



**Australian Army
Research Centre**



The Effectiveness of Influence Activities in Information Warfare

Cassandra Brooker

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Abstract

Rapid, globalised power shifts, technological advances, and increasingly interconnected, ungoverned communications networks have resulted in the rise of asymmetric grey zone threats. The lines are now blurred between political, civil, and military information environments. The rise of influence activities is the new ‘sharp power’ in information warfare (the iWar). Western democracies are already at war in the information domain and are being out-communicated by their adversaries.

Building on the commentary surrounding this contemporary threat, and based on a review of the literature across three academic disciplines—systems thinking, influence, and cognitive theory—this paper investigates solutions for improving Australia’s influence effectiveness in the iWar, as part of the Australian Army Research Centre’s Conflict Theory and Strategy Series.

This paper demonstrates how systems thinking can offer an effective approach to holistically understanding complex social systems in the iWar, as well as explaining why understanding both successful influencing strategies and psychological cognitive theories is central to analysing those system behaviours.

This research employed a systems thinking methodology to compare two contrasting case studies to determine their respective influencing effectiveness. The successful case system of the terrorist group ISIS was compared and contrasted with the unsuccessful case system of Hillary Clinton’s 2016 election campaign, using a single stock of influence to determine relevant reinforcing and balancing feedback.

The findings validate the utility of systems thinking analysis for holistically understanding complex iWar systems, and reveal why the case systems were effective or not in raising influence stocks, dominating the iWar, and manipulating cognitive behaviour. The results highlight the configurational, behavioural and causal factors contributing to influence effectiveness and are summarised into key themes for each of the research disciplines to provide the Australian Army with tangible iWar strategies.

This paper concludes with a number of recommendations for improving Australia's influence effectiveness in the iWar, such as having a resonant strategic narrative and cohesive communications strategy, turning democratic vulnerabilities into strengths, adopting systems thinking approaches, enhancing critical thinking, exploiting civilian capabilities, and regaining control over the media. Further research is required across all three academic disciplines to enhance understanding and resilience, refine approaches, and improve the effectiveness of Australia's future iWar strategy.

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Introduction

Superiority in the physical environment is of little value—unless it can be translated into an advantage in the information environment.¹

A combination of rapid globalised change, technological advances in communications, and international networks, alongside urbanisation, transnational movement, and population growth, has seen an increasingly interconnected, accessible world; a concerning rise in grey zone threats; and power being devolved to lesser nations, fringe groups, and individuals. This has led to the rise of influence activities as the new ‘sharp power’ in information warfare (iWar) and a blurring of lines between political, societal and military information environments.² Internet and global telecommunications companies have rapidly erased the lines between East and West and between innocent civilians and government agents.³

Western democracies are already at war in the information domain and, in being slow to react, are being thoroughly out-communicated by their adversaries.⁴ While its ‘active measures’ are not new, Russia, along with tech-savvy groups such as the Islamic State of Iraq and al-Sham (ISIS), has managed to exploit the opportunities presented by this new world order and hybrid battlespace. Adversary information warfare tactics are difficult to counter or even track effectively. This is due to their unconventional methods; rapid widespread dissemination; and highly networked, less hierarchical and less institutional iWar system structures. Adversary influence activities impact on democratic processes and sovereignty, disrupt populations’ expression of political will, and undermine collective wisdom. The iWar is cheaper than conventional war, is real and effective, and has immediate impacts.

The West has been complacent, reactive, and risk averse in dealing with this new frontier of hybrid political warfare. Australia's strategic environment is rapidly changing and demonstrating fundamental shifts in power.⁵ The way conflicts are now contested has led to an era of hyper-competition in a multi-domain, social media saturated information environment. The West's adversaries know that to 'compete on the traditional playing field of conventional warfare is disadvantageous'⁶ and therefore have asymmetrically dislocated Western nations' dominant military and political power through the use of cognitive warfare tactics.

This paper summarises my findings by applying three disparate research disciplines—systems thinking, influencing activities, and behavioural science—to explain why certain influence activities prove effective in the iWar. It will firstly contextualise the contemporary iWar problem for Western democratic states in the global information environment (IE) and outline the problem, associated vulnerabilities, and capability gaps as they pertain to Australia across the three research disciplines. It will then use a systems thinking methodology to compare two contrasting case studies in order to demonstrate how and why Western democracies have proven ineffective in the iWar. The two complex social case studies are the successful influencing system of ISIS and the unsuccessful influencing campaign of Hillary Clinton in the 2016 US election. The utility of adopting a systems thinking analytical approach will be validated for understanding the modern, complex social systems of key adversaries and own-force iWar systems, as well as determining why the case study systems were effective or not in raising their system influence stock, dominating the information environment and manipulating cognitive behaviours. Accordingly, this paper will conclude with key recommendations arising from the findings for improving Australia's iWar influencing effectiveness.

Information Warfare Contextualised

Imagine a world where hate wins, where authoritarian regimes and terrorists control the narrative, and where one no longer knows what is true and who to trust. Unfortunately, such circumstances are already occurring across the globe. Every internet-connected individual is unconsciously embroiled in global information warfare. Western democratic nations are losing in this iWar, being out-communicated by their adversaries in cyberspace.⁷

Australia has not faced a threat of such proportions since World War II. Information age threats now bypass physical sovereign borders, poison public debate, and attack government, industry and society.⁸ These threats are seemingly unstoppable, are usually completely legal, and have blurred the lines between politics and war. Information age threats are enhanced and accompanied by sophisticated manipulation of strategic communications and public opinion. Australian voters, businesses and political discourse have already been targeted. For its part, the Australian Defence Force (ADF) has been largely left to deal with this problem in isolation. However, the ADF's stovepiped, doctrinal, linear approaches and myopic assumptions⁹ are unsuited to addressing the unstructured, evolving, complex social problems of the iWar.

As this goes, most Western influencing efforts are led by military units in a bounded battlespace and often lack coordination with other government or civilian agencies, despite doctrine urging such cooperation.¹⁰ Information warfare is today no longer an enabling function supporting military operations in physical domains. The iWar is a multidisciplinary cognitive function in its own right—a whole new geopolitical realm. Furthermore, sociocultural systems analysis and human intelligence knowledge are not usually transferred from classified settings into the contemporary civilian context for effective democratic social influencing. Contrast this with Russia and China, where the lines between military, government, social media and business influencing activities are completely blurred. Russia and China also hold a centrality of focus regarding their influencing campaigns, from the highest levels down to the individual troll.

Australia currently lacks effective influence across social, political, economic and military spheres. The character of the contemporary high-tech, multidimensional battlespace highlights the prominence of information warfare capabilities in modern conflict.¹¹ There are more than 3.8 billion people online and 2.9 billion on social media; Western nations must reorientate their national security paradigms and view this complexity as an opportunity to exploit to their advantage.¹² The blurring of military and civilian media and communications capabilities particularly illustrates the urgency with which the ADF must develop and integrate effective iWar capabilities as part of its combat power—not only to meet future security challenges but also to provide leadership and guidance to other national political, economic and civilian agencies in the influence space.

Information warfare is defined as the ‘conflict or struggle between two or more groups in the information environment’¹³—that is, controlling the narrative and associated messaging to win influence—and closely aligns with the ideas of Sun Tzu and Clausewitz, who both contended that the imposition of will or winning the battle of minds can be achieved through the control of information. Influencing activities to support battlefield operations, such as information operations (IO), psychological operations (PSYOPs), deception and disinformation, have been used in wars throughout history, with the fundamental goal of making the adversary comply with your will, while protecting own-force secrets. In the 6th century the military genius Sun Tzu stated that ‘the clever combatant imposes his will on the enemy, but does not allow the enemy’s will to be imposed on him’.¹⁴ Sun Tzu also championed deception, influencing and intelligence tactics, which, along with other writings in his treatise ‘The Art of War’,¹⁵ have stood the test of time and provide important principles for modern iWar strategists.

The contemporary iWar information environment comprises a complex web of both interlinking and competing complex social systems. However, my research identified current gaps in the iWar approaches of Western democratic nations, which demonstrate that systems thinking and behavioural economics are not being used to full potential, particularly in a military context, for influencing effectiveness in the iWar. Systems thinking is not only an invaluable approach to holistically understanding the information environment and addressing own-system vulnerabilities in the conduct of information operations but also, combined with behavioural theories, can enable the effective influencing of audiences and targeting adversary systems in the iWar.

Much is written in the grey literature about the third research discipline, influence—such as military influence activities (IA), battlefield lessons learnt, PSYOPs and wartime propaganda techniques. However, there are gaps in the literature analysing the actual effectiveness of such activities. Admittedly it is difficult to obtain metrics in war zones, and to collect against measures of effectiveness is resource intensive, particularly among populations of different languages and cultures.

The ADF must think critically about iWar problems, break down target audiences into social systems, and exploit research into human nature and behavioural economics during its target systems analysis in order to find enhanced solutions. Despite rapidly changing technology, shifting

geopolitical paradigms, asymmetric power imbalances, globalisation and ever-evolving hyper-connectivity, human nature, even in the global interconnected information environment, is inherently predictable and can be manipulated. It is, therefore, very possible for Australia to regain the initiative in the iWar by using systems thinking approaches, effective influencing tactics and cognitive science to overcome the obstacles it currently faces in dominating the information environment.

The Problem

For many years, governments, corporations, analysts, strategists and academics have investigated how to better influence target audiences and exploit cognitive human behaviour for control, power and profit. Additionally, the literature reveals evidence of a long and colourful history associated with the evolution of media and advertising to better persuade consumers, while conducting propaganda and controlling the narrative are established influencing activities as old as warfare itself.

Unfortunately the benefits, knowledge and valuable lessons provided by historical experience and the three research disciplines focused on here have been overlooked, stovepiped into silos of excellence, or not yet fused by Western democracies to create holistic, complementary approaches for better influencing strategies in the contemporary iWar.

In more recent Western military history, influencing activities have increasingly been planned and executed in isolation from kinetic operations. Current ADF information operations doctrine lacks a definition of ‘non-kinetic effects’—that is, targeting enemy audiences’ cognitive biases using communication methods to exert influence. Furthermore, while systems thinking has emerged as a viable methodology for understanding, leveraging and targeting tangible economic, ecological or weapons systems, it is more slowly being adopted for analysing complex social systems operating in the iWar, and only by a minority of niche specialists.¹⁶

However, following the results of Russian interference in the 2016 US election and the Brexit vote in the UK, the collective interest in influence activities and cognitive warfare has recently increased. As Jensen and Sear¹⁷ explain, human consumption of cyberspace content—with all our cognitive biases—has combined with rapid global dissemination and a more tribal,

adversarial democratic system, blurring the line between politics and war and creating a new type of information warfare. Research into systems thinking also continues to evolve from systems engineering, analysing tangible systems, to thinking about our intangible complex social systems and those of our enemies. A deeper appreciation of iWar systems will enable our improved resilience and provide a holistic understanding of the mental models and system structures that underpin Australia's participation in the contemporary interconnected world.

In this paper, the systems thinking and influence research are linked with related psychological and behavioural theories to better understand mental models that can be leveraged or manipulated in the iWar. The fusion of these three research disciplines is unique and enables a deeper understanding of 'enemy' systems, their influencing tactics, and their aims of achieving maximum psychological effect through exploitation of heuristics and cognitive biases.

Research Discipline 1: Systems Thinking

*If a revolution destroys a government, but the systematic patterns of thought that produced that government are left intact, then those patterns will repeat themselves ... There's so much talk about the system and so little understanding.*¹⁸

Linear or reductionist analytical approaches are not suited to complex environments and unstructured problems. When applied to complex problems, current doctrinal analytic approaches tend to oversimplify the system.¹⁹ Systems thinking approaches enable a holistic understanding, deeper analysis, and improved targeting of the complex adaptive social systems of our adversaries, as well as providing methods for developing effective influencing and counter-influence strategies. Systems thinking also enables better understanding of own-system fragility and vulnerability, across all aspects of democratic society, which facilitates increased resilience, cognition and effectiveness in the iWar.

Complex social systems, like those analysed in this paper, comprise interconnected human components, entities and subsystems that, as a whole, produce outputs and feedback flows of information, generate stocks, and possess hidden mental models, behaviours and varying levels of resilience. Byrne and Uprichard²⁰ explain that most complex social systems do not have states which can be understood as determined by interactions among simple agents. Rather, their states are consequent on elements within the system itself, including complex assemblages in subsystems, and the relationship of that system with other systems. Seeking to understand this complexity is often described as a 'wicked problem' and has methodological consequences. This is the reason why a holistic systems analysis is required to observe multiple micro and

macro levels of the system's framework—which, in turn, provides true understanding of the hidden behaviours, structures and mental models apparent in the system, as well as capturing complex causation impacting system flows.

While certain niche sections operating in Australia's intelligence agencies adopt systems thinking approaches to analysing and targeting adversary complex adaptive social systems, a systems approach to the non-kinetic iWar by the broader ADF, and by extension the Australian Government, is misunderstood, underutilised and overlooked in favour of traditional, stovepiped, doctrinal processes.²¹ Current intelligence analysis, targeting, and information operations planning efforts are siloed, follow divergent doctrines and have different objectives, definitions, outputs and levels of risk acceptance.²² Additionally, systems engineering approaches are often confused with systems thinking methodologies. Systems thinking offers an extremely effective approach to holistically understanding both friendly and adversary complex adaptive social systems, and provides a sound methodology for analysing the effectiveness of influencing activities and identifying potentially successful iWar strategies.

A key gap exists regarding the use of systems analysis for non-kinetic information warfare at a practitioner level. While some doctrine and literature covers kinetic target systems analysis (TSA) to inform effective targeting, there is a clear deficiency in practical systems thinking guidance to analysts and operators planning complex PSYOPs activities or targeting the human terrain. Goble²³ contends that 'complexity science' should be used to predict and measure the effects of information operations, in the same manner in which TSA models predict and measure the effects of kinetic weapons. The application of proper systems approaches for strategic influence is lacking, which undermines own-force ability to conceptualise complex social systems for effective targeting.²⁴

A convenient way to understand a system with a single stock of influence is to imagine a plumbing system where there are pipes providing inflows (increasing influence) into a tank (stock) which are regulated by a tap, and outflows (decreasing influence) flowing out through an overflow drain. Some of the fluid in that tank (influence stocks) is diverted by a mechanism to control the inflow and some of it is diverted to the outflow (feedback loops). We can describe the process that increases the inflow to the tank as positive feedback (a reinforcing feedback loop), and the process

that increases the outflow as negative feedback (a balancing feedback loop). For example, a population size (stock) is increased by births (inflow) but does not continue to increase infinitely, due to the outflows achieved by balancing feedback of deaths.

Social systems comprise the most complex class of systems.²⁵ This class of adversary system is being targeted in the iWar and presents an associated gap in the literature. A systems thinking methodology is key to understanding complex sociocultural systems holistically. When analysing and modelling a system, the decomposition of that system into its key components is essential for enabling better understanding of underlying structures, mental models, behaviours and archetypes, as well as the information flows and interconnections between elements—all of which can be leveraged for change or targeted effectively. Decomposition enables insight into the relevant attributes, characteristics, interactions and behaviours of an adversary system, while ‘recomposing’ and fusing the data with intelligence allows analysts to synthesise it into whole-of-system knowledge to drive future collection and effective targeting. As the world becomes increasingly complex, a systems thinking lens assists in solving contemporary ‘wicked’ problems.²⁶ This paper is not an instruction on how to conduct a system analysis; however, key systems terms to enhance understanding of the case study comparison are defined in Table 1.

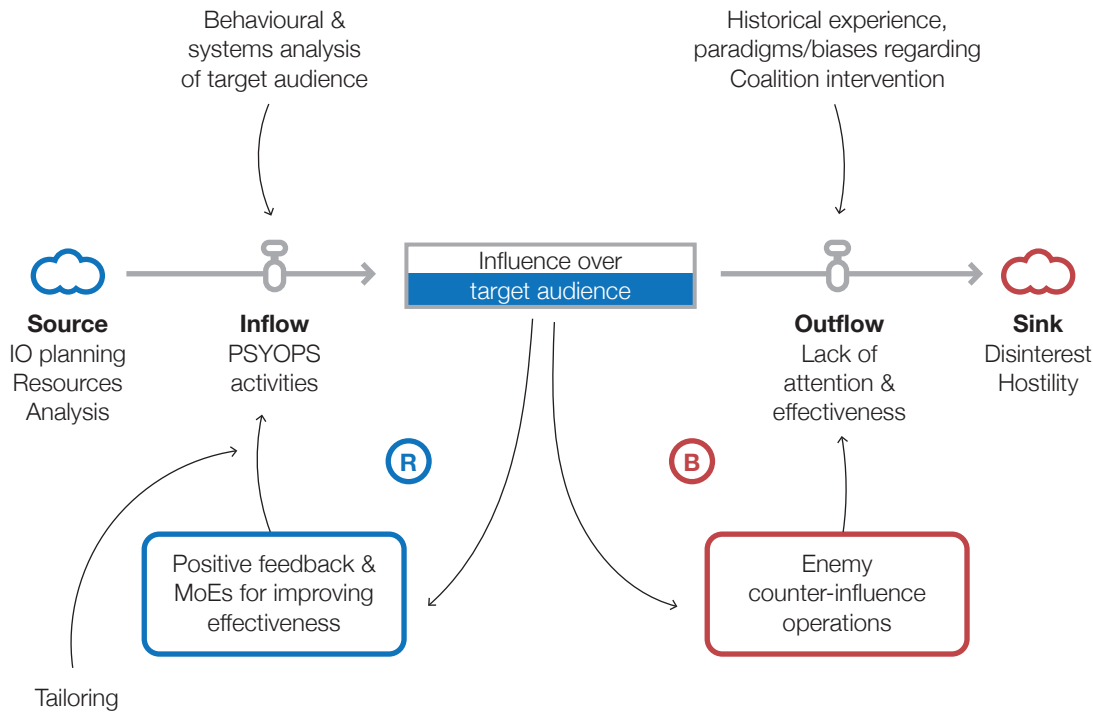
Table 1: Key systems terms and definitions²⁷

Key Systems Terms	Definition
System	A set of elements or parts that is coherently organised & interconnected in a pattern or structure that produces a characteristic set of behaviours, often classified as its ‘function’ or ‘purpose’.
Archetypes	Common system structures that produce characteristic patterns of behaviour.
Stock	An accumulation of material or information that has built up in a system over time.
Flow	Material or information that enters or leaves a stock over a period of time via feedback loops. Flow direction is depicted using feedback ‘link’ arrows.

Key Systems Terms	Definition
Feedback loop	The mechanism (rule or information flow or signal) that allows a change in a stock to affect a flow into or out of that same stock. A closed chain of causal connections from a stock, through a set of decisions & actions dependent on the level of the stock, & back again through a flow to change the stock. Can be a balancing or reinforcing feedback loop.
Balancing feedback loop	A stabilising, goal-seeking, regulating feedback loop, also known as a 'negative feedback loop' because it opposes, or reverses, whatever direction of change is imposed on the system.
Reinforcing feedback loop	An amplifying or enhancing feedback loop, also known as a 'positive feedback loop' because it reinforces the direction of change. These can be either vicious or virtuous cycles.
Interconnections / Relationships	Interconnections are the relationships that hold the system elements together. They can be physical, informational, emotional, cultural etc. Relationships can be linear or non-linear.
Linear relationship	A relationship between two elements in a system that has constant proportion between cause & effect & so can be drawn with a straight line on a graph. The effect is additive.
Nonlinear relationship	A relationship between two elements in a system where the cause does not produce a proportional (straight-line) effect.
Source & sink	Stocks at the beginnings & ends of flows are called sources & sinks, respectively. They mark the boundary of the system diagram but rarely mark a real boundary, because systems rarely have real boundaries.
Resilience	The ability of a system to recover from perturbation; the ability to restore, repair or bounce back after a change due to an outside force.
Self-organisation	The ability of a system to structure itself, to create new structure, to learn, or to diversify.

Systems thinking offers an effective approach to understanding complex adaptive social systems both of our adversaries and of our own forces. Figure 1 is a basic system diagram of an intangible example of Army PSYOPs, as a single-stock system with no subsystems, and the basic flows and feedback loops that either contribute to or deplete its influence stock. This basic model was expanded upon to inform the methodology for analysing the two case systems. For any system to function, there must be at least one reinforcing loop driving growth and one balancing loop constraining growth, because no system can grow forever in a finite environment.²⁸ Reinforcing feedback within system cycles may be either 'virtuous' or 'vicious';²⁹ this correlates to the cycles observed for ISIS and the Clinton campaign, respectively. However, while feedback loop theory can be easily applied to the virtuous cycle of ISIS's rise in influence, it is more difficult to apply neatly to the declining influence stock of the Clinton campaign, with its multiple complicated external pressures and often misaligned competing subsystems.

Figure 1: Example of a one-stock system with feedback loops—Army PSYOPs



Key



Reinforcing loop



Balancing loop



Growing action in reinforcing loop



Corrective action in balancing loop



Stock



Flow (inflow or outflow)



Sources or sinks

Meadows³⁰ contends that a ‘diverse system with multiple pathways is more stable and less vulnerable to external shock’; however, such systems are also more complex, particularly in the iWar. Therefore, a methodical approach of decomposing adversary systems into their base components is required to truly understand and target those network pathways and redundancies. Systems thinking approaches are already used by Western militaries for kinetic TSA to attack tangible, functional weapon systems through effects-based operations but are still not effectively applied to non-kinetic complex sociocultural systems analysis. A summary of the benefits of systems thinking for iWar planning compared with traditional linear approaches is in Table 2.

Table 2: Comparison of systems thinking with current linear thinking approaches in the iWar

Linear Doctrinal Approaches	Systems thinking
<ul style="list-style-type: none"> • Kinetic, functional target systems analysis focused • Siloed within Military Joint Effects / Targeting space • Not considered at the National-Political level for the iWar 	Can be applied to complex sociocultural systems of our adversaries, neutral populations & target audiences in the iWar
Network, stakeholder and link analyses all largely focused on targeting the nodes	Analyses linear and non-linear relationships (links) between nodes to determine cause and effect, and apply leverage
Set doctrinal processes, checklists, and templates for Intelligence and Planning discourages alternative critical thinking approaches	<ul style="list-style-type: none"> • Systems thinkers set own boundaries on limits of system to be analysed and problems to address. • Scalable methodology enables exploration of various aspects & branches
Ad-hoc, siloed approaches to target system analysis by different military branches, focused on specific sub-systems, rather than the whole	Holistic approach to understanding the whole system, including all its subsystems, flows, and external pressures
Focus on reacting to the outputs or events produced by an adversary system	Uncovers underlying behaviours, structures and mental models driving a system’s outputs, which can be leveraged

Linear Doctrinal Approaches	Systems thinking
Difficult to measure effectiveness of non-kinetic targeting / influence activities, as MoE focuses on tangible system outputs	Enables the measurement of system changes to processes (rather than outputs or behaviours), following the application of leverage or nudges
Limited literature related to iWar systems problems. Complexity science & systems approaches being adopted by niche elements of the intelligence community, largely misunderstood by majority of senior leaders in Defence and at the strategic level	Extensive academic research surrounding systems thinking approaches to complex, sociocultural systems' problems
Intelligence analysis and planning outputs limited by time and resource constraints	Researching, understanding and solving problems within complex systems is very time intensive and continually evolving

Using system-of-systems analysis for planning iWar strategies is a valuable method for solving contemporary complex problems. It enables the prediction and measurement of influencing activities' effects, the modelling of adversary decision systems, and effective targeting of an enemy's capabilities and value system, with the goal of changing attitudes, decisions and behaviours of a target audience.

Systems thinking also enables the streamlining of intelligence collection operations to determine impacts on adversary system functionality and target audiences, the appropriate use and allocation of intelligence resources and collection assets, and a framework for combining various analytical techniques. Goble³¹ understood the complexity of the information environment, where military forces must 'conduct information operations against one of the most complex adaptive systems—the human mind' but he also conceded a systems approach was not a 'panacea for explaining the infinite number of interrelated complex adaptive systems of the world'.

The United States Department of Defense (DoD) has updated its 'Joint Operations' publication³² to include systems perspectives of adversary, friendly and neutral systems in the operational environment, with the information environment contained within.³³ 'Joint Operations'³⁴ encourages practitioners to view the operational environment as a 'set of complex and constantly interacting political, military, economic, social, information, and infrastructure systems', and understand that the interaction of these

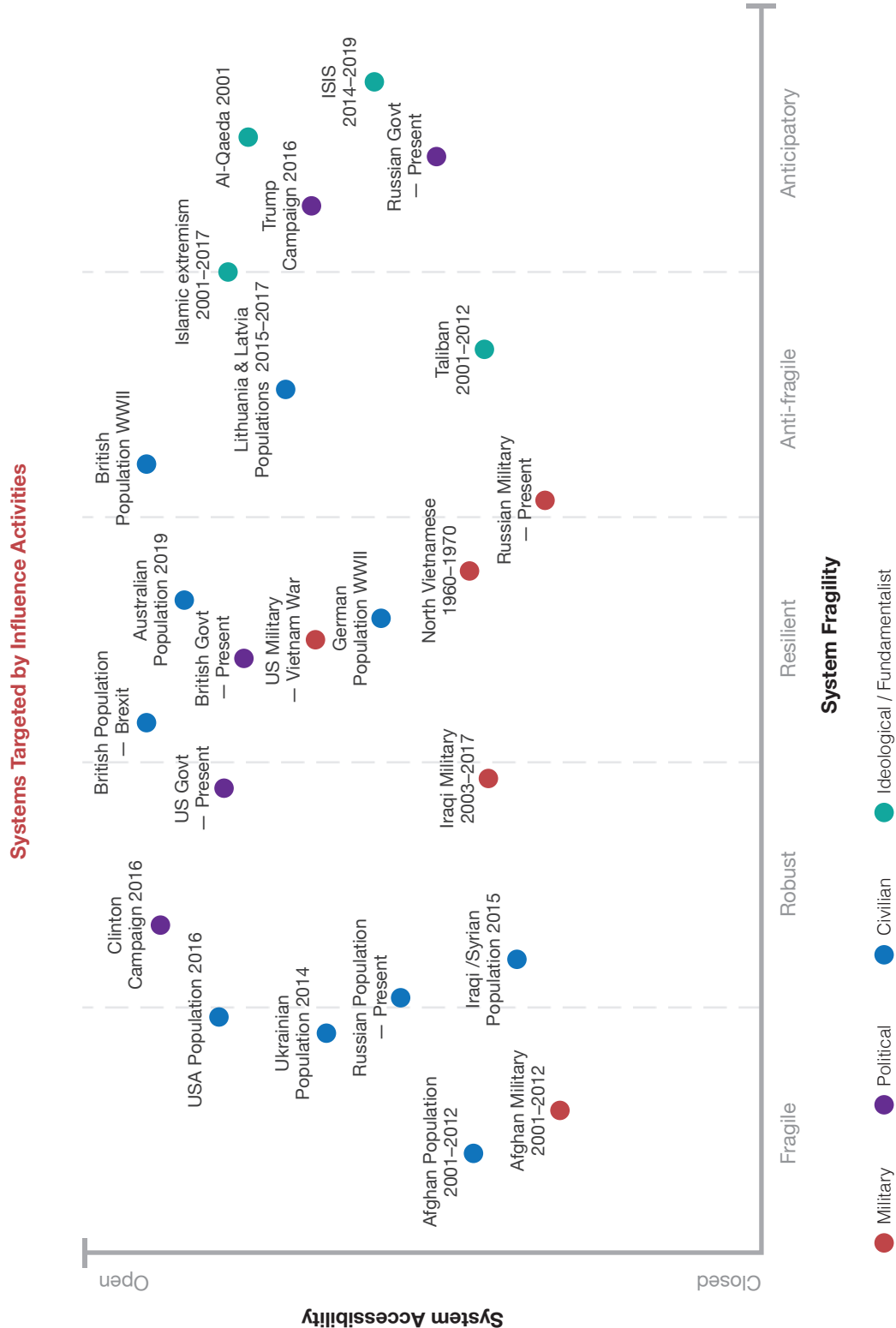
systems affects the conduct of operations. The doctrine advises that systems thinking perspectives help focus intelligence, facilitate operational design and enable efficient, detailed planning.³⁵ This demonstrates that the US DoD understands the benefits of using systems thinking approaches in operational planning; however, gaps remain in its iWar doctrine with respect to applying an appropriate method.³⁶

A challenge of applying a systems analysis to complex social systems of our enemies, such as terrorist groups or authoritarian regimes, is that they are often closed systems, meaning they are less transparent about their structures, flows and behaviours and remain largely inaccessible to Western researchers. A sociocultural system such as ISIS is an 'organisation of meanings emerging from a network of interactions among individuals', with their shared image constituting the principal bond among members.³⁷ Analysing the behaviour of information-bonded sociocultural systems presents a different proposition from analysing open social or functional systems of democratic societies, which are more transparent and cooperative. Additionally, the application of Western democratic paradigms and assumptions to different sociocultural target systems will ultimately fail to achieve effective influence and undermine the legitimacy and credibility of the information operations campaign.

Analyses of complex iWar systems can identify those systems' responses to attack, once it has been determined whether a system is fragile, robust, resilient, anti-fragile or anticipatory on a scale of strength.³⁸ 'Robust' or 'resilient' systems are characterised by the ability to tolerate stress and recover from shock; therefore, targeting them is a wasted effort. A 'fragile' system deteriorates when stressed, while an 'anti-fragile' system grows stronger.³⁹ 'Anticipatory' responses are a key capability of complex systems, which is the ideal Western democracies should be aiming for in the iWar.

Figure 2 depicts the differences in characteristics of complex social systems operating in the iWar. ISIS was a high-resilience, anticipatory system and also relatively closed—although not as closed as authoritarian or communist regimes, whereas the Clinton campaign was an open system with some fragility, sitting initially at a robust level of resilience. The openness of the Clinton system is indicative of all Western democratic systems and is a vulnerability in the iWar that must be turned to our favour and become a strength.

Figure 2: Indicative characteristics of systems targeted by influence activities



Understanding an adversary system's characteristics is imperative for determining its level of resilience (see Figure 2). Unfortunately, traditional perspectives of military strategy implicitly assume adversary fragility. This undermines Western military planning efforts to target enemy systems that prove to be robust or anti-fragile, which are actually strengthened by attacks against them.⁴⁰ Complex social systems in the iWar, such as ISIS, can evolve and strengthen themselves through feedback mechanisms, using setbacks as a source of inspiration for future responses and anticipatory actions.⁴¹

Anti-fragile systems 'must be opposed by means of other dimensions'⁴²—for example, dislocating an anti-fragile military system's power through its political, social or economic fragility. This is demonstrated by the Taliban and al-Qaeda. Both groups gained members, power and support as a result of the conditions of conflict. In these cases, as with ISIS, the actions of the Coalition fuelled their systems' will, cohesion and organisation, and provided lessons in responding to stressors and adapting accordingly.⁴³ Kinetic responses have often proven to be counterproductive in fighting insurgencies; this reinforces the importance of adopting non-kinetic, effects-based actions, such as effective influencing.

The very nature of PSYOPs is to influence an audience's emotions, motives and objective reasoning, and ultimately change its behaviour favourably towards the originator's objectives;⁴⁴ therefore it is imperative to understand the target audience as a complex social system. Asymmetric warfare involves the political, civilian, military and economic spheres, meaning the power of kinetic technologies has been displaced by the need to influence, persuade and control those audiences.⁴⁵ Analysing audiences through a systems thinking lens allows a deeper understanding of the conditions in which such complex social systems exist, the vulnerabilities that may be targeted and the sensitivities, stressors, motivations and attitudes providing interconnections and driving system flows and leverage.

Understanding a system's interconnections is also important for understanding the vulnerabilities, weaknesses and effects of discord within one's own social system in order to strengthen it from enemy influence. A detailed system analysis of the target audience exposes linkages, which are the Achilles heel of the network because they can be exposed, manipulated and weakened.⁴⁶ Effective systems analysis also determines target system levels of fragility, robustness or anti-fragility, which in turn identifies characteristics or attributes that may be effectively targeted through a variety of psychological, economic and political measures.⁴⁷

Research Discipline 2: Behavioural Science

No matter how enmeshed a commander becomes in the elaboration of his own thoughts, it is sometimes necessary to take the enemy into account.⁴⁸

This section will explore the key psychological concepts relating to why certain influence activities prove more effective and how those theories apply to analysing the associated effects on a complex social system. It is imperative the West catches up in understanding and exploiting this wisdom. The contemporary Russian propaganda model features psychological techniques and peripheral cues that are highly effective in manipulating target audiences, through their beliefs, attitudes, or preferences, in order to shape behaviour that complies with Russia's political goals.⁴⁹ Therefore, understanding how psychological and cognitive theories enable effective influencing and contribute to shifts in behaviours is vital for improving Australia's effectiveness in the iWar.

System 1 and System 2 Thought Processes

'System 1' thinking is conducted by the emotional, unconscious part of the brain; it is automatic, requiring little energy or attention, and is prone to bias. 'System 2' is a slower, more controlled analytical thought process, where reason and logic dominate, and it requires cognitive effort. System 1 relies heavily on a number of cognitive biases and heuristics for making rapid judgements, and even good critical thinkers fall for System 1 thinking errors. The most frequent heuristics operating in System 1, and exploited by effective influencers, are listed in Table 3.⁵⁰ These heuristics, especially when exploited, can lead people to jump to conclusions, make inaccurate estimates and unwise decisions, and have mistaken expectations,

unfounded fears or biases. System 1 is gullible and biased to believe and, in the absence of System 2 thinking, will generate its own context, discard rejected alternatives and avoid conscious doubt.⁵¹ Even a nonsensical statement will evoke initial belief, which is why ‘fake news’ and ‘clickbait’ are so successful with non-critical thinkers.⁵² Additionally, due to System 1’s speed, ease and dominance over System 2 thinking, people are more likely to be influenced by baseless persuasive messaging, such as commercials and propaganda, when they are tired or depleted.⁵³

However, System 2 thinking is not immune to heuristics and biases (Table 3) that undermine critical thought with ingrained habits or dominant System 1 emotions and can also be exploited by influence activities. These heuristics lead people to avoid taking risks, make evaluative judgements that are difficult to sway, misconstrue their personal influence on past events in a form of ‘hindsight bias’, and apply flawed ‘dominance structures’ to decisions—for example, elevating the merits and diminishing the flaws of a chosen option relative to other options.⁵⁴ The dangers of reduced attention spans, cognitive limitation and a lack of critical thinking in contemporary Western society mean a lazy System 2 will endorse many intuitive beliefs arising from the impressions generated by System 1.⁵⁵

Table 3: System 1 and System 2 heuristics

System 1	System 2
Automatic, quick, no effort, relies on heuristics and unconscious processes of perception and memory. Biases cannot be turned off. Gullible, generates its own context, discards rejected alternatives, does not exercise conscious doubt, limited attention span.	Deliberate, effortful, slow. Requires conscious attention. Only mobilised when System 1 doesn't offer a ready low-effort answer.
'Availability' —assess an event as more or less likely depending on how readily examples come to mind or swayed by recent memories	'Satisficing' —choosing the first alternative that is 'good enough' and discarding the rest, without proper critical analysis
'Affect' or gut reaction—for rapid decision-making	'Risk or loss aversion' —leads people to avoid taking risks
'Association' —where a word or idea reminds us of something else	'Anchoring with adjustment' —using incorrect scales (or anchors), or readily available numbers as a starting point resulting in biased probabilistic reasoning, which results in evaluative judgements that are difficult to sway
'Simulation' —in imagining various scenarios playing out, leads to phobias, incorrect expectations	'The illusion of control' —where people overestimate their ability to control events, overly confident, overly optimistic, especially in their own abilities
'Similarity' —comparison of a personality or situation like our own or 'Representativeness'—using implicit stereotype biases or explicit biased judgements	'Hindsight bias' —misconstrue/ overestimate their personal influence on past events, selective memory
Jump to conclusions, make inaccurate estimates, unwise decisions, hold mistaken expectations, unfounded fears and biases, bad habits	'Dominance structures' —applied to decisions, bias towards chosen option, i.e. elevating the merits and diminishing the flaws of a chosen option, relative to other options

A number of human behavioural traits are exploited by propagandists, marketers, advertisers and campaigners to ‘nudge’ or persuade audiences more effectively. Many of these techniques, which capitalise on heuristics and bias, seek to ensure target audiences only superficially analyse information with their System 1 thought process—that is, they take mental shortcuts and make quick, automatic decisions based on emotion and unconscious processes of perception and memory. One example is Russia’s use of repetition, which can create an ‘illusory truth effect’. As a form of persuasion bias, this leads to familiarity, and familiarity leads to acceptance as truth.⁵⁶ This frequency heuristic also enables successful influencing tactics such as the ‘exposure effect’, ‘search engine manipulation effect’ and ‘halo effect’,⁵⁷ which will be explained in the section on the third research discipline, influence.

Exploiting the intuitive, automatic System 1 thought process reinforces numerous cognitive biases, argument fallacies and logic errors, which are easily exploited by influence industries. Because System 2 enables critical, rational and deductive thought, it also requires cognitive effort and conscious attention; therefore people usually default to their unconscious, effortless System 1 thinking, due to limited attention spans and computational capacity.⁵⁸ This is why personalised, emotive messaging and narratives framed as stories, which play on biases and social norms, can be so effective. Conversely, this is also why electoral candidates making first impressions with complex arguments and detailed statistics often fail to influence voters.⁵⁹

Psychological Exploitation Tactics

To effectively influence and ‘nudge’ systems, the psychological roots of behaviour must be targeted. This is achieved through understanding human cognitive limitations, biases, self-control issues and social pressures.⁶⁰ The West’s adversaries have demonstrated they readily understand the complementary psychological concepts that enhance influence activities and their exploitation of popular thinking in the iWar. Argument fallacies, such as ‘straw-man’ tactics or using ‘red herrings’, were commonly employed by Russia and the Trump presidential campaign in 2016. Other cognitive tools employed extensively in the iWar are cognitive biases such as ‘persuasion bias’ through repeated exposure; the ‘appeal to authority bias’ as utilised by ISIS and conspiracy theorists to enhance perceptions of source credibility

and expertise; and 'confirmatory bias', which is used extensively by Russia to reinforce discriminatory beliefs, stereotypes and opinions in internet echo chambers to exacerbate social divisions in democratic states.

