Intelligence, Surveillance and Reconnaissance (ISR):
A federation/system of systems-based agent of and for change?

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Introduction

- **Rapidly growing + key domain** of **ISR** >>> undeniably <mark>central</mark> to **DEF, STRAT,** + other **War-to-Peace**-rel. activities.

- Both **direct to indirect, + even on + from powerful bases**

- At widest <mark>ISR performs incr. imp. role</mark> of **fed./SoS agent of + for change** inc. extend to contemp. world politics.

- In contemp. circ.s + esp. as <mark>used greater extent</mark>, **advancing enhanced understanding rel. to ISR = req.**

- Now that >>> further accomplished.

Contents

- What is ISR?

- Federation/System of Systems (SoS)+ ISR

- ISR Challenges

- ISR Future Directions

- Conclusions

What is ISR? #1

- ISR =

  - '*An activity that **synchronizes and integrates the planning and operation** of sensors, assets, and processing, exploitation, and dissemination systems in direct support of current and future operations. This is **an <mark>integrated intelligence and operations function</mark>**.' (US Air Force, 2015)*

- Accordingly:

  - '*Managing the [USAF's ISR] enterprise **involves everything** from acquiring multimillion dollar intelligence assets to training personnel and <mark>ensuring that commanders receive the information they need…</mark>'*

- Much >>> readily accrued when better characterising ISR.

What is ISR? #2

- More trad., support INT, SUR + RECON tasks **>>> more combined**

- **Simult. assume** <mark>a more central position</mark> in overall internat. SEC. related affairs.

- **More specifically-bounded, strongly tech., incr. networked, systems-laden, + multiple sensor-orientated domain**

- Becomes ISTAR - when + 'Target Acquisition'

- + C4ISR, when + 'C4' considerations.

What is ISR? #3

- **ISR spans <mark>both HUMINT + TECHINT</mark>**,

- Witnessed both in + across various operational-to-battlespaces during the <mark>**MFO-SpecOp/SOs**</mark> undertaken during **overall GSR <mark>+ multiplexity**</mark>.

- Emp. **'ways' + 'means' of data-to-information handling + processing-to-dissemination**

- For **overall aim or strategic 'ends' of fost. greater <mark>'situational awareness'**</mark>

- **To deeper + wider conditions of 'knowledge' + contextual <mark>'understanding'**</mark> in DEF enterprises

What is ISR? #4

- **Signif. wide-ranging status** >>> accounts for **broad + contin. extend uptake of ISR**

- For defence-to-offensive purposes by many countries + other entities globally.

- <mark>Transformative leverage</mark> simult. + subseq. follows.

- ISR activities have a respectable-sized history, US def. analyst, Benjamin Jensen:

  - *In the United States, Cold War-era interdiction campaigns and Soviet military theory are the historical foundations of the emerging preference for smaller, joint precision forces. Starting with experiments in <mark>Vietnam in the 1970s</mark> and later Assault Breaker experiments led by the Defense Advanced Research Projects Agency (DARPA), the United States experimented with an integrated battle network of strike and C4ISR assets… <mark>Between the 1990/1991 Gulf War and the air interdiction operation in Kosovo in 1999,</mark> the United States rapidly accelerated its use of different types of precision strike and ISR assets toward what Russian Major General Vladmir Slipchenko called <mark>"sixth generation warfare."</mark> Today, this network enables missions ranging from global strike to distributed ISR operations.*
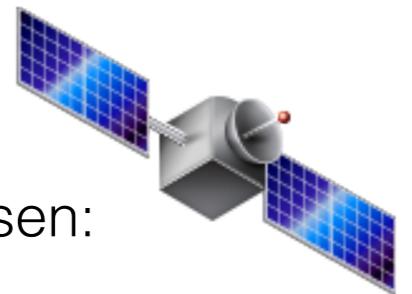
What is ISR? #5

- Closely assoc. with ==computer, cyber, + information/digital revs==,

- **ISR >>> exponential changes + other extensive transforms**.

- ISR = rapidly evolves as a domain

- **Several readily citable examples** of ISR testing, experiment, R&D, + applied use constantly underway.

