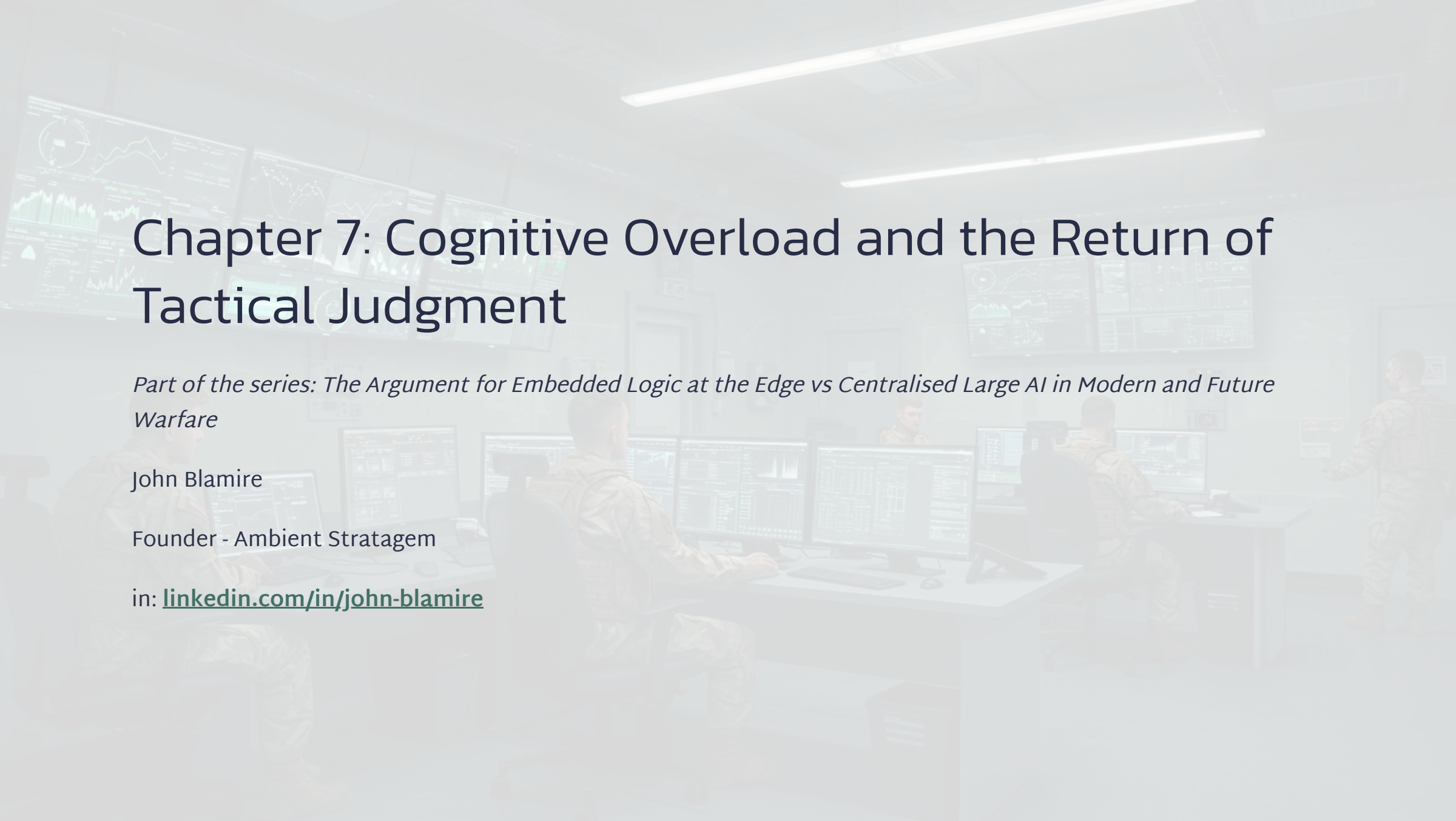

Chapter 7: Cognitive Overload and the Return of Tactical Judgment

Part of the series: The Argument for Embedded Logic at the Edge vs Centralised Large AI in Modern and Future Warfare

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The Challenge of Information

> "Our greatest enemy may be the flood of information that blinds us to what really matters."
>
> — General Stanley McChrystal, Retired Commander, Joint Special Operations Command (JSOC)

The Digital Battlefield Paradox

In the fog of modern conflict, information is abundant—but clarity is rare. The rise of sensor-rich systems, drone-enabled ISR, and AI-fuelled data streams has created an environment where the human operator is overwhelmed not by the absence of input, but by its excess. This is the paradox of the digital battlefield: more data, less decision.

This chapter explores how embedded AI—designed to interpret, filter, and contextualise information in real time—restores tactical judgment by reducing the operator's cognitive load. It argues for a shift away from raw data delivery and toward decision-ready outputs that support fast, informed, and confident action.

