragile Systems**

By LTA(NS) Chin Hui Han

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ANALYSING RADICAL ISLAMIC TERRORIST ORGANISATIONS AS ANTI-FRAGILE SYSTEMS

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ABSTRACT

The essay views radical Islamic terrorist organisations as *anti-fragile systems* to understand better the resilience of these organisations and the requirements of a successful counter-terrorism containment strategy. Despite the 20-year Global War on Terrorism, the scourge of terrorism has not been eradicated but has seen a resurgence in recent years globally and in Southeast Asia. Currently, Radical Islamic terrorists form the bulk of terrorist attacks in terms of numbers and geospatial coverage. Compared to other forms of terrorism, Radical Islamic terrorist organisations' unique characteristic is their singular goal of imposing their radical version of Islamic supremacy.

Radical Islamic terrorist organisations are highly resilient and exhibit 'antifragility' properties—the ability for systems to benefit when stressed. Systems thinking methodology was applied to analyse the interdependencies of the underlying factors of the political influence of terrorist organisations. The source of their antifragility was identified to be a group of factors which are interlinked in four self-reinforcing loops. By shattering the four loops, the terrorist organisations will lose their political influence, leading to their eventual demise.

Radical Islamic terrorist organisations are media savvy and exploit the media and social influence to amplify the factors contributing to their antifragility. Strategies to contain terrorist organisations must account for the media dimension by reducing the terrorists' ability to exploit the media and increasing the general population's social resilience to terrorists' propaganda. Tech companies and governments have attempted to create counter-narratives to reduce the effectiveness of terrorists' propaganda in the media. For social resilience, a key thrust of Singapore's counter-terrorism approach is the SGSecure programme which aims to build up vigilance, unity and resilience in Singapore society.

Keywords: antifragile; terrorist; systems thinking; reinforcing loop; ISIS

TERRORISM IS THE UNDYING SCOURGE OF THE MODERN WORLD

On 26th August, 2021, amidst the chaotic air-lift from Kabul, Afghanistan, an explosion occurred outside the airport gate of the Hamid Karzai International Airport, killing at least 170 people and wounding another 150. 13 United States (US) military personnel were killed and the majority of those killed were Afghan civilians.¹ The terrorist group, the Islamic State of Khorasan Province (ISIS-K), claimed responsibility for the suicide attack. The attack was a devastating sign that ISIS-K is on a resurgence and its renewed capacity for mass-casualty attacks could further destabilise the fragile security situation in Afghanistan. After more than two decades in Afghanistan, costing the US government USD 2.3 trillion, and claiming tens of thousands of lives in Afghanistan and neighbouring Pakistan, the 'Global

War on Terrorism' has yet to achieve its goal of eradicating terrorism but ironically served as a testament to the resilience and longevity of terrorist organisations.² Terrorism is the undying scourge of the modern world that exacts a heavy toll on humanity. The current estimated cost of the 20-year 'Global War on Terror' stands at USD 8 trillion and 900,000 deaths.³ While terrorist attacks in the West declined substantially in 2022, the Global Terrorism Index reports that terror attacks have increased globally and have been more concentrated in regions that are unstable geopolitically, such as Sub-Saharan Africa.⁴

The author focuses on radical Islamic terrorism organisations in this essay as they are responsible for the bulk of terrorism's activity and hostility, in terms of numbers and geospatial coverage in recent times.⁵ The author examines the resilience of terrorist activity and

the 'antifragile' nature of terrorist organisations. The author also studies the organisational behaviour of terrorist organisations, apply existing systems thinking methodology to understand the source of their antifragility, and examine measures to contain the radical Islamic terrorist threat.

Radical Islamic terrorism is defined as any terrorist act committed by groups or individuals who profess Islamist motivations or goals.

RADICAL ISLAMIC TERRORISM AND THE RESURGENCE OF ISIS

Radical Islamic terrorism is defined as any terrorist act committed by groups or individuals who profess Islamist motivations or goals. Like all terrorists, Islamic terrorists employ violence and intimidation, especially against civilians, for political goals.⁶ The idea

of Islamic supremacy, as encapsulated by the phrase, 'Islam is exalted and nothing is exalted above it', is not unique to radical Islamic terrorists. It is also the basis for Islamic states such as Iran and the philosophy of many Islamist parties. However, it is the radicalisation of this idea of Islamic supremacy that distinguishes Islamic terrorism from other forms of terrorism, such as the Irish Republican Army (IRA) in the 20th and 21st Centuries.⁷ The modern-day radical Islamic terrorism movement was catalysed by Abdallah Azzam, a Palestinian Sunni Islamic scholar and founding member of Al-Qaeda. Throughout the 1980s, Abdallah Azzam travelled across the world to champion the Pan-Islamic identity movement and call for global 'jihad'; all Muslims were considered one people and they were in a constant struggle against external threats such as the oppressive Western world.⁸ Many responded to Azzam's call to arms and formed radical Islamic terrorist organisations, with the goal of establishing a global Islamic caliphate. To achieve this specific goal, these groups need to spread their influence beyond their physical geopolitical reach, hence the extensive use of social media networks for influence and the export of



Figure 1: Image from Singapore Terrorism Threat Assessment Report 2021, ISD.

transnational terrorism. In recent times, radical Islamic terrorist organisations have established themselves as incumbents in the religious terrorism domain. In 2016, the Global Terrorism Index reported that four Islamic extremist groups, the Islamic State of Iraq and Syria (ISIS), Boko Haram, the Taliban, and Al-Qaeda, were responsible for 74% of all deaths from terrorism, and the highest numbers of incidents and fatalities caused by Islamic terrorism occur in Iraq, Afghanistan, Nigeria, Pakistan, and Syria.⁹

While the terrorist organisations in the African and Middle Eastern regions command physical territory, the terrorist groups in Southeast Asia thrive in cyberspace.

