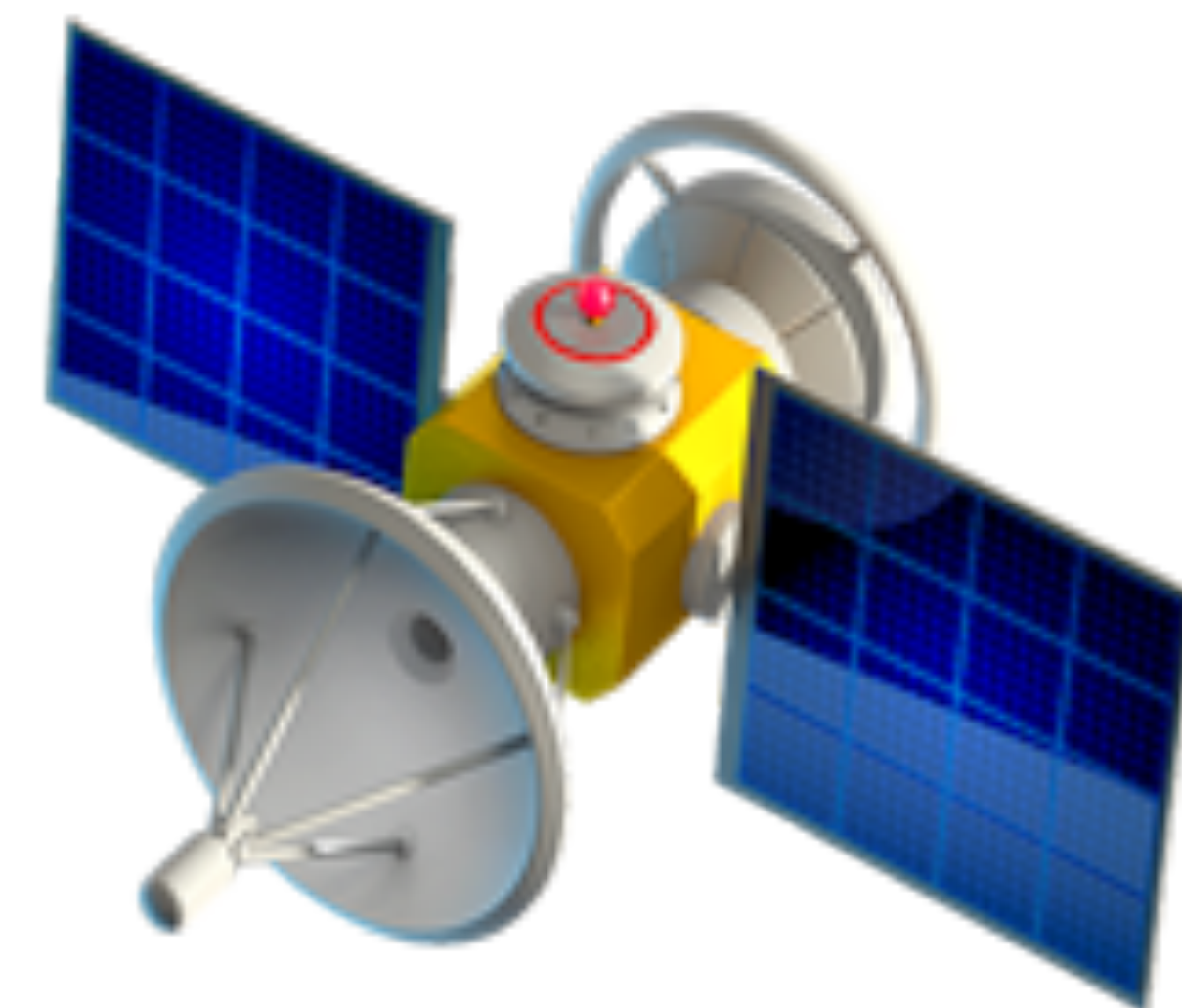
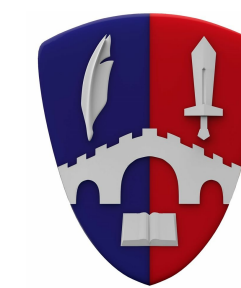


Risky or Rewarding?