Adversaries in the iWar combine knowledge of these behavioural traits with other tactics that grab the attention of System 1 cognition, such as 'present bias'; repetition; situational or environmental cues; and use of imagery, emotion, colour, stories and addictive dopamine rewarding feedback mechanisms on social media.⁶¹ These approaches influence humans outside of conscious awareness and create an accumulated conceptual fluency over time.⁶² This often results in changes of opinion occurring without a subject being able to recall the facts that caused their opinions to shift.⁶³

One of the most powerful tools in the psychological arsenal of the iWar is the effectiveness of social contagion, particularly for messaging that appeals to social pressures and identities.⁶⁴ The power of social norms, peer pressure and group approval ensures a tendency to conform and primes identities to be associated with certain behaviours and opinions, as people fear the social costs such as stigma, rejection or ridicule. This relates to the 'appeal to the masses' logic error, which is a form of influence often applied by politicians and advertisers to emphasise what or whom the majority are supposedly choosing or supporting.⁶⁵ Peer comparison and social contagions have considerable impacts on behavioural change, with the 'pluralistic ignorance'⁶⁶ of group-think creating cultural bandwagons, herd behaviour and a fear of missing out. Also, research has shown that persuasion bias is significantly more effective if information is repeatedly conveyed by multiple sources connected through a social network.⁶⁷

The demonstrated power of 'homophily' ensures like-minded people group together and create echo chambers online, where they reinforce each other's views and share content that agrees with their group biases.⁶⁸ In an evolutionary setting, this behaviour provided social benefits for humans; however, in contemporary social media environments this behaviour is undermining critical thought and reinforcing stereotyping, hate speech and racism. Within these echo chambers, people spread fake or contentious messages to a supportive audience for attention, which endorses confirmation biases, strengthens group bonds and is difficult to halt.⁶⁹ Additionally, both 'confirmation bias' and 'persuasion bias' contribute to individuals' beliefs often evolving to match the views of social groups with which they interact.⁷⁰ The combination of internet-accelerated homophily

and confirmation biases has fragmented civil society, which Russia and groups like ISIS have expertly exploited to draw support for themselves while exacerbating divisions and spreading conspiracy theories and hate.

The other powerful tool in the psychological arsenal of the iWar is influence through emotions, especially anger, which bypasses System 2 thinking completely.⁷¹ Emotions arouse audiences, evoke sympathy, provide humour, feed fury and alter experiences—so, unsurprisingly, they capture the most attention on social media. The stronger the emotions involved, the more likely content will go viral, with anger spreading faster and further and being more influential than any other emotion.⁷² Unlike social contagions, emotional contagions can spread without direct social interaction and in the absence of non-verbal cues. Anger is exciting and addictive, which explains the rapid rise of online trolling.⁷³ Hitler recognised the power of stirring emotion in creating persuasive propaganda and appealing to the masses. Being caught up in a mob's fervour led to changes in mental processing of information, even to the point of believing something different.⁷⁴ Hitler realised animated crowds extended the possibilities of influence; the collective excitement opened up people's minds to information.⁷⁵ The power of emotion in influencing System 1 thinking and subsequent behaviours affects even the most well-educated, cynical, critical thinkers, as it transports them from the role of listener to that of participant.⁷⁶ Table 4 summarises the concept linkages between identified effective influencing activities, which will be detailed in the next section, and the behavioural science techniques discussed here.

Table 4: Linkages between effective influence activities and behavioural science

Effective Influence Tactics	Cognitive / Behavioural Theory
Media bias, covert influence & audience susceptibility	<ul style="list-style-type: none"> • Bias exploits intuitive & automatic 'System 1' thinking • Certain demographics more impressionable or gullible
Exposure, inundation, amplification & repetition	<ul style="list-style-type: none"> • 'Persuasion Bias' • 'Illusory truth effect' • 'Exposure effect' and 'frequency heuristic' • Exploits 'Availability' heuristic of System 1 • Exploits 'Association' heuristic of System 1 • 'Appeal to Authority' cognitive bias
Disinformation / fake news / forgeries / bot accounts	<ul style="list-style-type: none"> • 'Halo effect' = resilient first impression • Argument fallacies, e.g. 'straw-man' tactics or 'red herrings' • Grab the attention of 'System 1' cognition = not critically analysed • Occurs outside of conscious awareness, creates accumulated conceptual fluency • Even nonsensical statements will evoke initial belief
Ordering of search results, news feed rankings & sequencing	<ul style="list-style-type: none"> • System 1 focuses on higher ranked results • Sequence matters, 'halo effect' increases weight of first impressions, subsequent info is discarded • Coherence-seeking 'System 1' generating intuitive impressions
Controlling the narrative	<ul style="list-style-type: none"> • Narratives framed as stories, play on biases, emotions & social norms exploits unconscious, effortless 'System 1' thinking • A good narrative that evokes emotion will stimulate action
Visual imagery & entertainment	<ul style="list-style-type: none"> • System 1 immediately responds to imagery, humour, emotion • Exploits 'Representativeness' bias • 'Confirmatory Bias' reinforces discriminatory beliefs

Effective Influence Tactics	Cognitive / Behavioural Theory
Emotional contagion	<ul style="list-style-type: none"> • ‘Affect’ heuristic of System 1 – or gut reaction, for rapid decision making. • Anger bypasses ‘System 2’ thinking completely, spreads faster, further, most influential emotion • Anger and outrage are exciting and addictive • Power of emotion influencing ‘System 1’ affects even well-educated, cynical, critical thinkers
Social contagion	<ul style="list-style-type: none"> • Exploits peer group pressure, social norms, group approval • Appeal to the Masses logic error • ‘Appeal to Authority Bias’ • Power of ‘Homophily’ — endorses ‘Confirmation Biases’ • Exploits ‘Similarity’ heuristic of System 1
Personalisation & tailoring	<ul style="list-style-type: none"> • Unconscious, effortless ‘System 1’ thinking, • Limited attention spans and computational capacity • System 1 immediately pays more attention to personalised content
Addictive content & feedback mechanisms	<ul style="list-style-type: none"> • Addictive ‘system 1’ behaviours related to emotional & social contagions

The behavioural science research highlights the importance of developing a strong, resonant narrative and associated messaging that evoke emotion through storytelling in order to stimulate action, offer hope and prevent counter-arguments.⁷⁷ The human dimension plays a significant role in the contemporary iWar,⁷⁸ due to the involvement of social systems; therefore, it is essential that Western nations adopt behavioural economics research to confront the complex adaptive system of the human mind in future influencing activities.

Behavioural Science and Systems Thinking

Understanding nudge theory and behavioural economics changes preconceived assumptions about people's behaviour and what motivates their decisions. This realisation has led to new approaches across various disciplines to better understand the importance of psychological factors and mechanisms that drive the success or failure of programs, policies or interventions.⁷⁹ However, aside from a few niche courses offered to ADF iWar planners, such as the Information Environment Advanced Analysis training,⁸⁰ Potentium wargaming⁸¹ and TSA, Australia has been sluggish in responding to the iWar threat and slow to adopt systems thinking, and has largely ignored research into effective influencing techniques and associated behavioural theories as they apply to the contemporary battlespace.

Understanding behavioural economics is important for effective analysis of complex adaptive social systems, as human behaviour is often unpredictable and inexplicable. People choose their behaviours based on interpretations of what may happen, as a result of inaccurate mental models of cause and effect, and not all of these interpretations are anchored in reality or in accordance with their espoused values.⁸² Psychological research confirms actual behaviours are inconsistent with standard assumptions surrounding human decision-making due to deficiencies in mental accounting, choice overload and imperfect optimisation.⁸³ The complexity of analysing the qualitative effectiveness of PSYOPs on the human mind was recognised by Goble,⁸⁴ who recommended the military adopt a non-traditional systems thinking approach to addressing this issue.

To appreciate the ability to influence each level of a system, an understanding of the human connections between behaviours, motives and abilities, and the limits of each, is required to determine the best approaches—for example, to make the undesirable desirable, harness peer pressure or create reward structures.⁸⁵ Therefore, behavioural economics provides useful explanations both for understanding social systems being influenced and for diagnosing problems within systems.

Behavioural economics theories provide insight into the features of a system that are impacted upon by external pressures, such as its interconnections, stocks or flows, as well as identifying the characteristics of a system, such as its fragility or resilience. Understanding the mental models,

behaviours and psychological structures of a social system, as well as which cognitive biases are present, allows the effective design of communication and influencing activities to address, exploit or take advantage of these biases.⁸⁶

Systems, and the humans they comprise, are influenced by observing the behaviour of others. As Patterson et al.⁸⁷ explain, if you want to change a system, you have to change how people behave, and to do that you must first change how they think—which is why understanding behavioural theory is so important. To effectively influence a system, you must first identify vital behaviours that will drive the required changes, and these should not be confused with outcomes. Honing the scope of influence activities to target specific behaviours will concentrate efforts and ensure success in solving complex problems, without falling into the systems trap of ‘quick fixes’.⁸⁸

Understanding behavioural impacts on the interconnections within a system is also important for effective influencing or targeting. The strengths and vulnerabilities of links, relationships and flows of information between nodes ultimately determines the characteristic resilience of the system—and these are best identified through cultural analysis, as it relates to the attitudes, thoughts and behaviours of the system.⁸⁹

Adopting behavioural economics into complex systems analysis improves understanding of target systems and their associated interconnections, as well as assisting in diagnosing own-system problems and enabling the creation of effective influencing strategies in the iWar. As Datta and Mullainathan⁹⁰ explain, understanding behavioural economics is not merely about having better tools of persuasion; rather, it provides the potential to change system behaviours without ever changing people’s minds. However, Western democracies must act now in taking a systematic approach to analysing problems and unlocking the potential of behavioural solutions in regaining control and achieving effective influence over their adversaries in the iWar.

Research Discipline 3: Influence

It's not whose Army wins but whose story wins.⁹¹

The research into the effectiveness of influencing activities across other disciplines, such as advertising and election campaigning, provides valuable insights for addressing deficiencies of Western democratic approaches to the iWar and for holistically analysing the systems being targeted to influence. It is not enough to rely on military information operations in the modern globalised iWar environment, where the lines between civilian, political and military communications are blurred.

Understanding the effectiveness of influence activities is essential to appreciating how complex social systems adapt behaviours in response, based on balancing feedback loops—that is, either declining towards systemic fragility or strengthening resilience through adaptation. There exists extensive research into which advertising, marketing, media biases, propaganda, and electioneering activities have proven most effective at persuading target audiences throughout history, the findings of which have informed this paper. This section summarises a number of effective influencing techniques and concepts, as described in the research literature.

Media Influence and Manipulation of Bias

In 2007, DellaVigna and Kaplan⁹² researched the 'Fox News Effect'. They contended that while newspapers provided informed commentary on current events, they were unable to respond to unfolding situations in a timely manner and with the same reach as cable news. Nowadays, with the global, instantaneous reach of the internet, this study is somewhat redundant; however, it did uncover valuable insights regarding media influence.

It showed that Fox News's influence altered voter behaviour and political beliefs and significantly impacted on the 2000 US election.⁹³ DellaVigna and Kaplan forecasted that this influence would increase over time as Fox News's audiences and diffusion grew, and estimated that exposure to Fox News induced a substantial percentage of non-Republican viewers to vote Republican.⁹⁴ Their results suggested media can have a sizeable political impact, which nowadays has intensified further with the more extreme biases contained within the echo chambers and filter bubbles of social media. Analysis of the right-wing media's influencing tactics in the Clinton case study further reinforces these findings about the power that media can wield in the iWar.

Exposure, Inundation and Repetition

The effect of exposure, particularly repeated exposures, in influencing audiences is considerably persuasive, with researchers frequently documenting strong associations between media exposure with a distinctive slant and viewers' political attitudes.⁹⁵ DeMarzo et al.⁹⁶ contend that repeated exposure is a form of 'persuasion bias' and highlight how unfair, excessive airtime given to one side in political campaigns or court trials, which contains repeated arguments, has a significant influencing effect. Additionally, it has been demonstrated that repeated exposure to false statements will evoke belief in the content, due to familiarity. DeMarzo et al.⁹⁷ add that marketing, propaganda, and censorship strategies all effectively employ repeated exposures to an idea for greater persuasive effect. Berger and Fitzsimons⁹⁸ confirm these findings in their study of commercial advertising. They explain that repeated incidental exposure to features of the everyday environment can influence product evaluation and choice. They found that repeated exposures to familiar environmental cues prime related product representations in the memory and, when activated, were known to affect judgement, preference and decision-making.⁹⁹ These same psychological effects can be replicated for greater influence in the iWar.

Order and Sequencing

Internet search rankings have a significant impact on consumer choices, mainly because users trust and choose higher-ranked results more than lower-ranked results.¹⁰⁰ The order of search results can be manipulated by

search engine providers to alter and shape consumer or voter preferences. In their research into the 'Search Engine Manipulation Effect' and its possible impact on the outcomes of elections, Epstein and Robertson¹⁰¹ built on the aforementioned 'persuasion bias' generated from exposure to show the ordering of search results had a powerful and persuasive impact on subjects' recollection and evaluation of that item. Kahneman¹⁰² also clarifies how sequence matters—that is, a 'halo effect' increases the weight of first impressions or the first entry on a list, to the point where subsequent information is discarded. Kahneman¹⁰³ explains this mental shortcut as a combination of the coherence-seeking System 1 thought process generating intuitive impressions, which a lazy System 2 then endorses and believes. For this reason, internet search rankings have a significant impact on consumer decision-making, because users trust and choose higher-ranked results.¹⁰⁴ Exploiting this influencing tactic has a proven impact on election results, be it through the ranking of names on a ballot paper or through manipulation by search engine companies, which have the power to influence elections with impunity.¹⁰⁵

Additionally, as observed during the 2016 US election, algorithms sorting search results and newsfeeds can be manipulated by adversaries, external to tech companies, for their own persuasive purposes. The manipulation of search rankings exerts a disproportionate influence over voters due to the digital bandwagon effect achieved via social contagions and skewed exposure towards certain candidates, and because voter attention spans have waned and shifted from traditional information sources towards the internet—with all its biases, disinformation, and filter bubbles¹⁰⁶ (that is, where users filter out content they dislike or disagree with).

Controlling the Narrative

Social media has changed the face of warfare; it is global, complex and invasive of civilian lives and businesses. Singer and Brooking¹⁰⁷ argue that military propaganda has proven historically ineffective against target adversary audiences, and that modern information warfare attempts by Western militaries to undermine enemy morale are almost never successful. The reasons for this include slow, reactive, unwieldy approval processes, risk aversion, a lack of understanding of the targeted social system, and a failure to apply related behavioural theories for best effect. In one decade, social media has significantly changed traditional information operations

approaches and the face of warfare. Nowadays, attacking an enemy's will, its cohesion and the spirit of its people¹⁰⁸ no longer requires conventional threats or traditional propaganda; rather, anyone with an internet connection can potentially create a strategic effect within seconds.

Those most effective at influencing in the contemporary iWar battlespace have mastered key elements of traditional PSYOPs and adapted them for the social media age. The key information operations concepts ensuring the success of adversaries in the iWar include having an effective narrative that resonates; using emotion as an arousal, particularly anger as an emotional contagion; having authenticity to create brand engagement and online tribalism; and inundation of persuasive messaging ('exposure effect').¹⁰⁹ Unfortunately, Western democracies and traditional media outlets adhering to journalistic standards are often restricted from employing clandestine, underhanded iWar tactics in response. Additionally, large institutions—such as government organisations—that are too bureaucratic or hesitant to weave an effective narrative are losing control in the iWar.¹¹⁰

Disinformation

Russia's Internet Research Agency and extremist groups such as ISIS successfully manipulate social media, out-publish and out-manoeuvre traditional forms of journalism. They can rapidly inundate global audiences with disinformation that reinforces their narrative. Western mainstream media (MSM) is largely hamstrung by tone, fairness, allegiance to facts, and context over conclusions.¹¹¹ However, fake stories are a new form of political activism, revenue and addictive entertainment, and fuel dopamine cycles of 'likes' and 'shares' among internet partisans,¹¹² meaning that less scrupulous media outlets will spread enemy disinformation, exploit salacious content, and lower journalistic standards to win the news cycle.

Following Russia's interference in the 2016 US election, the Canadian Security Intelligence Service¹¹³ (SIS) analysed the effectiveness of disinformation in the contemporary information environment and highlighted the deficiencies of Western democracies to counter such operations. The reach and speed of social media escalates the impacts of disinformation, and it has become a highly effective tool for skilled purveyors of falsehoods to influence political views, exacerbate divisions, and undermine the ability to mediate the quality of public information. Therefore, the rapid spread of disinformation

via social media subsequently threatens the integrity of democratic discourse.¹¹⁴ Russia's disinformation campaign is so effective because it employs an extensive, industrial-level network of trolls, sock puppets and bots, whose activities are intensified and corroborated by a multi-pronged state-owned media machine, diplomatic support, forgeries, and de facto alliances with organisations such as WikiLeaks.¹¹⁵ Russian influence is not bound by borders, is often untraceable, and is unconcerned by democratic ethics, values or legalities.¹¹⁶ Most importantly, there is no similar opposing capability apparent in Western democratic nations to counter Russia's iWar campaign.

Paul and Matthews characterised the contemporary Russian propaganda model as a 'firehose of falsehood'¹¹⁷ because of the inundation of numerous messages across multiple channels. Russia's 'shameless willingness to disseminate partial truths or outright fictions'¹¹⁸ was successful in its design to entertain, confuse and overwhelm target audiences. Russia's lack of truth and consistency in its iWar content actually runs counter to conventional wisdom on effective influencing, where the veracity and consistency of information was always deemed of high importance.¹¹⁹ Russia has proven successful in conducting direct persuasion and achieving obfuscation, confusion and disruption using unconventional tactics.¹²⁰ Unfortunately, if Western democratic nations were to attempt the same approach it would likely backfire because spreading disinformation goes directly against democratic principles of transparency, honesty and openness and, therefore, would undermine the state's credibility and authenticity with target audiences.

Enhancing Russia's effectiveness is its propagandists' remarkable responsiveness to events, aided in part by a freedom of creative action and the lack of approval processes enjoyed by Russian trolls. They are not hamstrung, as traditional journalists are, by fact-checking or source verification. They repeat disinformation and plagiarise stories, meaning they are first to publish, and their articles are subsequently rebroadcast by legitimate news outlets.¹²¹ In accordance with the 'halo effect',¹²² stories published by Russia's propaganda machine leave a resilient first impression, the information of which audiences are more likely to accept and favour when later faced with conflicting messages.¹²³ Russia's use of repetition also creates an 'illusory truth effect', where repetition leads to familiarity, and familiarity leads to acceptance as truth.¹²⁴

Even more effective is the use of clandestine, invisible sources of disinformation, designed to influence, such as exploiting biases and other psychological heuristics, to manipulate and alter target system behaviours. These hidden tactics of seeding disinformation and messaging into people's media consumption are harder to counter or defend against, especially if the system comprises impressionable people of certain demographics who believe they have made decisions autonomously and without coercion.¹²⁵ This invisible manipulation is especially dangerous as a means of control, particularly in biasing voter behaviour, influencing attitudes and beliefs, and ultimately affecting the outcomes of close elections.¹²⁶

Emotional and Social Contagions

By 2015, the average attention span of internet users was measured at eight seconds.¹²⁷ Tech-savvy groups are exploiting people's System 1 heuristics accordingly. They create emotional or social contagions that play on anger, outrage, social connections and in-group dynamics, as well as harnessing the simplistic power of evocative imagery through videos and humorous memes, which deliver their point rapidly, enjoy longevity (even if proven false), are easily shared, and impact on waning attention spans. The effectiveness of imagery to persuade is even more powerful when it exploits semiotics—that is, where signs, symbols and imagery represent cultural identity and how people communicate.¹²⁸ Memes, symbology and colours are more powerful than slogans or words for effective influencing. Berger and Fitzsimons¹²⁹ explain that consumers being primed by certain imagery or environmental cues can influence the success of program implementation, trigger addictions, influence the salience of cultural identities, and lead to the prevalence of certain behaviours.

Personalisation and Tailoring

Donald Trump's election campaign successfully used personalisation and tailored messaging, alongside inundation, as effective influencing tactics. Trump had the most social media followers and deployed his network on a massive scale, 'pushing out the most messages, on the most platforms, to the most people'.¹³⁰ The Trump campaign utilised personal data, stolen by Cambridge Analytica, and exploited social media tools in order to micro-target voters with tailored personalised messaging.¹³¹

These tactics ensured the amplification of messages, due to shortened attention spans taking more notice of personalised content, and thereby expanded Trump's support base, using multiple storylines and demographic targeting that appeared to address the concerns of every voter personally. These tactics resulted in 'Team Trump' controlling the national conversation and created 'perfect' messages for dynamically and simultaneously engaging different groups of voters.¹³²

The integration of human factors, cultural understanding, accurate linguistics, and personalised tailored messages cannot be overstated for attaining maximum influence over target audiences.¹³³ Customised slogans and tailored advertising, targeted towards specific geographic regions or demographic groups, prove extremely successful, as they benefit from links with everyday environmental cues and capture attention.¹³⁴ These tactics were quickly understood and applied by both the Trump campaign and the Russians as a method for generating support, reinforcing their narratives, and widening social fissures and creating conflict.¹³⁵ Table 5 summarises key influencing techniques identified in the research literature, as listed in Table 4 and discussed in this section.

Table 5: Summary of key findings from the influence literature

Influence Effectiveness Concepts

Media bias & audience susceptibility

- Fox News' media bias, journalistic content choices & unfair airtime
 - Use of covert, invisible sources of influence manipulates & changes behaviours = hard to counter, especially if audience impressionable
 - Different populations as audiences (systems) have varied susceptibility to influence
-

Exposure, inundation & repetition

- Repeated exposures are considerably persuasive
 - Amplifies messages, expands support bases, generates multiple story lines
 - Repeated exposures to environmental cues prime related representations in the memory
 - Known to affect judgment, preference and decision making
 - "Super-spreaders" spread disinformation like a virus, difficult to counter
 - Inundation of numerous messages across multiple channels
 - Disinformation spreads ~six times faster than real news
 - Contributes to echo chambers, algorithmic tailored newsfeeds, biased search rankings
 - Sophisticated influence activities in uncontrolled, unbounded commons of the internet
 - Used in marketing, propaganda & censorship, with charismatic or authoritative messengers
-

Disinformation / fake news / forgeries / bot accounts

- Extensive, industrial level, multi-pronged, multi-domain, multi-platform, 24/7, never ending
 - Fire-hose of falsehood (Russia)
 - Reach & speed of social media escalated the impacts of disinformation - highly effective in influencing
 - Remarkable responsiveness of propaganda to events / Contain element of truth = highly effective
 - First to publish, with false articles rebroadcast by legitimate news outlets
 - Rapidly evolving trial and error of various iWar tactics by adversaries / Unbound by ethics, legalities or journalistic standards
-

Ordering & sequencing

- Ordering of search results has a powerful and persuasive impact
 - Users trust and choose higher-ranked results
 - Digital bandwagon effect, unequal skewing of exposure towards certain candidates
 - Gaming of algorithms to skew search results' rankings
-

Influence Effectiveness Concepts

Controlling the narrative

- An effective narrative must be simple, novel and resonate
- Use of visual media to enhance and stir emotions
- Out communicate adversaries / competition narratives
- Harness power of instigating events, full control over the narrative = powerful propaganda wins

Visual imagery & entertainment

- Memes, symbology, and colours are more powerful than slogans or words as an effective advertising
- Raw entertainment, humour, visual media, videos – content exploiting biases and stereotypes
- Evocative imagery, slick videos/humorous memes deliver the point rapidly, enjoy longevity, easily shared, exploit waning attention spans

Emotional contagion

- Using emotion – particularly anger / outrage - captures the most attention on social media
- Trolling / inciting societal divisions, riots, protests

Social contagion

- Being authentic & build sense of community / social in-groups / Echo Chambers / Filter bubbles
- Integration of human factors, cultural understanding, accurate linguistics, personalised tailoring of messages for maximum influence
- Contributes to virtuous cycles in 'disinformation system'

Personalisation & tailoring

- Creation of tailored messages, micro-targeting & simultaneously engaging different groups of voters = effective influencing tactic
- Customised slogans and tailored advertising, targeted towards specific geographic regions or demographic groups, prove extremely successful, benefit from links with everyday environmental cues

Addictive content & feedback mechanisms

- Attention from receipt of likes / notifications and other feedback provides dopamine hit
 - Imagery & environmental cues can undermine program implementation, trigger addictive behaviours, influence cultural identities
 - Fake stories / memes / click bait fuel dopamine cycles of likes and shares among internet partisans, enabled by mobile internet
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Case Study: Combining Influence Strategies

An effective psychological warfare plan adopted by Hezbollah against Israel in Lebanon (1982–2000) allowed a relatively small guerrilla force, with no conventional capabilities, to exert its will on a regional power and ultimately force Israel's withdrawal from Southern Lebanon. Hezbollah employed traditional PSYOPs archetypal messages directed at target audiences on the home front, the enemy, and neutrals.¹³⁶ Hezbollah enhanced its effectiveness by exploiting events for maximum propaganda effect, employing an excellent hearts and minds campaign, undermining Israeli Force morale, and using symbolism and emotionally evocative visual media as effective weapons.¹³⁷

Hezbollah's tactics were later adopted by al-Qaeda and ISIS—particularly the use of well-presented videos. Hezbollah would film and produce slick productions depicting exciting attacks against Israeli Forces to draw in viewers and make it look heroic. ISIS adopted this tactic in its creation of high-quality YouTube videos depicting execution footage, to spread fear, horror and influence. These videos enabled control over a very selective view of frontline reality and allocated footage a significance well above its battlefield worth,¹³⁸ such as making a minor skirmish where Hezbollah was quickly neutralised look like a raging battle that it won against the larger oppressor. ISIS also learnt from Hezbollah the power of instigating events, with full control over the narrative and visual media, to gain powerful propaganda wins and force the Coalition into reacting. Hezbollah regarded the capture of symbolic events on video as its main mission and, with simple equipment and creative thinking, could net huge military and psychological dividends.¹³⁹ ISIS also learnt the importance of viciously imposing control over local civilian populations and projecting virtual power to accentuate its military and religious dominance.¹⁴⁰

Comparing Hezbollah's planning of objectives designed for maximum psychological effect with Western military information operations planning highlights the lack of flexibility, opportunities and imagination available in our non-conventional operational processes. Hezbollah took a systems analysis approach¹⁴¹ in familiarising itself with Israeli culture and psyche and in allocating the Israeli public and military into several functional or ideological sub-groups. This systems analysis paid off, as it enabled tailored messaging against targeted audiences and increased Hezbollah's influence stock. Hezbollah was also masterful at balancing local vicious anti-West rhetoric with credible messaging along human rights themes, to appeal to Western

liberal mores.¹⁴² This ensured its messaging and footage was aired on mainstream media, including in Israel, which was another key lesson ISIS learnt in creating global reach and a pervasive belief in its military prowess.¹⁴³ Hezbollah displayed creative military thinking in its systems analysis approaches and astute employment of PSYOPs tactics, resulting in the successful combination of information operations, guerrilla warfare, terrorism and religious ideology to overcome the asymmetry between it and a major regional power.¹⁴⁴ Hezbollah provided key lessons surrounding the limitations of traditional and predictable Western iWar tactics, which enemies of the West have heeded.

Limitations of Western Democracies' Influence Effectiveness

While researching why certain influence activities are effective, gaps in the literature and the limitations of Western approaches to countering effective information operations campaigns both became apparent. There is a distinct lack of scholarly research into PSYOPs, despite their being practised for decades.¹⁴⁵ The modern iWar has moved beyond the military, where 'war and politics have never been so intertwined—politics has taken on elements of information warfare, while violent conflict is increasingly influenced by the tug-of-war for online opinion'.¹⁴⁶

While much academic research exists into the effectiveness of certain media persuasion techniques, advertising, marketing and historic propaganda successes, less is known about how Western nations can effectively influence audiences in the complex iWar environment. The West is constrained by democratic values, ethics, credibility concerns and transparency requirements. The lines are blurred in the iWar between civil society, politics and the military. The contemporary dynamics of the uncontrolled, unrestricted frontier of the global internet commons—specifically social media—with its rapid growth, extensive reach, malicious content, echo chamber dynamics and security deficiencies, have not really been addressed in the literature to date.

This new dynamic battlefield is undermining traditional thinking and doctrinal approaches to information operations. Not only are nations at war in the information environment but so are their citizens, businesses and communities—and many Western democracies do not even realise it.

Leaving the iWar for the military or government to contend with in isolation is no longer viable. As observed in Israel and Lithuania, it will take the engagement and collective effort of the entire nation to counter adversary activities intent on threatening societal structures and undermining the integrity of public discourse and democratic institutions.¹⁴⁷

Western nations face a number of difficulties in the iWar, including the complexity of deterring or coercing rogue states and non-state actors, which is exacerbated by the constant requirement to maintain international reputation and domestic support. Western democracies find themselves at a distinct disadvantage: having been shaped by the Enlightenment and its proclaimed values, they now, to some extent, constrain their institutions and corporations from competing on a level playing field in the iWar. The West seeks to be logical, consistent, transparent and accountable; however, ‘these are not the values of a good troll’¹⁴⁸ or indeed of an effective contemporary influencer. Table 6 summarises the limitations faced by Western democracies in the iWar and compares those limitations with adversary freedom of action.

Table 6: Comparison of Western democratic limitations with adversary freedom of action in the iWar

Western Democracies	Adversary groups / Authoritarian Regimes
IO / PSYOPs siloed into military operational effects & targeting. Limited cross-agency or WoG approaches, strategy or narrative.	Multi-domain, multi-pronged campaigns involving extensive, industrial level network of military, government, civilians, businesses, state-owned media, local tech companies, hacker groups etc. Have effective narratives that resonate.
Hamstrung by democratic values, ethics, credibility concerns and transparency requirements. Need to be logical, consistent, and accountable to both domestic and global audiences.	Extensive use of deception and disinformation. State-owned media is biased, distributes propaganda, and not held to journalistic standards. Exploit cognitive biases and heuristics. Not bound by national borders, activities often untraceable and unconcerned by Western democratic ethics, values or legalities.
Linear thinking, attack of nodes (often kinetically) – rather than developing IO effects non-kinetically targeting links / relationships / cognitive biases	Employ systematic, creative approaches to analysing and influencing global populations i.e. attack links to create social division rather than nodes, e.g. Hezbollah, Russia.

Western Democracies	Adversary groups / Authoritarian Regimes
<p>Complacency or wilful ignorance – reactive to adversary iWar attacks, risk averse in implementing own iWar activities. Too bureaucratic or hesitant to weave an effective narrative.</p>	<p>Proactive, rapidly responsive to events, will target everyone, including own population. No recognised boundaries. Strategic or Political-level endorsement. Unconcerned by exposure or consequences.</p>
<p>Focus on technical cyber operations rather than influencing. A simplistic understanding of the iWar. Military doctrine does not cover social media. One message fits all approaches.</p>	<p>Multi-faceted, multi-domain, complex systems approach to IO campaigns. Theft of personal data for personalised, tailored messaging. Use emotion as an arousal – particularly anger as a contagion. Exploitation of social contagions. Use of humour and imagery.</p>
<p>Overwhelmed by the open, boundless, unrestricted commons of the internet and the associated uncontrolled big data. Concerned about encroaching on civil liberties & freedom of speech.</p>	<p>Super-spreaders ensure the unprecedented spread, inundation, speed, exposure, repetition of disinformation. Trolls and bots exploit access of internet to enhance echo chambers, filter bubbles, and emotive content in Western countries to undermine democratic institutions and elections.</p>
<p>IO capabilities under-resourced and misunderstood, often incorrectly associated with propaganda & underhanded activities.</p>	<p>Hold paradigm of being at war; iWar activities therefore top priority and highly resourced to achieve obfuscation, confusion, and disruption within perceived enemy populations. Provides traditionally weaker adversaries disproportionate power over West.</p>
<p>Fact checking and monitoring disinformation is a massive job, which constrains profitability and is unpalatable for social media companies and mainstream media to ally with governments & intelligence agencies.</p>	<p>High volumes of state-sponsored or troll factory generated content overwhelms fact checkers, platform content monitoring, and traditional journalism. Ensures fake news is seen first, provides resilient first impression.</p>
<p>Traditional mainstream media hamstrung by tone, fairness, allegiance to facts, and context over conclusions.</p>	<p>Out-publish and out-manoeuvre traditional forms of journalism through constant inundation of salacious, addictive clickbait.</p>

Nowadays, conventionally weaker adversaries can easily maintain power over populations, using the psychological tactics discussed under 'Research Discipline 2', by controlling information and narratives, generating fear, steering opinion, 'gaslighting' (psychological manipulation to cause doubt in one's own sanity), bypassing traditional journalism, and quashing dissenters.¹⁴⁹ The leading example is Russia's 'active measures' campaign, which employs various experimental psychological information operations methods on a multi-pronged media front. This systematic approach to influencing global populations contrasts with the haphazard way Western governments regard the modern iWar battlespace, leaving them struggling to regain the initiative or control the narrative.¹⁵⁰ Democracies, whether out of complacency or out of wilful disregard, have not taken seriously the prospect that emboldened adversaries could 'reshape the undefended post-Cold War liberal order'¹⁵¹ and that engagement is unavoidable for addressing this undermining of democratic institutions and values.

The sophistication of Russian propaganda and the influence activities of adversaries in the uncontrolled, unbounded commons of the internet requires the West to abandon its simplistic understanding of the iWar.¹⁵² While Western nations forgot certain propaganda lessons of World War II (that is, keep innovating and deploy on a massive scale, using all technical means and media available), Russia embraced the mantra 'to succeed, propaganda must be total',¹⁵³ realising early on that sporadic efforts would fail, and therefore continues to evolve its iWar campaign accordingly. Meanwhile, Western democracies have been constrained by inertia, ethical issues or stovepiped strategies, as well as by political risk aversion and a reluctance to appropriately resource domestic iWar systems.

Western democracies have been unwittingly dragged into the iWar and, as such, are obliged to act to counter hostile influence activities, respond to unwelcome narratives, and safeguard their own narratives and democratic freedoms.¹⁵⁴ As this realisation sets in, regaining the initiative in strategic communications is slowly being addressed; for example, NATO is championing the importance of a strong narrative as a strategic necessity for Western nations.¹⁵⁵ However, the constraints on activating iWar strategies must be addressed—that is, where political and strategic cultures, policies, historical experiences and changing threat perceptions all influence the choice of strategy or, more often, inaction.¹⁵⁶ Coordinating information outputs of all government departments from the outset of a crisis to ensure

appropriate collective messaging is also imperative.¹⁵⁷ The current 'naïveté of technology companies, futurists, the general public, and policy-makers'¹⁵⁸ leads to an underestimation of how much damage can be done to Western democracies by unscrupulous adversaries with sophisticated information operations campaigns.

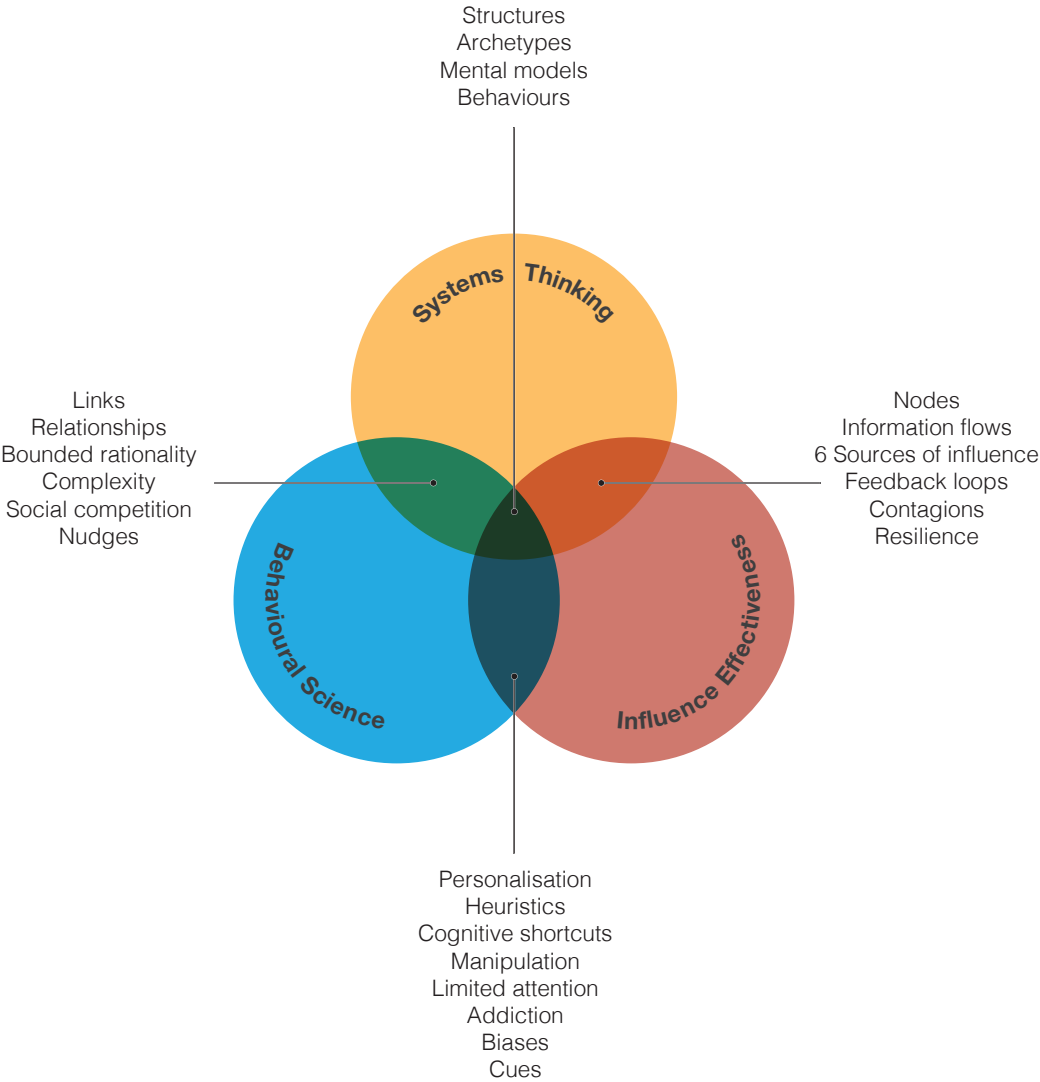
Other weaknesses and inefficiencies relating specifically to military information operations strategies include the construction of 'imagined audiences' in the absence of access to the civilian population. Messaging and information operations also fail to be effective due to illiteracy and innumeracy in target audiences, the inclusion of insulting colonialist rhetoric, and the use of stereotyped cultural assumptions and of inappropriate imagery and language.¹⁵⁹ Additionally, PSYOPs specifically has a poor public reputation, often associated with 'black arts' of mind control, and often fails in its effectiveness due to political interference or risk aversion of senior leadership.¹⁶⁰ Further, PSYOPs planning is often compartmentalised from kinetic operational and intelligence planning, with the measures of effectiveness development and analysis often left to the public affairs cell to determine in isolation.¹⁶¹

However, the obstacles to effective influencing by Western nations, such as the openness of democracies and the globalised internet, also provide an opportunity to be exploited to achieve an advantage in the iWar. The conduct and countering of information operations is no longer the purview of the military or even the government; there is now a requirement to engage civilian media and tech companies in the iWar. One of the most successful strategies for countering hostile influence, recommended by a number of researchers, is the education of citizenry to apply critical thinking to online information and media reports.¹⁶² This enables people to identify disinformation and empowers communities to dynamically counter electronic enemies without political or military restraints, as demonstrated in Lithuania.¹⁶³ Disinformation poisons public debate and threatens democracy. The Canadian SIS¹⁶⁴ contends that raised public awareness and online literacy skills are needed to distinguish the truth, counter adversary narratives and deception tactics, and halt the viral spread of disinformation.