Among the radical Islamic terrorist organisations, ISIS was the most prominent terrorist organisation from 2016 to 2020. Founded in 1999, ISIS started as Al-Qaeda’s local franchise in Iraq. It was the power vacuum

caused by the assassination of Osama bin Laden, the head of Al-Qaeda, by US military forces in 2011 that sparked the rapid expansion of ISIS’ operations and reign of terror.¹⁰ ISIS gained global prominence in early 2014 through spreading videos of gruesome beheadings of hostages on social media and achieved proto-state status by 2016 through the occupation of multiple key Iraqi and Syrian cities. ISIS’ brutality and notoriety drew a strong international response. In October 2014, the US launched Operation Inherent Resolve (OIR), an internal military campaign to eliminate ISIS.¹¹ Operation Inherent Resolve is still ongoing today and has seen some tactical and operational successes in eliminating ISIS’ leadership and limiting the amount of territory under control. The US actively targeted ISIS leadership. Over 130 ISIS leaders were killed during the period from 2014 to 2017. In October 2019, the then-leader of ISIS, Abu Bakr al-Baghdadi was killed in a raid conducted by the US special forces.¹² His successor, Abu Ibrahim al-Hashimi al-Qurashi, too was killed in a similar raid later in February 2022.¹³ At its height in January 2015, ISIS controlled 90,800 km² in Syria and Iraq and ruled over eight million people. By March 2019, ISIS had lost its last territorial stronghold and dwindled to 10,000 fighters.¹⁴

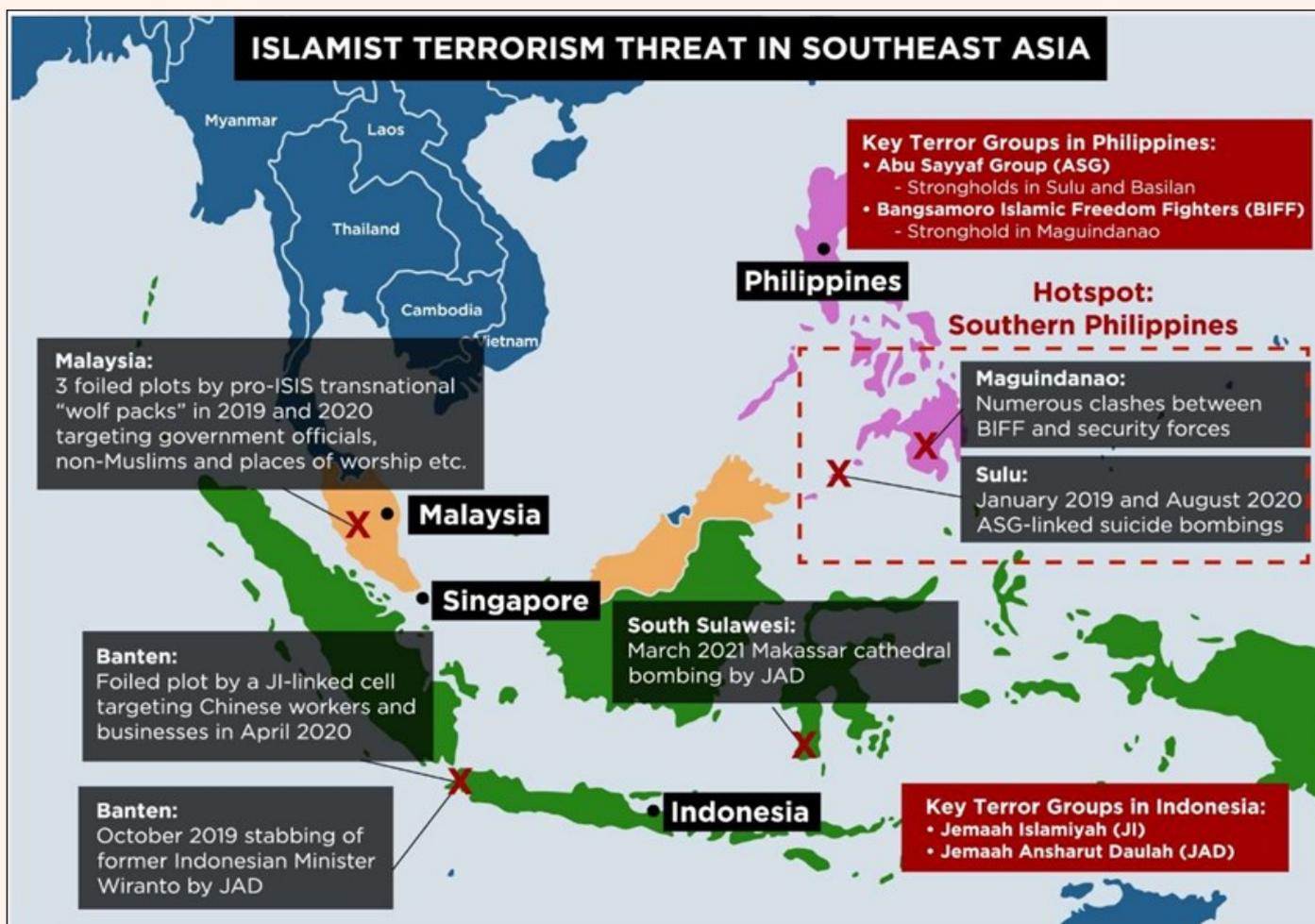


Figure 2: Image from Singapore Terrorism Threat Assessment Report 2021, ISD.

Despite ISIS’ setbacks, over the past year, there is a resurgence in the terrorist activities of ISIS and its affiliates. The 2021 suicide attack at the Kabul airport is a sombre reminder that ISIS is far from extinct. Taking advantage of the security vacuum due to COVID-19 and the reduction in US troops in Iraq and Afghanistan, ISIS renewed its recruitment efforts at internally displaced persons (IDP) camps in Syria, stepped up its recruitment and propaganda on social media, and encouraged its supporters to conduct attacks.¹⁵ As ISIS attempts to raise the next generation of ISIS fighters, there is renewed international concern over foreign fighters for ISIS returning from the Middle East to set up terrorist cells in their home regions.¹⁶

To destabilise a terrorist organisation, the best result was achieved by removing the 5 variables - ‘recruitment of potential terrorists’, ‘impact of attacks’, ‘media reports’, ‘financial and material resources’, and ‘negative perception of industrial countries’.

Closer to Singapore, Southeast Asia remains a prime target for ISIS due to its sizeable Muslim population. ISIS and its affiliates had previously declared Indonesia, Malaysia and parts of the Southern Philippines as possible territories of their Islamic caliphate. In March 2022, when ISIS announced Abu Hassan al-Hashimi al-Qurayshi as their new leader, multiple terror groups and ISIS supporters in the Philippines and Indonesia were swift to pledge their allegiances. While the terrorist organisations in the

African and Middle Eastern regions command physical territory, the terrorist groups in Southeast Asia thrive in cyberspace. Autonomous media groups and ISIS supporters are engaged in a ‘cyber jihad’ on social media networks, circulating both official ISIS and self-produced propaganda materials, to radicalise and recruit new ISIS members of a ‘virtual caliphate of believers.’¹⁷ Even though Singapore has not seen a major terrorism threat in recent times, the terrorism threat to the Southeast Asian region remains high.