  - *For our current and future forces, **[ISR] plays an even greater role**, ==not only in how we maintain situational awareness but in how we conduct operations and employ our forces against the adversary.==' - US JCS, [ISR] JF 2020 WP* (September 2014)
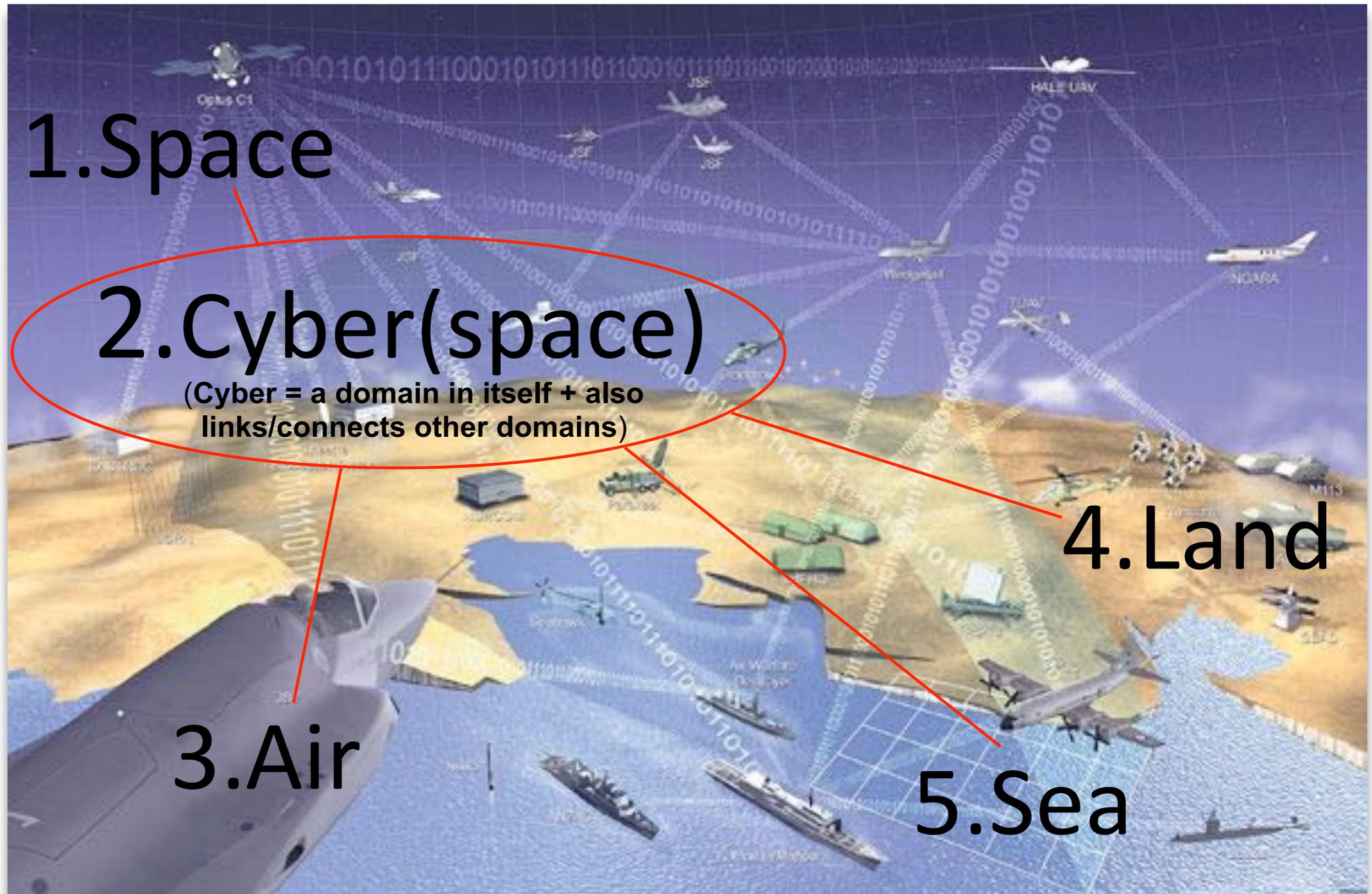
What is ISR? #6

- **Not only a *national* defence** concern.

- Reflects **M4IS2 - Multi-agency, Multi-national, Multi-disciplinary, Multi-domain Information Sharing and Sense-making**

- Multi-national mil. alliances - e.g. NATO - **invest heavily + in dev. 'Smart Defence'-rel. moves**

  - - e.g. ISR jointness - pointing esp. to NATO's JISR efforts.