So while the challenges from hostile influence activities have reached a new level of complexity in the contemporary hyper-connected iWar battlespace, Western nations must view this complexity as an opportunity to overcome their limitations and exploit the vast online populace as a resource in

countering their enemies. A key step in this process is understanding the three research disciplines described in this paper, which are looking into how influence activities impact on friendly and adversary system behaviours, as well as the behavioural theories contributing to the effectiveness of influence activities. Figure 3 demonstrates the important overlaps in theory between the three research disciplines as they relate to influencing effectiveness and leveraging behavioural change in a system.

Figure 3: Overlapping theory between the three research disciplines



Case Studies—a System Comparison

*The supreme art of war is to subdue the enemy without fighting.
Know your enemy and know yourself and you can fight a hundred
battles without disaster.*¹⁶⁵

Two contrasting systems were used as case studies to research influence effectiveness in the iWar. The two specific case studies are the successful influencing system of the terror organisation ISIS, contrasted with the unsuccessful system case of Hillary Clinton's US election campaign in 2016. Using these contrasting case systems enabled the scope of this research to be limited to analysis within a specified time period, with a single system stock of influence to be modelled. This enabled specific analysis of the narrative data relating to the two systems' feedback cycles and interconnections, rather than attempting to analyse the entire holistic organisation's historical activities and outputs. The two case studies provided important contextual conditions highly pertinent to this research for examining contemporary iWar events, and where the past behaviours contributing to system flows could not be manipulated.¹⁶⁶ Additionally, the two case systems were of comparable size and structure and had similar aims in raising their influence stocks, which enabled an appropriate qualitative comparative analysis, as opposed to modelling a large state-based adversary system, such as Russia's, or the massive internet ecosystem.

The successful case of ISIS, an adversary with a resilient closed system, contrasted strikingly with the unsuccessful case of Hillary Clinton's election campaign, which was part of an open Western democratic system, demonstrated some fragility and highlighted a confronting reality surrounding Western democratic weaknesses in the iWar. Both cases met the criteria of being similar systems with sufficient shared background characteristics but also having contrasting outcomes due to different system causal impacts, behavioural issues, inherent mental models, information flows, relationships and structures. There has also been a large quantity of qualitative narrative data published about both cases,

which enables a comprehensive systems analysis of their influence effectiveness. Table 7 outlines some significant systems characteristics of the two case studies, and demonstrates both their similarities and their differences.

The most effective way to develop accurate and complex systems models of the two cases was to collect, review and synthesise an extensive range of qualitative data from multiple sources, which contained the paradigms of commentators with different agendas, biases, loyalties, opinions, cultures and motivations. Analysing vast amounts of research data, from both traditional and non-traditional sources, assisted in identifying anomalies that may skew the findings, such as bad, deceitful or false data, which is unfortunately prevalent across contemporary media sources in this age of the iWar.

Table 7: Significant systems characteristics of the two case studies

Systems Characteristics	ISIS	Clinton Campaign
Purpose	Establish & hold Muslim caliphate , influence followers, control terrain & populace, hold power	Win US election , influence voters/ populace, national governance, hold power
Stocks	Influence , credibility, power, confidence	Influence , credibility, trust, good will, confidence
Subsystems Operating as part of system. May have competing purpose / undermine system's purpose	Media: own media wing (global, local, internet) Political: own shadow governance, local governments Economic: donors, local business, own shadow branch Military: Al-Qaeda elements, tactical branches, foreign fighters Religious: clerics, mosques & communities under ISIS control, Wahhabism	Media: global, national internet, own PR Political: Sanders campaign, Obama administration, intelligence community Economic: banks, businesses, donors Supporters: online groups, lobbyists, party members, volunteers
Interconnections Between system elements/nodes & subsystems	Relationships: political, personal, economic, religious, societal, membership, global Communication links: internet, social media, news media, strategy, religious messaging, travel, movements, hold over terrain & populace, e-magazine Ideological values: emotional/social contagions, homophily, biases, protect Muslim rights / way of life	Relationships: political, personal, economic, religious, societal, membership, global, feminist Communication links: internet, social media, news media, strategy, campaigning activities, travel, policies/messages, debate Democratic values: ethics, transparency, rules, laws, ideology, equality

Systems Characteristics	ISIS	Clinton Campaign
Information Flows Contributing to feedback loops	Internet / media commentary: impacts, influence, filter bubbles, echo chambers, growth, viral spread Data analytics & feedback mechanisms: social media, media consumption, engagement, shares, atmospherics Recruitment/retention: interest, discussion, numbers, strengthened interconnections Funding / resource provision: flows, support levels	Internet / media commentary: media commentary (skewed), public support (skewed), internet commentary (filter bubbles / echo chambers / trolls) Data analytics & feedback mechanisms: polls (wrong), engagement, atmospherics Voter turnout / levels of support: membership Campaign funding
Reinforcing Feedback Loops (growth)	Virtuous reinforcing cycle: more terrain / populace control = more influence/exposure, competitive, resilient system, success-to-the-successful, sense of purpose & community	Vicious reinforcing cycle: escalation, accidental adversaries, competing goals, drift to low performance, loss of control, counter-influence
Balancing Feedback Loops	Reduction of stock growth: too violent/ horrific, unpalatable violence against Muslims, Coalition counter-IO efforts, loss of appeal/ credibility/control & authority, drift to low performance	Regain/rebuild stocks: successful, proactive counter-propaganda activities, regain initiative & control of narrative, counter the conspiracies, lies, trolls, xenophobia, sexism, sense of purpose & community, build credibility
Sources	Jihadi ideologues, disenfranchised Muslim population, online fringe elements, unethical/criminal transnational franchises	Democratic ideological supporters, left-leaning American electorate, Western/global population, defenders of truth, feminists
Sinks	Loss of followers, messages ignored/ replaced, mistrust / lost credibility, lost power/control, new option / splinter group emerges	Loss of voters, supporters & followers, messages ignored/ replaced, mistrust / lost credibility, biased media

ISIS: System Analysis of Influence Effectiveness

*Fighting battles is not about territory, it's about people's attitudes and perceptions—the battlefield is in there.*¹⁶⁷

The selection of ISIS as the case system example used to understand why the group has been so effective in influencing target audiences was not only due to its unparalleled success and demonstrated adaptation, self-organisation and resilience as a highly functional social system but also to address the myopia of Western nations in crediting and learning from their adversaries and, equally, the failure to address and adapt their own systems' deficiencies to anticipate adversary actions in the iWar.¹⁶⁸

ISIS directly or indirectly affected the redistribution of power in the entire Middle East region for a time and, by virtue of having both a physical and a virtual caliphate, held far greater influence than any other terror network in history.¹⁶⁹ The ISIS legacy will live on long after the group has lost all its physical territory, because it was one of the first conflict actors to fuse warfare with the foundations of attention in the social media age.¹⁷⁰ ISIS mastered the key influencing elements of narrative, emotion, authenticity, community and inundation.¹⁷¹ This systems analysis of ISIS provides a holistic understanding of the components, structures, feedback loops and behaviours contributing to an anti-fragile, anticipatory adversary system in the iWar—one which was difficult to target, and arguably, whose 'virtual tribe' remains undefeated in the cognitive battlespace.¹⁷²

ISIS: Anti-fragile, Anticipatory System

Resilience is a measure of a system's ability to survive and persist in a variable environment, and arises from a rich structure of feedback loops working in different ways to restore a system even after a large perturbation.¹⁷³ In an anti-fragile system, elements possess characteristics such as rapid learning, adaptation, experimentation with different responses, and exploitation of accumulated knowledge to ensure successful strategies or to avoid unsuccessful ones.¹⁷⁴ ISIS promoted and exploited its anti-fragility to formulate a strategy of dynamic, anticipatory response to stressors. This is an intrinsic capability of complex systems and the ideal.¹⁷⁵ As a self-organising system,¹⁷⁶ ISIS also demonstrated the ability to evolve, using selection and replication, to reinforce success, eliminate weakness and enhance robustness. This evolutionary adaptation also shifted ISIS's intentions in response to balancing feedback, as over the years ISIS cared less about borders or territorial continuity and more about ideological and procedural continuity in its territoriality.¹⁷⁷

Understanding ISIS's system response characterisation provides insight into its hidden behaviours and structures. This exposes leverage points and archetypes that may be exploited. In order to deconstruct ISIS's complex system into its key elements, a holistic analysis of its centre of gravity (COG) and supporting critical capabilities (CCs) was an important step for bounding analysis to specifically focus on the system's influence stocks. ISIS's COG was assessed to be 'the ability to effectively influence target audiences to maintain power and control', with its critical capabilities being ideology, means, control, media and information operations (IO) capabilities, and resources (Figure 4). As the CCs are broken down further into critical requirements (CRs), which if targeted also double as critical vulnerabilities (CVs), the key elements providing the scaffold to ISIS's system model become apparent, as well as the consequences of targeting those elements and linkages.

Figure 4: ISIS influence centre of gravity analysis

COG Ability to effectively influence target audiences to maintain power & control				
CCs	Ideology	Means	Control	IO/Media
	<ul style="list-style-type: none"> • Credible/legitimate • Resonates/inspires • Authentic • Strong narrative • Wahhabism 	<ul style="list-style-type: none"> • MSM / social media • Communications • Cyber • Networks/links • Global access 	<ul style="list-style-type: none"> • Narrative • Message quality • Credibility • Security/resilience • Unified message 	<ul style="list-style-type: none"> • Multi-pronged • Multi-language • High quality • Responsive/viral • Specialised
CRs but also present as CVs	<ul style="list-style-type: none"> • Leaders • Sense of purpose • Social in-group • Community links • Relationships • Trust/loyalty • Belief in cause • Indoctrination 	<ul style="list-style-type: none"> • Access to all target audiences • Comms networks • Media channels • Social media • Publishing • 24/7 inundation • Freedom of movement 	<ul style="list-style-type: none"> • Clear narrative • Mission command • Cyber security • Physical security • Secure forums • Devolve controls • Subsystem loyalty • Power over civpop 	<ul style="list-style-type: none"> • Media wing • IO specialists • Tailored content • Military power • Global reach • Events/personalities • Linguists • Anticipatory
Results of CRs/CVs being targeted	<ul style="list-style-type: none"> • Coalition legitimacy • Coalition IO success • Disenfranchised / low morale • Loss of credibility • Loss of purpose • Loss of legitimacy • Subsystems' competing goals 	<ul style="list-style-type: none"> • Loss of access • Loss of comms • Lost freedom movt • Hardware damage • Loss of production & distribution • Cyber attacks/hacks • Denial of services • Loss of funding 	<ul style="list-style-type: none"> • Loss of leadership • Isolation • Loss security/safety • Counter-IO success • Loss of territory/caliphate / civpop • Lost trust/loyalty • Infighting • Alternative media 	<ul style="list-style-type: none"> • Loss of specialists • Faster counter-IO • Loss of content, capabilities, leaders • Loss of credibility • Isolation / cut off • Loss of quality, responsiveness & control of message
				<ul style="list-style-type: none"> • Resources • Time • Money/rewards • Travel/comms • Personnel • Logistics/support
				<ul style="list-style-type: none"> • Hardware/software • Network costs • Media personnel • Fighting forces • Funding • Military & media equipment • Security measures
				<ul style="list-style-type: none"> • Loss of funding & supporters • Loss of personnel • Excessive costs: widows/martyrs • Targeting of income sources, leaders • Loss of territory & population control

ISIS System Elements

The following key system elements were identified during the decomposition process and mapped accordingly (Figure 5).

Stock and Purpose

The stock being researched to determine system effectiveness is influence and, as a result, both case system models will be single-stock models bounded by configurations and activities related to the stock and purpose. The purpose of ISIS as a complex social system was to establish control and hold power by declaring a Muslim caliphate, influencing followers, maintaining legitimacy and credibility, and controlling the terrain, the populace and its ideological narrative.

Source

The source of ISIS influence stocks initially comprised marginalised, disempowered Sunnis, previous al-Qaeda supporters and splinter groups, anti-Western Muslim populations around the world, fundamentalist Wahhabi clerics, and Jihadi ideologues.¹⁷⁸ These source supporters were open to ISIS's narrative and ideology, actively contributed to the viral spread of its messages and media content and, in many cases, pledged deep allegiance to the organisation.¹⁷⁹ ISIS's influence stemmed from the shared Sunni culture shrouding it, as it was embedded within a large population with common cultural orientations, characteristics and grievances, and was also able to exploit secure social media forums as echo chambers to personalise its messaging and reinforce its extreme ideology.¹⁸⁰

As ISIS's power, control and reach expanded physically, territorially and online, so did its influence, which in turn expanded its source base to include fringe elements, disenfranchised youth in non-Muslim societies, and Islamic terrorists emboldened by the Arab Spring. Combining its skilled media propaganda efforts with successful military actions, an international scare campaign comprising filmed atrocities and the seizing of territory to declare a physical caliphate provided overwhelming media and political attention and further reinforced its source. In turn, this growth strengthened the group's subsystems, through interlinked reinforcing feedback loops, to rapidly increase influence stocks. ISIS's ideology and tactics were designed to take advantage of Sunni grievances as a source of funding, manpower and legitimacy and enabled the group to follow a territorially expansive agenda.¹⁸¹

Sink

Despite the virtuous cycle of reinforcing feedback exponentially growing ISIS's influence, balancing feedback loops existed to provide checks on unlimited growth and contribute to the sink. The balancing feedback's resultant sinks on influence included a scale of disengagement by target audiences starting from disinterest and a loss of trust and rising up to open hostility, disgust and anger. ISIS's influence sinks resulted from losses of credibility, legitimacy and appeal, which arose from a loss of power and control over target audiences; atrocities committed against Muslims; its extreme application of Wahhabism; physical losses of resources; deaths of charismatic leaders, fighters and media specialists; and, significantly, caliphate territorial losses. Additionally, because ISIS relied heavily on ideological support from disenfranchised Sunnis at the local level to recruit, fund and organise its quasi-state formation, over time a fundamental slowdown in this virtuous cycle occurred because ISIS encountered non-Sunni towns, whose populations staunchly resisted it.¹⁸²

Internal Subsystems

Terrorist groups require secrecy to survive, which places constraints on how the group communicates and conducts operations. Due to having to balance efficiency with a need for security, many terrorist groups adopt a decentralised 'hub-and-spoke' or 'market' hierarchical structure, where the nodes have individual autonomy to plan and carry out attacks, which makes them difficult to target.¹⁸³ However, ISIS was much more than a terrorist organisation; it was a terrorist state comprising almost all required governing elements and a bureaucratic hierarchy.¹⁸⁴ By employing a centrally commanded and controlled bureaucratic hierarchy over its subsystems, ISIS allowed its subsystems to regulate and maintain themselves while still serving the needs of the larger system. This resulted in a stable, resilient and efficient structure¹⁸⁵ which would not have been possible in a decentralised hierarchy. The subsystems of interest to this system model have been classified into five broad categories—political/leadership, military, media, religious, and economic—to understand their interlinking relationships and the feedback loops generated by each.

Subsystem: Political Wing / Leadership

Having charismatic, authoritative, likeable leaders, some of whom were minor celebrities, exploited the 'appeal to authority' bias, as did the authority of the scriptures that the religious subsystem effectively integrated into

ISIS's online content. The aura projected by the leadership also engendered loyalty, enhanced an image of authenticity, and maintained the sense of community and social contagions that ISIS promoted. Having a centralised command structure and strong interconnected relationships with the four other subsystems ensured ISIS's leadership could effectively maintain their image, control the narrative, project power, and exercise the same political authority as other state governments. ISIS's organisational leadership was not viewed as elitist, unlike the aloof leaders of al-Qaeda, and it used this perception in engaging with, influencing and appealing to disaffected Muslim audiences both locally and globally. ISIS created competing forms of authority, governance and community services, which were further enabled by its bureaucratic hierarchical structure.

Subsystem: Military

ISIS's influence stocks were significantly increased by battlefield successes, seizure of caliphate territory, and frontline actions conducted by its military fighters as 'propaganda by deed', all of which were captured in high-quality, full-motion video, manipulated, and disseminated globally.¹⁸⁶ ISIS's military wing was presented as a highly capable, adaptable and ruthless military force¹⁸⁷ to leverage funding, increase recruitment, inspire support, and evoke reactions. Again, the other four subsystems' interlinking relationships with the military subsystem provided considerable strength to the resilience of the whole system and its reinforcing feedback loops. For example, the media subsystem provided information operations content as a force-multiplying PSYOPS tool to enhance its scare campaign and thereby frighten Iraqi troops into fleeing their defensive positions around Mosul, while simultaneously strengthening the legitimacy of ISIS's rhetoric and enhancing recruitment through the conduct of actual deeds. With the military, media and leadership subsystems working in concert to reinforce its influence stock, ISIS was able to portray the strategic and historical context behind its operations, weave those narratives into a theme of struggle between good and evil, and out-communicate its enemies in the iWar with its own version of the 'truth', backed by deeds, across multiple channels.¹⁸⁸

Subsystem: Media

ISIS's media subsystem, comprising all its critical capabilities, requirements, architecture, specialists, resources and tactics, was the dominant subsystem contributing to the whole system's influence stock and virtuous cycle of reinforcing feedback. Accordingly, the media element had the

strongest relationships and interconnections with all other system elements. The other subsystems were configured to align with the media campaign to protect the centre of gravity, control the narrative, and maintain the virtual caliphate—anything else was secondary to the system's purpose. There were three levels to ISIS's media architecture: propaganda and content designed for transnational audiences, high-profile announcements targeting regional audiences; and communiqués focused on localised issues and events.¹⁸⁹ This three-tiered approach contributed to ISIS's media proficiency, exposure, reach and legitimacy, and reflected the strategic, operational and tactical level hierarchical delineation of the whole system. ISIS's media subsystem excelled at psychologically exploiting the online activities of its virtual tribe to ensure rapid, high-volume dissemination of its appealing, multilingual content and the domination of its targeted messaging in a multi-pronged approach, to create a sense of community, manipulate heuristics, and effectively cement its branding as a social movement.¹⁹⁰

Subsystem: Religious

ISIS's fundamentalist Wahhabi ideology¹⁹¹ was a critical capability underpinning the centre of gravity, providing legitimacy to the narrative and credibility to its media and leadership subsystems. Having authentic religious clerics who provided simple, resonant and appealing Wahhabi edicts and justifications for ISIS's actions strengthened the reinforcing feedback loops and shaped the whole system's psychology. The religious subsystem also benefited from the threat provided by the military subsystem and the scare campaign of the media subsystem in ensuring compliancy. Working in concert with the other subsystems and exploiting psychological and behavioural economics theories (Table 4), such as tailoring messages, appeal to authority biases, indoctrination practices, and social and emotional contagions, ensured continued inflows of influence. This cognitive exploitation also provided a unified purpose and high resilience, recruitment and retention rates within the system. ISIS leaders were clear about their guiding principles and almost exclusive commitment to the Wahhabi movement, which rejects modern influences and favours a fundamentalist reinterpretation of Islam. ISIS's version of Wahhabism was inspired, funded and imported from Saudi Arabia to exploit state failings in northern Iraq and eastern Syria.¹⁹²

Subsystem: Economic

Underpinning all the subsystems, and ISIS's system as a whole, was the economic subsystem providing the resources and incentives to enable all influencing activities, recruiting, shadow governance, battlefield success, and associated reinforcing feedback flows. The economic subsystem also relied on the activities of the other subsystems to reinforce its own virtuous cycle of fundraising and spending to secure further influence—for instance, payments to widows and to martyrs' families, providing services and infrastructure to win hearts and minds of the local populace, or purchasing communications and media platforms and services to dominate the information domain. A major source in establishing ISIS's economic subsystem was the inflow of surreptitious Saudi funds, material support, and foreign fighters to support the spread of Islamic extremism in the Wahhabi tradition.¹⁹³ ISIS's economic wing also benefited from other regional revenue sources: the theft of oil, antiques and agricultural products; and heavy taxation on populations in held territory.

External Systems

Local Target Audiences

Initially, local civilian populations living in seized caliphate territory, marginalised Sunnis, and former Ba'athists across Syria and Iraq were targeted to expand ISIS's source support and recruitment. As ISIS's power and influence grew with its territorial expansion, so too did the size and diversity of the local civilian population it sought to control. However, the further ISIS's caliphate expanded, the more its influence inflows slowed, as regional-level balancing feedback was introduced from non-Sunni populations, moderate Islam, and local political, clerical and military counter-influence.¹⁹⁴

Global Target Audience

Through its virtual caliphate, ISIS's global target audience initially comprised foreign terrorists, ideologues and disenfranchised Muslims around the world, as listed under the 'Source' element. However, due to its extremely effective multi-pronged, multi-platform and multilingual influencing activities, ISIS rapidly gained a massive global audience that experienced viral self-perpetuating growth, predominantly through 'super-spreaders' on social media, in a reinforcing feedback loop that was never really counterbalanced effectively by other external systems' influence in the iWar.¹⁹⁵ Rather, ISIS's influence over global audiences was mitigated by the direct targeting of

personnel, communications systems, resources and commercial networks.

Global Mainstream Media

As an external system, global media could either be exploited to provide legitimacy to ISIS's content and reinforce its influence stocks, or provide balancing feedback through transparent reporting mechanisms to expose ISIS's hypocrisy and undermine its credibility. However, traditional mainstream media are hamstrung by tone, fairness, allegiance to facts, and context over conclusions. This resulted in mainstream media often being out-published and outmanoeuvred by ISIS's media subsystem, which used tactics such as constant inundation in multiple languages, creation of salacious, addictive clickbait, and the rapid production of high-quality, credible content.

Coalition Governments/Militaries

Like the global media, Coalition counter-influencing actions could backfire in the iWar and actually reinforce ISIS's influence stocks, particularly in the event of kinetic targeting causing civilian casualties (CivCas) and damaging local infrastructure, or by overtly favouring Shia concerns. ISIS recognised this threat to Coalition legitimacy and conducted activities to bait Western forces, increase civilian casualty numbers, and exacerbate damage caused by Coalition targeting.¹⁹⁶ Also, while counter-information operations activities could succeed in undermining ISIS's influence and credibility with target audiences, often Coalition efforts were reactive, delayed and hampered by ethics, operational security, democratic values, and rules of engagement. Coalition governments and their militaries also played a role in strengthening the systems of regional governments and local militaries fighting ISIS within their borders to create domestic-level balancing feedback.

Regional Governments—Iraq/Syria

Like the Coalition, state governments and their military forces faced the conundrum that they could also strengthen ISIS's influence, either passively by creating a vacuum of governance, investment and services for minority Sunni communities, or actively through authoritarianist actions and committing atrocities against civilian populations, which undermined their own legitimacy and narrative. However, if states were able to win the trust and support of the population through ethical deeds, such as the provision of aid by the military, avoiding civilian casualties, nation-building activities, and transparent, honest community engagement, this dislocated ISIS's influence and created strong balancing feedback loops, as evidenced in Marawi.¹⁹⁷

The most important factor contributing to ISIS's resistance was its ideological roots and the social/political context that created them, and as long as those issues remained unaddressed, ISIS would not be politically or ideologically defeated.¹⁹⁸ Therefore, while regional and international actors were mainly focused on the military battle, there was an urgent need to address the aftermath of ISIS, as well as the structural failures and societal grievances that allowed ISIS's rise in the first place.

Competing Systems

Other external systems relating to ISIS's system influence model initially supported ISIS but later developed 'competing goals' or become 'accidental adversaries' (resulting in balancing feedback); they included al-Qaeda, non-Wahhabi Muslim clerics, splinter groups, and elements of the online community. However, in terms of competitive exclusion, ISIS largely won against al-Qaeda and other competitors in the 'success to the successful' archetype, which saw the losers gradually forced out.¹⁹⁹ Arguably, Saudi Arabia also became an accidental adversary when its duplicity in supporting ISIS while cooperating with the Coalition was exposed.²⁰⁰ However, a more in-depth analysis of Saudi Arabia's opaque, secretive nation-state system was beyond the scope of this model.

Linkages/Relationships

In Figure 5, the interlinked relationships in the baseline ISIS system model are depicted by arrows, coloured red if they contribute to a reinforcing feedback loop or blue for balancing feedback. The specific feedback loops will be covered in more detail in the following sections; however, it is important to detail some of the fundamental relationships. These relationships can be broadly split into two categories: ideological links and communications links.

Ideology and Narrative

In building up its complex adaptive system of influence, ISIS recognised that the relationships and linkages between its disparate elements, subsystems and supporters must be strong, resilient, and unified in purpose under an authentic, resonant ideology. In this it was assisted by Sunni Islam generally, which is described as a triumphalist faith 'programmed for victory',²⁰¹ and Wahhabism specifically, which is extremist, fundamentalist and exclusionist.²⁰² ISIS's ubiquitous narrative of 'Islam is under attack' was a driving force in uniting and motivating Muslim followers²⁰³ and was reinforced any time the Coalition carried out kinetic targeting. This narrative also

created a sense of purpose around the cause and a sense of community around the shared struggle. ISIS's ideology and associated narrative were critical capabilities (Figure 4) for system success, which were synchronised with deeds for maximum effectiveness and designed to provide supporters with a competitive system of meaning and to strengthen the lens fundamentally shaping audience perceptions.²⁰⁴

ISIS identified the need to fill not only a politico-military void but also a vacuum of values and meaning, which it addressed by influencing audiences and recruits towards its vision,²⁰⁵ to varying degrees of success. ISIS's narrative and ideological messaging was particularly potent because it fused pragmatic and perceptual factors in its communiqués to resonate with diverse global and local audiences.²⁰⁶ ISIS's messaging was simple, resonated, always aligned with its strategic narrative, and exploited the rapid, evocative power of imagery suited to the modern communications environment.²⁰⁷ It also employed rational-choice and identity-choice appeals, which further strengthened 'in-group' bonds. ISIS's media subsystem disseminated messages designed to build an affinity within its system and subsystems through appeals to a shared identity and an image of the group as champion and protector, while framing its enemies as evil 'others'.²⁰⁸

Communications Links

ISIS's shrewd exploitation of the information environment via multi-pronged communications links, to disseminate its narrative and 'propaganda of the deed', strengthened its system interconnections by unambiguously reinforcing perceptions and polarising support of friends and foes alike, while capturing global media attention.²⁰⁹ ISIS's influence system comprised an extensive network of physical, virtual, human, machine and multi-media communications links—producing content, disseminating messages, providing feedback, and reinforcing growth through influence. While many communications links within the ISIS system model may be categorised as 'hard system' linkages such as hardware, software, internet connections, broadcasting networks, applications and services, it is the 'soft system' definition of communications links—for example, relationships and human interconnections—that is of most importance to ISIS's influence.

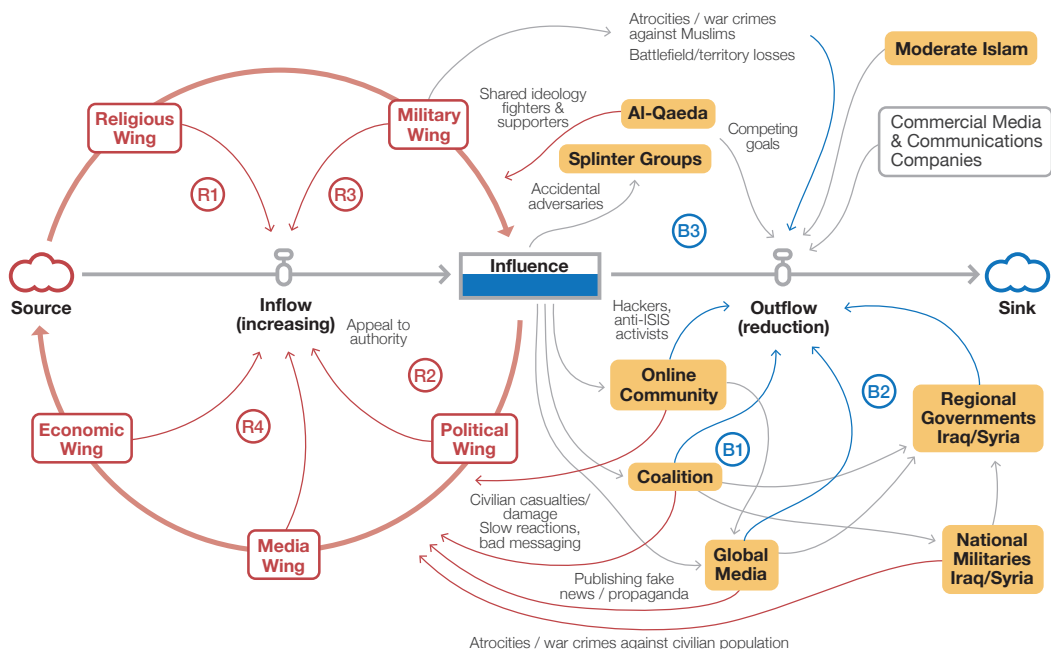
Communications links, combined with successful propaganda techniques and associated psychological theories, were exploited by ISIS to create an expansive interconnected virtual tribe. This community communicated through ideological echo chambers, content-manipulated filter bubbles,

and encrypted, personalised chat rooms to create deeply bonded, loyal relationships, and contributed to the rapid virtuous reinforcing cycle of growth in influence and power. The power of these communications links enabled receptive individuals to seek out one another and undergo processes of 'social bonding' as they exchanged grievances and exposed one another to similar ideological material.²¹⁰ The 'virtual caliphate' took this further with exchanges via communication links creating a semblance of geographical space, transcending traditional boundaries and enabling social bonding and a unity of identity, which strengthened the virtual tribe, motivated members and provided access to leaders.²¹¹ As a result of its vast and diverse transnational terror network and communication links, ISIS became the strongest, best resourced and most ideologically potent 'terrorist quasi-state' of recent times.²¹²

The other 'soft system' communications links central to ISIS's influence were the engagement and bonds formed and reinforced from its multi-axis, multi-platform, multi-level, multilingual media strategy. Information operations were a central pillar of ISIS's campaign, choreographed to sow terror, disunion and defection among its enemies, create shock value and gain the attention of global audiences,²¹³ while conversely strengthening its own internal relationships, support, loyalty and branding. ISIS understood the power of cyberspace for projecting power, weaponising viral content, and distributing messages by a global network of 'super-spreaders' beyond any one state's control.²¹⁴

Using hard and soft system communications links, ISIS was the first terrorist group to hold both physical and digital territory. It effectively controlled the narrative and perceptions of reality—that is, as long as most observers believed that ISIS was winning, it was winning—and its influence stocks continually increased as a result.²¹⁵ ISIS's communication and ideological links connected all the decomposed system elements depicted in Figure 5, and contributed to the reinforcing and balancing feedback loops created by the resultant interconnected flows between internal and external subsystems and elements.

Figure 5: ISIS baseline system model—key elements and concepts



Key (R) Reinforcing loop (B) Balancing loop → Growth flow in reinforcing loop → Corrective flow in balancing loop — Stock=Influence
 → Interconnection between subsystems → Flow (inflow or outflow) Internal subsystem External system Sources or sinks

Source

- Marginalised, disempowered Sunnis
- Al-Qaeda base supporters
- Anti-Western Muslim population
- Jihadi ideologues / Wahhabism
- Fringe elements, disenfranchised youth
- Arab Spring
- Successful military action
- Established caliphate

R1 Sense of community

R2 Sense of purpose

R3 Success-to-the-Successful

R4 Exposure

Religious Wing

- Ideology / strong narrative
- Jihad/caliphate/sacrifice
- Indoctrination/coercion
- Rules/laws
- Justification of actions
- Provide cause/purpose
- Difficult to counter

Military Wing

- Battlefield success
- Powerful media/imagery/content
- Jihadi/hero image, virile, strong
- Propaganda by deed, shock factor
- Generate fear, respect, awe
- Recruitment/martyrs
- Strong team bonds / loyalty

Economic Wing

- Hearts & minds—services, infrastructure
- Shadow governance—taxation, fill vacuum

- Fundraising/recruitment
- Resources
- Rewards
- Fund capabilities
- Production/dissemination

Media Wing

- Multi-platform, multi-language
- High quality, evocative, exploit heuristics
- In-group—tailored, targeted
- Sense of belonging & purpose
- Specialised, dynamic, anticipatory
- Diverse networks, means, inundation
- Social/emotional contagion
- 'Rock star' personalities

Political Wing

- Charismatic leadership
- Strong narrative
- Unified messaging
- Mission command & tight control
- Shadow governance
- Credible/authentic
- Structured organisation
- Non-linear, decentralised hierarchy

Influence

Target Audiences

- Global
- Local

Sink

- Audience disengagement
- Loss of credibility, power, control
- Hostility, disgust, mistrust
- Disinterest, loss of appeal

- Alternative/replacement options
- Loss of territory/caliphate

B1 Counter influence

B2 Loss of control

B3 Drift to low performance

Moderate Islam

- Counter ISIS's justifications / undermine legitimacy

Commercial Media & Communications Companies

- Provide alternative media sources, technology, information & access to banned content. Undermine ISIS control

Online Community

- Provide content, sources, support

Coalition

- Kinetic Targeting
- Non-Kinetic Targeting/Cyber
- IO / Counter Influence
- Political/Media engagement
- CIMIC / nation building

Regional Governments Iraq/Syria

- Address gaps in services, governance, security, safety, economy & infrastructure (creating source)
- Mil forces act fairly, humanely & legally
- Develop strong narrative/messaging
- Hearts & minds
- Honesty/transparency

Reinforcing Feedback Loops

As demonstrated through the decomposition process and modelling of the key elements (Figure 5), and despite being bounded by a single stock and specific time period, ISIS’s system is extremely complex, with multiple components, interconnections and behaviours contributing to the seemingly infinite array of configurations that could be modelled. Table 8 summarises the four reinforcing feedback loops discussed in this section.

Table 8: ISIS reinforcing feedback loops

Reinforcing Feedback Loop	Key	Description
Sense of Community	R1	Influence stocks are reinforced through the increased participation and support of members identifying with in-group / ‘us vs them’ narratives, social contagions, unified tribal dynamics, and heuristic biases manipulated by ISIS.
Sense of Purpose	R2	Influence over target audiences grows, motivation of members is reinforced, and ideological narratives spread when there is belief in a justified cause, the purpose is perceived as authentic/legitimate, and pride is derived from participation.
Success-to-the-Successful	R3	Influence grows with power and authority resulting from winning actions, which in turn provides reinforcing feedback and momentum for the adaptive, anticipatory, escalation of continued success in a virtuous cycle.
Exposure	R4	Influence stocks are reinforced through the effective exploitation of IO tactics, communications links, and behavioural economics as an ‘information jihad’—designed to virally inundate and control audience perceptions to build legitimacy, reinforce the narrative, and dominate the IE.