ISLAMIC TERRORIST ORGANISATIONS AS ANTIFRAGILE SYSTEMS

Radical Islamic terrorist groups like ISIS and Al-Qaeda have proven to be resilient and adaptable. The resurgence of ISIS and its affiliates despite their leadership losses and military setbacks in recent years affirms that Islamic terrorist organisations are resilient to organisation decapitation, and potentially, grow stronger with it, like the mythical water monster—the Hydra. Fragility, resilience and antifragility are emergent properties of systems. Nassim Taleb developed the concept of ‘Antifragility’ as a property of systems that become better or stronger when subjected to stressors or failures.¹⁸ For example, Nature is antifragile as the natural selection mechanism of genetic mutations improves the capabilities of organisms through exposure to environmental stressors. In contrast, a ‘fragile’ system breaks down under stress, like a house of cards. In the middle of ‘antifragile’ and ‘fragile’, is a ‘resilient’ system which can overcome stressors and failures. For example, the modern Internet is a resilient system that continuously operates under the demands of users globally. Not all organisations or systems can be or are meant to be antifragile. For example, we do not subject the Internet to continuous disruption and attacks in the hopes of improving it. However, it is crucial to understand the source of antifragility, so that

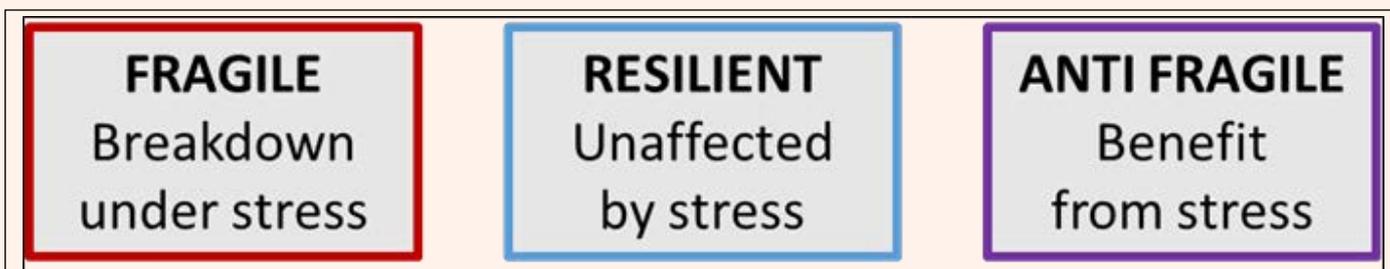


Figure 3: Fragility, resilience, and antifragility are emergent behaviour of systems.

the right strategies and policies can be applied to contain or eliminate antifragile organisations.

Radical Islamic terrorist organisations such as ISIS exhibit antifragility properties. They continue to adapt and grow stronger, despite the leadership and territorial losses, and the stress of the ongoing war on terror.¹⁹ To understand the source of antifragility of the Islamic terrorist is to first understand their mission and purpose. The purpose of terrorism is not to kill or destroy, but to evoke a response from its target. The acts of terror are simply a means to an end, the response.²⁰ The mission of radical Islamic terrorism is to establish Islamic supremacy.²¹ Combining both concepts, Islamic terrorism should not be viewed as a collection of individual terrorist organisations but as systems that provoke responses to achieve its goal of establishing the radical form of Islamic supremacy. This is the essence of the antifragility for Islamic terrorists.

A SYSTEM THINKING APPROACH TO ANALYSING RADICAL ISLAMIC TERRORIST ORGANISATIONS

Scholars and policymakers alike have struggled with the complexity and enormity of radical Islamic terrorist organisations. For example, ISIS at the height of its power in 2016, had the land, economy and military might of a quasi-state, the global operations of a Multi-National Corporation and the social influence of top social media influencers. To cut through the complexity, a systems thinking approach can be employed. Building upon a body of work in the system theory of terrorist organisations, Schoenenberger et al. built a model to capture the dynamics of large and internationally active terrorist organisations.²² The model featured 'political influence of a terrorist network' as the key variable and 15 other supporting variables, as noted in the following table:

Key variable – Political influence of a terrorist network. A terrorist network's attempt to increase or at least stabilise its political influence.

Supporting variables:

Variables	Details	Category
Support of sympathisers	Level of local support for the terrorist network.	Variables internal to the terrorist organisation
Recruitment of potential terrorists	People's willingness to join a terrorist network, and, in extreme cases, even sacrifice their lives.	
Density of terrorist network	The number of terrorists per area (region/country)	
Intragroup communications and coordination	Collaboration and knowledge exchange among terrorists in a network.	
Financial and material resources	Financial and material inflows into the terrorist network.	
Quality of life in emerging or developing countries	Factors such as political rights, freedom, education, GDP per capita, and safety.	Variables of potential target countries/cities
Negative perception of industrial countries	The level of denial and bitterness with regards to Western standards and ideologies.	
Control of overreaction	Governments' ability to avoid disproportionately severe reactions immediately following a terrorist attack.	
Impact of attack	Symbolism of the attack, number of people injured or killed, and economic damage.	Variables relating to the terrorist attacks
Media reports	Media coverage of terrorist activities	
Return to normal life	The population's process of returning to 'ordinary business' after a terrorist attack	
Security measures	All government measures for protecting the civil population from a terrorist attack.	Variables relating to counter terrorism measures
Anti-terror support by moderate forces	Level of support by moderate forces: anti-terror population groups in a hostile country, area, or organisation.	
Effectiveness of anti-terror measures	Magnitude of both civilian casualties and damage to the terrorist network.	
International anti-support and coordination	International anti-terror support and all anti-terror measures taken by allied governments, institutions, and organisations.	