Information Saturation is a Tactical Threat

Commanders and operators at every level now face:

- Multiple video feeds, often from autonomous or semi-autonomous drones.
- Real-time sensor data, including thermal, acoustic, radar, and signal intelligence.
- Live alerts and system status updates, many generated by AI detection engines.

While each of these systems is useful, together they create a constant cognitive churn—forcing operators to triage inputs rather than act. The result is:

- Delayed decisions under analysis paralysis.
- Misplaced focus due to alert fatigue.
- Reduced mission effectiveness, especially under time pressure.

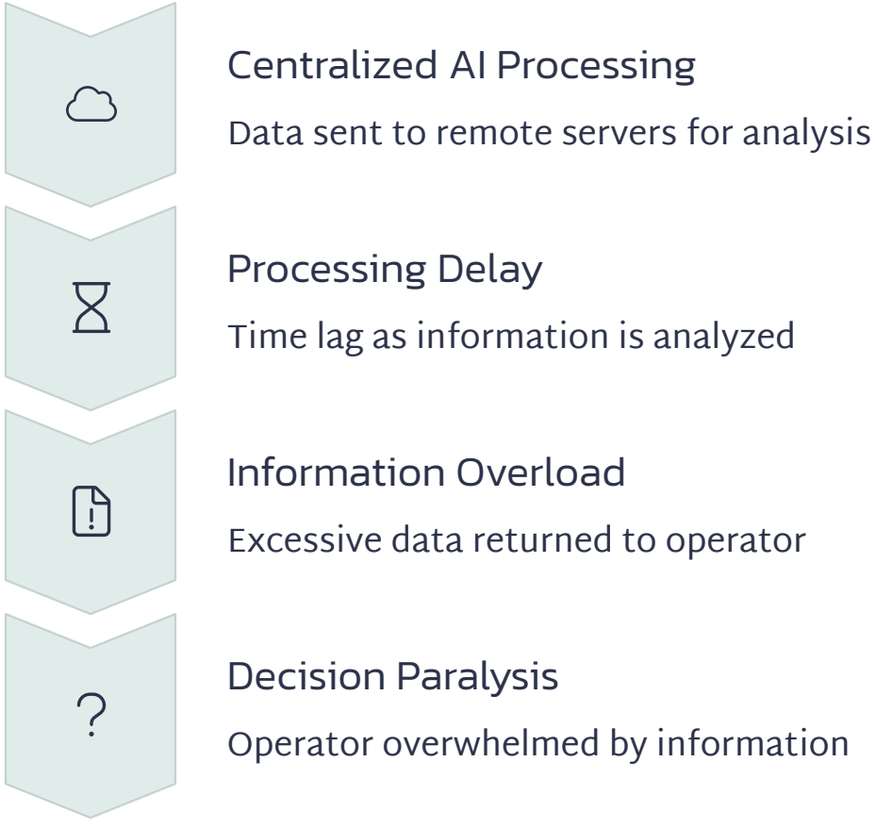
> "Our squad leaders were staring at feeds instead of leading. That's when we knew we had a problem."
>
> — French Army platoon commander, Mali deployment debrief, 2024

Centralised AI Often Adds to the Problem

Ironically, AI systems hosted in the cloud or fused at a higher command layer often:

- Deliver excessively detailed outputs, requiring further human interpretation.
- Provide low-context alerts, such as "object detected" without clarification.
- Queue data for delivery in ways that arrive out of order or after action has already been taken.

In some recent joint exercises, operators were forced to choose between trusting their own eyes or waiting for AI to confirm what they already suspected. This erodes the credibility of both man and machine.



Embedded AI Restores Human Primacy Through Clarity

Embedded logic, operating on the platform or in-field device, is uniquely positioned to:

- Pre-filter data before it reaches the operator—highlighting anomalies, dismissing irrelevance.
- Deliver mission-contextualised cues, not generic alerts.
- Allow operators to set relevance thresholds, adjusting what is shown based on current task load.

Examples include:

- An AI assistant that only alerts a fireteam leader if enemy movement is new, proximate, and unexpected.
- A drone feed that labels only priority targets, based on pre-briefed mission parameters.
- A voice-responsive tactical display that compresses five sensor streams into a two-word spoken prompt: "Movement—rear, fast."

This is how tactical judgment is preserved. The AI supports the decision-maker, rather than drowning them in data.