Sense of Community (R1)

The first reinforcing feedback loop (R1) provides influence inflows generated by a sense of community, achieved through increased participation and support of members and audiences. R1’s aspirational tribalism is derived from leveraging identity-choice appeals, and exploiting social contagions, confirmation biases, homophily and similarity heuristics (Table 4). In an increasingly globalised world, resulting homogenised

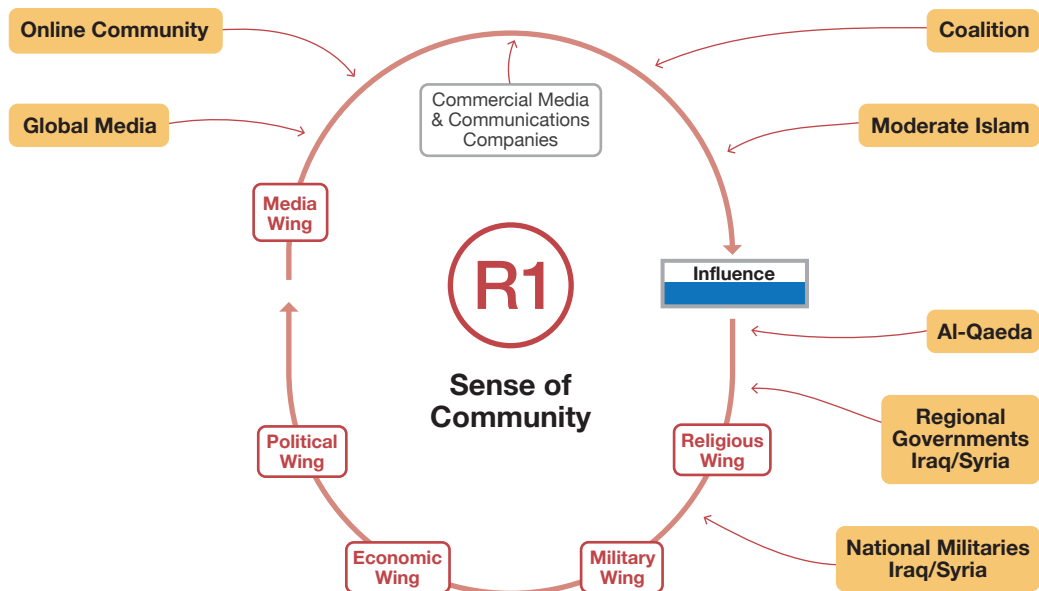
identities in cyberspace now threaten and dilute cultural distinctiveness, which causes feelings of marginalisation or discrimination within minority communities.²¹⁶ This phenomenon leads to vulnerable segments of society, particularly disenfranchised Sunnis, seeking a sense of belonging and solidarity. When combined with ISIS propaganda tailored to trigger feelings of disassociation and alienation, it increased the group's attractiveness, influence, and ability to radicalise.

ISIS combined numerous soft power tactics focused on charity, unity, and winning hearts and minds²¹⁷ with an 'us versus them' narrative of the 'benevolent in-group' confronting the 'crisis-generating others' which resonated particularly strongly in the socio-historical context of intergroup conflict in Iraq and Syria.²¹⁸ ISIS offered a common identity and unifying ideology that represented shared interests, values and goals among its members. ISIS also dominated local information environments, which were unsophisticated and barely penetrated by native media, let alone by external broadcasters.²¹⁹ When combined with resonant frames of familiar language and culture, and an authenticity achieved by relatable online videos, this contributed to the sustainability of this reinforcing feedback loop.²²⁰

In addition to messaging around perceptual factors such as in-group identity-choice appeals and crisis-solution constructs designed to shape audience understanding of the conflict, ISIS simultaneously appealed to pragmatic factors such as the security, stability and livelihood of its members, using rational-choice appeals, and framed itself as the champion of Sunni Muslims, fighting their shared enemies.²²¹

This two-pronged approach was not limited to local or regional caliphate audiences but extended globally to its online community. Cyberspace enabled extremists to band together, allowed their views to reinfiltrate mainstream discourse, and empowered them to 'be themselves'.²²² This virtual tribe and its shared hatred of perceived enemies, propagated by ISIS, provided companionship and comradery, embraced social outcasts and reinforced confirmation biases through echo chambers and filter bubbles, in turn increasing recruitment, support, influential reach and motivating violence. Figure 6 depicts ISIS's 'sense of community' reinforcing feedback loop (R1). The causes are listed for all internal and external subsystems and elements contributing to ISIS's in-group narrative and, therefore, the inflows of influence via R1.

Figure 6: ISIS reinforcing feedback loop (R1)—sense of community



Key

(R) Reinforcing loop

→ Reinforcing loop flow

→ Contributing reinforcing feedback from external systems/elements

Stock=Influence

Internal subsystem

External system

Media Wing

- Effective, multi-pronged IO campaign exploiting biases, heuristics & contagions to enhance feelings of disassociation & alienation within the Sunni population & the virtual tribe
- Reinforced the sense of community provided by ISIS—gaining loyalty, support, influence & control

Political Wing

- Charismatic, supportive leadership & governance
- Focus on community building / local Sunni issues
- Champions of marginalised Sunnis
- Provision of authority, stability, safety
- Engender loyalty via soft power initiatives

Economic Wing

- Provision of soft power initiatives
- Resources enabling other subsystems
- Community building
- Services/infrastructure

Military Wing

- Camaraderie / team environment
- Social/emotional/rational appeal
- Local units / commanders—familiar area & people, protecting own family/assets, loyalty
- Peer pressure / family expectations
- Anti-govt, anti-Coalition stance—'us vs them'

Religious Wing

- Leverage existing ideological sources
- Exacerbate Sunni–Shia division
- Provide rules, laws, shared ideology & culture to bind communities, create stability & reassurance
- Coercion / exploit social-identity pressures
- Wahhabism indoctrination, no alternative

Influence

Target Audiences

- Global
- Regional/Local

Global Media

- Globalised media creating homogenised identities
- Threatens & dilutes cultural distinctiveness
- Causes feelings of marginalisation & discrimination for minorities
- Enables success of ISIS propaganda

Online Community

- Reinforced virtual tribe
- Provision of global sources

Commercial Media & Communications Companies

- Enabled ISIS iWar campaign, global reach & creation of the virtual tribe

Coalition

- Targeting reinforces feeling of Sunni exclusion/isolation
- Western values, no shared culture/interests
- Lack of effective soft power initiatives
- Poor IO messaging / out-group

Moderate Islam

- Complacency regarding spread of Wahhabism
- Regional complicity in marginalising Sunnis
- Weak narrative, lack of unity & links

Al-Qaeda

- Shared ideology, culture & supporters
- Existing sense of community
- Provision of source members

Regional Governments Iraq/Syria

- Shia govt alienation of civilian population
- Cause of Sunni resentment/isolation
- No Sunni community services/support
- No soft power initiatives
- Lack national identity/pride/narrative
- Socio-historical context
- Relationship with Western Coalition nations

National Militaries Iraq/Syria

- Atrocities / war crimes against civilian population
- Damages to local infrastructure
- Lack CiMIC capabilities
- Targeting based on religious profiling
- Outsiders / Shia troops deployed into Sunni communities
- Inability to protect/secure communities
- Cooperation with Western Coalition nations
- Links with Iran & Shia militia

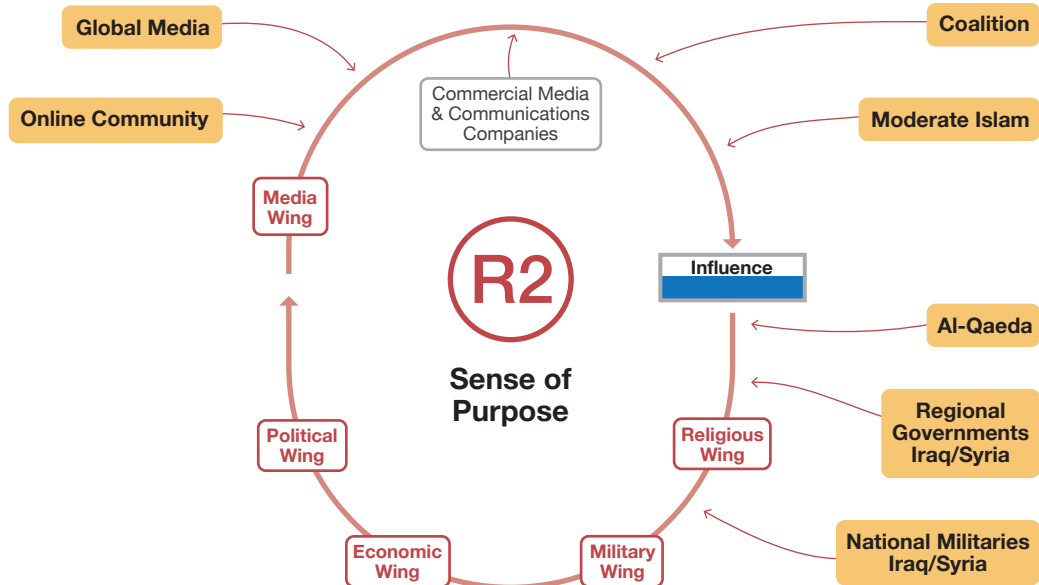
Sense of Purpose / Belief in Cause (R2)

The second reinforcing feedback loop (R2) contributes to influence stocks from the 'sense of purpose' and 'belief in a justified cause' feedback, as garnered by ISIS, which strengthens drive, passion and motivation, persuades target audiences of its legitimacy, and spreads its ideological narrative through the feeling of pride it invokes. This sense of purpose, nurtured by deeds fused with an effective information operations campaign that mastered the key elements of narrative, emotion, authenticity, community and inundation (R4), would ensure ISIS's legacy and influence would live on long after the group had lost all physical territory.²²³

ISIS provided a competitive system of meaning and purpose by targeting audiences with emotive imagery, powerful symbolism, a strong narrative, and appeals to both pragmatic and perceptual factors. This legitimised its actions and resonated with a broad spectrum of supporters—especially marginalised populations faced with poor living conditions, oppression, unemployment and instability.²²⁴ The engendered belief in the cause contributing to this reinforcing feedback was enabled by ISIS's mastery of modern technologies such as open social media platforms and closed messaging applications. ISIS radicalised individuals and created an impenetrable virtual tribe with a self-organising resilience derived from a united purpose and unwavering belief system.²²⁵

The simultaneous appeals to pragmatic and perceptual factors apply for both the R1 and R2 feedback loops in ISIS's system of influence. Ingram²²⁶ explains that this approach created mutually reinforcing narrative cycles whereby the veracity of ISIS's system of meaning was evidenced in the efficacy of its politico-military apparatus (and vice versa), as demonstrated by the strong interlinking relationships between its internal subsystems (Figure 5). Ingram²²⁷ adds that this fusion of factors (aligning rational and identity-choice decision-making) provides understanding as to why ISIS's messaging rapidly radicalised its supporters. The more that rational-choice decisions were processed from the perspective of ISIS's system of meaning, the greater the potential for its messages to resonate, influence, and act as a driver of mobilisation,²²⁸ thereby also contributing to the R3 'success to the successful' reinforcing feedback loop. Figure 7 depicts ISIS's 'sense of purpose' reinforcing feedback loop (R2) and the causes of contributing inflows for key internal and external subsystems.

Figure 7: ISIS reinforcing feedback loop (R2)—sense of purpose



Key

(R) Reinforcing loop

Stock=Influence

Reinforcing loop flow

Internal subsystem

Contributing reinforcing feedback from external systems/elements

External system

Media Wing

- Powerful media, emotive imagery, symbolic content
- Reinforced 'propaganda by deed' by fusing battlefield imagery with effective IO messaging
- Provided legitimacy & authenticity to other subsystem activities
- Appeals to pragmatic & perceptual factors, exploits heuristics
- Exploits social/emotional contagions
- Exploits communications links, social media & global reach

Political Wing

- Garnered broad spectrum of support to the cause
- Enabled competitive system of meaning
- Empowers supporters with purpose & pride
- Authentic, charismatic, inspiring leadership

Economic Wing

- Good pay & conditions empowered members in assuming a 'family provider' role
- Widow & family payments encouraged fighters to participate in the cause
- Funding boosted by ideology/purpose/pride

Military Wing

- Justified actions inspired recruitment, retention & martyrs
- Battlefield success raised morale, passions, motivation
- Conducted propaganda by deed, put words into action
- Jihadi/hero image—virile, strong, symbolic, purposeful
- Serving a legitimate cause/ideology
- Paradigm of protecting own community

Religious Wing

- Provided resonant ideology & purpose
- Developed competitive system of meaning
- Empowered supporters with purpose & pride
- Tailored messaging to engage target audiences

Influence

- Target Audiences
- Global
- Regional/Local

Online Community

- Super-spreaders
- Rapid viral spread of content
- Filter bubbles & echo chambers reinforced ideology/cause
- Enabled spread of contagions
- Connected the isolated & outcast
- Glorified ISIS

Global Media

- Biased, unresearched reporting
- Assisted in spread of iWar messages
- Reported ISIS stories & content as traditional news

Commercial Media & Communications Companies

- Provided ungoverned, unmonitored online spaces
- Provided comms links for exploitation by ISIS media
- Provided security & encryption for tailored comms

Coalition

- Underestimated power of ISIS' influence/ideology
- Underestimated ISIS's iWar tactics & global reach

- Reactive, Westernised responses to ISIS' IO campaign
- Historical-socio context of previous Middle East conflicts

Moderate Islam

- Disregarded rise of Wahhabism & Saudi influence
- Non-unified, weak, reactive messaging
- Ineffective in countering ISIS's competitive ideology & iWar tactics

Al-Qaeda

- Original Wahhabi messaging, clerics & scholars
- Inspired source supporters with ideology
- Defined 'propaganda by deed' with ultimate terrorist act
- First to use videos/imagery to spread message, inspire support

Regional Governments Iraq/Syria

- Underestimated levels of Sunni disenchantment & ISIS's influence
- Contributed to 'source' of marginalised Sunnis
- Lack of nationalist message of unity
- Couldn't compete with ISIS's shadow governance (pragmatic) or competitive system of meaning (perceptual)

National Militaries Iraq/Syria

- Violence committed against Sunni communities galvanised belief in ISIS's cause
- A lack of security & soft power initiatives provided for minority communities
- Viewed as cowardly & ineffective after ISIS's scare campaign & subsequently fleeing defensive positions
- Offered no viable alternative to joining ISIS (pragmatic factors)

Success to the Successful (R3)

In the R3 'success to the successful' reinforcing feedback loop, ISIS's influence grew with the power and authority resulting from winning actions, which in turn provided reinforcing feedback and momentum for the adaptive, anticipatory escalation of continued success in a virtuous cycle. Essentially, the more terrain and populace ISIS controlled under the caliphate, the more influence it had. This cycle enabled it to build its brand, which attracted more support, yielded demonstrable results, and further strengthened the brand, its resilience and its associated influence. Success-to-the-successful reinforcing feedback was built not on individual factors but rather on how all the elements interacted to reinforce one another over time.²²⁹

The feedback provided by this virtuous growth cycle enhanced ISIS's system resilience by becoming adaptive and then anticipatory. ISIS's improbable momentum continued: out-communicating adversaries in the iWar, recruiting over 30,000 fighters from nearly a hundred countries, and exporting its message internationally and in the mainstream.²³⁰ Singer and Brooking²³¹ describe ISIS as being 'like a demonic McDonalds' in rapidly opening new franchises and spreading a global contagion of fear, which in turn acted as a force multiplier strengthening its internal subsystems. The anticipatory characteristic of ISIS's system resulting from this R3 loop also produced a higher level of autonomy, leading to better representation and higher levels of influence. This provided ISIS the means to compete even more effectively at the strategic level and continue to dominate the iWar.²³²

Further strengthening ISIS's R3 virtuous cycle were the actions and inactions of external systems, often unwittingly, as depicted in Figure 8. ISIS was able to exploit the Coalition's quest for legitimacy and attempts to minimise collateral damage and civilian casualties, by manipulating the narrative to its own version of the truth, creating emotional contagions, and baiting its enemies into reacting with misguided information operations responses.²³³ ISIS positioned itself as an ethical actor, leveraged cultural fissures and entrenched grievances, exploited popular resistance, and accused security forces of hypocrisy and use of indiscriminate force—which was reinforced with fake content, staged events, and examples of US military and security forces human rights abuses such as Abu Ghraib and Guantanamo.²³⁴ ISIS also exploited the vacuum of governance, services, investment and infrastructure in Sunni communities caused by systemic Iraqi Government

failures, as well as the disruption of social stability and related adverse socio-economic conditions resulting from state military force.²³⁵ This shadow governance provided system learning which resulted in ISIS adapting from coercion-centric control to portraying its governance apparatus as multidimensional, sophisticated, bureaucratised and well resourced, thereby further reinforcing its success and associated influence.²³⁶

While there were balancing feedback loops in place to prevent the exponential escalation (and subsequent implosion) of the R3 reinforcing feedback loop, they initially comprised weaker, disparate efforts, conducted by external systems in isolation, with competing priorities.²³⁷ The next section details how these balancing feedback loops were continually improved and how those systems evolved to eventually slow ISIS's R3 reinforcing feedback and contribute to its influence sinks. Figure 8 depicts ISIS's 'success to the successful' reinforcing feedback loop (R3).

Figure 8: ISIS reinforcing feedback loop (R3)—success to the successful



Key

(R) Reinforcing loop

Stock=Influence

Reinforcing loop flow

Internal subsystem

Contributing reinforcing feedback from external systems/elements

External system

Media Wing

- Control of the narrative, out-communicating enemies
- Battlefield success / content strengthened brand, legitimacy & support
- Increased physical & virtual caliphates = increased influence
- iWar campaign a force multiplier for subsystems' success & resilience
- Actively targeting adversaries in iWar e.g. baiting, manipulating events, controlling perceptions of truth

Political Wing

- Battlefield success / territory won = increased power/authority
- Physical & virtual caliphates = global, regional & local control
- Enabled centralised bureaucratic hierarchy
- Enabled exploitation of state governance vacuum
- Increased system resilience—anticipatory decision-making
- Increased autonomy, leading to further domination

Economic Wing

- Success/winning = increased funding, support, recruitment
- Increased territory/populace provided increased revenue
- Increased number of global franchises
- Increased provision of resources to reinforce authority, governance & military capability

Military Wing

- Battlefield success
- Creation of inspiring imagery / media content / events
- Seizure of caliphate territory = greater control/influence/security

- Propaganda by deed & fear campaign = contagion, generated fear, respect, awe & enabled more battlefield wins
- Escalation of recruitment, morale, funding resulting in improved capabilities
- Relative safe haven / stability in caliphate territory enabled future planning & success

Religious Wing

- Success reinforces ideological narrative & belief in ISIS's cause
- Shift from coercion to engagement from position of power
- Territorial control over opposing moderate branches of Islam & clerics

Influence

- Target Audiences
- Global
- Regional/Local

Global Media

- Reports ISIS's stories without fact-checking
- Glorifies/reinforces ISIS battlefield success, using their content
- Publishes clickbait, sensationalist fake news stories & footage of ISIS atrocities to meet 24/7 news cycle demands
- Decline in journalistic ethical standards

Online Community

- Super-spreaders of emboldened ISIS iWar content
- Reinforces ISIS success within virtual caliphate
- Creation of responsive clickbait / viral content / memes reinforcing ISIS influence & fooling MSM

Commercial Media & Communications Companies

- Enabled activities of media wing & online supporters in iWar
- No monitoring, quality control, fact-checking or service denial actions

- Policies favour bad actors, undermines counter-terrorism efforts

Moderate Islam

- Overwhelmed by speed & effectiveness of ISIS success in seizing territory & gaining control/influence.

Coalition

- Previous US human rights abuses exploited by ISIS
- Quest for legitimacy exploited
- Incidental civilian casualties / collateral damage exploited
- Baited by ISIS to react kinetically or with poor IO responses
- Hesitant, risk averse counter IO—hampered by bureaucracy, democratic values, ethics & security concerns

Al-Qaeda

- Provided base ideology, motivations & sources from which ISIS launched this escalating virtuous cycle

Regional Governments Iraq/Syria

- Unprepared & overwhelmed by ISIS success, reactive responses undermined credibility/legitimacy
- Loss of territory, populace & revenue undermined authority & effective governance
- Lacked an effective strategic narrative
- Societal fissures exacerbated by ISIS success
- Poor media/community engagement

National Militaries Iraq/Syria

- Unprepared & overwhelmed by ISIS scare campaign & battlefield success
- Manipulated & baited by ISIS to provide detrimental content

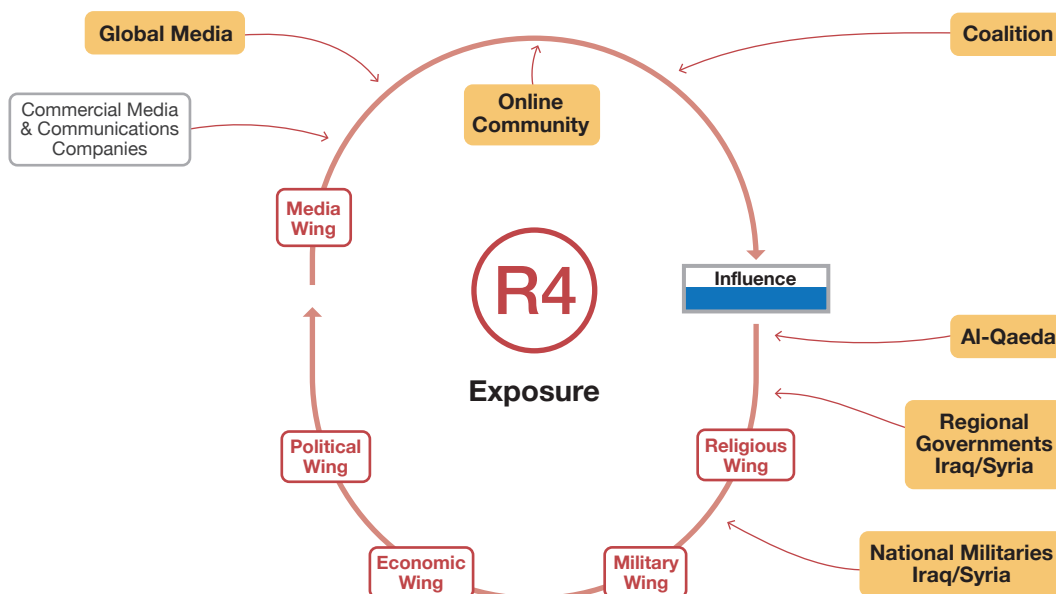
Exposure (R4)

The final reinforcing feedback loop (R4) relates to exposure, where ISIS's influence stocks were reinforced through the effective exploitation of information operations tactics, communications links and behavioural economics conducted as an 'information Jihad'.²³⁸ Exposure tactics such as inundation, amplification and repetition were designed to virally inundate and control audience perceptions to build legitimacy, reinforce the narrative and dominate the information environment. The exposure techniques employed by ISIS manipulated cognitive biases and heuristics such as persuasion bias, appeal to authority, and illusory truth effect, as well as the frequency, association and availability heuristics (Table 4).

ISIS's effective use of exposure to reinforce its influence stocks was assisted through its projected image of success (resulting from the R3 feedback loop and high-profile 'propaganda by deed' activities). It also employed a global network of recruiters and super-spreaders, a highly professional media wing, a steady torrent of viral online content and advertising tactics, and an unassailable brand that made terrorism 'sexy'.²³⁹

ISIS used exposure to reinforce its influence, to strengthen its internal subsystems and to run its military offensive like a viral marketing campaign. As Singer and Brooking²⁴⁰ explain, before invading northern Iraq, ISIS employed a tactic similar to the German blitzkrieg at the Maginot Line in World War II, which used radios to sow confusion, doubt and fear. However, ISIS pioneered a different sort of blitzkrieg, using the internet as a weapon.²⁴¹ Even though ISIS had not yet arrived, fear was already ruling the military and security force ranks, with thousands of Iraqi soldiers and police streaming out of Mosul, leaving weapons and vehicles behind. In addition, nearly half a million civilians fled. When ISIS forces arrived, they were astounded at their good fortune and learnt important lessons for strengthening system resilience. ISIS's use of exposure to enhance its scare campaign and grow its influence stock was further reinforced by videos and imagery that moved faster than the truth and were simultaneously horrifying and intoxicating to global audiences.²⁴² Its rapid multi-pronged, multi-platform, multilingual production and distribution of content won it a victory that probably should not have been possible. Figure 9 depicts the R4 'exposure' reinforcing feedback loop, including the external causes contributing to ISIS's success.

Figure 9: ISIS reinforcing feedback loop (R4)—exposure



Key

(R) Reinforcing loop

Stock=Influence

Reinforcing loop flow

Internal subsystem

Contributing reinforcing feedback from external systems/elements

External system

Media Wing / Political Wing / Economic Wing / Military Wing / Religious Wing

- Powerful network of super-spreaders, influencers, recruiters & infamous media personalities
- Viral marketing campaign of Information 'jihad'
- Domination of the information environment & global reach
- Manipulate cognitive biases / heuristics associated with inundation, repetition, amplification, contagions
- Addictive, intoxicating, horrifying, emotive viral content
- Rapid production, dissemination & adaptation to feedback
- Information blitzkrieg—weaponised the internet
- Multi-platform, multimedia, multilingual, accessible torrent
- Responsive, reinforced R3 success to successful loop in iWar

Influence

Target Audiences

- Global
- Regional/Local

Commercial Media & Communications Companies

- Uninterrupted service/access/bandwidth
- Internet security, privacy protections
- Multiple platforms/tools/apps/bots/hashtags
- Easily exploited policies / monitoring tools
- Open uncontrolled global commons
- Hard communications links

Global Media

- 24/7 news cycle demand for content
- Lack of editorial standards, fact-checking
- Accidental publication of propaganda, disinformation & misinformation
- Multi-platform, multimedia, global reach
- Risk averse / cost-cutting—prefer citizen/local content rather than deploying journalists
- Soft communications links

Online Community

- Lack critical thinking in evaluating content
- Reinforced contagions—emotional/social
- Shared content, clickbait, likes, spam—contributing to viral spread
- Accessible, global 24/7 audience
- Super-spreaders, influencers & trolls (not ISIS)
- Soft communications links

Coalition

- Slow, reactive, risk averse, hamstrung counter IO cycle
- Inaction caused by dilemma of multi-pronged inundation
- Traditional IO comms, ignored social media, internet

- Overclassified, secretive in messaging & tactics
- Misunderstood tailored cultural nuances, symbology, memes exploiting biases & heuristics—unable to counter effectively
- Lack of access/reach due to classified comms, OPSEC & lack of jurisdiction
- Dislocated by democratic values re: transparency, the internet commons, laws of armed conflict & privacy concerns

Al-Qaeda

- Introduced terrorist groups to benefits of the internet, media, & use of videos for exposure, to enable: networking, recruiting, messaging, planning attacks, funding & support

Regional Governments Iraq/Syria

- Historical context & contemporary actions contributed to ISIS content exploiting fissures, biases, emotional & social contagions
- Lack of strong national narrative, counter-narrative
- Hamstrung by bureaucratic processes, national security, poor comms links

National Militaries Iraq/Syria

- Kinetic targeting of comms links backfired with population & for future intelligence gathering
- Limited / non-existent counter-IO plan
- Low morale, fear, influenced by ISIS's internet blitzkrieg
- Poor decisions / actions filmed & exploited by ISIS to create more content

Balancing Feedback Loops

If reinforcing feedback loops are allowed to exponentially escalate, with no effective balancing feedback, this will result in an eventual collapse of the system.²⁴³ While ISIS's system initially comprised a virtuous cycle of strong reinforcing feedback loops creating rapid growth in influence stock, eventually the balancing feedback caught up, due to a combination of internal and external factors. The three key balancing feedback loops identified in this case system analysis are summarised in Table 9.

Table 9: ISIS balancing feedback loops

Balancing Feedback Loop	Key	Description
Counter-Influence	B1	ISIS's influence was diminished through the development of effective, diverse counter-influence activities designed to shift ISIS's iWar system from anticipatory to reactive, dislocate its power, and break its success to successful cycle (R3).
Loss of Authority & Control	B2	ISIS's influence was undermined by a loss of control and authority resulting from a number of internal and external system impacts and delays in the associated feedback.
Drift to Low Performance	B3	ISIS's reinforcing feedback loops deteriorated and sank influence stocks due to an internal drift to low performance, which resulted from balancing feedback including lost leadership and resources, degraded communications, competing systems' goals and policy resistance, and a decline in system resilience.

Counter-Influence (B1)

The B1 counter-influence balancing feedback loop strengthened over time as external systems learnt, adapted and became more anticipatory themselves, and therefore more effective in countering ISIS's virtuous cycle of influence. Meadows²⁴⁴ explains that success-to-the-successful loops (R3) can be controlled by putting into place balancing feedback that prevents competitors from taking over entirely. This 'levelling of the playing field' was achieved through a diversification of equalising mechanisms²⁴⁵ employed indirectly by various external systems to dislocate ISIS's anti-fragile influencing power through other more fragile political, social or economic

dimensions. Counter-influence activities were designed to shift ISIS's anti-fragile iWar system from its characteristic anticipatory resilience and pressure it to become more fragile and reactive, while concurrently enabling state and Coalition information operations and targeting cycles to overtake ISIS's own planning and decision cycles.

Counter-influence activities contributing to the effectiveness of the B1 loop (and consequently the B2 loop) included the use of soft power tactics, indirect effects, community engagement, and authentic, ethical information operations messaging backed up with deeds to develop trust, credibility and improved relationships with local populations, as well as providing access to local information networks relevant to undermining ISIS's influence.²⁴⁶ Counter-information operations and non-kinetic targeting of communications links were designed to expose ISIS's hypocrisies, undermine its influence over target audiences, and break its success-to-the-successful cycle. ISIS's 'propaganda by deed' tactics were countered with own-force deeds to reinforce Coalition messaging of being the ethical, truthful, and transparent actor in the 'battle of the narratives' with ISIS.

The efforts involved in making B1 an effective balancing loop were not without difficulties. Whereas soft power and nation-building activities were instrumental in gaining the trust and support of the population and undermining ISIS's control and influence in Marawi in the Philippines in 2017,²⁴⁷ such success was not automatically translatable to Iraq and Syria. Iraq's historical context of the state actively marginalising Sunni populations, the effects of airstrikes against civilian communities in Syria, and the difficulties of conducting urban operations in both countries all combined to provide further reinforcing feedback to ISIS's narrative and influence stocks. The most successful tactics contributing to B1 were counter-information operations strategies based on reverse-engineering the core principles underpinning ISIS's strategic logic. These included linking ISIS to perceptions of crisis, denigrating its system of control, and exposing ruptures between its narrative and its actions.²⁴⁸

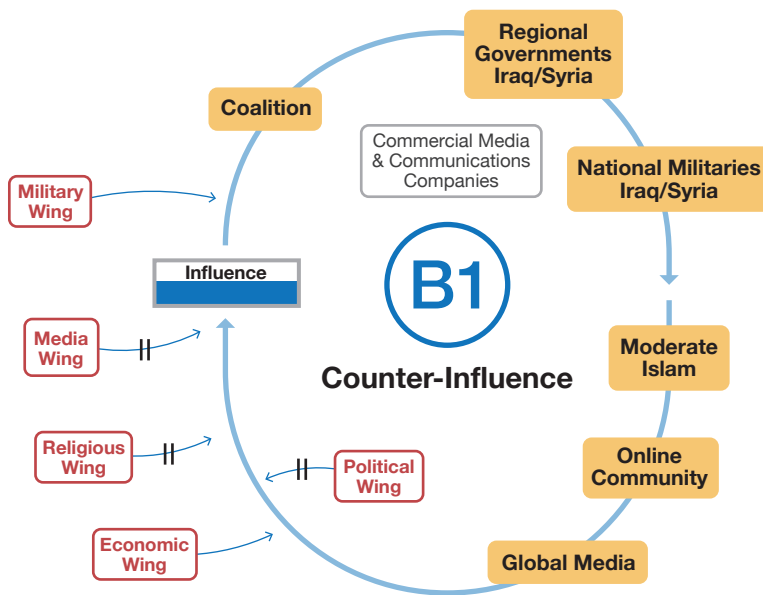
Counter-influence strategies contributing to B1 also had to recognise the challenges of competing against ISIS's extremely effective, sustained, ideological, multidimensional iWar campaign, from which its entire system derived its stocks, support, legitimacy, and centre of gravity.²⁴⁹ Accordingly, ISIS was not bound by convention or ethics, and was a master of manipulation and exploiting influence effectiveness,

behavioural economics, and hard and soft communications links. Additionally, counter-narrative strategies had to avoid confronting ISIS ideologically.²⁵⁰ For instance, even the most jurisprudentially sound counter-ISIS case commands zero credibility, undermines 'moderate' ideologues and reinforces ISIS's central narrative if it is delivered by non-Muslim actors.

Luckily, in September 2016, another external system addressed this ideological gap in counter-influence and contributed significantly to B1's growth, when globally renowned Sunni leaders spoke out in unison against Wahhabism during an international conference in Grozny.²⁵¹ All one hundred clerics unanimously took a stand against the Wahhabi terrorists who condemn and murder non-believers. This was the first time Sunni Islamic scholars had clearly rejected Wahhabism as part of the larger Sunni family.²⁵²

The counter-influence activities contributing to B1 growth, combined with improved counter-terrorism approaches, and increased political rights and civil liberties for the populace, also strengthened the B2 and B3 balancing feedback loops. All these factors eventually succeeded in slowing ISIS's influence stock growth, upsetting its interlinked relationships between internal subsystems, and reshaping ISIS's whole system towards a more decentralised organisation.²⁵³ The B1 loop is depicted in Figure 10; it comprises the key counter-influence contributions of various systems and elements.

Figure 10: ISIS balancing feedback loop (B1)—counter-influence



Key

ⓑ Balancing loop

→ Balancing loop flow

→ Contributing balancing feedback from ISIS' internal subsystems

▬ Stock=Influence

◻ Internal subsystem

◻ External system

|| Delay in balancing feedback

Military Wing

- Atrocities / war crimes / theft against civilian population
- Damage to local infrastructure
- Foreign fighters' excessive violence against locals
- Inability to defend caliphate, protect supporters
- Military actions & losses undermine narrative

Media Wing

- Messaging not adjusted for expansion into non-Sunni territory
- Increasingly reactive & erratic responses to Coalition IO
- Hypocrisy in messaging vs reality exposed
- Activities dislocated from other subsystems

Religious Wing

- Wahhabi ideology dominating ISIS narrative
- Obvious Saudi influence undermines ISIS ideology
- Hypocrisy in messaging vs reality
- Defection of ISIS' Sunni clerics

Political Wing

- Shift in influence from centralised control to decentralised coercion
- Viewed as a Saudi 'puppet'
- Governance & soft power initiatives backfire in non-Sunni areas & impacted by lack of funds
- Increasingly heavy-handed, authoritarian

Economic Wing

- Reduced income/support (esp. Saudi), increased costs, increased no. of martyrs/widows = unable to pay allowances, purchase new weapons, or media/comms capabilities

- Increased taxes but reduced services, medicine, food for caliphate populace

Influence

- Target Audiences
- Global
- Regional/Local

Coalition

- Targeting of key leaders, media personalities, comms & relationships
- Expose ISIS hypocrisy & atrocities; promote own legitimacy/authenticity
- Empower populace, restore political rights, civil liberties & services
- Dislocate ISIS media with diversification & rapid, multi-pronged IO targeting cycle
- Soft power initiatives & propaganda by deed (security, stability, investment)
- Adapt / learn from iWar feedback, improve resilience, anticipatory IO
- Limit kinetic targeting, civilian casualties & collateral damage

Commercial Media & Communications Companies

- Provided some assistance to CT/ intelligence efforts
- Restricted coverage/bandwidth over war zones
- Improved standards / monitoring / reporting of bots, trolls & malicious, fake or horrific content

Regional Governments Iraq/Syria

- Develop strategic narrative promoting unity, prosperity, nationalism

- Allay fears of Sunni populace regarding future
- Soft power—propaganda by deed, invest, support, rebuild, empower
- Emphasis on ISIS's foreign connections / support base (not local)

National Militaries Iraq/Syria

- Limit civilian casualties, collateral damage
- Manage image, messaging, morale
- Address corruption, cronyism, pay & conditions
- Develop CIMIC / soft power / IO capabilities
- Provide security, stability, law & order to populace

Moderate Islam

- Credible voice to counter ISIS ideology
- Leading clerics united in stand against Wahhabism
- Expose Saudi motivations & levels of support to terrorism

Online Community

- Hackers, anti-ISIS activists targeted content & profiles using humour, contagions & same viral marketing techniques as ISIS
- Freedom to use iWar tactics not allowed by govt or military forces

Global Media

- Some improved review processes prior to publishing
- Reporting Coalition content / good-news stories
- Emphasising mission success & ISIS defeat/losses
- More local news stories, reporters embedded with military or deployed into cleared areas

Loss of Control and Authority (B2)

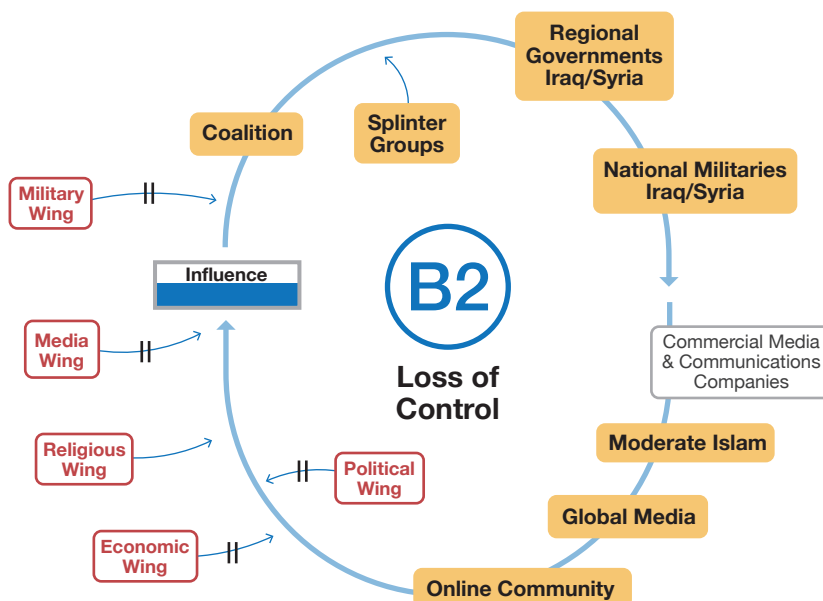
ISIS's influence was further undermined by the B2 balancing feedback loop comprising a loss of authority and control across both its physical and virtual caliphates. This loss of control, which is a critical capability supporting ISIS's centre of gravity (Figure 4), resulted from a number of internal and external system impacts combined with delays in the associated feedback surrounding the detrimental effects on its influence stock.²⁵⁴ Along with the effective counter-influence balancing feedback of B1, the physical losses of critical requirements such as personnel, resources, leaders, communications links, territory, and accesses to target audiences resulted in sinks of influence.