Table 1: Key & Supporting Variables.²³

To express the interaction between the variables and capture the system dynamics, they used a systems thinking technique popularised by Meadows named the ‘causal loop’.²⁴ The causal loop diagram (Fig 4) shows the inter-dependencies of the variables and the positive/negative impact variables have on each other. After mapping the inter-dependencies of the 16 variables, four positive reinforcing loops were identified within the causal loop structure.²⁵

Schoenenberger’s goal was to identify clusters of variables that can be eliminated to undermine the terrorist organisation efficiently. This was achieved by employing systems thinking techniques, analysing the causal loop structure using link analysis, modelling the dynamics and interaction between the variables, and using pathfinding algorithms to trace second and higher-order interdependencies.

Their key finding was that to destabilise a terrorist organisation, the four reinforcing loops need to be broken.²⁶ The capturing or killing of the leaders of the terrorist network has a very small impact on the overall organisation as can be seen by the linkages to the ‘Intragroup communications and coordination’ variable.

Even though the leaders exert a positive influence on the recruitment of potential terrorists and the impact of attacks, the leaders are not part of any reinforcing loop that is linked to the political influence of a network. Capturing or killing the leadership of a terrorist network might reduce its operational efficiency in the short run but in the long run, the leader’s impact on the overall terrorist network is limited. There is new clarity to the muted outcomes and sometimes counterproductive efforts of targeting terrorist leaders in the Global War on Terrorism. The killing of Osama bin Laden did not cripple Al-Qaeda but made its local franchise, ISIS, even stronger! On the other hand, the four positive reinforcing loops identified are the source of the resilience and expansive nature of radical Islamic terrorist organisations. To destabilise a terrorist organisation, the best result was achieved by removing the five variables—‘recruitment of potential terrorists’, ‘impact of attacks’, ‘media reports’, ‘financial and material resources’, and ‘negative perception of industrial countries’. By removing those variables, the four reinforcing loops are shattered and will lead to the eventual demise of the terrorist organisation.²⁷

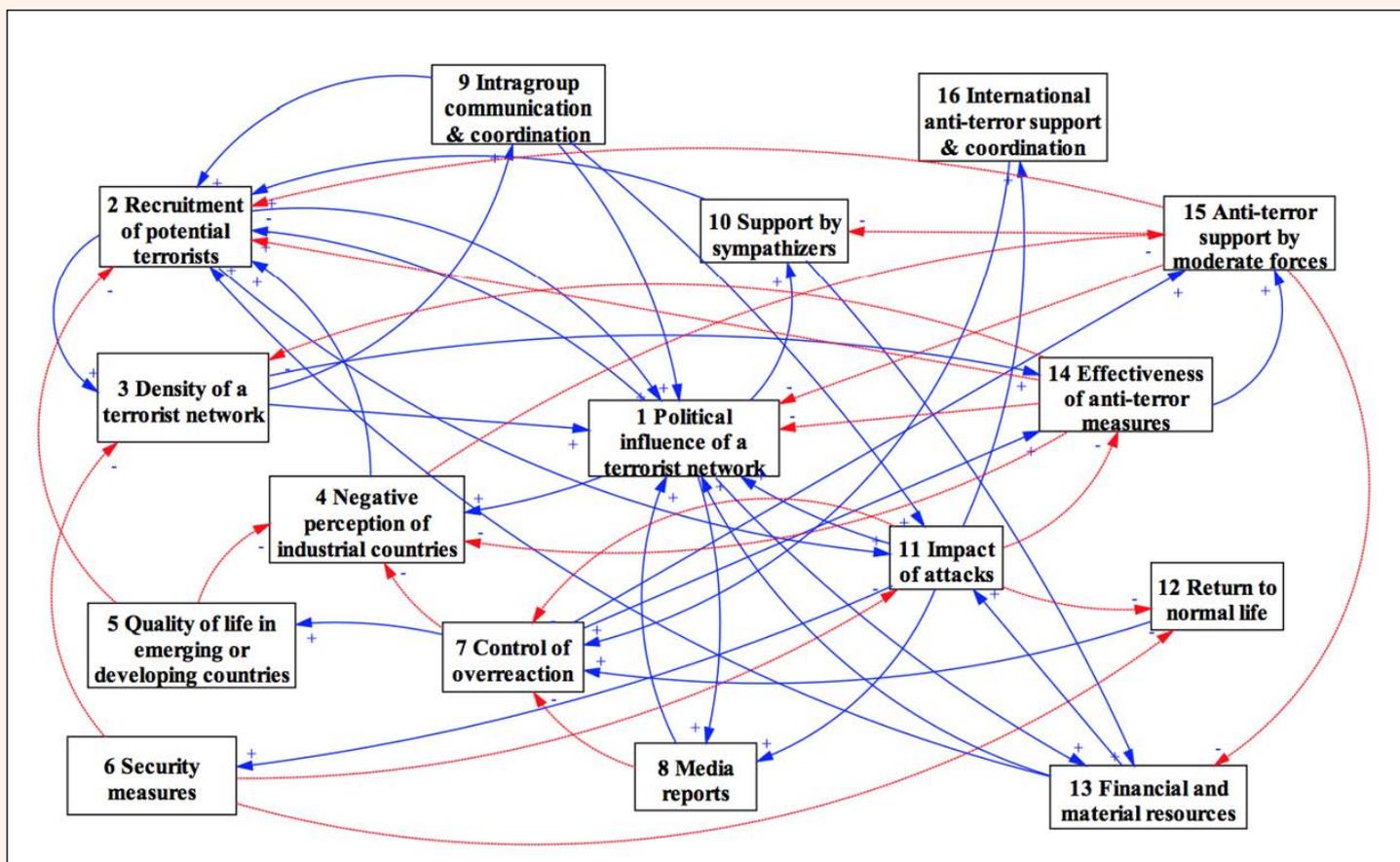


Figure 4: Casual loop diagram of a terrorist organization. Blue for positive and red for negative impact.

THE EXPLOITATION OF THE MEDIA AND SOCIAL INFLUENCE BY ISLAMIC TERRORIST ORGANISATIONS.