- As EUISS's Zoe Stanley-Lockman has argued:

  - *'Today's trouble is **not so much innovating, but rather harnessing innovation**… Moving forward, [the EU's] focus on R&D can help drive European innovation in connection with priority areas of the third offset strategy, including ISR and A2AD-related technologies.'*

5x domains of **geostrategic activity**

1.Space

2.Cyber(space)
(Cyber = a domain in itself + also links/connects other domains)

3.Air

4.Land

5.Sea

Source: http://www.defence.gov.au/news/raafnews/editions/4802/images/10-P12-Main-graphic.jpg

Fed./SoS + ISR #1

- ISR possesses many rel. characteristics = **Various neatness + hence satisf.**

- **Rels close to all 'different' 'INTs'** that exist.

- ==**ISR involves not just mil.-rel. G/J2 INT but also G/J3 Ops**==.

- + 'Fed./SoS' concepts + org. or 'enterprise' overlaps.

- **SoS = worth >>> explore further**.

- At widest **= rationalised as: SoS Dynamics (SoSD)** >>> comprise SoST, **SoSA**, + **SoSE**.

Fed./SoS + ISR #2

- Collectively, **SoSD >>> further parsed into**:

  - **(i) STEEP(L)** - as commonly used in commercial/business INT contexts;

  - **(ii) PESTLE** - as rel. to those navigated by, e.g. EUROPOL, e.g. rel. to tackling of cyber + transnational + serious organised crimes;

  - **(iii) PMESII** - harnessed in rel. to NATO contexts, e.g. crisis man. + other activities in op spaces to war-fighting in battlespaces; + finally,

  - **(iv) DIME** + **(v) HSCB** - all be drawn on in contexts similar to nego. by, e.g. US Military, inc. war-zones + in rel. to human. + disaster relief ops.

- Considerable SoSD complexities >>> **many ISR challenges**.

ISR Challenges #1

- **High demand persist. surveil. + long-endure reqs** - e.g. Afg., Iraq, Syria, PK

- When **UAV Predators + Reapers ('drones')** >>> not enough ISR capab. also several **manned (piloted) 'spy planes'** reqs.

- **ISR aerostats ('blimps')** simult. fig. - esp. in US + Asia-Pacific.

  - '*[The]* ***ability to share scarce ISR resources in an optimal way*** *is a key aspect of [INT] collection planning.*' + BatSp '*ISR "soak"*' (Hall+Citrenbaum)

- **Arming/weaponisation debates** continue

- Both operationally + strategically diff. **'wait + watch' +/or 'see and strike'** = sustained,

- Also various sensor/platform **trends: miniaturisation, AI employ, + autom**.

ISR Challenges #2

- As **ISR = constantly evolving** >>> **contin. nav. several commercial compet. pressures**

- Readily demo **expanding ISR business opp.s**.

- Recog. + ack. (at least US) ISR chal.s:

    - *[T]here are significant reasons why developing [ISR] architecture and gaining an enduring consensus remain problematic. …* **ISR technologies are not static***… it is doubtful that today's inventory of satellites, unmanned aerial vehicles, and manned aircraft will still be the right mix a few years hence. …* **ISR issues will continue to be an area of concern***… (US CRS, April 2013)*
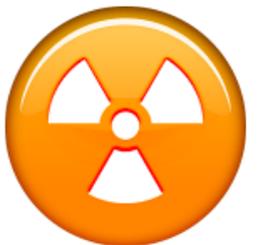
ISR Challenges #3

- Several ==**vexing 'paradoxes' = confronted**==:

  - e.g., In **Iraq + Syria**: *'fielding sovereign … intelligence-gathering platforms was … preferred … and, as a consequence, those ISR platforms harvesting vast quantities of technical intelligence (TECHINT) proliferated over IS [ISIS/ISIL/Da'esh] battlespaces.'*

- However: '*As these high-tempo operations simultaneously became extended, the different intelligence communities experienced the* ***paradoxical combination of both* ==(1) data-gathering shortages==*, relating to not enough coverage, and* ==(2) data-overload==*, too much volume, challenges***, which also subsequently impacted the extent and rapidity of intelligence sharing.'* (Svendsen, 2016)

- Alt.: ***'swimming in sensors but drowning in data,'*** >>> ***'in effect, information-rich but knowledge-poor'*** = current ISR probs.

ISR Challenges #4

- Overall ISR 'story' = **not just about merely** part-inform 'trad.' or 'convent.' sensors/platforms +/or 'classical' INTs.

- **ISR incr. >>> 'newer' INTs**: - e.g. SOCMINT, RESINT, + COLINT.

- **Involves other participants** - e.g. sub-to-non-state actors >>> harness Internet + assoc. pub.-avail. tech.: iPads + GoogleMaps.