**Navigating diversity in contemporary
Intelligence, Surveillance, and Reconnaissance (ISR)**

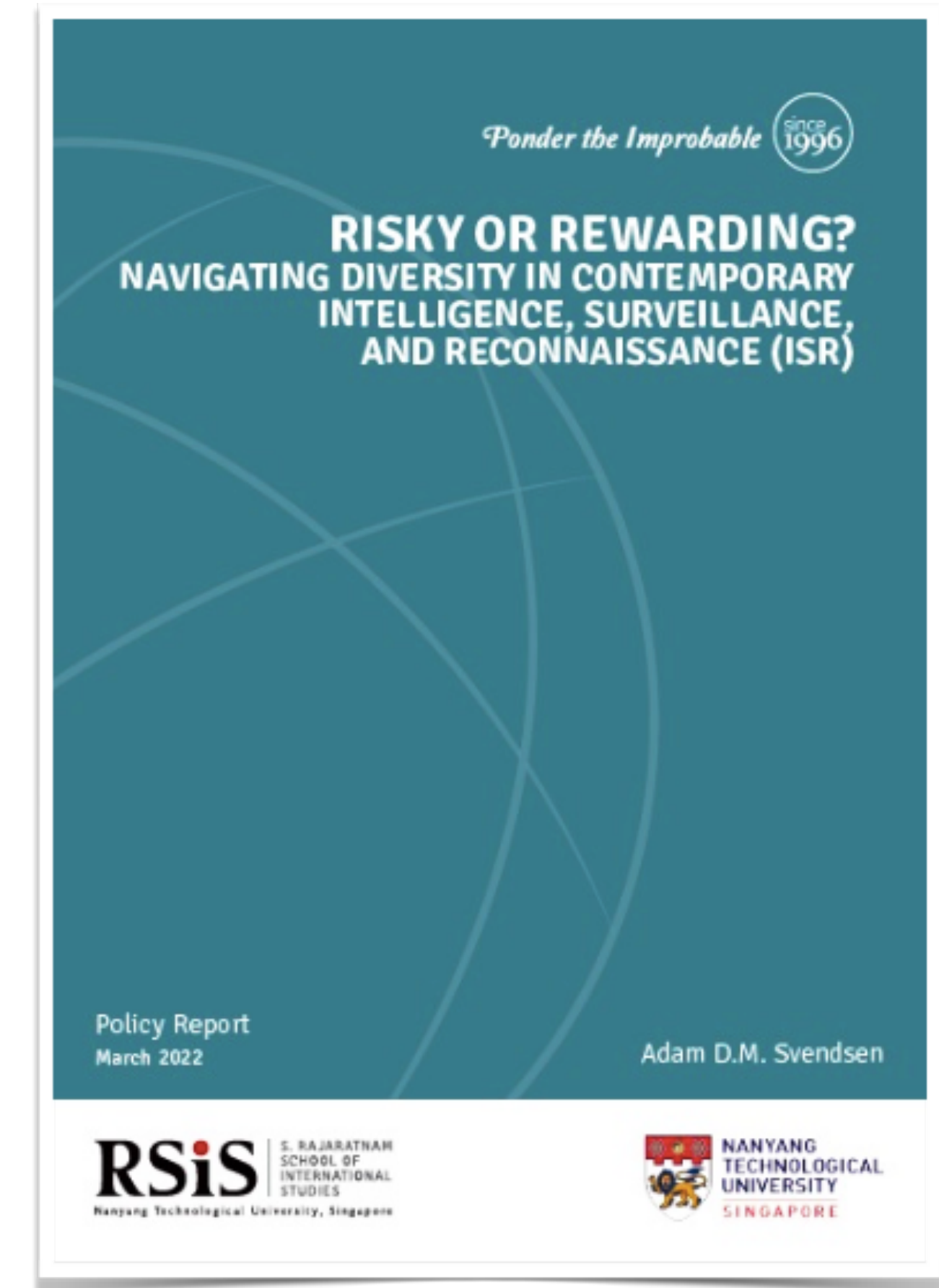




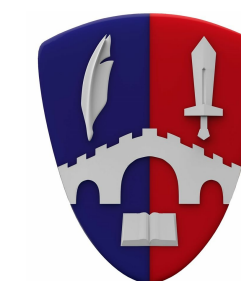
Introduction #1

Context:

- Remarks today = substantially based on & summarised from my *strategy/policy report* published in March 2022 with the S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University (NTU), Singapore, entitled: ***'Risky or Rewarding? Navigating diversity in contemporary Intelligence, Surveillance, and Reconnaissance (ISR)'***.
- Main report highlights:
 - It adopts an international focus examining **contemporary ISR trends**.
 - It concludes that **substantially greater diversity in ISR & its associated activities (e.g. C4/C5) is reflected overall**, thanks in part to the **increasing adoption of emerging technologies, e.g. automation & artificial intelligence (AI)**.
 - Several changes impacted influentially.
 - Many rewards figure, **notably 'information advantage'**.
 - Less desirably, **multiple pressing challenges & persistent uncertainties remain** in the form of attendant risks, hazards, & other vulnerabilities.



- **Download** via: <https://www.rsis.edu.sg/rsis-publication/idss/risky-or-rewarding-navigating-diversity-in-contemporary-intelligence-surveillance-and-reconnaissance-isr-strategies/#.YnJxEZLMLOT>

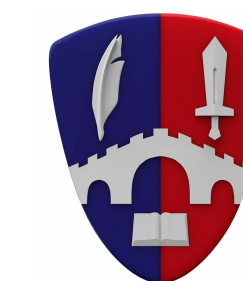


Introduction #2

Overview:

- **Strategy/policy recommendations** include:
 - As risks (etc.) continue to be rep. in a prominent manner = worthy of their **constant, close, & careful evaluation into the future** in overall (C4/C5)ISR enterprises.
 - Efforts extend towards **advancing further sustainable command-and-control-related management & addressing via ‘safeguards’ & similarly-guiding ‘tools’ to ‘frameworks’** during navigation.
 - Concepts, such as ***Intelligence Engineering***, increase.
 - Both regionally to globally, **many corresponding implications for operations to strategies prevail, + for War to Peace more broadly, as significant *disruptors* (even ‘spoilers’) continue nearby** - e.g. Putin & current War in Ukraine (or RUS: ‘special military operation’!!); + China & Taiwan (?)