Islamic terrorist organisations exploit both traditional media and social media to amplify the effects of its antifragility. Four out of the five variables, namely ‘recruitment of potential terrorists’, ‘impact of attacks’, ‘media reports’, and ‘negative perception of industrial countries’ are related to the media. The media reports play a crucial role in spreading the influence of Islamic terrorist organisations beyond their geopolitical reach. In addition, the shortest positive reinforcing loop among the four loops identified was between ‘media reports’ and ‘political influence of a terrorist network’. The greater the sensationalisation of a terrorist attack by the media, the more influence it generates for the terrorist organisation, thereby attracting more fighters and spurring them on to make the next big attack—‘Sensationalism sells’. The media has the propensity to report terrorist attacks than counterterrorism efforts which are often clandestine to maintain the operational

security of counter terrorism efforts. The Islamic terrorist organisations are acutely aware of this amplification effect of media and the asymmetry in influence between themselves and the counter-terrorism agencies. Today, Islamic terrorists exploit both traditional media and social media platforms. For example, at its height, ISIS generated 200,000 daily tweets from its supporters and members. It has 12 official accounts and 45,000 supporter accounts. ISIS is also known for its slick propaganda videos and grisly beheading videos, all distributed via social media platforms such as YouTube and Facebook. Al-Qaeda too uses encrypted e-mail exchanges and encrypted chat forums to communicate and disseminate its propaganda.²⁸ The radical Islamic terrorist organisations are aware that the positive reinforcing loop between media and their influence is their key leverage. They must provoke a response and stay under attack to remain relevant. Once the response stops, they risk becoming irrelevant, losing prestige and the ability to recruit fighters to their cause.²⁹

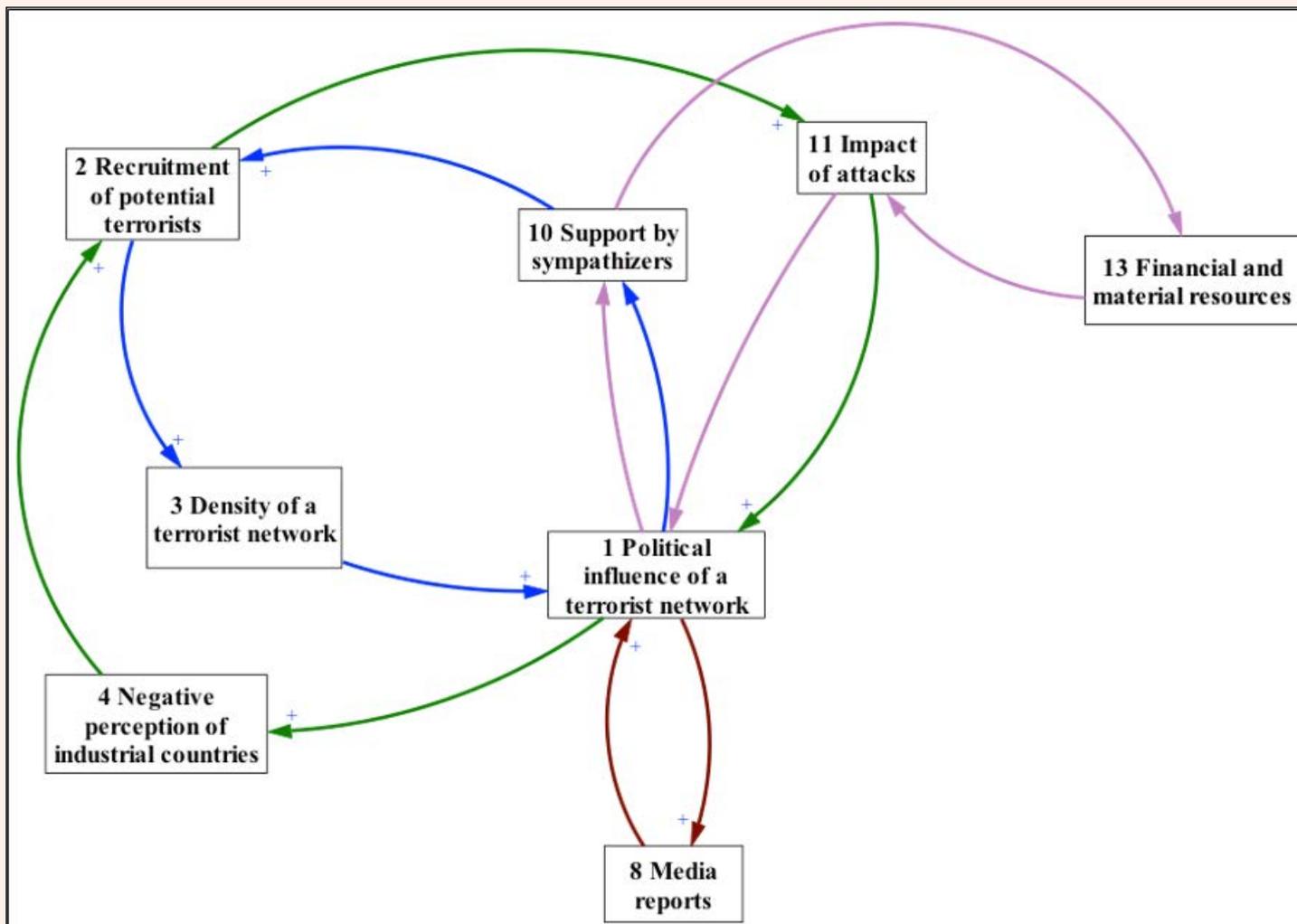


Figure 5: Four reinforcing loops of terrorist organisations. A positive reinforcing loop compounds the effects of the variables in the positive direction.

The media savviness and brand awareness of these Radical Islamic terrorist organisations cannot be underestimated. Since the decline of the ISIS campaign to build the so-called Islamic caliphate, ISIS has pivoted its propaganda narrative to one of a ‘battle of attrition’, stressing that it will outlive its enemies in this protracted struggle and has stepped up calls for ISIS’ affiliates and supporters worldwide to conduct attacks in-situ.³⁰ The ‘jihad’ has evolved into a ‘cyber-jihad’. Social media and the Internet facilitate communication between the remnants of ISIS in Syria and Iraq and regional supporters such as those in Southeast Asia. Such online communication lines may boost the operational capabilities of ISIS affiliate groups in the Philippines and Indonesia. These online networks coordinate terror activities across physical borders, exchange operational expertise such as in weapons-making, and finance terror attacks.³¹ In March 2022, Indonesian authorities arrested five members of a pro-ISIS media group, who had allegedly received instructions from ISIS to translate propaganda materials into Bahasa Indonesia. Regional terrorist groups are using social media to raise funds and operate under the guise of seemingly legitimate Non-Profit Organisations (NPOs). These NPOs solicit donations by tapping on public sympathy for the less fortunate, such as Muslim refugees overseas due to regional conflicts, and then channel some of these funds towards terror activities. In 2021, Indonesian authorities reportedly identified at least 181 terror-linked NPOs, many of whom are operating online.³² In Singapore, since 2015, there have been a total of three Singaporeans and ten foreigners who were convicted of terrorism financing offences. With the resurgence of ISIS and the resumption of travel activities globally, the renewed media interest in terrorist activities and continued online collaboration between the terrorists and supporters could spark the manifest as real-world attacks.