ISIS's use of indiscriminate violence and atrocities committed against Muslims, particularly by heavy-handed foreign fighters with contrary motivations, further undermined its legitimacy and credibility. This was a lesson previously provided by al-Qaeda that ISIS seemingly forgot as it grew more desperate on the physical battlespace.²⁵⁵ Additionally, ISIS's overreach of the caliphate saw a dilution of influence and control as it expanded into non-Sunni territory and encountered communities empowered to oppose it.²⁵⁶

Further contributing to B2 feedback effectiveness was the combined effect of separate activities conducted by external systems, such as the online community, technology companies, mainstream media, and transnational law enforcement. These individual systems successfully regulated, restricted and prevented flows of ISIS content, undermined ISIS's legitimacy and authority using transparency and humour, and denied services, network accesses and online safe havens.²⁵⁷ This resulted in an accidentally coordinated, multi-pronged front, which created compound dilemmas for the ISIS system to respond to effectively when it was already degraded.

ISIS's loss of authority, resulting from this B2 feedback, also applied internally and contributed to the B3 balancing loop 'drift to low performance'. As ISIS lost territory, communications links and key personnel, its image, branding and appeal were undermined. Many ISIS supporters became disillusioned, and internal subsystems and elements developed competing goals and alternative motivations.²⁵⁸ Additionally, as ISIS lost its territory and geographic centre, it relied increasingly on erratic electronic communications across vast distances, which limited its ability to maintain a centralised hierarchical bureaucracy and control its dispersed units and subsystems.²⁵⁹ The B2 loop is depicted in Figure 11.

Figure 11: ISIS balancing feedback loop (B2)—loss of control



Key



Balancing loop

→ Balancing loop flow

→ Contributing balancing feedback from ISIS' internal subsystems

Stock=Influence

Internal subsystem

External system

|| Delay in balancing feedback

Military Wing

- Battlefield, personnel & territorial losses
- Competing goals, motivations
- Increasing violence / war crimes & activities, not endorsed by hierarchy
- Low morale, lack pay & medical support, increased desertions / double agents
- Restricted movement/comms

Media Wing

- Messaging in isolation to subsystems' activities
- Mixed, multiple, competing narratives, loss of unity
- Reduced focus on regional/local audiences
- Reactive to counter IO = degraded brand, image, appeal

Religious Wing

- Disillusionment among followers
- Empowered communities questioning Wahhabi ideology, undermining ISIS legitimacy
- Loss of credibility/legitimacy with wider Muslim audiences

Political Wing

- Leadership, resources & territorial losses
- Degraded unity of command, decentralised authority
- Degraded communications links
- Loss of 'appeal to authority' influence
- Competing motivations, divided leadership

Economic Wing

- Reliance on cash, loss of electronic transfer, frozen assets
- Unpaid wages, disgruntled fighters, loss in capability
- Reduced recruitment & support

Influence

- Target Audiences
- Global
- Regional/Local

Coalition

- Counter IO & battlefield wins undermine ISIS's COG/CRs
- Targeting of comms links/relationships, cyber attack
- Denial of access to target audiences
- Empower populace autonomy
- Enhance fissures within ISIS system
- Provision of accessible media/internet to civilian population (previously cut off by ISIS)

Splinter Groups

- Competing goals
- Alternative option, more appealing
- Encourage division & defection
- Competing for supporters/resources
- Create confusion around ISIS's narrative & whether they are ISIS or not

Regional Governments Iraq/Syria

- Regain governance/authority over caliphate areas
- Soft power actions to reinforce messaging, rebuild trust
- Demonstrate national unity & strength of leadership
- Tailored messaging to local/national audiences

National Militaries Iraq/Syria

- Regain territorial control of caliphate areas
- CIMIC assistance to communities, rebuild, restore
- Provision of security/safety/services in previously held ISIS territory
- Actions reinforce strategic narrative & IO messaging

Commercial Media & Communications Companies

- Denial of service / network access
- Denial of online safe havens
- Enable cyber targeting
- Regulate/restrict ISIS info flows

Moderate Islam

- Credible voice to counter ISIS ideology
- Leading clerics united in stand against Wahhabism
- Expose Saudi motivations & levels of support to terrorism

Global Media

- Restrict ISIS narrative, expose hypocrisy
- Enhance/empower local voices/stories
- Investigative journalism
- Support counter-ISIS activities

Online Community

- Cyber attacks, hacking, trolling
- Expose ISIS activities / members / safe havens
- Undermine ISIS legitimacy using humour, viral content & transparency
- Reverse-engineer ISIS iWar tactics against them

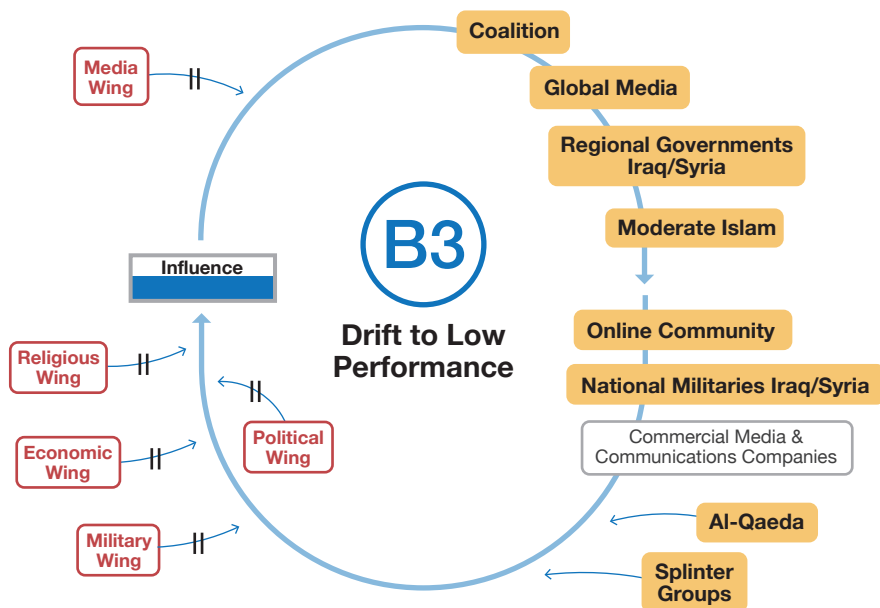
Drift to Low Performance (B3)

The performance of ISIS's reinforcing feedback loops deteriorated and increasingly sank its influence stocks due to an internal 'drift to low performance' archetype resulting from factors covered by the B3 balancing feedback loop, such as battlefield and leadership losses, degraded communications and media standards, eroding goals and policy resistance, and a rise in competing systems. ISIS's reinforcing feedback loops that should have kept the system state at acceptable levels were overwhelmed by the increasing strength of the balancing feedback loops countering its influence. Following the aforementioned system impacts generated by the B1 and B2 balancing feedback loops, the cohesion and unity bonding ISIS's internal subsystems started to corrode, leading to various actors pulling the influence stock toward various competing goals, resulting in policy resistance and a decline in system resilience.²⁶⁰ This drift to low performance was a gradual process whereby ISIS as a system became more reactive, employing quick fixes, tending to believe bad news over good, dwelling on failures, and developing a perception that the system was in a worse state than it actually was.²⁶¹

Where previously ISIS were extremely successful, resilient and difficult to counter, the drift to low performance balancing feedback eventually resulted in internal system elements lowering their expectations, efforts and performance standards.²⁶² This drift, when combined with other losses and the effects of delayed feedback on the system, was difficult for ISIS to prevent or reverse.

The loss of authority and subsequent undermining of ISIS's centralised hierarchy, created by the B2 loop, enabled the rise of internal system elements' competing goals, and supportive external systems becoming accidental adversaries. Certain actors' heavy-handedness in the application of sharia law eroded ISIS's support among local populations, which was central for its state-building efforts. Foreign fighters coming from Western countries were particularly violent and had their own external motivations, not aligned with ISIS's ideology.²⁶³ Disparate actors and sub-groups broke away from the organisation and conducted random, unjustified attacks. This leaderless resistance ultimately became a message-less resistance,²⁶⁴ which further balanced the R2 reinforcing feedback garnered from ISIS's ideological legitimacy and sense of purpose. Such acts of message-less resistance undermined legitimacy, failed to provide meaning and did not inspire others to act, which further reinforced the system's drift to low performance. The B3 loop is depicted in Figure 12.

Figure 12: ISIS balancing feedback loop (B3)—drift to low performance



Key

ⓑ Balancing loop
 █ Stock=Influence

→ Balancing loop flow
 █ Internal subsystem

→ Contributing balancing feedback from ISIS' internal subsystems
 █ External system
 || Delay in balancing feedback

Media Wing

- Declining ability to influence (B1)
- Degraded communications / media standards & influencing efforts
- Decline in system resilience in the iWar
- Degradation of system interconnections
- Inability to counter IO impacts (& B1/B2 feedback) on subsystems

Political Wing

- Policy resistance by subsystems/elements
- Eroding goals, quick fixes backfired
- Decentralised hierarchy, loss of control & authority (B2)
- Lack of effort, performance, care, shift in purpose—self-preservation
- Dwell on failures, believe bad news & IO content (B1)
- Loss of cohesion / unity / links across system

Religious Wing

- Corrosion of ideological bonds, loss of appeal
- Increasingly isolated messaging, competing goals
- Degradation of unity with political wing
- Lowered expectations
- Loss of target audiences

Economic Wing

- Rapid caliphate expansion too expensive to maintain
- Increased corruption, movement of assets out of caliphate (self-preservation of leaders/financiers)
- Isolation from other subsystems (except political)
- Eroding goals, policy resistance

Military Wing

- Policy resistance
- Competing system, contrary motivations
- Increased leaderless/message-less violence, undermining system purpose & legitimacy
- Degraded effort, performance, morale
- Lower expectations, dwell on failures
- Isolated from other subsystems

Influence

- Target Audiences
- Global
- Regional/Local

Coalition / Global Media / Regional Governments Iraq/Syria / Moderate Islam / Online Community / National Militaries Iraq/Syria /

- Counter influence activities contributing to B1 feedback loop
- Counter authority/control activities contributing to B2 feedback loop
- Enhance ISIS system fissures
- Empower accidental adversaries / competing subsystems
- Contribute to undermining ISIS cohesion & corrosion of bonds
- Reinforce ISIS's spiral of despair, paradigms of failure, downward drift

Splinter Groups

- Accidental adversaries
- Competing system
- Viable alternative for defectors
- Renewed, fresh appeal
- New focus of Saudi support

This is not to say ISIS did not adapt to this balancing feedback. ISIS was still a highly resilient system and effectively maintained its influence stocks among its sources and virtual tribe. Accordingly, ISIS evolved into a more decentralised, partially leaderless resistance movement in the face of territorial, leadership and iWar losses—effectively withdrawing back to its terrorist organisational roots to regroup, recoup and recover. ISIS shifted its strategy away from the physical caliphate in Iraq and Syria, towards leading the global Salafi-jihadist movement. As such, ISIS recognised the importance of declaring a global caliphate and securing territory in different parts of the world to maintain its influence.²⁶⁵

Delayed Feedback

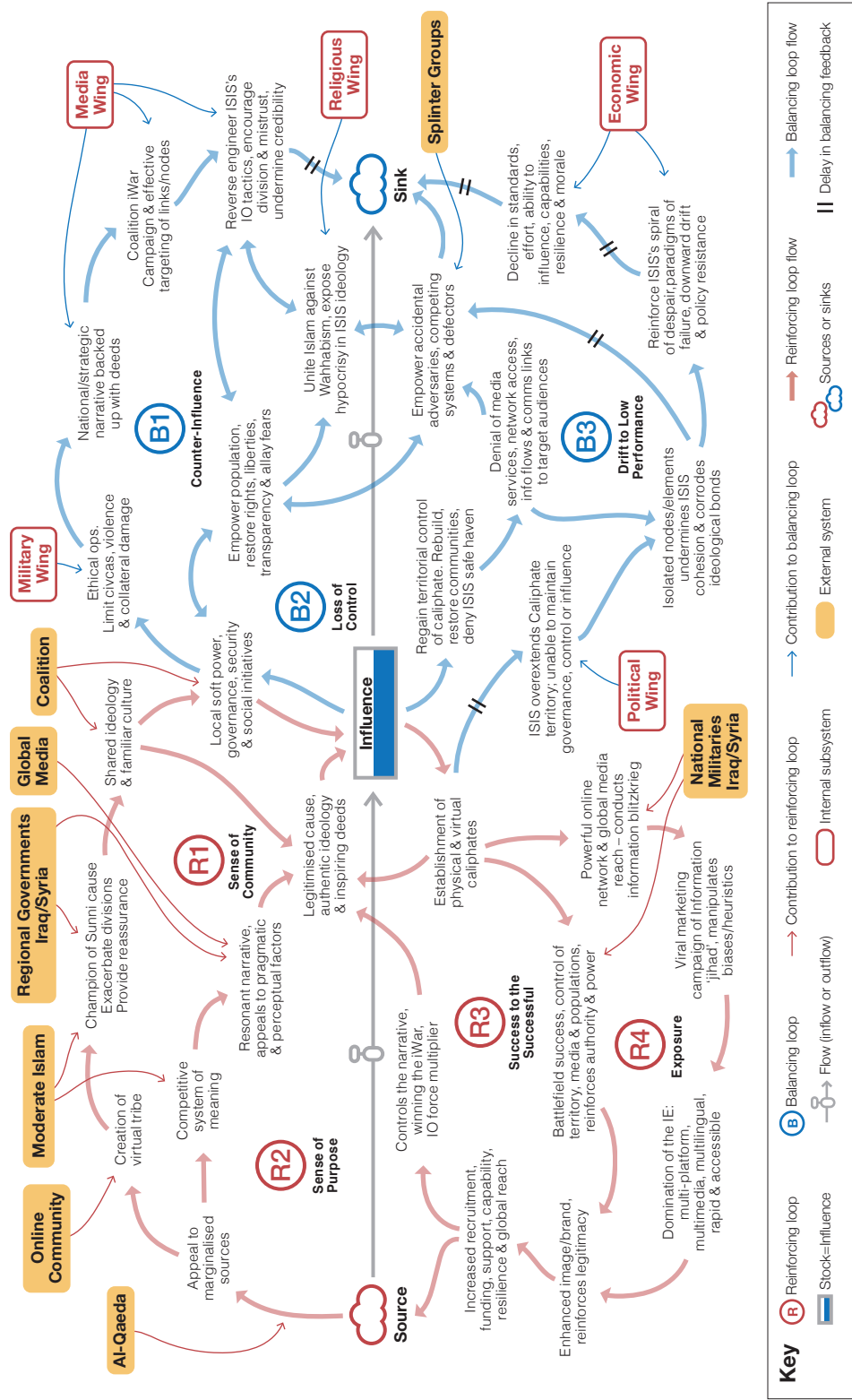
As depicted in the balancing feedback loop diagrams, ISIS suffered from delays in feedback when its influence stock started to decline and communications links were degraded. These delays undermined ISIS's ability to react effectively and therefore impacted on the whole system's anticipatory resilience. The time lags imposed by slowly changing stocks can provide room for a system to manoeuvre or revise its approaches.²⁶⁶ However, in ISIS's case this delayed feedback caused problems in its system behaviours, responses and decision-making. If a decision is made based on delayed information, the resulting action will be misguided and off-target, may amplify variations, and can create instability through oscillations.²⁶⁷ The loss of control (B2) and broken communications links were key contributors to the delays in feedback received by ISIS as it was defeated in Iraq and Syria.

ISIS: System Findings

Figure 13 depicts the holistic system diagram for ISIS, as an effective iWar case study. The following four key themes become apparent as contributing to the ISIS system's effectiveness at maintaining its influence stocks:

- Its system characteristics of being a relatively closed system with a high level of resilience.
- The efficiency of system flows both via feedback loops and through the strength of hard and soft interconnections between key elements.
- Having and maintaining control, which is a critical capability and a vital reinforcing element to increasing influence stocks.
- Having a centrality of focus, where influence activities are the main priority and purpose driving all system outputs, and which contributed to strengthening all four reinforcing feedback loops.

Figure 13: Holistic ISIS system diagram



Clinton Campaign: System Analysis of Influence Ineffectiveness

Fact checkers couldn't win the culture war in the US election.²⁶⁸

In contrast to ISIS's influence system, where virtuous reinforcing feedback enabled 'success to the successful', the Clinton campaign of the 2016 US presidential election suffered a vicious reinforcing cycle resulting from feedback associated with internal and external system events and activities. This impacted on its influence stock in a downward spiral. There is a psychological and political tendency to blame external influences as the cause of system problems,²⁶⁹ and Clinton had just cause in doing so, given the escalating counter-influence reinforcing feedback pitted against her campaign. However, competing goals of subsystems, the rise of accidental adversaries, and a loss of both control and system resilience resulted in a 'drift to low performance' archetype and contributed to this vicious cycle. The modelling of Clinton's campaign highlights the intrinsic system problems, undesirable perceptions and behavioural characteristics which, when combined with weak balancing feedback loops, undermined the effectiveness of the campaign.

The activities of external systems also generated significant impacts on the Clinton system's behaviour due to the inherent nature of an open, public election campaign. For example, in contrast to the closed, secretive, opaque ISIS system, on whose dynamics and influence stocks external systems had a limited effect, Clinton's system faced tens of thousands of entities and a diverse range of sources forming the complex ecosystem of America's political media, all of which contributed feedback into the campaign.²⁷⁰

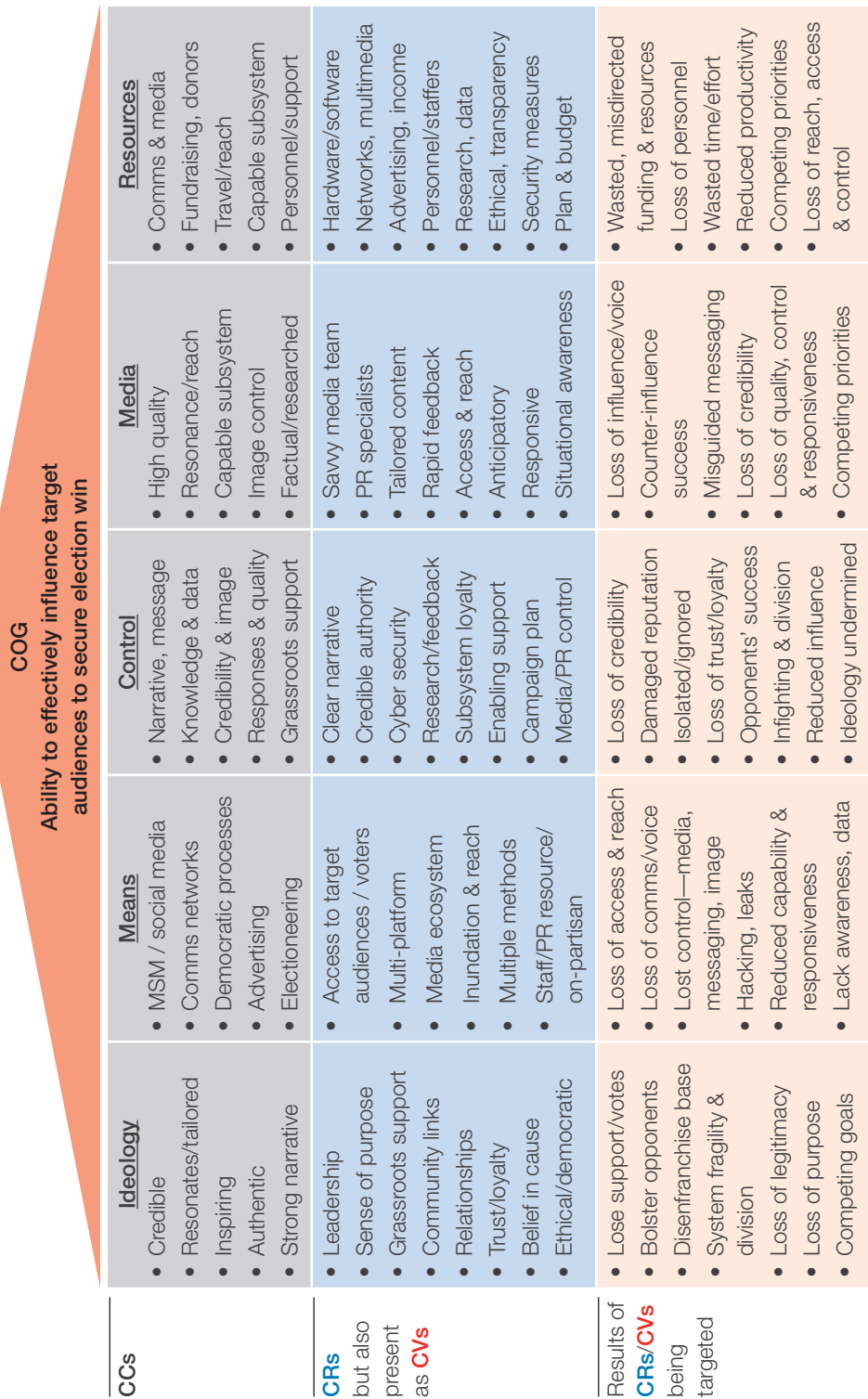
Clinton Campaign: Robust System Suffering Some Fragility

As determined in Figure 2, Clinton's campaign system was assessed to be an open system with a robust level of resilience that suffered increased fragility throughout the bounded time period of the 2016 election, due to an asymmetry of balancing and reinforcing feedback. While, like ISIS, the campaign was a complex social system, it suffered from a lack of diversity, making it more vulnerable to external shocks and unable to effectively balance the escalating vicious reinforcing feedback cycle. Additionally, systems that are constant over time can lack resilience, which is difficult to identify without a holistic system overview and due to the gradual nature of a drift to low performance. The Clinton campaign applied the same approaches to achieving the same outputs as Democrat systems had done during previous election campaigns. Unfortunately, having static stability and business-as-usual productivity or conducting familiar, repetitive activities can sacrifice system resilience.²⁷¹ Meadows²⁷² explains that 'a loss of resilience can come as a surprise, because the system is usually paying much more attention to its play than to its playing space. One day it does something it has done a hundred times before and crashes'.

The presence of a feedback mechanism does not necessarily mean the mechanism works well.²⁷³ The balancing feedback loops in Clinton's campaign were not strong enough to increase influence stocks to desired levels. Additionally, like ISIS, Clinton's system suffered from delayed feedback regarding its stock levels—where the interconnections' flows failed due to information arriving too late or at the wrong place, or being unclear, incomplete or hard to interpret. Therefore, reactions or decisions triggered by this feedback were often misguided, delayed or ineffective, which further weakened system resilience.

In order to deconstruct Clinton's campaign as a complex system, a holistic assessment of the centre of gravity (COG) and supporting critical capabilities (CCs) was conducted (Figure 14). This analysis informed the identification of key elements and the associated feedback loops, while bounding the model to a single influence stock. The campaign's COG was assessed to be 'the ability to effectively influence target audiences to secure the election win', with its critical capabilities being ideology, means, control, media capabilities, and resources. The CCs are divided further into critical requirements (CRs), which if targeted become critical vulnerabilities (CVs).

Figure 14: Clinton campaign centre of gravity



System Elements

Building upon the holistic understanding provided by the system characterisation, centre-of-gravity construct and qualitative narrative data analysis, the key elements of Clinton's campaign system were identified and considered in detail, as follows.

Stock and Purpose

As per the ISIS system model, the single stock researched in the Clinton campaign model was influence. The purpose of the campaign, as a complex social system, was to win the 2016 US election by effectively influencing target audiences to vote for Clinton and the Democratic Party (DNC). Priorities associated with maintaining influence stocks and achieving campaign aims included building credibility, trust and confidence in the system through a strong ideological narrative. Activities contributing to these aims included controlling the associated messaging, campaign and policy debates, maintaining the 'experienced front runner' reputation²⁷⁴ of Clinton, and building on goodwill generated by the Obama administration.

Source

The Clinton campaign's influence source primarily comprised the Democrats' ideological support base, specifically current supporters of the Obama Administration and previous supporters of Bill Clinton. However, sources also included centre-left media outlets, the left-leaning socially conscious American electorate, minority communities, feminists, and other voters wanting to see the election of the first female US President. There was also a groundswell of grassroots supporters who valued Clinton's experience as Secretary of State and her pragmatic, socially responsible campaign policies.

Sink

As a result of the vicious cycle of reinforcing feedback, sinks to campaign influence stocks included the loss of swing voters, supporters of presidential contender Bernie Sanders, centralist media, and online followers.²⁷⁵ Additional sinks comprised a loss of reputation and credibility, reduced messaging effectiveness, and campaign communications being ignored, misdirected or dislocated by events. These sinks further increased mistrust across the electorate and contributed to a loss of control, lowered system resilience, and undermined belief in the cause (all critical capabilities), which, when combined, contributed to the system's drift to low performance.

Internal Subsystems

Four internal subsystems were identified as integral to contributing to the system's influence stocks and maintaining the balancing feedback loops.

Subsystem: Campaign Leadership

Clinton herself, as leader of the campaign, was the primary influential contributor to system stocks. Her relevant experience as Secretary of State, combined with her husband's legacy, her social policies appealing to minorities and women, and the fact that she was the antithesis of Trump, set her up as the legitimate frontrunner.²⁷⁶ The leadership and media subsystems worked together to exploit the paradigms surrounding Clinton's proven reputation in building balancing feedback relating to her credibility, her proposals to address inequality, a united sense of purpose, and a sense of community with a social conscience. Additionally, many staffers involved in the leadership team were experienced professionals, adding to the campaign's legitimacy, authority and influence. The campaign leadership subsystem represented the critical capabilities of ideology and control in protecting the system's centre of gravity.

Subsystem: Campaign Media Team

As in ISIS's system, the media subsystem represented a critical capability and was well resourced.²⁷⁷ It worked effectively to adopt successful influencing tactics used during President Obama's campaign and apply them to the Clinton's campaign media strategy. The team collected metadata and conducted advanced data analytics to model the electorate, target voters, test messages, conduct grassroots organising, and win delegates.²⁷⁸ It also undertook polls, opinion research, and focus groups to create personalised messaging and targeted advertising. The media subsystem built an effective narrative surrounding balancing feedback associated with integrity, a sense of purpose, belief in the cause, and an inclusive community to further boost system influence and strengthen linkages between subsystems.

However, as demonstrated by subsequent feedback, the media team's tailored approaches paled in comparison to the aggressive, industrial-scale, data-driven, behavioural exploitation operation conducted by the Trump campaign, with the assistance of Cambridge Analytica.²⁷⁹ Also, due to the asymmetric media ecosystem, Clinton's media team was hamstrung by ethics and transparency requirements as to the influence tactics they could effectively employ. These obstacles correspond to those encountered by

Western democracies fighting ISIS in the iWar (Table 6). Additionally, while the media team was heavily focused on public relations to maintain Clinton's image and credibility, it forgot key influencing lessons from the Obama campaign. The DNC had alienated Obama's organic, grassroots support base, disempowered them and dislocated their self-organising capabilities.²⁸⁰ The failings of this corrosive approach towards grassroots supporters were neither recognised nor rectified for Clinton's campaign.

Subsystem: Campaign Membership

DNC members, volunteers and supporters (described under 'Source') represented the operational and tactical level subsystem that was a driving force in organising and conducting influence activities—both physically at rallies, visits and speeches, and virtually through online action groups, advertising and lobbying. This subsystem contributed to the critical capabilities of 'means' and 'control' for the whole system, and relied on the linkages and support of the other three subsystems to operate effectively and achieve its outputs for increasing influence. However, the insidious impacts of reinforcing feedback, which included multi-pronged attacks against members, networks, Clinton's credibility and the truth, slowly eroded the membership subsystem's resilience.²⁸¹

Subsystem: Campaign Resourcing

The resourcing subsystem represented the critical capabilities of 'resources' and 'means' in protecting the campaign's centre of gravity, while also supporting and enabling the other three subsystems' influencing activities. Clinton's campaign budget, and resulting expenditure of US\$1.2 billion, was double that of the Trump campaign, and the campaign had 3,320 more paid staffers than Trump.²⁸² The resourcing subsystem benefited from established Democratic revenue streams, traditional donor sources and the goodwill generated by the Obama administration, Clinton's reputation and their respective policy platforms. However, as with the other internal subsystems, delayed feedback arising from negative reinforcing loops, resultant poor decision-making surrounding influence activities, and misguided expenditure meant this subsystem's resilience was also impacted upon negatively, resulting in a drift to low performance.

External Systems

Target Audience

The target audience of voters, particularly swing voters, and moderate mainstream media comprised the main external systems the Clinton

campaign sought to influence. The campaign also relied upon the support of these systems to bolster its balancing feedback loops and assist internal subsystems in countering the vicious cycle of reinforcing feedback. However, the impacts of the counter-influence reinforcing feedback increasingly normalised and regularised political meaning derived from right-wing propaganda and disinformation, thereby undermining Clinton's influence stock. If the opinions of citizens are poorly formed, weak, or subject to manipulation informed by social and cognitive psychology, 'then the idea of deliberative democracy by an informed citizenry exercising self-governance is a utopia'.²⁸³

Trump Campaign

The external system of the Trump campaign inadvertently included a subsystem comprising an online troll army that evolved in concert with Russian iWar activities and Trump's domination of the spotlight.²⁸⁴ While this troll army was not directly linked to or controlled by Trump's internal media team subsystem, its activities were later backed by his campaign strategy, and demonstrably contributed to the campaign's effective massive-scale social media influencing activities. The Trump campaign used tactics that included personalised micro-targeting, marketing techniques, sentiment manipulation, and inundation.²⁸⁵ Watts²⁸⁶ compared the Trump campaign's influencing tactics in overtaking the Republican Party as eerily similar to how ISIS overtook al-Qaeda's influence on social media. The Trump campaign was unwittingly aided by other external systems in its influencing success, including Russia's Internet Research Agency, whose aim of interfering in the election to undermine confidence in the democratic system worked in the Trump campaign's favour. Additionally, activities conducted by right-wing media outlets, WikiLeaks and Cambridge Analytica also resulted in complementing the Trump campaign's influencing strategy. In combination, these disparate systems were able to dominate the information environment and heavily contributed to the vicious reinforcing feedback impacting negatively on Clinton's influence stock.

Due to the combined activities of these external systems and the associated content influencing public discourse, Trump was not held to the same standards of accountability and transparency as Clinton.²⁸⁷ Freedom from democratic norms, political ethics and tangible consequences enabled the Trump campaign to be fuelled by audacity, outrage and divisiveness, as well as facilitating the propagation of conspiracy theories, fearmongering, 'flame

wars', character assassinations and lies.²⁸⁸ Like ISIS and Russia's Internet Research Agency, the Trump campaign was not hamstrung by democratic limitations (Table 6), and it employed many of the same iWar tactics as America's adversaries. Trump's counter-influencing tactics and reinforcing feedback were so successful that James Clapper, the former US Director of National Intelligence, asked whether Trump meant it literally when he said 'I could stand in the middle of Fifth Avenue and shoot somebody and I wouldn't lose voters'.²⁸⁹ Trump's campaign tactics and how they relate to the influencing and behavioural research are summarised in Annex A.

Right-Wing Media

The US media ecosystem is split into two distinct, structurally different subsystems. The right-wing media subsystem is dominated by densely interconnected and insular partisan outlets, while the moderate mainstream media subsystem spans the rest of the centre-right to left spectrum, and generally adheres to journalistic standards, allegiance to facts, and context over conclusions.²⁹⁰ The asymmetric split in the US national media ecosystem means politicians and media outlets face starkly different incentives. Right-wing propagandists and the Trump campaign benefited and were rewarded for spreading lies and disinformation, whereas Clinton was held accountable by the centre-left media, which often diligently conducted fact-checking and reinforced truth-seeking behaviour,²⁹¹ particularly during the early stages.

The right-wing media ecosystem, comprising all forms of media, enabled the iWar tactics of both the Trump campaign and the Internet Research Agency during the 2016 election campaign. The Trump campaign's extensive creation, replication and propagation of 'fake news', conspiracies and counter-influence content, often containing an element of truth, which was central for influencing success, continued to the point where stories appeared natural, normal and credible and were therefore picked up by mainstream media outlets.²⁹² It was not one message, media outlet or social media troll that mattered, but rather the sum of echoed content creating an environment of seemingly independent sources repeating the same message.

The radicalisation of right-wing media content was driven by a group of extreme sites including Breitbart, Infowars, Truthfeed, Zero Hedge and the Gateway Pundit, none of which adhered to the norms or processes of professional journalistic objectivity.²⁹³ The right-wing media also employed

iWar tactics in its production and dissemination of content, including emotional appeals, evocative political clickbait, information saturation, and reinforcing biases and prejudices through the exploitation of closed-loop discourse such as filter bubbles, algorithms, echo chambers, and propaganda feedback loops.²⁹⁴

Fox News was exclusively biased in its coverage towards the Trump campaign, while reinforcing the right-wing media's counter-influence feedback against Clinton.²⁹⁵ In 2017, Fox News effectively became the propaganda arm of the White House in all but name.²⁹⁶ Additionally, right-wing media and politicians conditioned their supporters to distrust mainstream media, while pushing conspiracy theories. Fox News, in particular, used its prominent platform to demonise and delegitimise mainstream media that tried to adhere to traditional standards of objectivity and accuracy.²⁹⁷ The result of this multi-platform, multi-axis right-wing media barrage was what Benkler et al.²⁹⁸ call an 'anomic disorientation', where audiences could no longer tell truth from fiction, even if they wanted to. This left audiences with no option but to choose statements that were either ideologically agreeable or marked them as members of the 'tribe'. Where there was no truth, the most entertaining conspiracy theory often won. Achieving this 'anomic disorientation' demonstrates the successful exploitation of most of the effective influencing tactics combined with the cognitive science (Table 4).

While the right-wing media may have been initially defined as a subsystem nested within the national media ecosystem, throughout the election period it demonstrated increased independence and isolation, developed competing goals, and became an accidental adversary of mainstream media. This division between the right wing and the remainder of the political media ecosystem widened throughout the election campaign. While the moderate national media ecosystem remained stable, mostly adhered to professional journalistic norms and was resilient to external escalation, the right-wing media was increasingly caught up in a reinforcing feedback loop, creating a system shift towards more extreme versions of itself and perpetuating information disorder.²⁹⁹

National Media Ecosystem: Centre-Left

The hyper-partisan radicalisation demonstrated by the right-wing media was not mirrored on the left wing, largely because leftist sites do not enjoy the same visibility or prominence as right-wing sites. This is due to having to serve a more critical audience, and to the integration of left-wing media

into moderate, traditional, mainstream media outlets, which are usually committed to journalistic truth-seeking norms³⁰⁰ in order to maintain their credibility with target audiences.

While media outlets seek to attract large audiences and ensure profits through influence (which can lead to competing priorities), for the majority of the election campaign the national media ecosystem remained largely focused on the race.³⁰¹ Unfortunately, as the right-wing media and counter-influence tactics of the Trump campaign, the Internet Research Agency and WikiLeaks gained traction, mainstream media sought to win back some of this influence by letting standards slip and becoming caught up in publishing salacious stories and supposed scoops, in its own system's drift to low performance.³⁰² As Benkler et al.³⁰³ explain, only 30 per cent of the American population inhabits the insular right-wing media ecosystem, indicating that it alone could not have secured the result of the 2016 election. The mainstream media's 'scoop culture' and attempts to appear balanced in reporting made it particularly susceptible to being manipulated into spreading right-wing propaganda. As a result, Trump received more coverage of his core substantive issues (immigration, jobs and trade) than Clinton, whose coverage was dominated by scandals and her campaign being associated with the terms 'emails', 'lie', 'scandal', and 'foundation'.³⁰⁴

Clinton explains³⁰⁵ that discussion of public policy only accounted for 10 per cent of all campaign news coverage during the election; the other 90 per cent comprised obsessive coverage of controversies. In 2008 the major networks' nightly newscasts spent a total of 220 minutes on policy; however, in 2016 just 32 minutes was spent on policy and 100 minutes was spent covering Clinton's emails.³⁰⁶ Mainstream media also refused to report on Clinton's detailed policy plans and criticised her for being too prepared for debates while, conversely, never challenging Trump on his lack of policy, his deceitful promises and his political ignorance.³⁰⁷ This is due to the entertainment, shock value and addictive content that could be generated from Trump's unpredictable communications, whereas Clinton's announcements were considered boring and traditional (Table 4). Most of the press were busy chasing ratings and scandals, and were lured into over-reporting on the Internet Research Agency's document dumps of hacked emails.³⁰⁸ This shifted system behaviours, with increased irresponsibility and a degradation of professional standards undermining

the mainstream media system's purpose and contributing to the rise of competing goals of subsystems within the wider national media ecosystem.