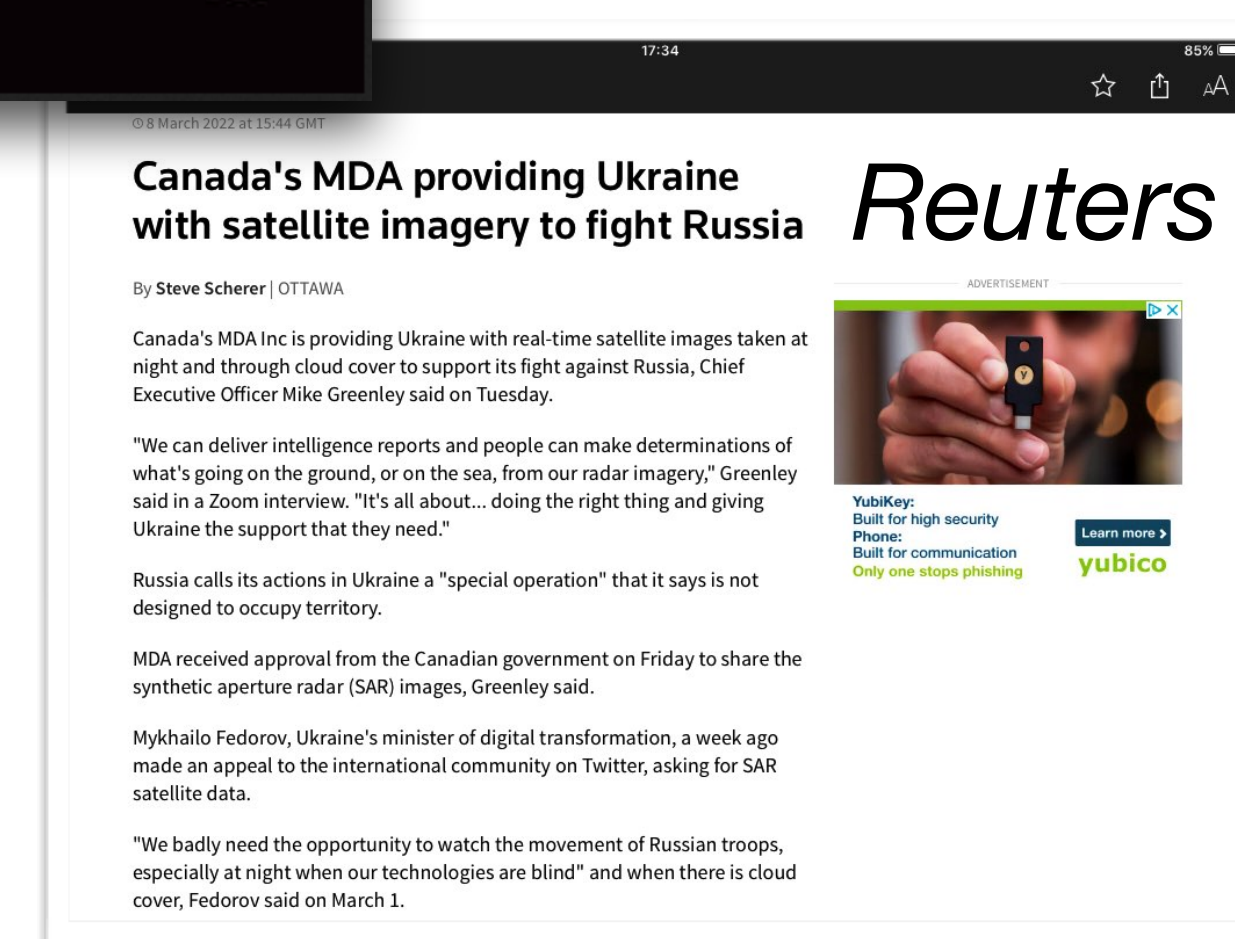
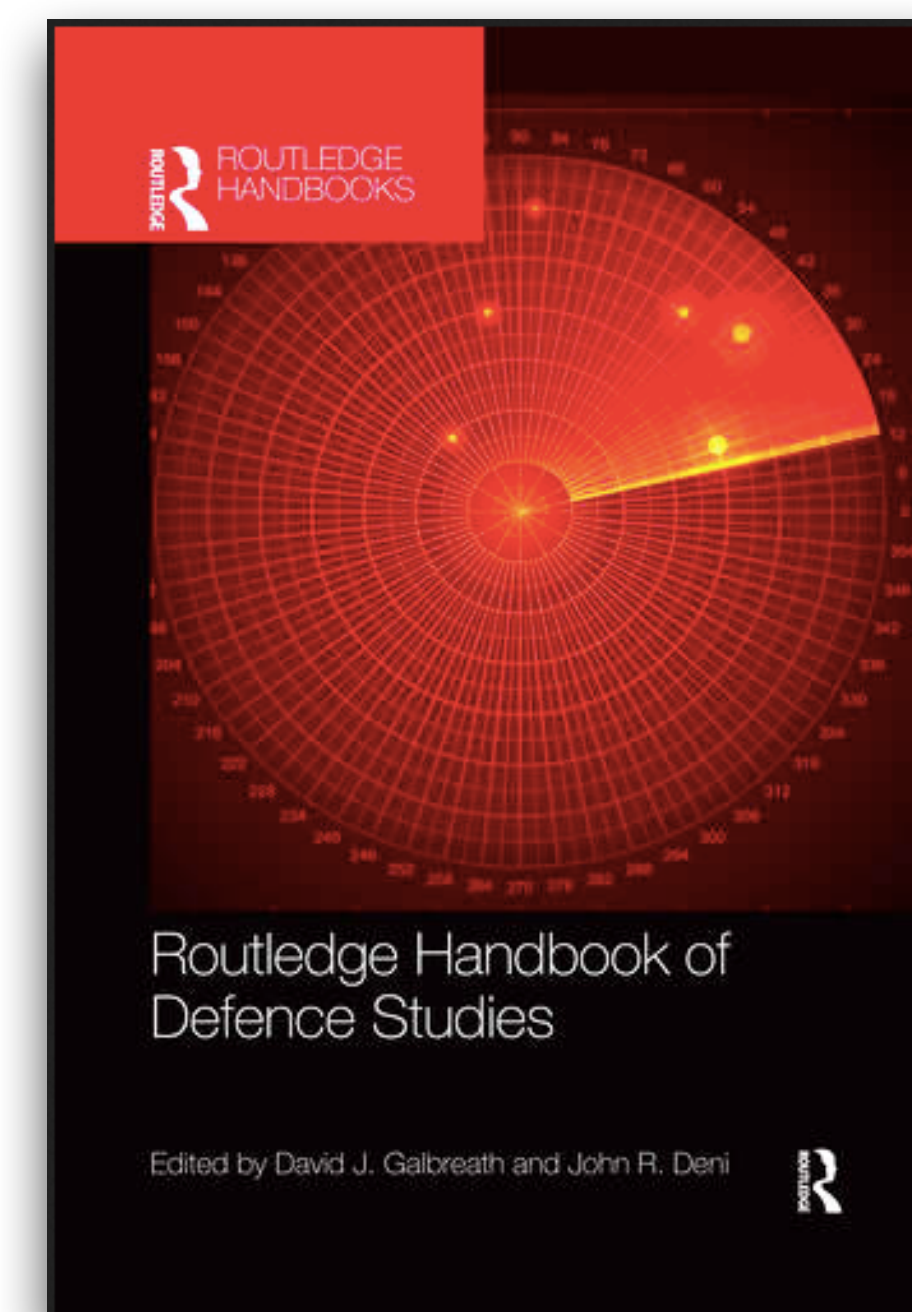