- **CYBINT-rel. consids = key**, inc. ext. to **enhanced nuclear risks**.

- Others: *'The cyber domain is about far more than a supercharged capability in C4ISR … + …* **this transformation will completely change the relationships + balance between soft + hard power.***'*

ISR Challenges #5

- **Wider challenges intimately inv. ISR**:

  - *There are … ==potential risks== apparent in the emerging character of war that will require military and civilian decision makers alike to ==relearn the art of crisis management==… as multiple countries optimize their forces and doctrine, they could produce a world **prone to rapid escalation and miscalculation**. … Actors threaten to strike first, crippling the adversary's C4ISR as seen in AirSea Battle. … **Military planners could inadvertently box in political leaders to high-risk courses of action** predicated on lightning fast assaults that force an adversary to capitulate. (Jensen)*

- Many world affairs = open up to even substant. potent. transform.

ISR Future Directions #1

- **Several futures for ISR**.

- **Various ISR partnerships = dev.**, bilateral + beyond, + multi-plats for facil. data + INFO-to-INT shar.

- **UK ISR-rel. exper. =** Urgent Operational Requirements issued 2010.

  - Early 2015, the British Army's ChoGS, Gen. Sir Nicholas Carter, revealed at Chatham House: *'[W]e're … **trying to think very differently about [ISR]**… That's why we've created a brigade called 1st ISR Brigade…'*

  - Other analysts: UK's *SDSR* (Nov. 2015) *'will **devote more resources** to the procurement of UCAVs, tripling the number of armed drones that the UK operates, as well as prioritising other [ISR] aircraft.'*

- Discernible: ***'trend towards smaller, multi-domain force capabilities in global and regional powers…',*** suggesting *'the character of contemporary conflict is being changed by the proliferation of precision strike and associated [C4ISR] systems combined with an assumption that conflicts will be fought **beneath the threshold of major war**.'* (Jensen).
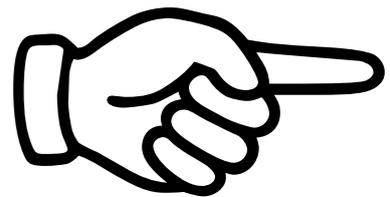
ISR Future Directions #2

- Argued elsewhere: *'Forces with **requisite technologies and skills benefit enormously from … [ISR]**… among other key functions.'*

- Also, *'If the* ==performance of forces is dramatically enhanced== *by such systems, it follows that **degrading them can provide important military advantages**…'*
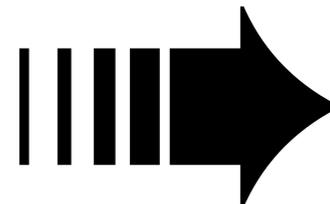
- A 2014 US JCS doc. followed up >>> tabling several suggestions for ways forward for US ISR into the future.

- US Army Gen. Martin Dempsey, Chairman of JCS: ***'[W]e must*** ==***share a common vision and sacrifice proprietary systems***== ***for a more powerful collective capability****…Doing so will … ensure our ISR capabilities respond to the challenges of 2020 + beyond.'*

ISR Future Directions #3

- <mark>Summer 2015 + **persist high-demand for signif. resource-intensive ISR**</mark>

- Evidence of **ISR outsourcing as DEF PPP >>> expand** on various paths.

- <mark>**Many ISR changes + trans**</mark> both natural + more forced nature = undergone both for + into future:

  - e.g. DARPA has an 'Upward Falling Payloads' programme >>> essentially focuses on 'sleeper ISR-release cells' that = located on ocean floors ready to be activated as + when required.

- <mark>**ISR contin. rapidly dev.**</mark>, further claims in 2015 that: <mark>*'TPED [(tasking, processing, exploitation, + dissemination)]* **has been edged out by a high-tech intelligence enterprise that derives data from millions of sensors at machine speed**, *in addition to the digital power of connecting intelligence tools and sources.'*</mark>

ISR Future Directions #4

- However, *'**In TPED's place … won't be a single system or approach, but rather a comprehensive ethos** that employs collaboration and open architecture to outsmart an increasingly savvy adversary.'*

- Operationally up to strategically, **other sophisticated ISR-enterprise related 'business process management' trends**

  - e.g. relating to 'BP' standardisation + interoperability.