APPROACHES TO CONTAIN THE ANTIFRAGILE TERRORIST ORGANISATIONS

Viewing from the perspective that radical Islamic terrorist organisations are *antifragile* organisations, any containment strategy of the antifragile Islamic terrorist organisations needs to account that terrorists are likely to provoke a response either through an attack or other

news-worthy activities and then exploit the media to maintain their political influence and relevance. As hypothesised by Schoenenberger, the best way to contain the antifragile terrorist organisations was to remove the five variables—‘recruitment of potential terrorist’, ‘impact of attacks’, ‘media reports’, ‘financial and material resources’, and ‘negative perception of industrial countries’, thereby shattering the four reinforcing loops and leading to the eventual demise of the terrorist organisations. The author does not address the variable of ‘financial and material resources’ as there are many direct interventions in place today such as international anti-money laundering laws and Singapore’s Terrorism (Suppression of Financing) Act 2002.³³ For the remaining four variables, there are no simple means for direct intervention thus an indirect approach is needed to reduce the effects of the variables. The proposed approaches are to 1) reduce the effectiveness of media for terrorist organisations and 2) build social resilience to terrorist activities and propaganda.

Terrorists are known to exploit differences and animosities between different social groups. Due to Singapore’s multi-ethnic and multi-religious population, Singapore’s leaders consistently stress the importance of social harmony.

The first approach is to reduce the ability of terrorist organisations to exploit the media for propaganda. It is impossible to impose a global media blackout on all terrorist activities as the media is incentivised to report on terrorist activities. However, it is possible to divert media attention from terrorist attacks and prevent terrorists’ propaganda messages from reaching their target audience. This will degrade the performance of the media-influence reinforcement loop. Social media technology can be used to prevent terrorist propaganda material from reaching its target audience. An example of this approach is the Internet

giant Google 2016 Project Redirect.³⁴ The Redirect Method uses Google's advertisement technology to detect susceptible Internet users, redirect them away from radicalisation content, and bring them to specialised websites and curated YouTube videos. The specialised social media content is designed to debunk the terrorist organisations' recruiting themes through positive messaging. In an eight-week pilot run, with the media-savvy terrorist organisation ISIS as the primary target, Project Redirect reached out to 320,906 individuals and served 500,070 minutes of de-radicalisation video.³⁵ Today, Project Redirect is operated by the company Moonshot. Partnering with other tech companies, government and grassroots organisations, Moonshot has expanded the Redirect technology to cover more terrorist organisations and other forms of online harm. Another means to reduce the effectiveness of terrorist's propaganda in the media is to generate more sensational news than the terrorist attack itself. The intent is to shift the focus of the media attention elsewhere, thereby reducing the media's focus on the actual terrorist attack. An example would be US president Trump's tweet branding terrorists as 'losers' after a 2017 London bombing incident by ISIS.³⁶ While the tweet might be controversial, it did shift the media focus away from the actual terrorist attack. Radical Islamic terrorist organisations exploit the media to spread their influence beyond their immediate geopolitical reach.

The second approach is to build social resilience to terrorist activities and propaganda. Even though terrorist attacks kill people and disrupt their way of life, terrorists will need to 'win the hearts and minds' to sustain their recruitment and gather supporters to build their caliphate. Strong social resilience reduces the effectiveness of the media reporting of terror attacks and the terrorists' propaganda messaging on the target audience. Social resilience can be built up by keeping the public aware of the terrorist threat. In September 2016, Singapore launched the SGSecure national movement to enhance awareness of terrorism threats and to equip Singaporeans with the skills and knowledge to respond to a terrorist attack.³⁷ SGSecure is a comprehensive approach to counteract the efforts of terrorism through three core actions:³⁸

1. Staying Alert (Vigilance) to prevent a terrorist attack and to keep the community safe in the

event of a terrorist attack;

2. Staying United (Cohesion) through building strong ties in the community and safeguarding Singapore's racial and religious diversity and harmony; and
3. Staying Strong (Resilience) to be ready to deal with a crisis, being resilient individuals and communities.

Terrorists are known to exploit differences and animosity between different social groups. Due to Singapore's multi-ethnic and multi-religious population, Singapore's leaders consistently stress the importance of social harmony. As part of the response to uncovering of the Jemaah Islamiyah terrorist network in December 2001, Singapore established 'Inter-Racial Confidence Circles' (IRCC) within its communities to serve as important bridges between religious, ethnic and community groups at the local level.³⁹ The IRCC networks aim to build friendship and trust and to deepen people's understanding of the various faiths, beliefs and practices through inter-faith and inter-ethnic themed activities such as heritage trails, inter-faith talks and various ethnic and religious celebrations. During crises such as a terrorist attack, the IRCCs are trained to respond quickly to racial and religious tensions and assist in the recovery process, to help their communities in the return to normalcy.⁴⁰

By changing the dynamics of media reporting and terrorist attacks through social media technology or by creating or manufacturing more sensation news, the terrorists will be denied the media coverage needed to amplify their influence. By building up social resilience within communities, the effect of media coverage of terrorist activities on society will be diminished and its people will have increased immunity against terrorist propaganda in traditional and social media.

CONCLUSION

Terrorism is a huge cost to humanity, in terms of economic losses and human lives. Radical Islamic terrorist organisations are complex systems that are an amalgamation of multinational corporations, private militaries, and social media influencers. Despite the staggering cost of the Global War on Terrorism, and sustained efforts in targeting the terrorist leaders and

their military capabilities, the scourge of terrorism has not been eradicated but has seen a resurgence in recent years globally and in Southeast Asia.

Radical Islamic terrorist organisations' mode of operation is to provoke responses from their targets and to impose their version of radical Islamic supremacy. They are antifragile systems which get stronger when subjected to stressors. To understand the complexity of these terrorist organisations, system thinking techniques and analysis of the Causal Loop were applied by Schoenenberger et al. Four positive reinforcing loops support terrorist organisations and are resilient to leadership decapitation. To contain the antifragile terrorist organisations will require the shattering of the four positive reinforcing loops by

eliminating five variables—'recruitment of potential terrorist', 'impact of attacks', 'media reports', 'financial and material resources', and 'negative perception of industrial countries'.