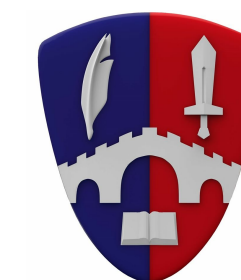
Why this topic? #1

Many reasons...

- In 2021, War and Defence Studies scholars, e.g. Robert Johnson, Director of the Changing Character of War Centre at Pembroke College, University of Oxford, & Martijn Kitzen & Tim Sweijts from NL Defence Academy in Breda, noted:
 - *'Command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) capabilities are essential to contemporary war fighting.'*
- However, as they go on to remark:
 - *'Surprisingly, some aspects of how technological advances in C4ISR are changing the conduct of conflict, and disrupting tactical and strategic actions, remain understudied.'* (*The Conduct of War in the 21st Century*, p.8)*
- Can equally add **'cyber'** to their list for highlighting C5ISR activities.



*For a rare e.g., see: A.D.M. Svendsen, 'Intelligence, Surveillance and Reconnaissance (ISR)', ch. 22 in J. Deni and D. Galbreath (eds), *Routledge Handbook of Defence Studies* (London: Routledge, 2018) - via: <https://www.routledgehandbooks.com/doi/10.4324/9781315650463-23>



Why this topic? #2

... and concerns

- That last research agenda persists + how (C4/C5)ISR relates to wider **full-spectrum ranging issues, problems, risks, hazards up & across to threats + considering associated broader, even grander, challenges** - e.g. with regard to (geo)strategy, war, peace, & other critical entities beyond + over **both now & future(s) time-horizons** — current Ukraine War crisis illuminates as e.g. providing daily insight(s).
- Naturally, **C4/C5ISR = how intelligence work is substantially conducted today**, such current developments relate much to the contemporary *'Innovation and Adaptation of Intelligence & Security Services'* - inc. alliances, e.g. NATO with its JISR:
 - ➔ As e.g. **March 2023 NATO Secretary General's Annual Report** equally highlights, such developments = increasingly **important in defence and security alliances to partnerships** beyond - *'NATO is working in close partnership with Allied industry to maintain its situational awareness and decision-making advantage.'* (p.70) + the NATO Communications and Information Academy *'works in support of the United Nations C4ISR Academy for Peace Operations.'* (p.145) + *'NATO drone unit has provided hundreds of flying hours collecting critical intelligence for the Alliance'*, *NATO Allied Air Command - AIRCOM Newsroom* (4 September 2023) - via: https://ac.nato.int/archive/2023/NAGSF_update_202309



Contemporary ISR Devs #1

Where are we today?

- USAF Col. John Holmgren highlighted ISR importance - e.g. in Indo-Pacific (Jan. 2021):
 - Whether **countering** the People's Republic of China (PRC) moves in the South China Sea, **interdicting** Russian Long-Range Aviation flights, or **providing a continued deterrence** of North Korea, **ISR is vital**.
 - While ISR is integral to war fighting, it is also the capability that is **absolutely critical during competition as well as Phase 0 and Phase I shaping and deterring operations**.
- ➔ As run-up to & current **Ukraine war** effectively demonstrates - e.g. several cases via satellite imagery, overflight imagery (IMINT), & other INTs - Geospatial Intelligence (GEOINT), SIGINT, COMINT, ELINT, MASINT (e.g. radiation detection), OSINT, etc.
- ➔ Ranked an '**intelligence success**' - e.g. observation of build-up RUS troops pre-invasion (c.Nov.2021-), how 'stood-up', subsequently deployed/employed (since 24 Feb.2022-), 'intelligence public use', etc.



Satellite images from Maxar recently showed a huge convoy of Russian armour advancing towards Kyiv from the north

Via: <https://www.bbc.co.uk/news/technology-60592657> (2-Mar-2022)

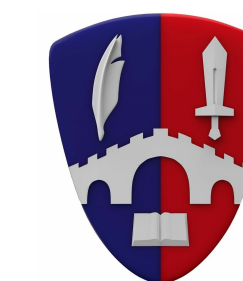


Source: Image from Maxar

BBC

Via: <https://www.bbc.co.uk/news/world-europe-60702464> (11-Mar-2022)

See also: 'Satellite Photos Show Massive Russian Column Near Kyiv Spreading Out Into Villages, Forests', RFE (11 March 2022) - via: <https://www.rferl.org/a/ukraine-satellite-images-kyiv-chernobyl/31747875.html>



Contemporary ISR Devs #2

Further insight - e.g. USA & NATO:



- US Congressional Research Service (CRS) Report (June 2020) - noted that:
 - *The [US] House and Senate Armed Services Committees have both taken an increasing interest in U.S. military ISR capabilities vis-à-vis China and Russia.*
 - *More specifically, the Department of Defense (DOD) aims to connect ISR sensors across all warfighting domains (space, air, land, sea, and cyber) directly with commanders and weapon systems, sharing data at an accelerated speed. This will enable U.S. and allied forces to outthink, outpace, and outmaneuver its adversaries.*
 - *To meet the demands of the new global strategic environment, the DOD ISR enterprise intends to shift from a manpower-intensive force optimized for operations within a permissive environment to an automation-intensive force capable of defeating a peer adversary within a highly contested environment.*
 - *To achieve operational success within a high threat environment, the [US military] Services have indicated they would like to invest in resilient and collaborative ISR capabilities that enhance situational awareness, aid rapid decision-making, and reliably find, fix, and target elusive targets deep within enemy territory.*
 - *The objective is to generate an information advantage for U.S. military forces, which is paramount to effective operations both in the grey zone and highly contested environments.*

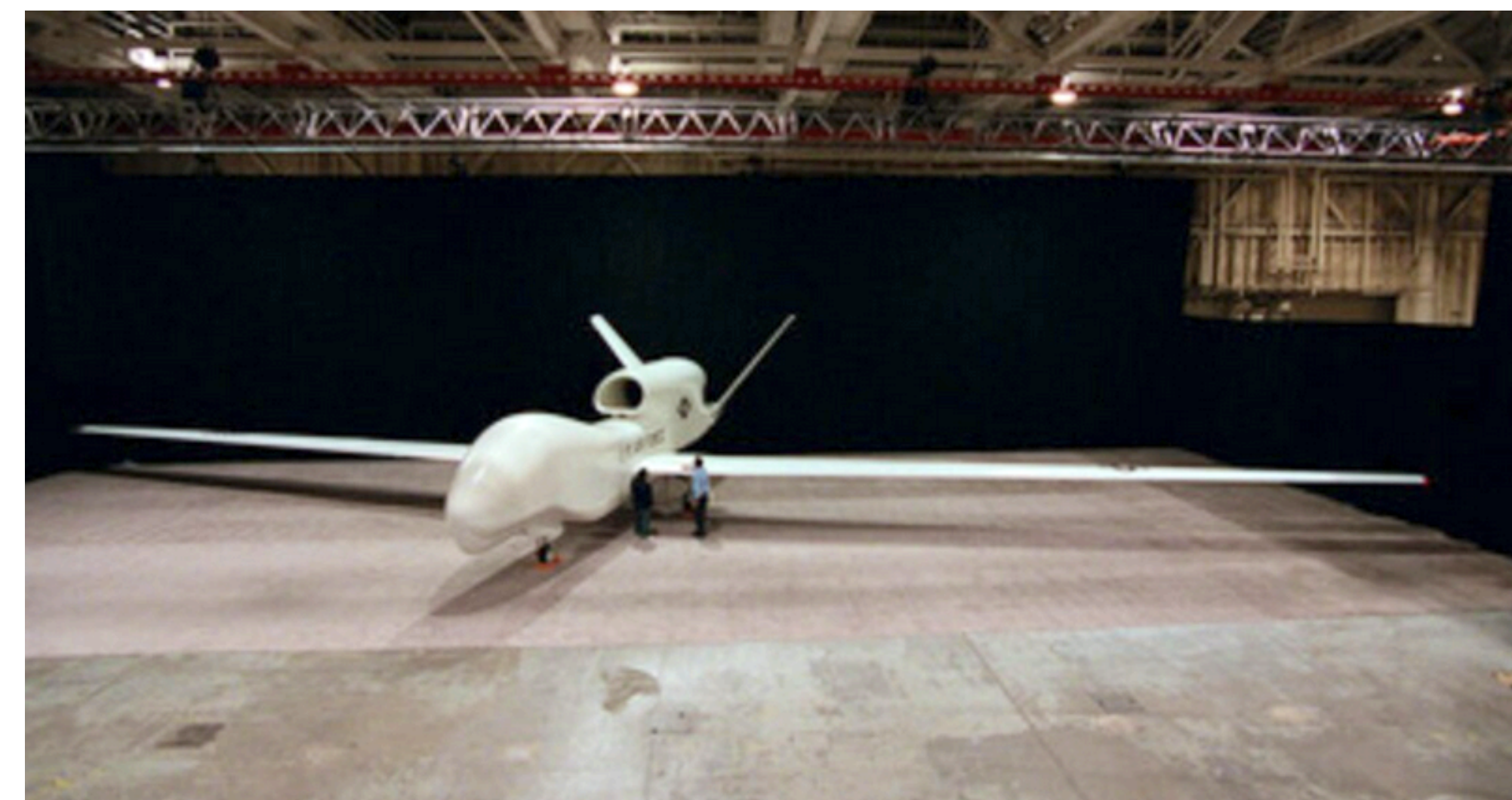
- ▶ **NATO JISR**-tech. example (video) via: <https://www.linkedin.com/posts/nato-communications-and-information-agency-nciagency-film-friday-connecting-nato-ags-aircraft-activity-7045004248736030720-65ia> (accessed Summer 2023).



Future-oriented ISR Devs #1

New & emerging tech. trends

- Alongside greater movements towards anything from **sensor to platform automation, miniaturisation, etc.**, emergent developing **Artificial Intelligence (AI) technologies** >>> similarly being increasingly harnessed in the (C4/C5)ISR domain.
- US pol. reps acknowledge: *'In the military domain, AI will help our service members **more effectively identify and engage targets, streamline our [ISR] systems, and assist in everyday human operations.**'*
- Equally invoked = the contemporary & anticipated future, technical or technological, even biological, **empowerment & augmentation of individuals** as **'super-soldiers'**, e.g. via **'wearable-tech'** & rel. trends.
- **AI adoption in the ISR domain** continues to proceed somewhat cautiously.
- Developers to deployers remain essentially mindful of the **substantial array of vulnerabilities to risks** — & not only those of a **strong ethical to cyber nature** — that exist in parallel.