Concurrently, the spread of misinformation by the mainstream media ecosystem also increased due to pressures associated with the 24-hour news cycle and the race for breaking news. Journalists were making mistakes in haste and failing to fact check, while the internet enabled numerous untrained, amateur reporters to rapidly and widely communicate inaccurate stories, which were never redacted or corrected.³⁰⁹ Contributing to this spread of political disinformation, misinformation and tabloid clickbait was the public's quest for media coverage and political messaging that informed them as well as possible while not causing too much cognitive discomfort.³¹⁰

The social media component of the national media ecosystem further contributed to reinforcing feedback impacting on Clinton's system influence. Social media makes threats feel urgent in an unprecedented way and instils a desperate need to access information through 'breaking news', which heightens fear and weakens people's filter for falsehoods.³¹¹ Internet platforms encourage rapid sharing, identity-performative behaviours, and emotional contagions—because slowing down to fact-check content before sharing is far less compelling than reinforcing one's political opinions to an audience and gaining instant feedback.³¹² The Facebook newsfeed algorithm and online echo chambers further reinforced patterns of sharing and social contagions within the insularity of tightly clustered user communities. All these disparate dynamics aligned to enable Trump to conduct an effective online iWar campaign, gave voice to millions of Americans who had not been heard before in Washington, and enabled Russia's propaganda strategy to undermine democracy by providing it legitimacy and reach.³¹³ The contemporary phenomenon of ever-present smartphones and mobile social media access also meant any gaffes made on the campaign trail were documented and uploaded instantly, propelling words or deeds beyond the control of any politician or journalist.³¹⁴

Russian Internet Research Agency

While analysts were divided on the level of impact the Internet Research Agency had on the election outcome, there was consensus that US democracy, values and institutions were attacked by a concerted, sustained, complex Russian iWar strategy, which was assisted by Trump's campaign influencing tactics and reinforced by the right-wing media.³¹⁵

The Russian offensive dwarfed all previous efforts in terms of staffing, online accounts, automation, and infiltration of every aspect of US political dialogue—effectively launching the most politically consequential attack in history.³¹⁶ Like ISIS's, the Internet Research Agency's influence system is relatively closed and anticipatory in its resilience (Figure 2). The Internet Research Agency's original goal was to undermine democracy, and it initially targeted both sides with its multi-axis, multi-platform propaganda and information manipulation. However, due to the asymmetric political media ecosystem, it was easier to target Clinton's campaign and this was effectively enabled by the right-wing media's propaganda feedback loop.³¹⁷

Russia's iWar success can be credited partly to the seamless integration of its intelligence and security services, as well as the effective application of influencing and psychological behavioural theories.³¹⁸ Their general iWar tactics included fomenting socio-economic divides, mixing true and false messages, seeding new conspiracies, inflaming tensions, infiltrating right-wing audiences, manipulating filter bubbles and algorithms, fanning anti-government sentiment and, most significantly, hacking email servers for compromising material or 'kompromat'.³¹⁹

While attacking Clinton's campaign specifically, Russian active measures blended three layers of propaganda messaging (white, grey, black) to influence different target Democratic audiences with aggressive anti-Clinton rhetoric, contradictory theories to obscure reality, and discrediting of known facts.³²⁰ Russia's multifaceted campaign created lies to help Trump and hurt Clinton, which were promoted through social media and state-sponsored channels to the point where traditional US media unwittingly spread Russian propaganda.³²¹ The Internet Research Agency's unprecedented intensity and inundation of social media content promoting Trump resulted in computational distortions, making Trump's appeal and support base appear greater than it was.³²² When Trump won the election, the Russians were shocked: they had succeeded beyond their wildest imagination and were completely unprepared for it.³²³ Clinton³²⁴ contends that the Russian attack succeeded because democratic immunity had slowly eroded and many Americans had lost faith in the institutions previous generations relied on for objective information, including government, academia and the press, thereby leaving them vulnerable to a sophisticated misinformation campaign. It was certainly a combination of these external systems' activities that provided the counter-influence reinforcing feedback contributing to Clinton's vicious downward cycle.

Competing systems / Democratic Subsystems

The three competing external systems that impacted on Clinton's system influence stocks and became accidental adversaries were Bernie Sanders's campaign, the Obama administration, and the intelligence community (IC). The Obama administration faced the predicaments of whether to openly deal with the Russian interference and whether to defend Clinton during the Benghazi investigation, while not appearing biased towards or viewed as assisting the Democrats' campaign. Partisan politics played a key role in preventing a timely response by the Obama administration to Russia's Internet Research Agency iWar activities.³²⁵ Subsequently, the decision by the IC to delay exposing the extent of Russia's massive cyber and propaganda efforts to undermine American democracy further strengthened the counter-influence reinforcing feedback undermining Clinton's influence stocks and exposed the IC's failures in assessing the extent of the threat against domestic audiences.³²⁶

In addition to this passive inaction by the IC, which contributed to the erosion of Clinton's influence by other external systems, were the active attacks on the system's resilience by the FBI, specifically the FBI Director, James Comey. Not only did the Republican-strong FBI actively leak information to damage Clinton's campaign but also Comey's letter to Congress two weeks before polling day regarding the Clinton email server investigation effectively cost Clinton the election.³²⁷ Combined with the counter-influencing effects of other external systems, even when Comey cleared Clinton of wrongdoing, it made no difference to those in the US electorate who were susceptible to the Russian campaign's psychological exploitation tactics.³²⁸

As a Democrat Party subsystem, the Sanders campaign disrupted the holistic DNC system and contributed to its drift to low performance, while also reinforcing the counter-influence feedback against Clinton's system by becoming an accidental adversary. Sanders's retaliatory attacks on Clinton, designed to undermine her control, reputation and credibility, were based on delayed feedback, competing goals and a downward spiral of his own influence. Clinton³²⁹ explained that because Sanders could not make arguments on policy areas they agreed on, he resorted to innuendo, questioning her character and attacking her supporters. This made it difficult for Clinton to unify progressives and paved the way for a new theme in Internet Research Agency messaging and Trump's 'crooked Hillary' campaign.³³⁰

Linkages/Relationships

In Figure 15, the interlinked relationships between the system elements are depicted by arrows, coloured red if they contribute to a reinforcing feedback loop or blue for balancing feedback. As with ISIS, the fundamental relationships depicted in the model can be divided into two categories: ideological and communications.

Ideology and Narrative

Much of the Clinton campaign's influence stocks were derived from the ideology and campaign narratives that contributed to the balancing feedback loops. Providing a sense of purpose to campaign supporters through messaging that championed Democratic values, social ethics and political morality worked in conjunction with Clinton's proven experience, existing support base and transparent approach, which in turn strengthened the system's credibility, legitimacy and influence.

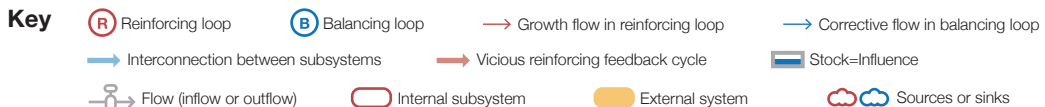
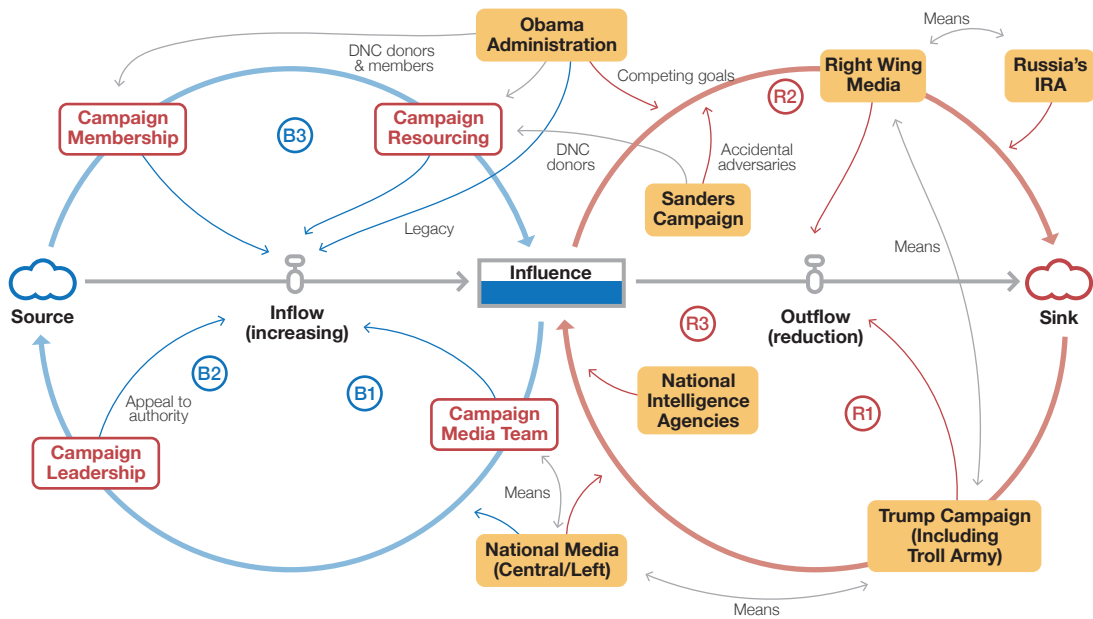
A sense of community created by campaign policies and pledges addressing equality, diversity and inclusivity was strengthened by the relationships formed through engaging minority audiences, women, and centralist-left moderates, and then reinforced through deeds that supported the messaging and countered the divisive, nationalist messaging of the Republicans. The interlinkages between internal subsystems, external systems and target audiences were strengthened through an ideology and narrative that exploited social and emotional contagions and heightened along partisan lines throughout the election campaign. Unfortunately, the resilience of these links was eroded by asymmetric reinforcing feedback that undermined the system's control of the narrative and influence stocks.

Communications Links

Both hard and soft communications links enabled the relationships created through ideology and narrative. Soft interlinkages included political, personal, economic, religious, societal, DNC membership, global and feminist relationships between the campaign system and its audiences. Strengthening these links was achieved through open, effective community engagement, visits, listening, conducting focus groups, winning debates, and the dissemination of policies, messages and ideas—and then receiving and acting on the associated feedback.

As with ISIS, hard communication links were a critical capability providing the means to influence audiences and data analytics for more tailored approaches. Hard links comprised the internet, social media and the news media ecosystem, as well as the campaign media strategy and engagement activities. Information flows via these links enabled the system's influence stocks to increase as they contributed to the balancing feedback. Unfortunately, these information flows also contributed to the negative reinforcing feedback loops by enabling biased media commentary, inundation of counter-influence content, skewed and inaccurate feedback, and the strengthening of filter bubbles, echo chambers and trolling. The baseline system model for Clinton's campaign, depicting all the key elements and interconnections, is in Figure 15.

Figure 15: Clinton campaign baseline system model—key elements and concepts



Source

- DNC ideological supporters
- Clinton / Obama supporters
- Centre-left media
- Left-leaning electorate
- Minority communities
- Feminists

B1 Sense of purpose

B2 Credibility

B3 Sense of community

Campaign Membership

- Critical thinkers, educated
- Propaganda by deed
- Force multiplier
- Virtual & physical tribe
- Fundraising / engagement
- Grassroots/community, inclusive
- Tactical / operational level

Campaign Resourcing

- Provided 'means'
- Personnel & support
- Fundraising, donors
- Capable subsystem
- Large budget & staff
- Enabled comms, media, travel & reach

Campaign Leadership

- Credibility / legitimacy
- Reputation / experience / knowledge
- Strong narrative & inspiring ideology

- Control—message, image, responses
- Strong policies / social conscience
- Relationship building
- Structured organisation
- Open system, transparent, rule following
- Engaged leadership, antithesis of Trump

Campaign Media Team

- Multi-platform, multi-level
- Savvy, experienced
- Resonance / reach / resourced
- Image & message control
- Data analytics
- Multiple feedback channels
- Factual / researched
- In-group—tailored
- PR specialists
- Access & relationships

Influence

- Target Audiences
- Central / Left Voters & MSM Swing Voters

Sink

- Lost swing voters
- Sanders supporters
- Some centralist media
- Lost comms effectiveness
- Lost control of narrative

- Lost credibility, reputation, control
- Audience disengaged / mistrust
- Lack of critical thought

- R1 Counter-influence
- R2 Loss of authority & control
- R3 Drift to low performance

Sanders Campaign

- Undermines Clinton / DNC credibility
- Attacks Clinton & supporters
- Supporters refuse to vote
- Competing goals

Right Wing Media

- Multi-platform ecosystem
- Propaganda & disinformation
- Fake news, conspiracies, counter-influence clickbait
- Filter bubbles / echo chambers
- Unbound by journalistic norms
- 'Fox News effect'

Russia's IRA

- All out iWar campaign
- Massive multi-pronged, multi-platform offensive
- Anticipatory system
- Well resourced
- Supported by intelligence
- National priority of effort

Trump Campaign (Including Troll Army)

- Strong narrative & iWar tactics
- Data analysis & manipulation
- Targeted, personalised messaging
- Emotional/social contagions
- Offering change, broke the rules
- Partisan, nationalist, divisive
- Controlled headlines, dominated spotlight, exposure
- Multi-platform, multi-pronged, inundation of content

National Intelligence Agencies

- FBI undermines Clinton with leaks
- Public comment on investigations
- Comey's actions re: emails
- Inaction on IRA iWar attacks
- Intelligence / national security failures

National Media (Central/Left)

- Diverse, multi-platform
- Journalistic standards / ethics
- Fact-checking, accuracy
- Subject to scoop culture
- Published misinformation
- Skewed coverage
- Failure to cover policy issues

Reinforcing Feedback Loops

As demonstrated through the decomposition process and modelling of the key elements (Figure 15), and like the ISIS model, Clinton’s campaign system, with a single stock, is also extremely complex, with multiple components, interconnections, flows and behaviours contributing to a countless array of configurations that could be modelled. Table 10 summarises the main reinforcing feedback loops identified in the model.

Table 10: Clinton campaign reinforcing feedback loops

Reinforcing Feedback Loop	Key	Description
Counter-Influence	R1	Influence was diminished through the conduct of effective, diverse, multi-axis counter-influence activities designed to undermine Clinton system resilience & ideology (a CC). Influence stocks were sunk by target audiences being manipulated & subsequently identifying with in-group narratives, social/emotional contagions, unifying nationalist dynamics, & heuristic biases exploited by Trump, the IRA & right-wing media. Influence stocks further weakened by the effective manipulation of comms links, info flows & behavioural economics in multi-platform attacks by external systems.
Loss of Authority & Control	R2	Influence diminished concurrently with reduced authority & a loss of control resulting from misguided reactions to R1 feedback & the targeting of Clinton’s credibility (B2). The loss of control (a CC) contributed to a downward spiral of influence, which provided momentum to negative reinforcing feedback & escalated the vicious cycle. The loss of control & authority resulted in reputational damage, undermined Clinton’s legitimacy & reinforced false perceptions, which eroded balancing feedback relating to credibility & sense of community (B2 & B3 loops).

Reinforcing Feedback Loop	Key	Description
Drift to Low Performance	R3	Clinton's balancing feedback deteriorated further & sunk influence stocks due to an internal drift to low performance, which resulted from a loss of system resilience caused by the R1 & R2 feedback loops. This drift to low performance resulted from vicious reinforcing feedback including lost support & resources, ineffective communications, competing systems' goals, subsystem policy resistance, accidental adversaries, & a decline in system resilience. Clinton's influence was undermined by a loss of credibility & control resulting from a number of internal & external system impacts & delays in the associated feedback. The R3 loop impacted the 'sense of purpose' balancing feedback (B1), due to a lowering of morale, undermining of the ideology (a CC), & increased disillusionment & division.

Counter-Influence (R1)

As described in Table 10, the counter-influence reinforcing feedback was relentless, aggressive and multi-pronged, and created a vicious escalating cycle which eroded Clinton's balancing feedback, as well as feeding the other reinforcing feedback loops. The intent driving the inundation of counter-influence feedback was the manipulation and control of target audience perceptions which undermined Clinton's legitimacy, reinforced opposing narratives and dominated the election information environment. The R1 loop was further enabled by a media and political 'propaganda feedback loop', which progressively lowered the costs of telling lies consistent with a shared political narrative, and increased the costs of resisting that narrative in the name of truth.³³¹

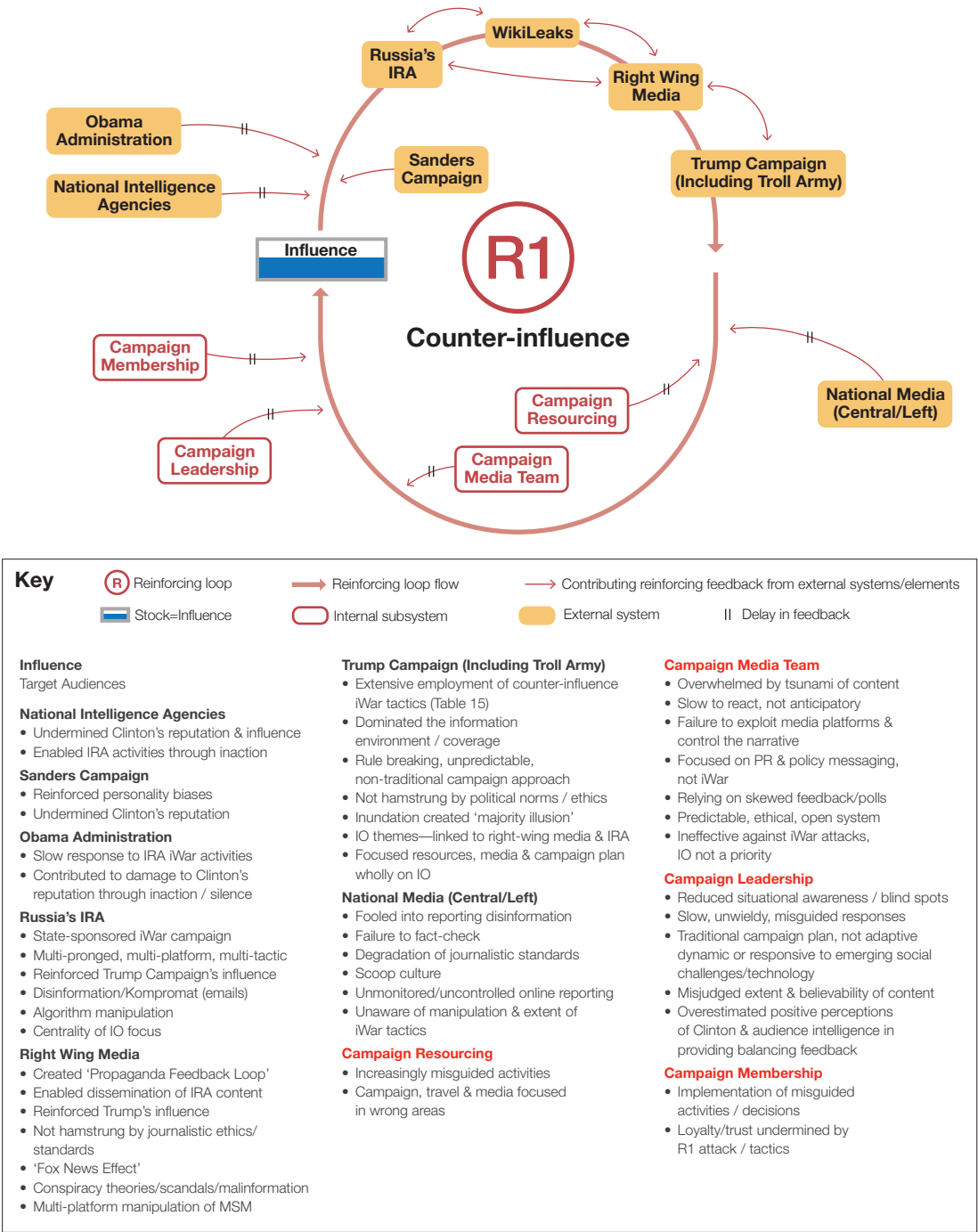
The R1 loop comprised various forms of effective influencing tactics and the exploitation of behavioural and cognitive biases by isolated external systems in order to undermine Clinton's influence stock. As the campaign progressed, however, individual systems' counter-influencing efforts became increasingly complementary and subsequently reinforced each other's outputs. For example, the Internet Research Agency took elements of a story developed by Fox News, created a new layer of fabrication, and repeated variations on the story, which was then further warped and rapidly disseminated by right-wing agitators on multiple platforms. Right-wing news outlets subsequently reported these lies as truths.

This reporting was then picked up by mainstream media, not wanting to miss the scoop, and amplified by Trump—effectively reaching millions of people.³³² This propaganda feedback loop demonstrates the power of inundation, repetition, emotional/social contagions, and personality bias confirmations, as well as demonstrating behaviours of people preferring to access entertaining content that does not require ‘System 2’ critical thought. Audiences encountered multiple versions of the same story, propagated over months, through their favoured media sources, to the point where both recall and credibility were enhanced, fact-checkers were overwhelmed and a ‘majority illusion’ was created.³³³

The combined counter-influence activities contributing to R1 resulted in American audiences relying on biases, believing disinformation, doubting facts, turning on each other, and becoming overwhelmed by the tsunami of conflicting information.³³⁴ The fusion of separate counter-influence campaigns against Clinton was further demonstrated by the identical themes underlying conspiracy theories espoused by external systems seemingly operating in parallel. Both Russia and the Trump campaign promoted themes that Clinton was corrupt, was physically and mentally unwell, and had ties to Islamic extremism³³⁵—which specifically undermined all three of Clinton’s balancing feedback loops and reinforced the R2 and R3 loops.

The extent of online counter-influence feedback impacting on Clinton’s system was enabled by hard and soft communications links. Singer and Brooking³³⁶ describe it as an ecosystem so vast it dwarfed all previous hoaxes and disinformation operations in election history, and demonstrated an unrivalled level of algorithmic manipulation and virulent political attack. The effectiveness of this online feedback contributing to the R1 loop was further reinforced by the ‘most damaging technique’ of hacking, manipulating and leaking DNC and Clinton emails, in cleverly timed releases, in order to undermine credibility, damage reputations, dominate headlines, and attack the legitimacy of the election process.³³⁷ Clinton³³⁸ describes the relentless WikiLeaks email dumps as being like ‘Chinese water torture’, where no single day was bad but the effect added up over time, contributing to an acceleration of fake news, and her campaign ‘could never get past it’. This meant that Clinton’s balancing feedback was not strong enough to counter the vicious escalating R1 loop (Figure 16). Combined with counter-influence strategies persuading audiences to vote against their economic interests by appealing to cultural issues, such as race, ‘gays, guns, and God’,³³⁹ this led to a loss of authority and control and the second reinforcing feedback loop.

Figure 16: Clinton campaign reinforcing feedback loop (R1)—counter-influence



Loss of Control and Authority (R2)

As the R1 loop escalated and undermined Clinton's influence stock, misguided system reactions by the Clinton campaign combined with those iWar effects to trigger momentum in the 'loss of control' negative reinforcing feedback loop (R2). The loss of control and authority, which were critical capabilities for the system's centre of gravity (Figure 14), resulted in reputational damage, undermined Clinton's legitimacy, and reinforced false perceptions, which eroded balancing feedback relating to credibility and sense of community (B2 and B3 loops).

Both internal and external systems contributed to the reinforcing feedback of the R2 loop, which, like R1, also escalated in a downward spiral over time—albeit not as rapidly. The R2 feedback contributing to the loss of control was achieved by external system activities undermining perceptions of Clinton, exacerbating social divisions, controlling the narrative, and eroding communications links caused by the asymmetric media ecosystem. These factors combined with increased partisan political discourse, a resultant loss of trust and loyalty among supporters, a disunity among internal subsystems, and damage to ideological legitimacy and associated relationships.

The more hits the R2 loop succeeded in landing against Clinton's reputation and political bipartisanship more generally, the more damage was done to overall system resilience. This occurred in Clinton's case by undermining subsystem unity, influence stocks and balancing feedback loops, and in relation to democracy as a whole through the weakening of institutions and the creation of disparate values and societal fissures—the relentless momentum of which was very difficult to counter or reverse.³⁴⁰

The most aggressive, effective contribution to the R2 loop was the multi-axis attacks on Clinton's credibility and reputation using psychological manipulation and influencing techniques. Such tactics included associating Trump with Jesus and Clinton with Satan to target conservative audiences; manipulating grievances and emotional contagions of Sanders supporters and black communities; and exploiting a loathing of Muslims and fears of gun control, job losses, immigration, corruption and the Washington 'swamp' to target veterans, racists, misogynists, pro-gun groups and low socio-economic audiences to vote against Clinton.³⁴¹ Effective content was focused on polarising both Clinton and various hot-button policies

by fearmongering using targeted messaging, oversimplified narratives, conspiratorial explanations, and demonising others.³⁴² Quoting lines from the leaked emails, out of context, reinforced this paranoid logic and seemingly verified false conspiracy stories attacking Clinton's credibility and integrity.³⁴³ Additionally, the inundation of salacious content attacking Clinton's reputation skewed the media coverage and further reinforced false perceptions, as residual associations remained in voters' minds, thereby overshadowing any truthful counter-messaging or policy discussion attempted by Clinton.³⁴⁴

The R2 reinforcing feedback contributing to Clinton's loss of control and authority was facilitated by the same communications links enabling the escalation of R1. Stories attacking Clinton were repeated and linked through an interconnected network of sites; those associations were then reinforced through inundation and disseminated through multiple, diverse sources, thereby increasing the stories' credibility.³⁴⁵ As a result, Clinton's system lost control over its hard and soft communication links, as well as its messaging, ideology, media strategy and narrative, which were all critical for maintaining influence stocks and protecting the centre of gravity.

From an internal system perspective, actions and reactions by the Clinton campaign also contributed to the R2 loop. The campaign media and leadership subsystems were not as shrewd as their adversaries in controlling the narrative, in having anticipatory responses, or in influence targeting. Where the Democrats provided factual, analytical explanations surrounding their campaign plan and policy positions, as was required for System 2 thinking and received well in previous elections, the Republicans shifted the focus, manipulating System 1 cognitive behaviours to stir up anger, resentment and despair, and divide the electorate. The DNC's carefully considered, detailed messaging was ineffective, boring and unsatisfying to voters with existing cognitive biases and high emotions.³⁴⁶ The politics of cultural identity and resentment overwhelmed any evidence, reason and personal experience presented to the voting public, and control over the messaging was lost to the Republicans.³⁴⁷

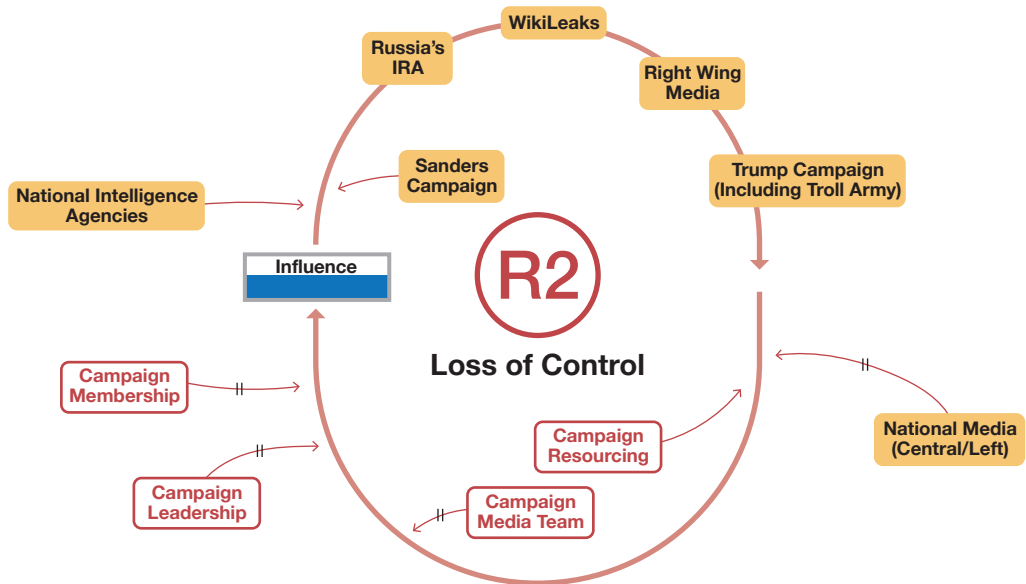
As a result, the Clinton campaign was viewed as overly educated, liberally elite, wealthy, unrelatable and aloof, leading to a loss of control over its image portrayal, and was unable to effectively counter the pessimism and social contagions espoused by Trump and the Internet Research Agency.³⁴⁸ Additionally, the internal subsystems of Clinton's campaign failed to realise

the extent of rage and resentment building across America resulting from R1 and R2 feedback, thereby undermining the system's resilience in its ability to adapt or respond appropriately. The campaign did not assess the attacks on Clinton as credible or worth responding to, given Clinton's reputation, record of independence, and experience in politics. It also underestimated the levels of sexism and misogyny across the electorate further undermining Clinton's authority.³⁴⁹ This inaction, combined with delayed feedback from a lack of situational awareness and inaccurate polling, further reinforced the loss of control (R2) and system influence stocks.³⁵⁰

The leadership subsystem inadvertently contributed to the R2 loop considerably—not only because Clinton herself was as unpopular as Trump and the electorate was potentially suffering 'Clinton fatigue' but also because its messaging lacked the authenticity of Trump's unpredictable hyperbole.³⁵¹ Trump's captivating Twitter feed, where people felt he was talking to them, was in stark contrast to Clinton's, whose tweets were sometimes crafted by a team of 11 staffers.³⁵²

Notwithstanding the specific error of the 'deplorables' comment, as the R1 and R2 loops escalated, the leadership subsystem increasingly employed misguided reactions. Fact-checking was powerless in countering the rapid inundation of disinformation. Denials and explanations strengthened scandals and allowed them to remain front page news and foremost in voters' minds. Accidental adversaries, such as Sanders and Comey, reinforced adversary attacks against Clinton's image.³⁵³ As a result, the Clinton team was unable to regain the initiative and strengthen balancing feedback, thereby losing control of the narrative, the presidential candidate's reputation, and the loyalty of her supporters, which in turn further undermined the system's influence stocks and the leadership's interconnections with the other three internal subsystems. The R2 reinforcing loop is depicted in Figure 17.

Figure 17: Clinton campaign reinforcing feedback loop (R2)—loss of control



Key

(R) Reinforcing loop

→ Reinforcing loop flow

→ Contributing reinforcing feedback from external systems/elements

Stock=Influence

Internal subsystem

External system

|| Delay in feedback

Influence

Target Audiences

National Intelligence Agencies

- Unethical public comments re: email server & Benghazi investigations
- Leaking info re: Clinton
- Biased towards Republicans

Sanders Campaign

- Reinforced content attacking Clinton's image & reputation
- Encouraged supporters' grievances
- Encouraged mistrust of DNC & Clinton
- Accidental adversaries

Russia's IRA

- team & ability to respond
- Cyber attacks, iWar tactics undermined Clinton's control of her reputation, legitimacy & credibility
- Overwhelmed Clinton's media cking of emails / servers
- Content designed to undermine DNC trust / loyalty & exacerbate divisions

WikiLeaks

- Cannily timed, constant document drops

Right Wing Media

- Dominated the IE with propaganda & attacks on Clinton
- Content to damage Clinton credibility, reputation, image
- Content demonising Democrats, generating fear & anger

- Reinforced Trump's control & influence
- Content designed to cause DNC infighting & division
- Undermined Clinton's Ideology & messaging

Trump Campaign (Including Troll Army)

- iWar tactics undermined Clinton's control of reputation/image
- Controlled the narrative, media coverage, & IE focus
- Emotive/social contagions
- Anger, outrage, fear drove campaign messaging
- Increased partisan divisions, in-group, hate-speech, nationalism
- Targeted iWar messaging
- Created a culture war

National Media (Central/Left)

- Ignored, dislocated Clinton's messaging & ideology
- Reporting of right-wing & IRA content
- Shift away from fact-checking / reporting truth
- Lowered journalistic standards
- Pursued own agenda, lost impartiality
- Skewed coverage favouring Trump
- Reinforced false perceptions arising from scandals
- Reported scandals, scoops & clickbait—not requiring System 2 thinking by audiences

Campaign Resourcing

- Misguided media strategy & influence activities

Campaign Media Team

- Lost control of comms links
- Lost control of narrative & domination of IE

- Relationships with mainstream media eroded
- Overwhelmed by multi-platform inundation
- Lacked rapid, anticipatory responses
- Underestimated extent of rage/resentment created by R1
- Couldn't counter Increased emotive & partisan political discourse with rational/ logical messaging
- Hamstrung by ethics, transparency, values, truth
- Competing goals, reactive messaging not IAW leadership intent / ideology or engaging for audiences

Campaign Leadership

- Disunity among internal subsystems
- Couldn't counter increased emotive & partisan content
- Overwhelmed by relentless momentum of IO attacks / doc drops
- Averse to employing same emotion evoking tactics as Trump
- Denials reinforced negative conspiracies
- Factual, analytical messaging couldn't win the culture war
- Misunderstood extent of success of iWar attacks on influence

Campaign Membership

- Loss of trust & loyalty
- Loss of situational awareness
- Competing goals
- Disparate values & societal fissures

Drift to Low Performance (R3)

The effects of R1 and R2 feedback on Clinton's campaign system as a whole, as well as on the behaviours and linkages of the individual subsystems, resulted in a drift to low performance archetype, resulting in a downward spiral feeding a third reinforcing loop (R3). As with ISIS, this descending performance drift was a gradual process, where exponential growth of trivial problems worsened over time, and this slow growth failed to raise alarms until the system experienced the effects in real time.³⁵⁴ But Clinton's campaign was not as resilient as ISIS in its reactions and ability to counter the negative feedback; therefore its balancing feedback, influence stocks and overall performance deteriorated more rapidly.

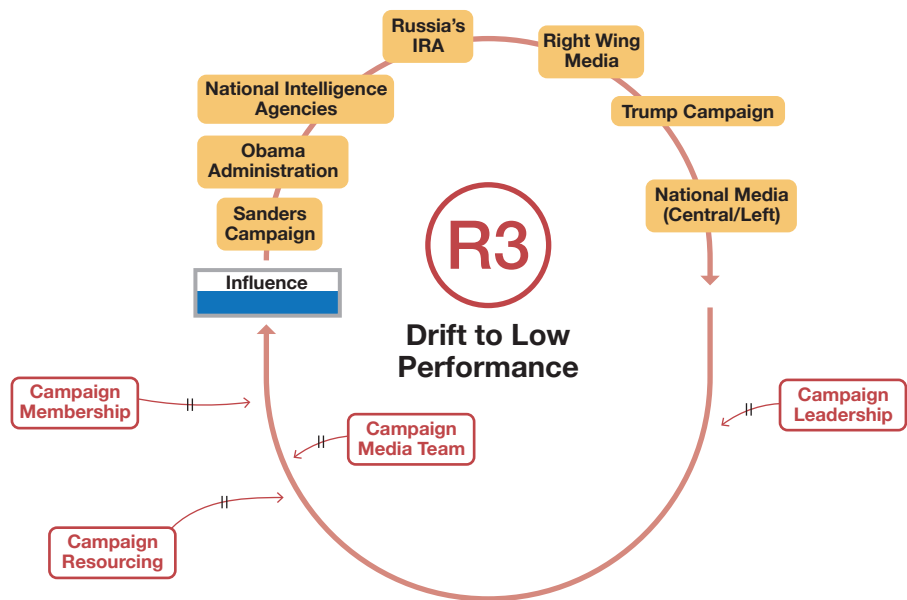
Clinton's system influence had already deteriorated from counter-influence attacks (R1) and a loss of community cohesion (B3), which caused a loss of credibility (B2) and control (R2). The R3 loop added to the vicious cycle of reinforcing feedback by predominantly impacting on the sense-of-purpose balancing loop (B1), due to a lowering of morale, undermining of the ideology (a critical capability), increased disillusionment, and internal division. This drift to low performance affected all four subsystems as a result of lost support, donations and resources; ineffective communications; competing systems' goals; subsystem policy resistance; accidental adversaries; and a decline in system resilience.

As Clinton's leadership subsystem contributed to the R2 reinforcing feedback, so too did its behaviours and actions reinforce the R3 drift to low performance. The hierarchy was too large, unwieldy and slow to react. Conducting the campaign in the same old traditional, conventional manner, without regard for modern communications technology and not anticipating iWar attacks, resulted in a malfunctioning subsystem failing to meet its goals. Clinton was increasingly dislocated from the messaging; it was no longer her voice or vision being disseminated, which undermined authenticity and ideology. The system became increasingly isolated from the ground truth. It lacked awareness of the actual situation across the electorate as it relied on skewed polling and delayed feedback, and was unaware of counter-influence success being achieved by external systems. The poor performance and sub-optimisation resulting from this bounded rationality further weakened the campaign's balancing feedback, led to misguided decision-making, lowered expectations, competing goals, and quick fixes, all of which created unwanted behaviours and drove results down further.

'Accidental adversaries' are seen when independently chosen, misguided solutions by various systems or subsystems inadvertently obstruct each other's performance in a vicious cycle.³⁵⁵ This phenomenon was evident during the 2016 election and contributed to the R3 loop. The Clinton campaign, the media, the Obama administration, and Sanders supporters were all trying to optimise their own performance independently of the other systems. This resulted in competing goals, contradictory and undisciplined messaging, and quick fixes—and ultimately undermined them all.³⁵⁶

The R3 loop was further reinforced by system overload resulting from high aspirations for Clinton as the inevitable frontrunner, incorrect resource allocation, escalating goals and expectations, and difficulties in measuring progress, which all impacted on system resilience and subsystem performance.³⁵⁷ Specifically, the drift to low performance resulted in Clinton's approval numbers dropping, increased distrust, messages being blocked or overwhelmed, greater criticism, analytical blind spots, and more mistakes.³⁵⁸ This downward spiral of Clinton's campaign system could be defined as a 'sticky trajectory', in that it failed to achieve its goals despite having more resources, funds, experience and credibility than Trump.³⁵⁹ The R3 loop comprising all of these factors is depicted in Figure 18.