Cognitive Load as a Design Metric

Forward-looking defence organisations are beginning to treat cognitive burden as a quantifiable metric in capability development. Embedded AI systems are now tested not just for accuracy, but for:

Time-to-decision under stress

Measuring how quickly operators can make informed decisions when using the system in high-pressure scenarios

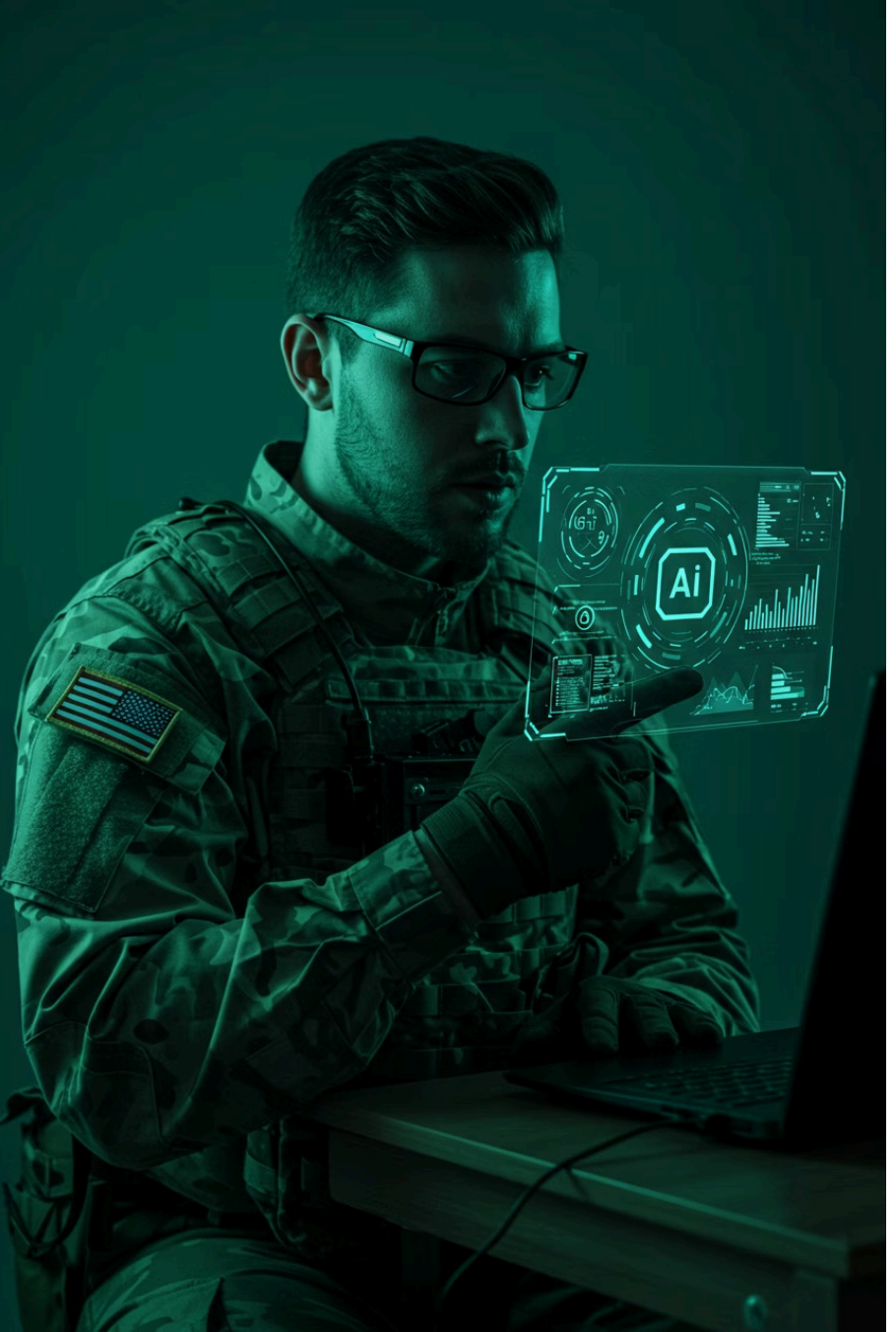
Operator comprehension rates of AI output

Evaluating how clearly and effectively the information is presented and understood

Trust and usage consistency across diverse mission types

Assessing whether operators consistently rely on the system across different operational contexts

Systems that perform well in lab conditions but induce doubt or distraction under fire are no longer considered operationally credible.



Conclusion

The edge is not just a place. It is a mindset: that the person closest to the fight must be empowered to decide—clearly, quickly, and with confidence.

To enable this, embedded AI must filter the noise, highlight the critical, and serve the operator—not swamp them.

Tactical judgment is not obsolete—it is more important than ever. Embedded logic is how we protect and empower it.

Looking Ahead

NEXT - Chapter 8: AI as a Field Advisor – Enabling Smart Decisions in Small Units

The next chapter will explore how AI can function as a trusted advisor to small military units, providing contextual intelligence and decision support at the tactical edge. We'll examine how embedded AI systems can enhance the effectiveness of small units operating in complex environments by offering relevant information and options without overwhelming operators.