- Req. adeq. harness + further advance on constantly ongoing + agile bases **for sustainable ISR improvement** into future.
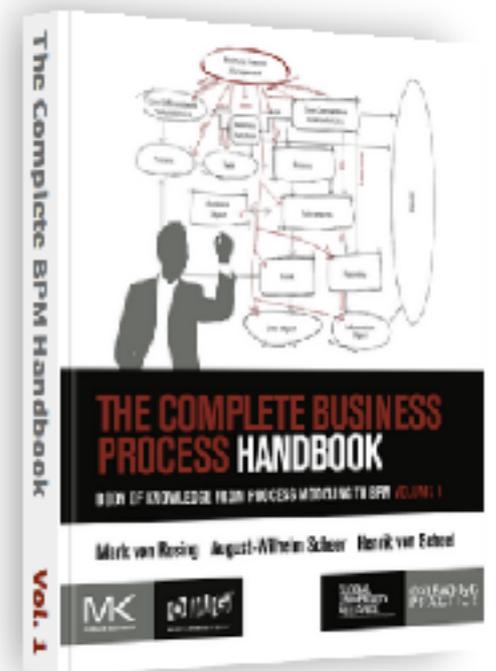
Conclusions #1

- Several <mark>questions rel. to ISR use</mark> + its central management:

  - e.g., pressing worries exist about the **potential over-reliance** of SOF on ISR, about **reliability + safety of ISR assets**, + on what soldiers to decision-makers will do if **'go dark' or 'blind'**.

- **No easy answers** = quickly cascading queries.

- **ISR resilience - with necess. alt. contingencies fig. - matters**

- Several useful guides to the future = provided

- Offer help >>> what contin. to be alert to in rapidly evolving ISR

Conclusions #2

- <mark>Much frustrating disruption</mark>

- Contemp. **ISR = on contin. of much challenging change**

- **Remains deserving of sustained close scrutiny**.

- ISR >>> performs **ever-signif. role of a fed./SoS-based agent of + for change in DEF + MIL enterprises**

- **Inc. extending to in + across other realms beyond**

- e.g. having even transform. effect on contemp. world politics - esp., **rel. to how contemp. warfare manifests itself + subseq. + conseq. progress**.

- <mark>Many interesting moving parts strive in continued articulation</mark>.

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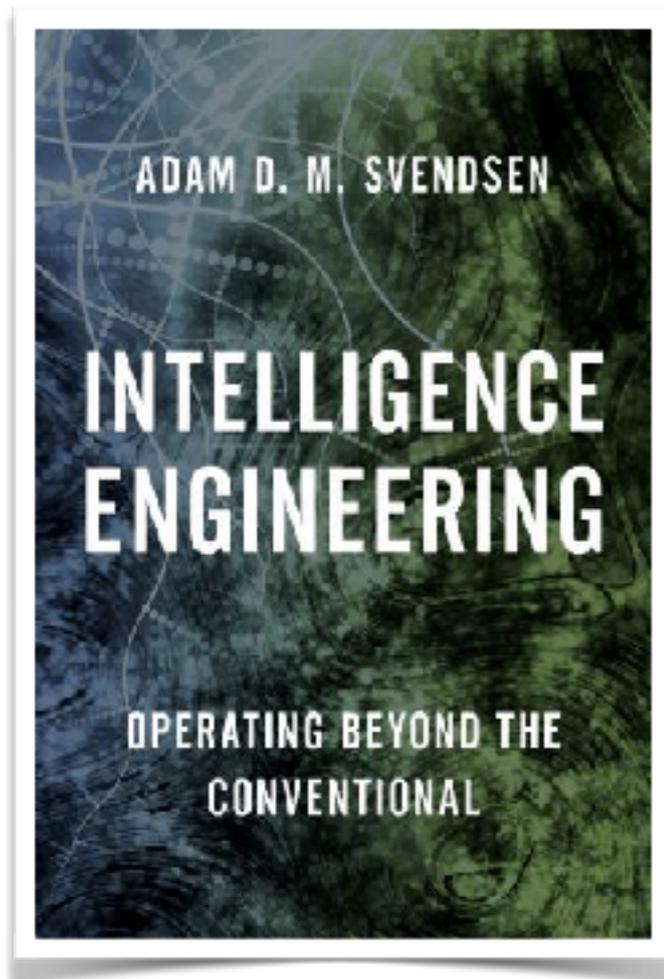
A.D.M. Svendsen, *Intelligence Engineering: Operating Beyond the Conventional* (New York: Rowman & Littlefield, 2017)

A.D.M. Svendsen, 'Intelligence, Surveillance and Reconnaissance (ISR)', ch. in J. Deni and D. Galbreath (eds), *The Routledge Handbook of Defence Studies* (London: Routledge, 2017)