Global Hawk, UAV: *US DoD*

'Video shows moment Russian fighter jet hits US drone over Black Sea', BBC News (16 March 2023):
<https://www.bbc.co.uk/news/world-europe-64975766>

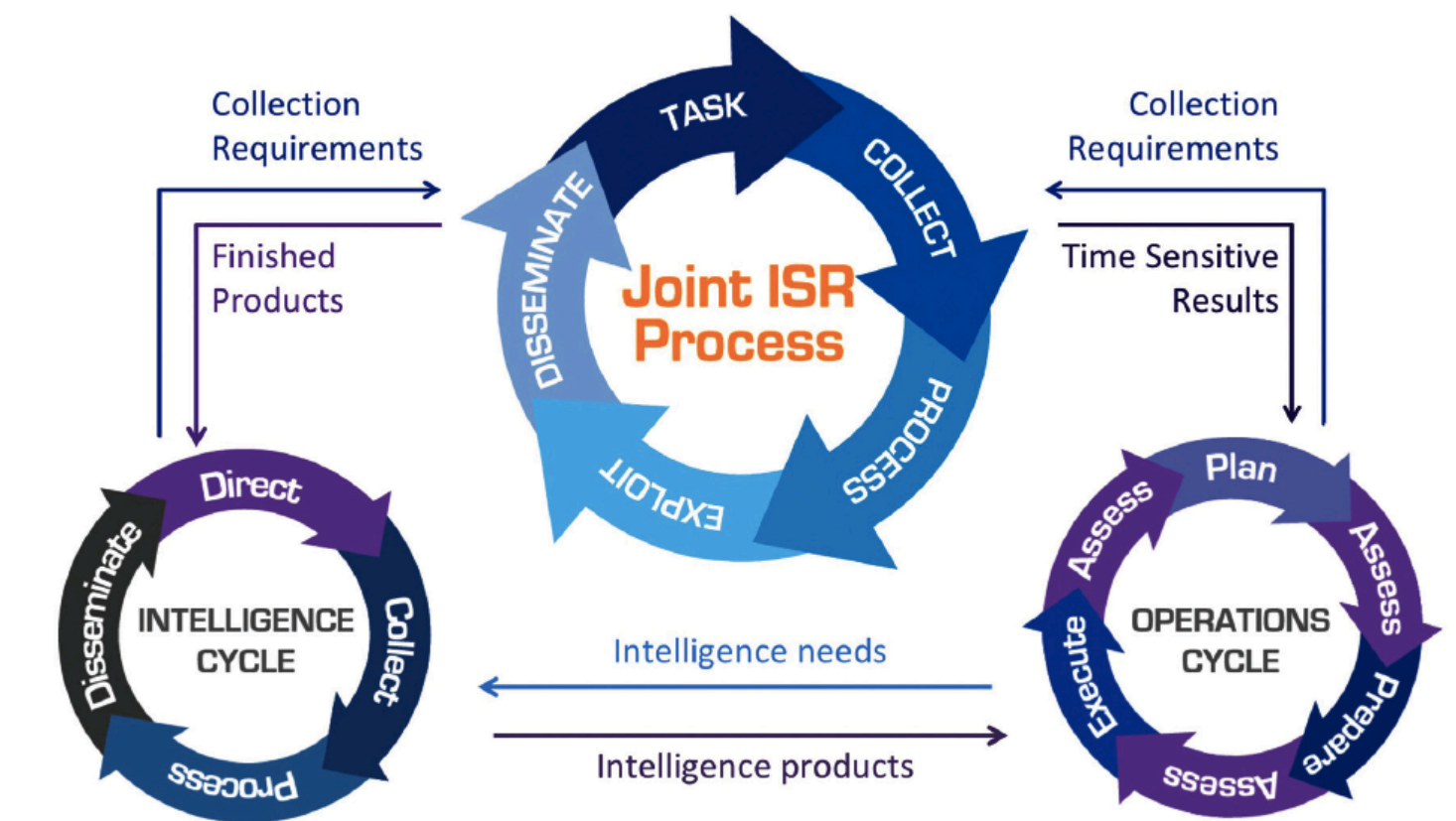


Watch: US releases footage from its drone of the encounter with a Russian jet

Future-oriented ISR Devs #2

Management considerations

- With appropriately **fine-tuned command-and-control ‘safeguards’** to **‘guiderrails’ moving higher up agendas**, degrees of **incrementalism** = observed surrounding these shifts + elsewhere.
- Aim = to **overcome 'misunderstandings' over what (C4/C5)ISR + its platforms & sensors can, &, equally, cannot, realistically achieve** - e.g. in both physical to tech. terms.
- Notably, conventional scientific **‘Rules of Physics’** still apply.
- From a commercial perspective, the **(C4/C5)ISR market continues to reflect substantial growth** as, in parallel, official (C4/C5)ISR strategies undergo further refinement & changes in form of **updating & upgrading steps**.
- Closely related to diversification, **greater use of a broad-range of public-private-partnership (PPP) approaches** >>> widely encouraged to, again at least partially, compensate in terms of **(C4/C5)ISR capability & capacity shortcomings both encountered to experienced, + relating to those already anticipated** ahead in future.
- **Costs figure intimately alongside value gains** on overall balance-sheets.