Figure 18: Clinton campaign reinforcing feedback loop (R3)—drift to low performance



Key			
	Reinforcing loop		Reinforcing loop flow
	Stock=Influence		Contributing reinforcing feedback from external systems/elements
	Internal subsystem		External system
			Delay in feedback
Influence			
Target Audiences			
Sanders Campaign / Obama Administration / National Intelligence Agencies / Russia's IRA / Right Wing Media / Trump Campaign / National Media (Central/Left)			
<ul style="list-style-type: none">• Counter influence activities contributing to R1 feedback loop• Counter authority/control activities contributing to R2 feedback loop• Enhanced DNC & Clinton system fissures, competing goals• Empowered accidental adversaries / competing subsystems• Contributed to undermining Clinton system resilience & cohesion, corrosion of interlinking relationships & bonds• Reinforced Clinton's downward spiral of influence, paradigms of losing / being overwhelmed, downward drift of subsystem performance• Undermined morality: contributed to cynical public discourse, immorality not held to account, idealism was ridiculed			
Campaign Leadership			
<ul style="list-style-type: none">• Loss of situational awareness, control & authority (blind spots)• Loss of control of narrative, image• Loss of resilience & ability to anticipate or react rapidly or appropriately• Corrosion of ideological bonds, loss of appeal• Increasingly isolated/dislocated messaging• Competing & eroding goals of subsystems, quick fixes backfired• Degradation of system unity, cohesion & relationships• Lowered expectations• Losses in target audience support, influence over swing voters			
Campaign Resourcing			
<ul style="list-style-type: none">• Reduced support, donations, resources• Reduced performance—fundraising & spending• Eroding goals, policy resistance• Misguided spending decisions / resource allocation• 'Sticky Trajectory'			
Campaign Media Team			
<ul style="list-style-type: none">• Declining ability to influence due to R1 impacts• Degraded communications, media standards & influencing efforts• Decline in system resilience• Degradation of system interconnections• Inability to counter IO effects (R1/R2 feedback) on subsystems & balancing loops• Competing goals / policy resistance• Loss of situational awareness & ability to anticipate or react appropriately			
Campaign Membership			
<ul style="list-style-type: none">• Lowering of morale• Increased disillusionment & internal division• Competing goals / policy resistance• Sense of purpose & community undermined• Lower expectations, dwell on negatives• Increasingly isolated from other subsystems			

Balancing Feedback Loops

The balancing feedback loops that should have kept Clinton’s system state at an acceptable level were overwhelmed by the downward cycle created by the reinforcing feedback loops. A system will eventually collapse should the vicious downward spiral resulting from reinforcing feedback loops be allowed to escalate unabated, without any effective balancing feedback to slow the flow.³⁶⁰ While Clinton’s campaign was increasingly dominated by a vicious cycle of strong reinforcing feedback loops creating a rapid downturn in influence stock, balancing feedback ensured the system survived and maintained base-level sources and stocks. The three key balancing feedback loops identified in this system analysis are summarised in Table 11.

Table 11: Clinton campaign balancing feedback loops

Balancing Feedback Loop	Key	Description
Sense of Purpose	B1	Influence over target audiences grows, motivation of members is reinforced, & ideological narratives spread when there is justified belief in the cause. Achieved when the purpose is perceived as authentic, legitimate, & just; & when pride is derived from participation. Clinton was marketed as an ethical, democratic champion—fighting for the rights of minorities, women, & socio-economic equality. B1 also benefited from Obama’s legacy, strong social policies, & resonant, authentic messaging—a stark contrast to hateful, xenophobic Republican messages.
Credibility	B2	Exploited Clinton’s reputation to reinforce credibility & increase influence. Key aspects contributing to B2 were Clinton’s political experience, transparency, ethical policies, authentic messaging, knowledgeable/factual claims, willing to admit mistakes, proven performance, & residual political currency from Bill Clinton’s legacy & her time as Secretary of State.
Sense of Community	B3	Influence gained through a sense of community. Clinton portrayed as a mentor/leader for women, fighter for minority rights, champion of diversity & Democratic/left social policies. Presented as the polar opposite of racist, sexist right-wing media & Trump. System source included diverse support base & strong relationships. Policies addressed wide range of social solutions, campaign, researched & understood target audiences & issues.

Sense of Purpose (B1)

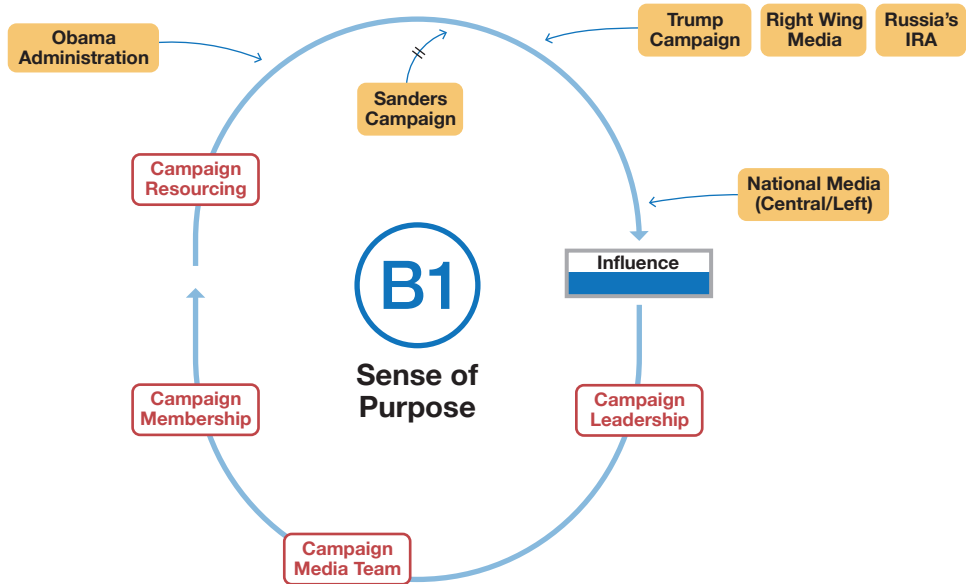
Like ISIS's reinforcing feedback loop that provided a sense of purpose, Clinton's B1 loop also provided a competitive system of meaning by targeting audiences with resonant messaging, a strong narrative, and authentic appeals to both pragmatic and perceptual factors, which contrasted starkly with the pessimistic Republican ideology. The B1 loop not only enhanced influence and countered negative reinforcing feedback for Clinton's system, but also projected balancing feedback against other external systems, such as the Trump campaign and right-wing media. As described in Table 11, a justified belief in the cause, garnered from the sense of purpose and optimism, reinforced the source support and influence among the Democrats' own 'tribe' and resonated with other target audiences still undecided on how to vote.

Clinton's campaign marketed itself as an ethical, righteous, democratic champion—fighting for the rights of minorities, women, diverse social groups, and socio-economic equality. The B1 loop also benefited from espousing policies that would continue Obama's legacy and protect democratic values and the attractiveness of America on the world stage, which had proven to be the most successful narrative in previous elections.³⁶¹ The media and leadership subsystems were also able to reinforce the sense-of-purpose balancing feedback through the exploitation of centralist and left-wing cognitive biases and social contagions of fear, disgust and disbelief regarding Trump's abrasive personality, outrageous rule-breaking tactics, and extreme, polarising right-wing messaging.³⁶²

Clinton³⁶³ explains that, unlike the Trump campaign, she wanted her policies to be bold, innovative, industrious and responsive to people's real-life needs, and her associated messaging to have substance and be based on community feedback. This connection of ideology with subsystem actions in the B1 loop was the most effective method of influencing—that is, propaganda by deed. It motivated people to cooperate as they could see the big picture and their role in it.

The B1 loop allowed both audiences and the system's elements to appreciate how their individual success depended on the success of all stakeholders and their effective collaboration in overcoming the polarisation of US politics. Figure 19 shows the B1 loop and system contributions to enhancing the sense of purpose and the influence stock.

Figure 19: Clinton campaign balancing feedback loop (B1)—sense of purpose



Key

ⓑ Balancing loop

→ Balancing loop flow

→ Contributing balancing feedback from external systems

Stock=Influence

Internal subsystem

External system

|| Delay in balancing feedback

Influence

Target Audiences

Campaign Leadership

- Provided resonant, inclusive ideology & purpose
- Developed competitive system of meaning
- Empowered supporters with purpose & pride, ethical social cause
- Clinton's reputation / proven record inspired belief, trust & support
- Tailored messaging to engage target audiences with resonant, strong narrative
- Authentic appeals to pragmatic & perceptual factors
- Ethical, righteous, democratic champion—fighting for rights of minorities, women, diversity & socio-economic equality
- Contrasted against Republican narrative re: inclusion, equality, social solutions

Campaign Media Team

- Garnered optimism, belief in the cause
- Reinforced influence & Clinton's reputation/experience
- Reinforced 'propaganda by deed' with effective messaging fusing grassroots activities & Clinton's ideology
- Provided legitimacy & authenticity to ideology & policies
- Appeals to pragmatic & perceptual factors, exploited heuristics

- Exploited social/emotional contagions
- Exploited communications links, data analytics, relationships, multimedia channels & global reach

Campaign Membership

- Garnered broad spectrum of grassroots support
- Activities/deeds backed up ideology / social policies
- Empowered supporters with purpose & pride
- Authentic, experienced members & leadership
- Passionate DNC / left-wing source supporters
- Sense of purpose, pride & community

Campaign Resourcing

- Well staffed & resourced
- Empowered subsystems
- Enabled propaganda by deed
- Strengthened 'means', reach, communications
- Positive feedback of donor support—belief in cause
- Fundraising boosted by ideology / purpose / pride / ethical policies

Obama Administration

- Provided DNC ideological / social policy legacy
- Democratic values/ethics provided campaign base
- Contributed to source support/influence
- Clinton's proven experience/reputation as Secretary of State backed up messaging with proven past deeds

Sanders Campaign

- Agreed with Clinton on policy
- Undermined own support by attacking Clinton's character

Trump Campaign / Right Wing Media / Russia's IRA

- Generation of outrage, fearmongering, racism, sexism, personal attacks turned audiences off, unrelatable, negative
- Multi-platform inundation, theft of personal data, lies & disinformation undermined influence & credibility
- Right-wing / partisan discourse too extreme & pessimistic for mainstream audiences
- Trump's lack of policies & experience undermined his influence
- Superficial content did not appeal to educated audiences / critical thinkers

National Media (Central/Left)

- Multi-platform, far reaching, global
- Balanced, unbiased, ethical, factual—journalistic standards
- Supportive of Democratic/Clinton's policies & ideology
- Analytical, investigative, substantive stories
- Assisted in system 'means' (CC) of communication & dissemination of ideology

Credibility (B2)

The importance of having and maintaining system credibility in ensuring legitimacy, control, authenticity and effective influence was identified in the influencing research. The B2 loop reinforcing Clinton's campaign credibility was fed by her established reputation and political experience; the media subsystem's authentic messaging and reputation management; the leadership subsystem's researched, ethical, targeted policies based on lessons learnt and community engagement; the membership subsystem's belief, support and dissemination of ideology at the grassroots level as a social contagion; and the resource subsystem's funding of targeted activities that backed up the narrative with deeds.

External systems also contributed to the B2 loop, with the positive legacies of Obama's and Bill Clinton's administrations, the supportive unbiased media coverage from the central-left media ecosystem, and the initial lack of credibility surrounding Trump as a candidate and the Republicans' recent lack of political experience.

Clinton's subsystems applied lessons learnt from the Obama campaign regarding advanced data analytics to further strengthen the B2 loop and enhance influence stocks.³⁶⁴ Specifically, the subsystems collaborated in developing holistic system B2 feedback in their determination to obtain the best data, deploy more field organisers, create the biggest fundraising network, and establish the deepest political relationships—with no in-fighting or rivalries.³⁶⁵ Clinton individually contributed to her credibility by seizing the initiative through early policy development and inspired messaging in order to mobilise support and inform target audiences of her vision, what they could expect, and how her election success would affect their lives.³⁶⁶

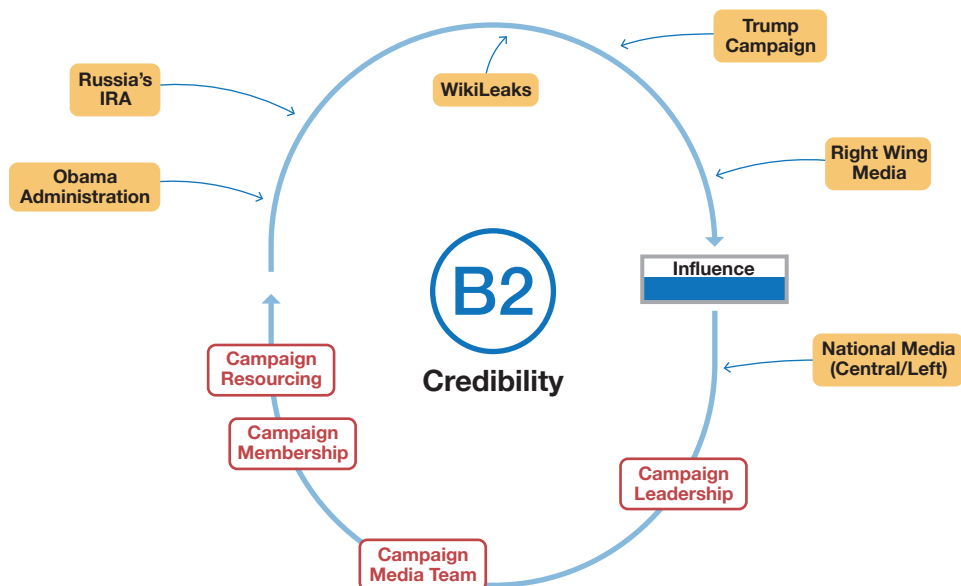
The B2 loop complemented the other balancing feedback loops in strengthening both internal and external system relationships. This was achieved by reinforcing the in-group sense of community and the righteous sense of purpose of the campaign, and through building credibility via authentic influencing activities.

The B2 loop remained strong throughout the election campaign despite the escalation of reinforcing feedback working against it. The B2 loop also increased system resiliency due to a large majority of voters being turned off by fake news, lies, hate speech, propaganda, right-wing conspiracy theories, and abuse of the internet commons. Additionally, these same

moderate voters were critical thinkers, were more highly educated, and received their news from a diverse range of sources—external to the right-wing media echo chambers.

That is not to say the R1 and R2 loops did not have an effect on the B2 loop. Clinton's campaign largely ignored fake conspiracy scandals attacking her credibility or reputation, so as not to give the stories validity in the mainstream media. However, this presented a paradoxical conundrum for the system. On one hand, its silences and omissions were viewed as suspicious and aloof, and dislocated its control of the narrative; on the other, when it did try to directly refute the lies, clarify the facts or own up to mistakes, this often backfired and reinforced the vicious cycle.³⁶⁷ Additionally, the external system of mainstream media failed in its journalistic objectivity and lost its balanced perspective towards the end of the campaign, with the associated coverage impacting on Clinton's B2 loop and ultimately affecting the outcome of the election.³⁶⁸ The B2 credibility balancing feedback loop is depicted in Figure 20.

Figure 20: Clinton campaign balancing feedback loop (B2)—credibility



Key

ⓑ Balancing loop

→ Balancing loop flow

→ Contributing balancing feedback from external systems

▬ Stock=Influence

▭ Internal subsystem

▭ External system

Influence

Target Audiences

Campaign Leadership

- Clinton's proven political experience, established reputation
- Established key relationships/networks—political, economic, social, community
- Credentials in strategic policy, feminism, equality, diversity, minority issues
- Transparent, open, factual messaging, admitted mistakes/weaknesses
- Researched, ethical, targeted policies based on lessons learnt & community engagement
- Seized initiative through early policy development & inspired messaging
- Credibility ensured legitimacy, control, authenticity & effective influence

Campaign Media Team

- Authentic messaging & reputation management
- Strong PR campaign re: image, capabilities, proven results, achievements
- Good audience engagement & collection of analytic data for tailoring messages, policies & reinforcing credibility
- Media content was factual, researched, relevant, problem solving

Campaign Membership

- Fuelled positive social contagions
- Inclusive community feel, trust, teamwork

- Numerous field organisers reinforcing image & vision
- No rivalries/infighting
- Belief, support & dissemination of ideology at grassroots level

Campaign Resourcing

- Funding network conducted targeted activities to reinforce the narrative with deeds
- Positive feedback of credibility on increasing donor support
- Reinforced by good charity work of Clinton Foundation

Obama Administration

- Contributed to a positive legacy of authenticity & credibility
- Provided lessons on advanced data analytics, grassroots engagement & tailored messaging
- Unified DNC resilience against right-wing propaganda

Russia's IRA

- Public outing of IRA iWar tactics, accounts, content undermined credibility & belief in its sources
- Poor-quality content from bot & troll accounts
- Nonsensical, bad English, blatant fake news

WikiLeaks

- Lost its own credibility when proven to be a Russian puppet, assisting in attacking Clinton, democracy & US institutions

Trump Campaign

- Lacked credibility, substance & political experience
 - Lies, deceit, unethical behaviour undermined credibility
 - Inauthentic, superficial, unintelligent messaging
 - Personal attacks, emotive System 1 partisan discourse
 - No policies, just soundbites designed to stir fear/outrage
- #### Right Wing Media
- Disinformation & lies undermined messaging & influence
 - Shallow content, fake news, lies, hate speech, propaganda, right-wing conspiracy theories & abuse of internet commons undermined effectiveness, reach, & credibility of right-wing media
 - Unrelatable, unbalanced, polarising content ignored by mainstream media, moderate audiences
 - Proven dissemination of IRA content, propaganda feedback loop

National Media (Central/Left)

- Supportive, unbiased media coverage
- Championed Clinton's reputation, achievements & leadership
- Diverse sources provided factual content
- Held to account by educated audiences, critical thinkers

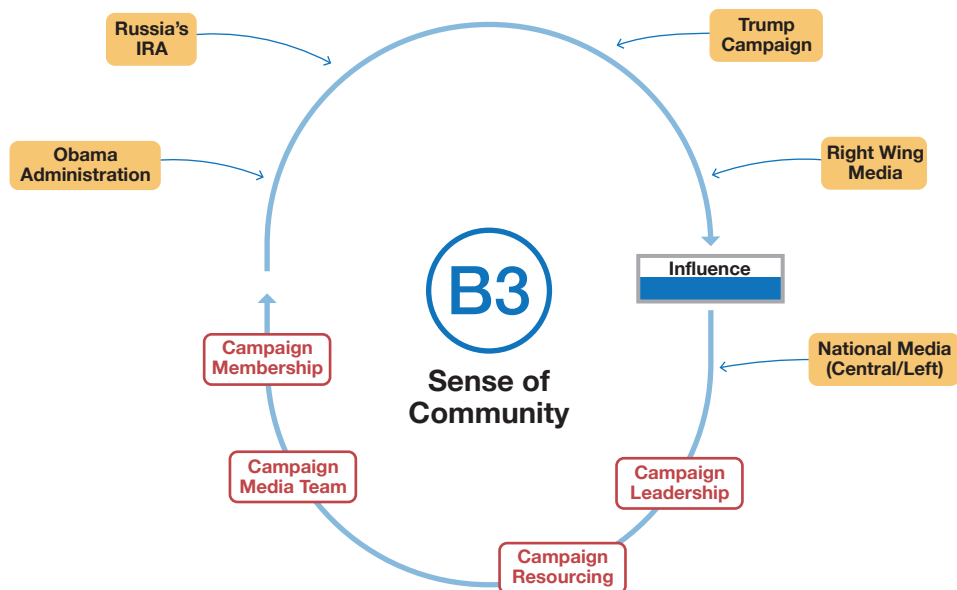
Sense of Community (B3)

Complementing the B1 and B2 feedback loops was an inherent sense of community, carefully managed by the system and uniquely achievable by Clinton playing on her strengths—as a female Democratic candidate campaigning on a platform of social justice, minority rights and championing equality and diversity. Clinton's supporters were also more highly educated and engaged with her narrative, meaning her social policies and inclusive narratives interested and resonated with audiences, while reinforcing the sense of community and an 'us versus them' confirmation bias against the 'hateful, xenophobic, nationalist, and misogynist' right wing.

Clinton's system approach to engaging with and receiving feedback from communities, organisations, minorities and social groups to adjust policy platforms and fund activities reinforced the B3 loop. These activities combined with an exploitation of emotional and social contagions related to the increasing polarisation of US politics, resulting in increased buy-in, participation and investment of target audiences along partisan lines, and created a sense of belonging to the righteous, inclusive 'tribe'. Benkler et al.³⁶⁹ explain that social identity is linked to party affiliation and that when people choose sides, they become emotionally invested in promoting their side and opposing the other side. These group bonds determine opinions on issues and the interpretation of political events, and exacerbate polarisation, biases and anger.

While this phenomenon was wholly apparent on the right wing of politics with Republican supporters reacting with increasing levels of anger and outrage, Clinton's B3 feedback and interconnections also benefited from this partisanship. Just as ISIS did in creating its sense of community, Clinton's system created messaging around both perceptual and pragmatic factors. Perceptual aspects included the aforementioned in-group identity-choice appeals and crisis-solution constructs designed to shape audience understanding of potential election outcomes. Appeals to pragmatic factors included the security and stability of the nation and the socio-economic quality of life of the voters. Rational-choice appeals were also employed, using themes regarding Trump's hypocrisy, evil intent and lack of credibility, while framing Clinton as the champion of minorities, women and equality. The B3 balancing feedback loop is depicted in Figure 21.

Figure 21: Clinton campaign balancing feedback loop (B3)—sense of community



Key

Balancing loop
 Stock=Influence

Balancing loop flow
 Internal subsystem

Contributing balancing feedback from external systems
 External system

Influence

Target Audiences

Campaign Leadership

- Experienced, supportive leadership & socially responsible governance
- Focus on community building, minority, equality, diversity issues & rights
- Champions of democratic values, social justice, maintaining Obama's legacy
- Provision of authority, framed itself as champion of minorities, women & equality
- Leverage existing ideological sources & supporters
- Exacerbated partisan division developed by right wing
- Provided ethical, authentic, socially orientated ideology to bind communities, create reassurance, strengthen links
- Exploit social-identity pressures, social contagions, morals/values
- Increased polarisation of politics, only choice for left-leaning audience

Campaign Resourcing

- Provision of community initiatives & engagement activities
- Resources enabled other subsystems to reinforce inclusivity
- Enabled community & relationship building

Campaign Media Team

- Effective, multi-platform IO campaign exploiting biases, heuristics & contagions to enhance feelings of belonging to the 'righteous' side

- Reinforced sense of community provided by DNC values & loyalty
- Listened, engaged, acted on feedback from communities
- Exploited emotional/social contagions related to the increasing polarisation of US politics
- Perceptual appeals to 'in-group' identity-choice & crisis-solutions
- Pragmatic appeals to stability, safety, socio-economic issues
- Rational choice appeals re: Trump's lack of credibility, hypocrisy, evil intent

Campaign Membership

- Camaraderie, team environment, in-group
- Engender loyalty via social/community initiatives
- Social/emotional/rational appeals
- Local organisers familiar with community, people, represent their issues, increased loyalty
- Peer pressure, social & family expectations
- Anti right-wing sentiment, us vs them

Obama Administration

- Shared ideology, DNC values & supporters
- Existing sense of community & grassroots support
- Provision of source members
- Inclusive, had support of black communities, minorities

Russia's IRA

- Reinforced partisan sentiment & central-left support of Clinton
- Undermined right-wing media credibility with certain audiences when exposed

Trump Campaign

- Created own in-group sense of community of white, nationalist, right-wing audiences
- Lack of effective social policies & initiatives
- Divisive, pessimistic IO messaging, lacking authenticity or critical thought
- Viewed as 'hateful, xenophobic, nationalist, misogynist' by moderate audiences

Right Wing Media

- Extreme right-wing content reinforced partisan polarisation, pushed swing voters towards Clinton
- Right-wing content focused on white nationalist values, not inclusive to minorities, migrants, women
- Demonised the 'other' / non-right-wing out-group
- Exposure of Russian content undermined appeal & trust of US nationalists & patriots

National Media (Central/Left)

- Reinforced 'righteous tribe' construct & Clinton's ideology
- Social/community policies were of interest to moderate central-left audiences
- Global reach tested Clinton's ideology/policies, reinforced relevance & utility
- Contrasted optimistic, inclusive social values of Clinton against Trump's divisive, negative, pessimistic messaging

Delayed Feedback

As depicted in the reinforcing feedback loop diagrams, the Clinton campaign suffered from delays in feedback when its influence stock started to decline, which undermined its ability to react effectively. This delayed feedback also reduced the Clinton campaign's system resilience at a much faster rate compared to ISIS, due to the nature of the campaign being more open and fragile on the starting scale of system characterisation (Figure 2). As Meadows³⁷⁰ explains, the information delivered by a feedback loop can only affect future behaviour; it cannot correct behaviour that drove the current feedback in real time. This means there will always be delays in responding by decision-makers. If a system is not anticipatory in its resilience and lacks situational awareness, as Clinton's system experienced, then further reactive, misguided decisions and actions are implemented, further contributing to the downward spiral and loss of influence.

To counter the effects of delayed feedback, an analysis of historical trends is recommended, rather than focusing on current events or fluctuating flows, in order to properly understand system dynamics and reasons for behaviours.³⁷¹ The DNC ignored important lessons from past elections, and Clinton's system lacked situational awareness and resilience to anticipate and correct these behaviours. Clinton herself admitted:³⁷²

*I didn't realise how quickly the ground was shifting under our feet.
I was running a traditional presidential campaign, playing by the rules,
with carefully thought out policies and painstakingly built coalitions.
Trump was running a reality TV show that expertly and relentlessly
stoked Americans' anger and resentment.*

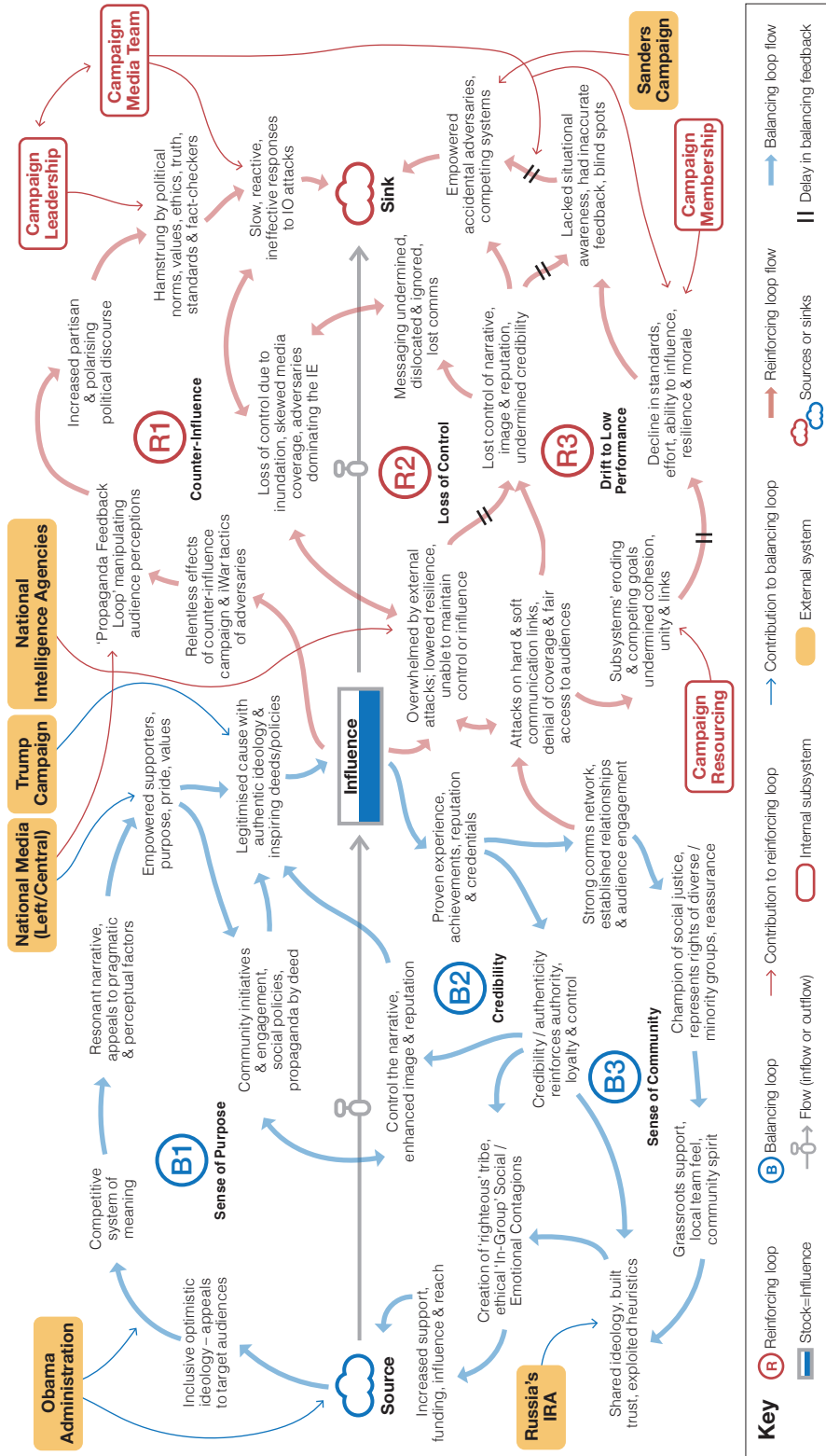
The corrective processes employed by Clinton's system in response to the delayed feedback failed due to an employment of quick fixes, a failure to appreciate the time required to effect change, and a weakening of the balancing feedback loops once the R3 loop gained momentum.

Clinton Campaign: System Findings

Figure 22 depicts the holistic system diagram for the Clinton campaign. The following four key themes contributed to the Clinton's campaign system's ineffectiveness at maintaining its influence stocks:

1. The system characteristics of Clinton's campaign. It was an open system with lower levels of resilience and, therefore, a higher propensity towards increasing fragility and a lack of responsiveness (Figure 2).
2. The inefficiency of system flows both via feedback loops and through hard and soft interconnections between key elements, which led to delays in feedback, misguided responses, a lack of situational awareness and an asymmetric increase of reinforcing feedback.
3. Increasingly losing control, specifically of the narrative, the campaign's credibility and Clinton's image. Control is both a critical capability and a vital balancing element for increasing influence stocks (Figure 17).
4. Lacking a centrality of focus. Unlike those of ISIS, the Clinton campaign's influence activities were not the main priority driving all system outputs. The campaign's stovepiped, slow, traditional campaign media strategies contrasted sharply with the agile, adaptive iWar tactics of Clinton's adversaries. This lack of focus on the system's stock and purpose contributed to the asymmetric escalation of all three reinforcing feedback loops.

Figure 22: Holistic Clinton campaign system diagram



Discussion

*There are but two powers in the world, the sword and the mind.
In the long run, the sword will always be beaten by the mind.³⁷³*

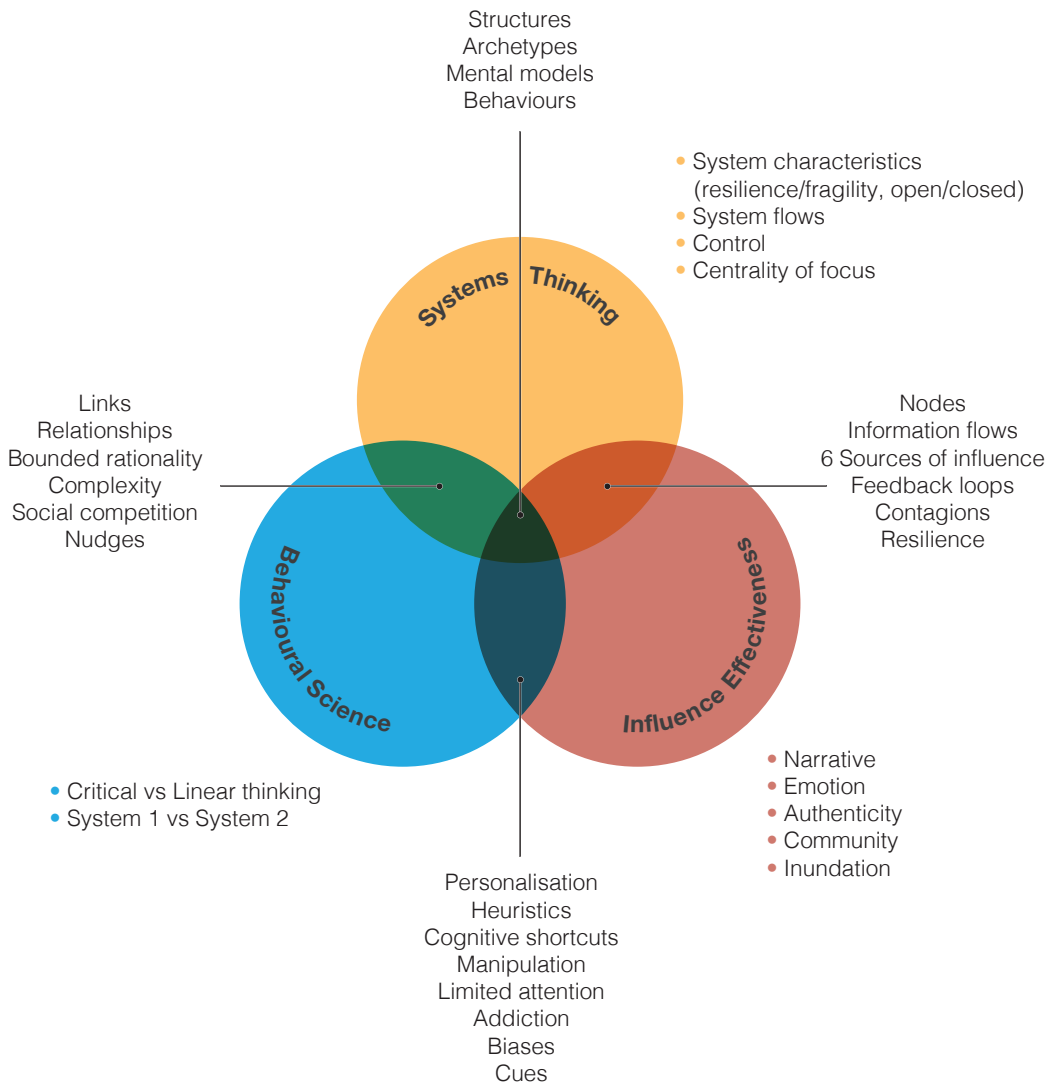
Despite doctrine stating that ‘in war, the fundamental goal is to make the adversary comply with your will’,³⁷⁴ Western militaries, in contrast to their enemies, decentralise influencing activities and segregate the associated analysis and targeting disciplines into niche, professional stovepipes. Western militaries and government organisations rarely internally analyse their own systems holistically. They fail to employ a fused approach to the iWar, and fail to harness the benefits of behavioural economics as an integrated, centralised focus of the whole system. Additionally, there is an inherent resistance to change present in both military culture and politics, which presents a significant barrier to adopting critical thought and innovative iWar solutions.

The research has demonstrated that governments, corporations, analysts, strategists and academics have all been investigating how to better influence target audiences and exploit cognitive human behaviour for many years. There is a long and colourful history associated with the evolution of media and advertising, while propaganda and controlling the narrative are established influencing activities as old as warfare itself.³⁷⁵ The collective interest in these fields increased following the results of Russian interference in the 2016 US election and Brexit. Systems thinking theory has also developed over a number of years and the associated literature continues to evolve to better apply the principles to improving our own complex social systems in the modern interconnected world.

Because influencing activities, cognitive behaviours, and systems thinking have all been impacted upon by the interconnected global information environment of cyberspace, research into the results of such modern effects is required to address the gaps in the accepted knowledge. However, researching all three disciplines as they relate to each other, the West's adversaries, and the contemporary iWar, as well as analysing what those findings specifically mean for Australia, had, until now, not been attempted.

The Venn diagram in Figure 3 demonstrated the important overlaps in theory between the three research disciplines as they related to influencing and leveraging behavioural change in a complex social system. Following the modelling of the case systems, Figure 3 was updated to create Figure 23, which summarises the key concepts and overlapping findings of this research.

Figure 23: Linkages and findings from the three research disciplines



The following paragraphs detail the findings from this combined research approach.

Comparative Systems Analysis Findings

The two case analyses revealed four key themes contributing to both systems' level of effectiveness in maintaining their influence stocks:

- System characteristics—open or closed, level of resilience versus fragility
- System information flows—feedback loops, interconnections, delayed feedback
- Control—as a critical capability and balancing element
- Centrality of focus—regarding the level of importance placed on influence activities.

Both case systems experienced an asymmetry of balancing and reinforcing feedback, with their respective system characteristics significantly contributing to either the vicious or virtuous escalation of those cycles, which in turn further affected the levels of overall system resilience. The anticipatory characteristic of ISIS's system resulting from its 'success to the successful' reinforcing feedback loop (R3) produced higher levels of autonomy, representation and influence, which provided ISIS the means to compete effectively at the strategic level and dominate in the iWar. Clinton's open, public election campaign was a less diverse and less robust system, making it more vulnerable to external shocks, counter-influence attacks, and suffering a more extreme loss of control.

A system with high levels of resilience and an ability to self-evolve also enjoys effective flows of information in the form of feedback loops via interconnections formed by hard and soft communications links. As the system modelling demonstrated, the efficacy of ISIS's system flows both via its feedback loops and through the strength of its interconnections contributed to the group's effectiveness in maintaining influence stocks and its virtuous 'success to the successful' R3 reinforcing cycle (Figure 8). In contrast, the inefficiency of system flows for the Clinton campaign led to delays in feedback, misguided responses, a lack of situational awareness, and an asymmetric increase of negative reinforcing feedback. These factors combined to create a vicious reinforcing cycle, which the balancing feedback loops were too weak to counter, thereby impacting on the campaign's influence stock in a downward spiral.

Control was identified as a critical capability for both cases in protecting the centre of gravity and as a vital reinforcing element in increasing system influence stocks. Specifically, the narrative, messaging, media quality, system credibility, image, legitimacy and subsystem behaviours were the most important elements requiring control by both systems for effective influencing. While ISIS's system initially proved strong in having and maintaining control over its subsystems and iWar activities, it was a 'loss of control and authority' feedback loop that contributed to a deterioration of influence and a drift to low performance for both systems (Figures 11 and 17).

The fourth theme extrapolated from the comparative analysis was the importance of having a 'centrality of focus' around building and maintaining influence. While the ability to effectively influence target audiences was a centre of gravity for both systems, there was a manifest contrast in the level of importance placed on influence activities by each. Like Russia's Internet Research Agency and other adversaries of Western democracies, ISIS had a centrality of focus, where influence activities were the main priority and purpose driving all system outputs, at all levels and receiving majority resource allocation, which ultimately contributed to strengthening all four of its positive reinforcing feedback loops and the escalating virtuous cycle.