Terrorist organisations are media-savvy and have exploited both traditional and social media to expand their influence beyond their geographical reach. Two approaches were proposed to reduce the influence of the four variables: 1) reduce the effectiveness of media for terrorist organisations' propaganda and 2) build social resilience to terrorist activities and propaganda. If radical Islamic terrorist organisations can be denied their main source of antifragility, and have their influence contained, in time to come, the world will be able to extinguish this scourge of the modern world.

BIBLIOGRAPHY

- A Medium Corporation. 2015. *Antifragile*— *What Trump and ISIS have in common*. 5 August. <https://medium.com/homeland-security/anti-fragile-what-trump-and-isis-have-in-common-c5f25398dc36>.
- Ang, Desmond. 2016. *Extending SGSecure to the Communities*. 26 September. <https://www.mha.gov.sg/home-team-news/story/detail/extending-sgsecure-to-the-communities/>.
- BBC News. 2022. 'Islamic State leader Abu Ibrahim al-Qurayshi killed in Syria, US says.' <https://www.bbc.com/news/world-middle-east-60246129>.
- BBC. 2017. *Parsons Green: Trump terror tweets 'not helpful', says May*. 15 September. <http://www.bbc.com/news/world-us-canada-41283984>.
- Cooper, Helene, Eric Schmitt, and Thomas Gibbons-Neff. 2021. *As US troops searched Afghans, a bomber in the crowd moved in*. 27 August. <https://www.nytimes.com/2021/08/27/us/politics/marines-kabul-airport-attack.html>.
- Cooper, Helene. 2011. *Obama Announces Killing of Osama*. 1 May. <https://www.nytimes.com/2011/05/02/world/asia/osama-bin-laden-is-killed.html>.
- Friedmann, Yohanan. 2006. *Interfaith Relations in the Muslim Tradition*. Hebrew University of Jerusalem.
- Hegghammer, Thomas. 2020. *The Caravan: Abdallah Azzam and the Rise of Global Jihad*. Cambridge University Press.
- Hoffman, Bruce. 2017. *Inside Terrorism*. Columbia University Press.
- Institute for Economics and Peace. 2017. 'Global Terrorism Index.' <http://visionofhumanity.org/app/uploads/2017/02/Global-Terrorism-Index-2016.pdf>.
- Internal Security Department. 2021. *Singapore Terrorism Threat Assessment Report 2021*. Ministry of Home Affairs. <https://www.mha.gov.sg/docs/default-source/default-document-library/singapore-terrorism-threat-assessment-report-2021.pdf>.
- Internal Security Department. 2022. *Singapore Terrorism Threat Assessment Report 2022*. Ministry of Home Affairs. <https://www.mha.gov.sg/docs/default-source/default-document-library/singapore-terrorism-threat-assessment-report-2022.pdf>.
- Meadows, Donella H. 2009. *Thinking in systems*. Earthscan.
- Ministry of Culture, Community and Youth. 2021. *Inter-Racial and Religious Confidence Circles (IRCCs)*. 17 July. <https://www.mccy.gov.sg/sector/initiatives/inter-racial-and-religious-confidence-circles>.
- Ministry of Home Affairs. 2022. *SGSecure Website*. <https://www.sgsecure.gov.sg/>.
- Monetary Authority of Singapore. 2002. *Terrorism (Suppression of Financing) Act 2002*. 30 September. <https://www.mas.gov.sg/regulation/acts/terrorism-suppression-of-financing-act>.
- Moonshot. 2018. *How tech companies like Google deal with terrorists on their platforms*. 12 June. <https://moonshotteam.com/resource/how-tech-companies-like-google-deal-with-terrorists-on-their-platforms/>.
- Schoenenberger, Lukas, Andrea Schenker-Wicki, and Mathias Beck. 2014. 'Analysing Terrorism from a Systems Thinking Perspective.' *Perspectives on Terrorism* 16-36.
- Taleb, Nassim Nicholas. 2016. *Antifragile: Things That Gain From Disorder*. Random House.
- United Nations Office on Drugs and Crime. 2012. *The use of the Internet for Terrorist Purpose*. New York: United Nations.
- US Department of Defense. 2017. *Operation Inherent Resolve*. <https://dod.defense.gov/OIR/dvpTag/Resolve/>.
- Watson Institute of International & Public Affairs. 2021. *US Costs to data for the war in Afghanistan, 2001-2022*. Brown University. <https://watson.brown.edu/costsofwar/figures/2021/human-and-budgetary-costs-date-us-war-afghanistan-2001-2022>.
- Watson Institute of International & Public Affairs. 2021. *US Post 9/11 war spending FY2001-FY2022*. Brown University. <https://www.visionofhumanity.org/wp-content/uploads/2022/03/GTI-2022-web-09062022.pdf>.

Wilson Center,. 2017. *ISIS after the caliphate*. 28 November. <https://www.wilsoncenter.org/article/isis-after-the-caliphate-0>.