Multi-national, multi-service, multi-echelon process

Source: NATO Intelligence, Surveillance, and Reconnaissance, Defense Investment Division

Conclusions & Takeaways #1

Much to consider

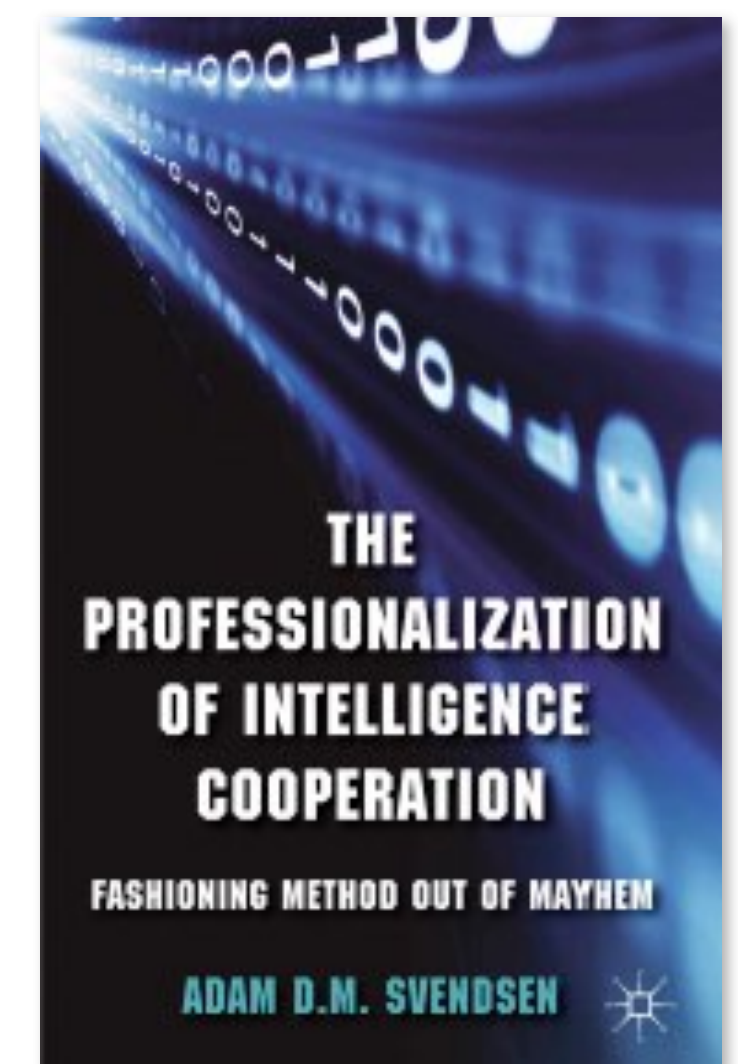
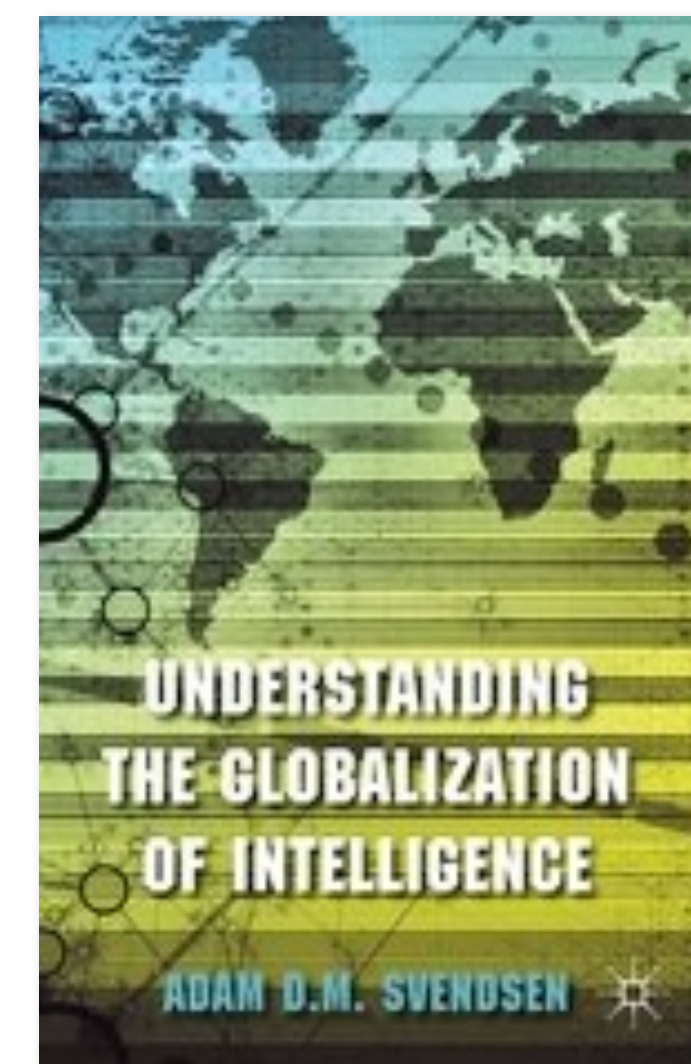
- For illustrative purposes & due to sheer size/scale-of-effort reasons, research mostly focused on **e.g. the US & its global-ranging (C4/C5)ISR.**
- However, evidently **other countries, indeed other actors internationally – ranging from small- to mid- & large-sized states and/or powers, even down & across to tech.-empowered individuals = naturally not immune** to similarly burgeoning trends, re-organisations, challenges, etc., esp. close US allies, partners...
- Clearly, **neither are US competitors exempt**, extending to its more visceral adversaries - with **Russia & China featuring further.**
- A wealth of both ‘**top-down**’ & ‘**bottom-up**’, extending to ‘**original**’ &/or ‘**imported**’, **(C4/C5)ISR approaches & methodologies**, + their relatives or close associates to derivatives, **all exist & strive to succeed.**
- **Many risks & rewards prevail side-by-side**, & therefore **co-exist in plurality** >>> Several obvious implications for the ‘**future of war**’.