Conversely, like Western democratic nations and their militaries, the Clinton campaign lacked that centrality of focus. The campaign's influencing strategy was not the main priority driving all system outputs, and other stocks not as critical to the centre of gravity were competing for priority and diluting resource allocation. Its stovepiped, slow, traditional campaign media strategies and a focus on quantitative data contrasted sharply with the agile, qualitative iWar tactics of Clinton's adversaries. This lack of focus on the system's stock and purpose contributed to the asymmetric escalation of all three negative reinforcing feedback loops and the associated vicious cycle.

Many pundits believe that ISIS was defeated through kinetic targeting in the physical battlespace, whereas, while the virtual caliphate and its associated influence have shrunk due to balancing feedback, it remains largely undefeated in the information domain.³⁷⁶ ISIS suffered a decline in influence stocks as a result of balancing feedback, but the system itself did not collapse—rather it contracted and shifted purpose, and is likely adapting lessons learnt and rebuilding its resilience before potentially rapidly escalating again in the future. This self-evolution is only possible due to the system's centrality of focus on influencing target audiences through dynamic

iWar tactics, technological innovation, exploiting cognitive behaviours, and understanding adversary systems and leverage points.

Influence Effectiveness Findings

The key findings arising from the influence research are categorised under the five most effective influencing concepts, described by Singer and Brooking,³⁷⁷ for winning the iWar:

- Narrative
- Emotion
- Authenticity
- Community
- Inundation.

Controlling the narrative is an imperative for achieving success in the iWar. A narrative must be simple and credible, must resonate, and must have a certain novelty for target audiences.³⁷⁸ As demonstrated by the case systems, the narrative is the underpinning device driving the critical capability of ideology and providing the 'sense of purpose' feedback. Control of the narrative is therefore critical for protecting an influencing system's centre of gravity. The West's enemies formulate narratives that resonate far more greatly than democratic ideals and create a sense of belonging which ties into the key influencing concepts of 'community' and 'emotion'.³⁷⁹ The importance of a resonant narrative was clearly evident in the different level of influencing success achieved by ISIS compared with the Clinton campaign. Adversary systems are adept at disseminating their narratives using simple language, cultural memes, evocative imagery, and humour to ensure the novelty and memorability of the messaging. Stories shape our identity, communicate our values in memorable form, and inspire others to act.³⁸⁰ Therefore, narratives not only bind system elements to their purpose but also are a key source of conflict.

Western democracies struggle to commit to having a strong narrative, largely due to risk-averse, stovepiped bureaucracies that dilute, micromanage or overly sanitise iWar messaging. This interference dulls innovation, slows responsiveness, and fails to resonate with target audiences.³⁸¹ Additionally, Western media contributes to these messaging failures. Inexperienced journalists lacking critical-thinking skills often misunderstand, believe and spread enemy propaganda, as well as invariably criticising any

government messaging effort, thereby undermining democratic states' iWar campaigns. The US DoD³⁸² advises that the Joint Force must better understand how relevant actors 'assign meaning to information', in order to understand how to better leverage information in the iWar battlespace.

The primary element influencing behaviour and underpinning cognitive manipulation is emotion. Emotion also contributes to the success of the other concepts of narrative, authenticity and community, through social and emotional contagions and in exploiting biases and heuristics. When there is a strong emotional response to messaging or content, this correlates to changes in real-world behaviours.³⁸³

The exploitation of emotions and 'System 1' thinking (Table 3) is the reason why polarising subjects, conspiracy theories, humorous or evocative clickbait, and sensational fake news stories are so compelling and become viral contagions. In addition, 'humans are wired to respond to emotional triggers and share misinformation if it reinforces existing beliefs and prejudices'.³⁸⁴ This presents a significant challenge for Western governments trying to understand their audiences and develop emotionally compelling content.

While evoking any emotion is an advantageous influencing device, anger and outrage are the most effective emotional contagions. Adversaries intent on deepening existing societal fissures, such as ISIS or Russia's Internet Research Agency, design content to anger or excite audiences and incite them into becoming messengers. This leads to users spreading the emotive content virally throughout their networks, while also adding their own social capital to reinforce and give credibility to the original message.³⁸⁵

The comparative case system analysis starkly demonstrated the importance of being authentic, having credibility and maintaining legitimacy for ensuring strong balancing feedback and abundant influence stocks. Having an authentic narrative and credible ideology were critical capabilities for protecting the centre of gravity. Conversely, this analysis also revealed the powerful impacts that counter-influence activities had when attacking the two systems' authenticity through negative reinforcing feedback. Without authenticity, trust cannot be established. For the case systems, the 'sense of purpose', 'credibility', 'success to the successful', and 'sense of community' feedback loops would have been severely degraded or even ceased to exist.

A key iWar tactic that contributes to authenticity and develops trust is the tailoring of messages to target different audience interests, sharing relatable human interest stories, and personalising content for individuals. Both ISIS and the Trump campaign used tailored content, relatable stories, psychometric analysis and personalised advertising to great effect in order to enhance their influence, manipulate sentiment and ensure brand engagement.³⁸⁶ Audience engagement tactics contribute to creating a sense of belonging, encouraging partisanship and heightening in-group versus out-group tensions, and were used by both case systems in the development of their respective 'sense of community' feedback loops (Figures 6 and 21).

Nudge theory and social contagions are much more effective in influencing behaviours when they exploit real or perceived community expectations and anxieties surrounding in-group conformity. Community linkages, social relationships, trust, loyalty, and access to target audiences were all critical requirements for the two case systems in maintaining their 'sense of community' feedback loops and overall influence stocks. iWar tactics that exploit emotions and display authenticity also reinforce the sense of community among target audiences.

In developing an in-group community feel for achieving effective influence, systems should employ cognitive exploitation devices such as using targeted, personalised messaging; reinforcing polarising 'them versus us' narratives and in-group ideals; manipulating biases, heuristics, fears, and cultural guilt; and exploiting social pressures to belong to a tribe, conform to group norms, and be accepted by the group (Table 4). The Trump campaign demonstrated a canny use of such tactics (Annex A), which contrasted starkly with the Clinton campaign's safe, traditional influencing strategy and contributed to negative reinforcing feedback that undermined Clinton's own 'sense of community' feedback loop (Figure 21). Extremist narratives that tap into shared grievances or cultural identity, such as ISIS's messaging that 'Islam is under attack', resonate far more greatly than democratic ideals in Coalition-deployed locations, because they provide a sense of belonging and unity.³⁸⁷ Just as understanding target audience culture, language and symbolism is important for ensuring authenticity, understanding societal frames and integrating human factors are fundamental to conducting any complex social system analysis for informing information operations or in formulating themes and messages.³⁸⁸

Understanding the psyche of a community and having a thorough knowledge of cultural and social issues contributing to its in-group dynamics enables effective influencing of that target audience. Ethnic identity plays a particularly large role in in-group versus out-group dynamics. Russia's troll army leveraged social fissures, community grievances and group outrage to manipulate political discourse, effectively attack the Clinton campaign, and undermine US democratic institutions more broadly. These in-group factors also contributed to Russia's information operations success in the Baltic states and Ukraine.

After the four abovementioned concepts are combined into an iWar influencing strategy, the effectiveness of that strategy is further enhanced through inundation. Saturating target audiences with an authentic narrative and emotive ideology using a repetitive, multi-pronged, multi-layered, multi-platform media approach proved highly successful for attaining exposure and influence for Russia's Internet Research Agency, for ISIS and for the Trump campaign.

Disinformation will often be built around an element of truth to enhance believability and make it more difficult to expose.³⁸⁹ However, it is then the volume of content, the repetition leading to familiarity, and the long-term effect of the disinformation campaign's multi-media inundation that forms the basis of its success. Human brains are wired to rely on heuristics to help us judge credibility.³⁹⁰ As a result, repetition and familiarity are the most effective mechanisms for ingraining misleading narratives, even when audiences receive contextual information explaining why a narrative is false. It becomes a reinforcing cycle as audiences with declining attention spans develop familiarity with the messages, which leads to easier acceptance of the message, and the message is then spread further via their social networks by amplifiers and multipliers to dominate the information environment as contagions, overwhelming and undermining adversary narratives, content and reach. As Singer and Brooking³⁹¹ explain, social media is now a battlefield with real-world consequences and on which only losers play fair.

Homophily, filter bubbles and echo chambers, and associated viral contagions created by an inundation of iWar content, now shape reality. Unlike the Trump campaign, which employed constant exposure, inundation, amplification and repetition methods (Annex A) to dominate the information environment with pithy, superficial and emotive messaging, Clinton's campaign focused on detailed policy announcements, substantive discussions, deliberate messaging and researched, factual statements.

As a result, Clinton's media strategy haemorrhaged audience attention, bored journalists, appeared overly stage-managed, and lacked the agility to counter opposition attention-grabbing content or respond to headline-grabbing controversies.³⁹²

Further contributing to the effectiveness of inundation are darker forces associated with automation, the rise of bots and sock-puppets, micro-targeting using artificial intelligence, and troll farms operating numerous social media accounts. These tactics have effectively weaponised social media by fuelling information campaigns designed to manipulate public opinion on a massive scale, and overwhelmed fact-checking processes and technology companies' content moderation practices.³⁹³ The failures of technology companies to take action against these exploitative inundation tactics has resulted in a 'polluted information ecosystem' and 'intentional chaos'³⁹⁴ designed to cause confusion, overwhelm critical thought, and undermine trust in democratic institutions.

Behavioural Science Findings

Understanding and exploiting human cognitive behaviours is central to conducting successful influencing activities and leveraging target systems (Table 4). As the research revealed, cognitive behaviours that can be exploited in the iWar are separated into either 'System 1' or 'System 2' thinking heuristics (Table 3). The effective manipulation of these heuristics has been demonstrated in practical form by Russia's Internet Research Agency, by ISIS and by the Trump campaign in recent years, and their success underlines the importance of developing critical-thinking skills in Western democratic audiences.

The psychological manipulation of target audiences, use of social engineering and heuristic exploitation sees social media becoming 'anti-social media' and enables adversaries to reinforce their influence and effect behavioural change.³⁹⁵ Combined with a revolution in communications technology, traditional media broadcasters are losing control over their target audiences.

The human cognitive behaviours exploited by Western adversaries in the iWar reinforce the five influencing themes of narrative, emotion, authenticity, community, and inundation, and play on System 1 and 2 heuristics to develop a sense of purpose and an 'in-group' sense of community, which proved very powerful tactics in strengthening positive feedback loops and

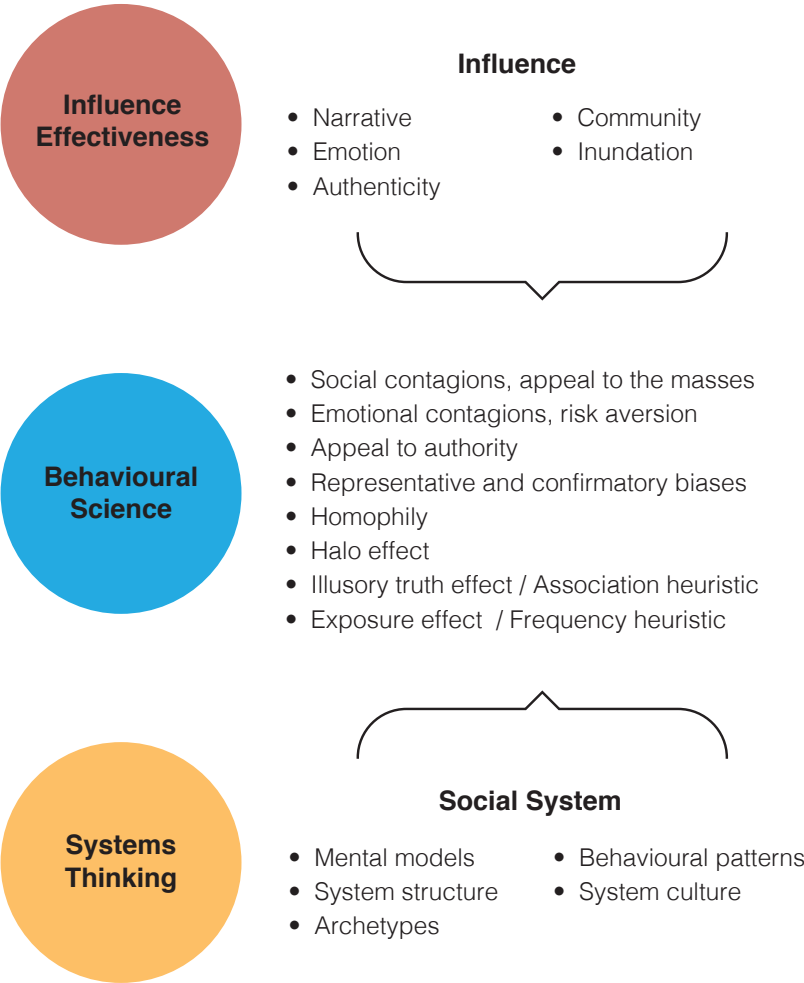
building influence stocks in the case studies. The manipulation of social and emotional contagions and the creation of addictive feedback mechanisms further reinforce influencing success, as target audiences decide and react using System 1 thought processes.

The second cognitive behaviours lesson relates to employing critical thinking over linear thought processes. The rapid advent of communications technology and globally connected social media communities have heralded a new information age, where target audiences are becoming increasingly 'dumb' and more easily manipulated. Linear thinking and conventional, risk-averse approaches employed in the asymmetric, rapidly evolving iWar battlespace further undermines the influencing effectiveness of democratic nations and their militaries (Table 2). As Watts³⁹⁶ explains, nowadays people are 'driven by ideology, desire, ambition, fear, and hatred—or what might collectively be referred to as preferences'. These preferences have led to insulated filter bubbles, echo chambers, algorithm-selected newsfeed content and an overall loss of critical-thinking skills across the online population, which are easily exploited by adversary systems. This use of the automatic, quick, effortless System 1 thinking relies on heuristics and unconscious processes of perception and memory. Biases cannot be turned off; audiences become more gullible to disinformation and increasingly fail to exercise conscious doubt. This lack of critical thinking is further exacerbated by shortened attention spans and increased time spent on social media. Addiction to devices and social media feedback mechanisms essentially rewires users' brains, affecting cognition, and causes strange behaviours outside traditional social norms or interpersonal relationships.³⁹⁷

The manipulation of these human behaviours, cognitive processes and mental models has been termed 'cognitive warfare' and takes the 'weaponisation of information' a step further into the realm of 'neuro-weapons'. When cognitive warfare is coordinated and directed at open, liberal, democratic societies, it has realised significantly positive results for adversary systems.³⁹⁸ This scrambling of Western democratic societal orientation, and the undermining of situational awareness in the iWar, contributes to a vicious reinforcing feedback loop of misguided reactions and increased system fragility, as demonstrated by the counter-influence feedback undermining the Clinton campaign and contributing to its drift to low performance (Figures 16 and 18). As Bienvenue et al.³⁹⁹ explain, adversary actors have strategised to avoid confrontation with the US and

allied forces at their strongest point—namely, high-intensity conventional warfare—instead pursuing gains in the information domain by denying, disrupting and countering the narratives that underpin Western legitimacy and by diminishing their influencing power. As demonstrated by the research, the most effective way to counter such asymmetric iWar attacks is by holistically understanding one’s own complex social system and identifying leverage points, behaviours, structures and mental models to be adjusted for increased system resilience. Figure 24 shows the interlinkages between the key findings of the three research disciplines.

Figure 24: Interlinked findings of the three research disciplines



Recommendations

While cognitive warfare is not a new concept, and influencing the will and morale of target audiences is a long-held military and strategic tactic, the globalised, hyper-connected, accessible, media-saturated information environment presents a significant contemporary threat to democratic societies like Australia. Until now, Australia was a key beneficiary of the rules-based global order and geographically protected from conventional threats.⁴⁰⁰ These contemporary threats against democracy, sovereignty and truth, which are enabled by modern communications technology and which blur the lines between East and West, civilian and military, and innocent civilian and government agent,⁴⁰¹ mean Australia needs to urgently engage, compete, and assert its dominance in the information environment.

While there is no one solution to countering the modern iWar threat, this research has suggested that a proactive, anticipatory, cooperative, non-conventional approach which leverages adversary system weaknesses and biases while building own-system resilience and stocks, is the most effective method. Complacency is the biggest threat. The iWar is political warfare, where the ability to influence and motivate target audiences is essential to success. The unpredictability and complexity of modern communications platforms, particularly social media, diminishes situational awareness and the ability to control the message or predict events and behaviours. Australia is neither immune nor isolated from hostile influences arising from this rapidly changing, contested strategic environment. Australia is being out-communicated by its adversaries as they present a consistent narrative, alter the rules to their advantage, and manoeuvre in the information environment to embrace conflict below the threshold of conventional warfare.⁴⁰² This is why it is important for Australia to holistically understand its own system and address any fragility, before attempting to deploy into the iWar battlespace.

The following recommendations are based on the research findings:

- Develop a strong, credible, resonant narrative as a matter of priority.
- Allocate resources and shift traditional national security paradigms towards having a centrality of focus on the iWar, as our enemies do.
- Create an influencing strategy that is anticipatory, is engaging, dominates the information environment, amplifies the messaging and deflects attention from our adversaries, as well as undermining their capacity to respond coherently.
- Reconsider the national communications strategy—with its associated risk-averse obstructionism and siloed cyberwarfare approaches—in order to better exploit both hard and soft communication links, which are a critical enabler in the iWar.
- Turn democratic-specific disadvantage in the iWar into an advantage—for example, exploit democratic values, journalistic standards, adherence to the truth, and ethical targeting to counter adversaries' tactics, expose their lies, and undermine their credibility and legitimacy.
- Widely adopt systems thinking approaches to both own-force and adversary systems operating in the iWar, as well as to target audiences. This research has shown that while systems thinking can improve attacks on enemy capabilities, leverage their vulnerabilities and enhance iWar targeting, it also provides heightened understanding of own-force system responses and how negative feedback impacts resilience.
- Australian government and military influencers should be encouraged to apply critical thinking, different socio-cultural lenses, and unbiased paradigms to their target system analysis and creation of PSYOPs content, this also contributes to credibility and legitimacy in messaging. Having freedom of creative action in the iWar is vitally important for developing own-force anticipatory levels of resilience.
- Improved civilian integration for informing asymmetric iWar tactics, for example: incorporating lessons from advertising agencies, psychologists, cyber experts, and social scientists.
- In line with this, Australia may consider developing its own civilian cyberwarrior force as a subsystem contributing to national efforts, similar in structure to those in other democratic nations facing imminent iWar threats—as seen in Lithuania and Israel, and leverage the lessons

learnt by other nations.

- Lift the shroud of secrecy surrounding iWar threats to the nation and engage the civilian populace with factual information and transparency to enhance resilience. A holistic national, strategic, political approach is required. Critical-thinking skills have atrophied across vast swathes of the population, and manipulation of System 1 heuristics leads to increasingly engaged but ignorant audiences, who blur reality due to the inundation of skewed, emotive content and fake news. Raising public awareness of misinformation and manipulation efforts, enhancing media literacy and critical-thinking skills, and exposing enemy influencing activities and threats all contribute to improving national iWar resilience and dislocating Australia's enemies' power in the iWar.
- Implement practical solutions to regain control over the media ecosystem and tech companies, such as regulating and upholding journalistic standards, improving source appraisal and fact-checking, creating media rating systems and dashboards, and improving online monitoring and regulation of news and social media.
- Finally, further research is required across all three academic disciplines to enhance understanding and resilience, refine approaches, develop appropriate measures of effectiveness, improve responsiveness, and therefore increase the effectiveness of Australia's future iWar strategy.

Conclusion

There is a need for Western forces to blend emerging technological capabilities with sociocultural analysis, in a sustained approach, to inform the integration of physical and informational activities and enable freedom of action in countering adversary influence.⁴⁰³ As the leading organisation in the national strategy for the iWar, the ADF must treat the information environment as it would any key terrain, shape conditions by manipulating and leveraging the inherent informational aspects of the iWar battlespace, and ensuring the intended narrative is controlled and able to mitigate any unintended interpretations. As General Mattis stated in 2009 (as NATO's Supreme Allied Commander for Transformation) 'capturing perceptions is the new "high ground" in today's conflicts, as the moral is to the materiel as three is to one'.⁴⁰⁴

Information warfare strategies used in isolation will never compel a complete capitulation by the enemy. Coalition forces still require kinetic warfare capabilities across all domains, resources to conduct soft power activities (propaganda by deed), and the threat of economic or political leverage to back up any information operations campaign and effectively impose their will on the enemy. Therefore, as modern militaries respond to growing threats, it is important to remember that war in the information age is not just warfare in the information domain.⁴⁰⁵

Annex A: Trump Campaign's iWar Tactics⁴⁰⁶

Trump Campaign iWar tactics	Effective Influence	Behavioural Theory
<ul style="list-style-type: none"> Used Twitter to exert power & create feedback loop with media Influence flowed in both directions via unusual multimedia relationship Trump in mutually reinforcing dynamic with Breitbart & right-wing media—'Fox News effect' Trump's tweets became legitimate news—across entire media ecosystem Trump was centre of media attention = influenced the media agenda 	<ul style="list-style-type: none"> Media bias Covert influence Audience susceptibility 	<ul style="list-style-type: none"> Exploits 'System 1' thinking Exploits impressionable/gullible Exploits exposure bias
<ul style="list-style-type: none"> Troll Army: never stopped, endlessly available, always producing Frantic mania—set a tempo no traditional campaign could match Helped steer online trends to promote Trump & shape the election Ensured impactful attacks continued to fester & never left public attention Inundation: Trump had the most social media followers & vastly greater media coverage Deployed network to scale, sent most messages, on the most platforms, to the most people Trump's Twitter loudspeaker drove the national conversation at pace & volume where journalists & opponents couldn't keep up—contributing to information disorder Understood wealth of information = poverty of attention, generated 4–5 storylines a day Campaign focused on social media, tailoring, sentiment manipulation & machine learning. Largest digital effort ever in US political history 	<ul style="list-style-type: none"> Exposure Inundation Amplification Repetition News feed rankings Sequencing 	<ul style="list-style-type: none"> 'Persuasion bias' 'Illusory truth effect' 'Exposure effect' & 'frequency' heuristic Exploits 'availability' heuristic Exploits 'association' heuristic 'Appeal to authority' cognitive bias System 1 focus on higher ranked results Sequence matters / 'halo effect' System 1 intuitive impressions Rankings related to shares/likes/clicks

Trump Campaign iWar tactics	Effective Influence	Behavioural Theory
<ul style="list-style-type: none"> • Troll Army provided best of both worlds: Trump could deny or incorporate into campaign • Troll Army created controversies & conspiracy theories to waste opponents' resources • Bots & sock puppets amplified messages, expanded support base • Promoted topics/themes of audience preferences (filter bubbles) • Use of framing: immigration, fear of Muslims, Islamic terrorism, Clinton taking jobs/guns • Manipulated truth (Clinton's emails), enabled character assassination & conspiracies • Aligned with right-wing media to reinforce confirmation biases, propaganda feedback loop • Disorientation—bizarre stories circulated widely in RW media re: Clinton 	<ul style="list-style-type: none"> • Disinformation • Malinformation • Fake news • Forgeries • Bot/troll accounts 	<ul style="list-style-type: none"> • 'Halo effect' = resilient first impression • Argument fallacies • Grab the attention of System 1 cognition • Exploit lack of critical thinking • Nonsensical statements evoke initial belief • Links to social/emotional contagions • Reinforce flawed beliefs, confirmation bias • Addictive content / political clickbait
<ul style="list-style-type: none"> • Diversion: of attention by introducing new themes of greater impact or interest • The more a narrative grew in popularity, the more Trump amplified it = more support • Skewed versions of events perfectly suited Trump's political narrative • Benefited from manipulating the facts (intelligence allowed to become politicised) • Shifted the narrative—which the public & media willingly followed 	Controlling the narrative	<ul style="list-style-type: none"> • Narratives framed as stories—play on biases, emotions & social norms • Exploit unconscious, effortless System 1 • Narratives evoking emotion stimulate action
<ul style="list-style-type: none"> • Understanding & mastery of self-made marketing via reality television • Reality TV formula: keep people watching with an endless soap opera, sustained drama, constant conflict, heroes, villains, simple storylines • Entertained & exploited audience biases, weaponised memes • Expert at clickbait populist narratives, repeated regardless of facts or making sense • Outrageous & disrespectful statements, personal insults, trafficked in conspiracy theories 	Visual imagery & entertainment	<ul style="list-style-type: none"> • System 1 immediately responds to imagery, humour, emotion • Exploits 'representativeness' bias • 'Confirmatory bias' of discriminatory beliefs • Entertaining content more memorable • Exploits limited attention spans

Trump Campaign iWar tactics	Effective Influence	Behavioural Theory
<ul style="list-style-type: none"> Generated fear & anger re: immigration, Muslims, gun control, 'crooked Hillary', threats 'Flame wars' succeeded at drawing attention Emotive content stoked cycle of attention & outrage that kept Trump in the spotlight Riled up support base re: Clinton shredding constitution, confiscating guns Fear lowers people's ability to distinguish fact from fiction, lies easier to sell 	Emotional contagion	<ul style="list-style-type: none"> 'Affect' heuristic of System 1 Anger bypasses System 2 thinking Anger is most influential emotion Anger/outrage are exciting & addictive Emotion affects educated, critical thinkers
<ul style="list-style-type: none"> Appealed to similarity & homophily biases, justified racism, xenophobia—difficult to counter Immigration topic—created emotional/social contagions Reinforced nationalism / 'in-group' narrative by cognitive appeals Tailored messages targeted low socio-economic areas suffering job losses Trump's persona on The Apprentice appealed to disadvantaged rural populace Didn't use big words, used soaring rhetoric, voiced their concerns Flouted convention & upset progressive politicians & liberal media 	Social contagion	<ul style="list-style-type: none"> Exploits peer group pressure, social norms, group approval 'In group' vs 'others' dynamics Appeal to the masses logic error 'Appeal to authority bias' Power of 'homophily', 'confirmation biases' Exploits 'similarity' heuristic of System 1
<ul style="list-style-type: none"> Low-income households heavily targeted with ads focused on immigration & racial conflict Cambridge Analytica = tailored messaging, population modelling, psychometric analysis Research identified political dispositions, psychological profiles, & creation of 'perfect' messages for engaging voters Multi-platform inundation linked to demographic data 	Personalisation & tailoring	<ul style="list-style-type: none"> Unconscious, effortless System 1 thinking Limited attention spans Limited computational capacity System 1 pays more attention to personalised content
<ul style="list-style-type: none"> Clickbait, fake news, conspiracies—widespread, echo chambers, filter bubbles Use of reality TV formula, entertainment, contagions Group reward: 'Build the Wall' = hot topic, got people excited, a rallying call 	Addictive content & feedback mechanisms	<ul style="list-style-type: none"> Addictive System 1 behaviours Emotional/social contagions Rewards from peers, monetary gain, confirmation biases, in-group

Annex B: Glossary and Acronyms

ADF: Australian Defence Force.

Anti-fragile: The direct opposite of fragile: a fragile system is one that deteriorates when stressed; an anti-fragile system grows stronger.

[D. Albino, K. Friedman, Y. Bar-Yam & W. Glenney IV, Military Strategy in a Complex World, New England Complex Systems Institute Report 2016-02-02 (Cornell University, February 2016), 12]

Bots: Social media accounts that are operated entirely by computer programs and are designed to generate posts and/or engage with content on a particular platform. In disinformation campaigns, bots can be used to draw attention to misleading narratives, to hijack platforms' trending lists, and to create the illusion of public discussion and support. Researchers and technologists take different approaches to identifying bots, using algorithms or simpler rules based on number of posts per day. [C. Wardle, Information Disorder: The Essential Glossary (Shorenstein Center on Media, Politics and Public Policy, July 2018), 3]

Centre of gravity (COG): A characteristic, capability or locality from which a military force, nation or alliance derives its freedom of action, strength or will to fight. [LWD-1 (2002:14)]

CIMIC: Civil and military cooperation.

Critical capabilities (CC): Inherent capabilities enabling a centre of gravity to function as such. [Grade 3 Operations Battle Book (2006:vii)]

Critical requirements (CR): Essential conditions, resources and means for a critical capability to be fully operative. [Grade 3 Operations Battle Book (2006:vii)]

CSCC: Center for Strategic Counterterrorism Communications (USA)

Critical vulnerabilities (CV): Characteristics or key elements of a force that, if destroyed, captured or neutralised, will significantly undermine the capability of the force and its centre of gravity. A critical vulnerability is not necessarily a weakness but any source of strength or power that is capable of being attacked or neutralised. [LWD-1 (2002:14)]

Data mining: The process of monitoring large volumes of data by combining tools from statistics and artificial intelligence to recognise useful patterns. Through collecting information about an individual's activity, disinformation agents have a mechanism by which they can target users on the basis of their posts, likes, and browsing history. A common fear among researchers is that, as psychological profiles fed by data mining become more sophisticated, users could be targeted based on how susceptible they are to believing certain false narratives. [Wardle (2018:3)]

Disinformation: Dissemination of explicitly false or misleading information [Y. Benkler, R. Farris & H. Roberts, *Network Propaganda: Manipulation, Disinformation, and Radicalization in American Politics* (Oxford University Press, New York, 2018), 32]. False information deliberately and often covertly spread in order to influence public opinion or obscure the truth [Merriam-Webster Online Dictionary].

DoD: Department of Defense (US).

Effect: The consequence of an action or cause, which impacts on physical, physiological, psychological or functional capabilities. [ADDP 3.14—Targeting, Third Edition, Australian Defence Doctrine Publication (ADDP), Operations Series, 12 July 2018]

Fact-checking: Fact-checking (in the context of information disorder) is the process of determining the truthfulness and accuracy of official, published information such as politicians' statements and news reports. Fact-checking emerged in the US in the 1990s, as a way of authenticating claims made in political ads airing on television. There are now around 150 fact-checking organisations in the world, and many now also debunk misinformation and disinformation from unofficial sources circulating online. [Wardle (2018:4)]

Gaslighting: Manipulation of someone by psychological means into doubting their own sanity. This may be achieved by manipulating or denying the truth to warp another's view of the world. Gaslighting can create self-

doubt and self-censorship; and it is being perpetuated repeatedly and successfully through social media. [P.W. Singer & E.T. Brooking, *LikeWar: The Weaponization of Social Media* (Houghton Mifflin Harcourt, New York, 2018), 116]

IC: Intelligence community.

Information activities (IA): The integration, synchronisation and coordination of two or more information-related capabilities that generate and sustain a targeted information advantage. [ADDP 3.13; ADDP 2.1]

Information environment (IE): The aggregate of individuals, organisations and systems that collect, process or disseminate information [ACP 167—ADFP 2.0.1]. A heterogeneous global environment where humans and automated systems observe, orient, decide and act on data, information and knowledge [US DoD Strategy for Operations in the Information Environment (2016)].

Information operations (IO): The integrated employment, during military operations, of information-related capabilities in concert with other lines of operations to influence, disrupt, corrupt or usurp the decision-making of adversaries and potential adversaries while protecting our own. [US DoD Strategy for Operations in the Information Environment (2016)]

Information warfare (iWar): A concept involving the battlespace use and management of information and communication technology in pursuit of a competitive advantage over an opponent. [A. Kiyuna & L. Conyers, *Cyberwarfare Sourcebook*, 14 April 2015]

IRA: Russia's Internet Research Agency.

ISIS: 'Islamic State of Iraq and al-Sham' or, alternatively, 'Islamic State of Iraq and Syria'.

Kinetic: Involving the use of forces of dynamic motion/energy to achieve an effect (see 'Effect').

Note: Includes traditional explosive weapons as well as capabilities that can create radiofrequency effects such as continuous wave jammers, lasers, directed energy and pulsed radiofrequency weapons. [ADDP 3.14]

Mainstream media: Traditional or established broadcasting or publishing outlets.

Malinformation: Genuine information that is shared to cause harm. This includes private or revealing information that is spread to harm a person or reputation. [Wardle (2018:5)]

Manipulation: Directly influencing someone's beliefs, attitudes, or preferences in ways that fall short of what an empathetic observer would deem normatively appropriate in context. [Benkler et al. (2018:30)]

Manufactured amplification: Manufactured amplification occurs when the reach or spread of information is boosted through artificial means. This includes human and automated manipulation of search engine results and trending lists, and the promotion of certain links or hashtags on social media. There are online price lists for different types of amplification, including prices for generating fake votes and signatures in online polls and petitions, and the cost of down-ranking specific content from search engine results. [Wardle (2018:5)]

Meme: The formal definition of the term meme, coined by biologist Richard Dawkins in 1976, is an idea or behaviour that spreads from person to person throughout a culture by propagating rapidly and changing over time. The term is now used most frequently to describe captioned photos or GIFs that spread online. The most effective are humorous or critical of society. They are increasingly being used as powerful vehicles of disinformation. [Wardle (2018:5)]

Misinformation: Communication of false information without intent to deceive manipulate, or otherwise obtain an outcome [Benkler et al. (2018:37)]. Misinformation is information that is false, but not intended to cause harm. For example, individuals who do not know a piece of information is false may spread it on social media in an attempt to be helpful [Wardle (2018:5)].

Non-kinetic: Not involving the use of forces of dynamic motion and/or energy to achieve an effect (see 'Kinetic'). [ADDP 3.14]

Propaganda: Communication designed to manipulate a target population by affecting its beliefs, attitudes or preferences in order to obtain behaviour compliant with political goals of the propagandist [Benkler et al. (2018:29)]. Ideas, facts, or allegations spread deliberately to further one's cause or to damage an opposing cause [Merriam-Webster Online Dictionary].

Propaganda by deed: Using violence as a form of communication [S. Murray & P. Blannin, 'Diplomacy and the War on Terror', *Small Wars Journal*, 18 September 2017]. This term can also be applied to undertaking soft power or hearts and minds initiatives that provide actions to back up promises.

Propaganda feedback loop: A network dynamic in which media outlets, political elites, activists, and public figures form and break connections based on the contents of statements, which progressively lowers the costs of telling lies that are consistent with a shared political narrative, and increases the costs of resisting that shared narrative in the name of truth. [Benkler et al. (2018:33)]

PSYOPS: Psychological operations, a form of information operation carried out by the military.

Satire: Writing that uses literary devices such as ridicule and irony to criticise elements of society. Satire can become misinformation if audiences misinterpret it as fact. There is a known trend of disinformation agents labelling content as satire to prevent it from being flagged by fact-checkers. [Wardle (2018:6)]

Sock puppet: An online account that uses a false identity designed specifically to deceive. Sock puppets are used on social platforms to inflate another account's follower numbers and to spread or amplify false information to a mass audience. The term is considered by some to be synonymous with the term 'bot'. [Wardle (2018:6)]

Troll farm: A group of individuals engaging in trolling or bot-like promotion of narratives in a coordinated fashion (see 'Trolling'). One prominent troll farm was the Russia-based Internet Research Agency, which spread inflammatory content online in an attempt to interfere in the US presidential election. [Wardle (2018:7)]

Trolling: Deliberately posting offensive or inflammatory content to an online community with the intent of provoking readers or disrupting conversation. Today, the term 'troll' is most often used to refer to any person harassing or insulting others online. However, it has also been used to describe human-controlled accounts performing bot-like activities. [Wardle (2018:6)]

TSA: Target system analysis.

System Definitions

[D.H. Meadows, Thinking in Systems: A Primer, ed. D. Wright, Sustainability Institute (Earthscan, London, 2008), 4, 13, 95, 187–188]

Archetypes: Common system structures that produce characteristic patterns of behaviour.

Balancing feedback loop: A stabilising, goal-seeking, regulating feedback loop, also known as a ‘negative feedback loop’ because it opposes, or reverses, whatever direction of change is imposed on the system.

Behaviour: A system’s ‘performance over time’—with ‘events’ viewed as simply the outputs of a system and its structure.

Bounded rationality: The logic that leads to decisions or actions that make sense within one part of a system but are not reasonable within a broader context or when seen as a part of the wider system.

Dynamic equilibrium: The condition in which the state of a stock (its level or its size) is steady and unchanging, despite inflows and outflows. This is possible only when all inflows equal all outflows.

Dynamics: The behaviour over time of a system or any of its components.

Feedback loop: The mechanism (rule or information flow or signal) that allows a change in a stock to affect a flow into or out of that same stock. A closed chain of causal connections from a stock, through a set of decisions and actions dependent on the level of the stock, and back again through a flow to change the stock.

Flow: Material or information that enters or leaves a stock over a period of time. Flow direction is depicted using feedback ‘link’ arrows.

Hierarchy: Systems organised in such a way as to create a larger system. Subsystems within systems.

Interconnections: The relationships that hold the system elements together. They can be physical, informational, emotional, cultural etc. Relationships can be linear or non-linear.

Limiting factor: A necessary system input that is the one limiting the activity of the system at a particular moment.

Linear relationship: A relationship between two elements in a system that has constant proportion between cause and effect and so can be drawn with a straight line on a graph. The effect is additive.

Nonlinear relationship: A relationship between two elements in a system where the cause does not produce a proportional (straight-line) effect.

Paradigms: The deepest set of beliefs within a society about how the world works; 'paradigms are the sources of systems'.

Reinforcing feedback loop: An amplifying or enhancing feedback loop, also known as a 'positive feedback loop' because it reinforces the direction of change. These can be either vicious or virtuous cycles.

Resilience: The ability of a system to recover from perturbation; the ability to restore, repair or bounce back after a change due to an outside force.

Self-organisation: The ability of a system to structure itself, to create new structure, to learn, or to diversify.

Shifting dominance: The change over time of the relative strengths of competing feedback loops.

Source and sink: Stocks at the beginnings and ends of flows are called sources and sinks, respectively. They mark the boundary of the system diagram but rarely mark a real boundary, because systems rarely have real boundaries.

Stock: An accumulation of material or information that has built up in a system over time.

Sub-optimisation: The behaviour resulting from a subsystem's goals dominating at the expense of the total system's goals.

System: A set of elements or parts that is coherently organised and interconnected in a pattern or structure that produces a characteristic set of behaviours, often classified as its 'function' or 'purpose'.

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