ENDNOTES

1. Helene Cooper, Eric Schmitt and Thomas Gibbons-Neff, 'As US troops searched Afghans, a bomber in the crowd moved in', *The New York Times*, 27 August 2021. Retrieved from <https://www.nytimes.com/2021/08/27/us/politics/marines-kabul-airport-attack.html>
2. Watson Institute of International & Public Affairs, 'US Costs to data for the war in Afghanistan, 2001-2022', Brown University, August 2021. Retrieved from <https://watson.brown.edu/costsofwar/figures/2021/human-and-budgetary-costs-date-us-war-afghanistan-2001-2022>
3. Watson Institute of International & Public Affairs, 'US Post 9/11 war spending FY2001-FY2022', Brown University, August 2021. Retrieved from <https://watson.brown.edu/costsofwar/figures/2021/BudgetaryCosts>
4. Institute for Economics & Peace. 'Global Terrorism Index 2022', March 2022, pg2. Retrieved from <https://www.visionofhumanity.org/wp-content/uploads/2022/03/GTI-2022-web-09062022.pdf>
5. Ibid pg2-5.
6. Bruce Hoffman, 'Inside terrorism', Columbia University Press, September 2017, pg13.
7. Yohanan Friedmann, 'Tolerance and Coercion in Islam', Hebrew University of Jerusalem, June 2006.
8. Thomas Hegghammer, 'The Caravan: Abdallah Azzam and the Rise of Global Jihad', Cambridge University Press 2020, pg320-323.
9. Institute for Economics & Peace. 'Global Terrorism Index 2017', November 2017, pg2-3. Retrieved from <https://www.visionofhumanity.org/wp-content/uploads/2020/10/Global-Terrorism-Index-2017.pdf>
10. Helene Cooper, 'Bin Laden Is Dead, Obama Says', *The New York Times*, 1 May 2011. Retrieved from <https://www.nytimes.com/2011/05/02/world/asia/osama-bin-laden-is-killed.html>
11. US Department of Defense, 'Operation Inherent Resolve', 2017. Retrieved from <https://dod.defense.gov/OIR/dvpTag/Resolve/>
12. Wilson Center, 'ISIS after the caliphate', 28 November 2017. Retrieved from <https://www.wilsoncenter.org/article/isis-after-the-caliphate-0>
13. BBC News, 'Islamic State leader Abu Ibrahim al-Qurayshi killed in Syria, US says', 4 February 2022. Retrieved from <https://www.bbc.com/news/world-middle-east-60246129>.
14. Wilson Center, 'ISIS after the caliphate', 28 November 2017. Retrieved from <https://www.wilsoncenter.org/article/isis-after-the-caliphate-0>
15. Internal Security Department, 'Singapore Terrorism Threat Assessment Report 2021', Ministry of Home Affairs, 23 June 2021, pg3. Retrieved from <https://www.mha.gov.sg/docs/default-source/default-document-library/singapore-terrorism-threat-assessment-report-2021.pdf>
16. Internal Security Department, 'Singapore Terrorism Threat Assessment Report 2022', Ministry of Home Affairs, 13 July 2022, pg3. Retrieved from <https://www.mha.gov.sg/docs/default-source/default-document-library/singapore-terrorism-threat-assessment-report-2022.pdf>
17. Ibid, pg3-4.
18. Nassim Nicholas Taleb, 'Antifragile: Things That Gain from Disorder', Random House Publishing Group, 2014.
19. Institute for Economics & Peace. 'Global Terrorism Index 2017', November 2017. Retrieved from <https://www.visionofhumanity.org/wp-content/uploads/2020/10/Global-Terrorism-Index-2017.pdf>
20. The Medium Company, 'Antifragile — What Trump and ISIS have in common', 5 August 2015. Retrieved from <https://medium.com/homeland-security/anti-fragile-what-trump-and-isis-have-in-common-c5f25398dc36>
21. Yohanan Friedmann, 'Tolerance and Coercion in Islam', Hebrew University of Jerusalem, June 2006.

22. Schoenenberger, L., Schenker-Wicki, A., & Beck, M. 'Analysing Terrorism from a Systems Thinking Perspective'. *Perspectives on Terrorism*, February 2014, pg16-36. Retrieved from <https://www.universiteitleiden.nl/binaries/content/assets/customsites/perspectives-on-terrorism/2014/issue-1/analysing-terrorism-from-a-systems-thinking-perspective--schoenenberger-et-al..pdf>
23. Ibid, pg20-21
24. Donella Meadows, 'Thinking in systems', Earthscan, 2009.
25. Schoenenberger, L., Schenker-Wicki, A., & Beck, M. 'Analysing Terrorism from a Systems Thinking Perspective'. *Perspectives on Terrorism*, February 2014, pg19-29. Retrieved from <https://www.universiteitleiden.nl/binaries/content/assets/customsites/perspectives-on-terrorism/2014/issue-1/analysing-terrorism-from-a-systems-thinking-perspective--schoenenberger-et-al..pdf>
26. Ibid, pg30-32
27. Ibid, pg32
28. United Nations Office on Drugs and Crime, 'The use of the Internet for terrorist purposes', United Nations September 2012. Retrieved from https://www.unodc.org/documents/frontpage/Use_of_Internet_for_Terrorist_Purposes.pdf
29. The Medium Company, 'Antifragile — What Trump and ISIS have in common', 5 August 2015. Retrieved from <https://medium.com/homeland-security/anti-fragile-what-trump-and-isis-have-in-common-c5f25398dc36>
30. Internal Security Department, 'Singapore Terrorism Threat Assessment Report 2022', Ministry of Home Affairs, 13 July 2022, pg3. Retrieved from <https://www.mha.gov.sg/docs/default-source/default-document-library/singapore-terrorism-threat-assessment-report-2022.pdf>
31. Ibid
32. Ibid
33. Monetary Authority of Singapore, 'Terrorism (Suppression of Financing) Act 2002', 30 September 2002. Retrieved from <https://www.mas.gov.sg/regulation/acts/terrorism-suppression-of-financing-act>
34. Moonshot. 'The Redirect Method'. 2017. Retrieved from <https://moonshotteam.com/the-redirect-method/>
35. Moonshot, 'How tech companies like Google deal with terrorists on their platforms', 12 June 2018. Retrieved from <https://moonshotteam.com/resource/how-tech-companies-like-google-deal-with-terrorists-on-their-platforms/>
36. Parsons Green, 'Trump terror tweets 'not helpful', says May', BBC, 15 September, 2017. Retrieved from BBC News: <http://www.bbc.com/news/world-us-canada-41283984>
37. Desmond Ang, 'Extending SGSecure to the Communities', Ministry of Home Affairs, 26 September 2016. Retrieved from <https://www.mha.gov.sg/home-team-news/story/detail/extending-sgsecure-to-the-communities/>.
38. Ministry of Home Affairs, 'SGSecure Website', 2022. Retrieved from <https://www.sgsecure.gov.sg/>
39. Ministry of Culture, Community and Youth, 'Inter-Racial and Religious Confidence Circles (IRCCs)', 17 July 2021. Retrieved from <https://www.mccy.gov.sg/sector/initiatives/inter-racial-and-religious-confidence-circles>
40. Ibid



LTA(NS) Chin Hui Han is currently the Chief Information Officer and Deputy Chief Digital Officer of DSO National Laboratories. He graduated from Carnegie Mellon University with Master and Bachelor degrees in Computer Science. LTA(NS) Chin is a Guards Officer by vocation and is a NSMen in the Cyber Defence Group.