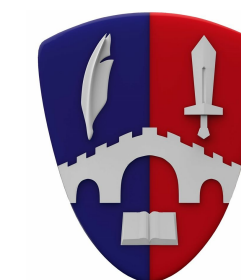


Conclusions & Takeaways #2

Risks & Rewards

- Overall developments - e.g. **AI & automation** - confer a number of **rewarding advantages** - esp. occasions when trend adoptions = suitably caveated & managed with **'safeguards' &/or 'guiderails'**.
- However, when **ISR command-and-control-related 'checks & balances'** = more lacking or neglected >>> **greater risks** of more disadvantageous (C4/C5)ISR deployment & employment.
- Most notably, **paramount 'information advantage' statuses** = more lost.
- Counterproductive 'imbalanced' conditions & situations of **'over-reach' &/or 'under-reach'** >>> variously reflected.

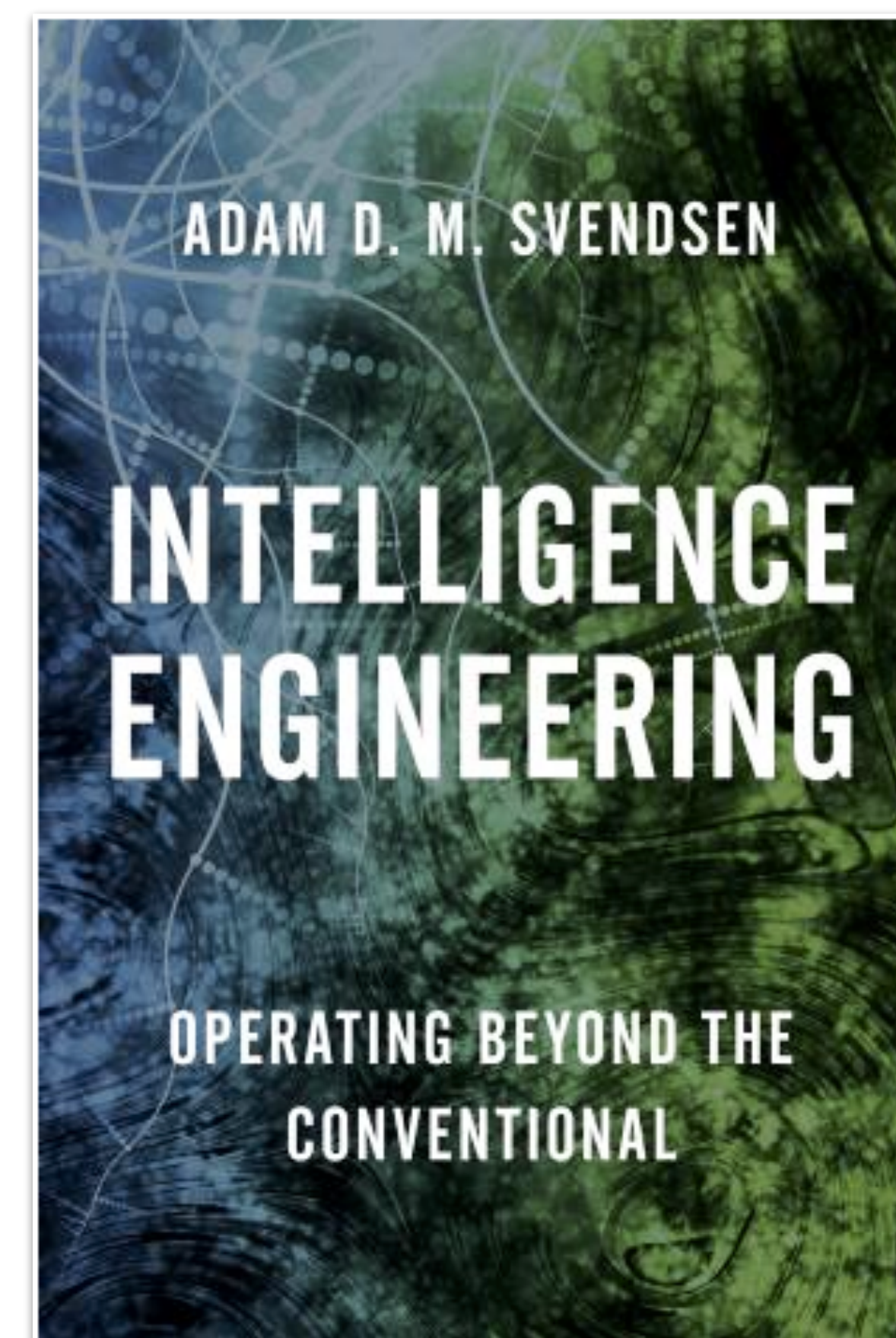


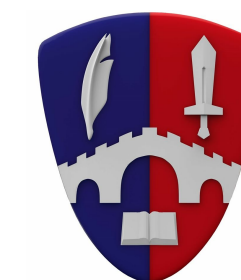


Conclusions & Takeaways #3

Further thoughts for the future...

- Closely responding to **current & projected needs**, + as some re-tooling to framework refinement is underway — inc. reg. strategy updates — **contin.** **‘works-in-progress’ = reflected overall in the (C4/C5)ISR domain as increasingly direct ‘sensor-to-shooter’ ambitions = maintained.**
- Likewise, **wider-impacting concepts, e.g. system-of-systems-based ‘Intelligence Engineering’, & their growth cannot be more ignored, denied, or passed over**, either analytically to strategically, &/or more practically to operationally.
- Efforts also reflect **management modes** that respectively extend from conditions of **‘containment’ to more substantial ‘rollback’** in their different configurations.
- Requiring their **constant sustainment** through their creation & subsequent maintenance or regular update going forward, **the ‘safeguards’ to ‘guiderails’ again emerge prominently, performing an important & persistent role. //**





Further information

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