

My Fifth Generation

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The Lockheed Martin marketers who came up with the 'fifth generation' slogan for the F-22 Raptor must be very pleased. The three Services of the ADF, led by the Royal Australian Air Force but joined more recently by the Royal Australian Navy and Australian Army, have embraced the goal of becoming a fifth-generation force. It has become the catchphrase of choice to differentiate where the Services are going from where the Services have been.

There is enormous value in having such a unifying theme and the habitual use of 'fifth generation' in formal presentations and informal discussion would suggest it has firmly taken root. However, despite its widespread use, the characteristics of a fifth-generation force remain ambiguous. Someone invariably asks 'what exactly is a fifth-generation force and how will we know when we get there? Come to think of it, what were generations one to four?'

These are valid questions. But I tend to think it has been quite useful not to have too much specificity

so far. The absence of specifics has prompted each Service tribe, their myriad sub-tribes, and their partners to think what fifth generation means to them in their circumstances. But we are perhaps getting to the point where we need to put some flesh on the skeleton of what it means to be a fifth-generation force. This commentary is my attempt to do that, or at least prompt a discussion that will help people put meat on the bones of their own version of fifth generation.

In my view, a fifth-generation force is an organisational response to the Information Age and the characteristics of fifth-generation systems. 'Fifth generation' began as a technology descriptor, and assessments of that technology's impact on warfare have been used to derive a notion of fifth-generation warfare. The missing leg of the triad so far has been the organisational change necessary to operate fifth-generation technology most effectively to fight fifth-generation warfare. This appears to be, as Peter Layton points out in his article elsewhere in this *Journal*, a 'very



complicated way of war', so organisational considerations are important.

So as not to stray too far from the origins of the fifth-generation nomenclature, I have sought to characterise a fifth-generation force by adapting the characteristics that define fifth-generation systems. The characteristics of fifth-generation fighter aircraft are generally perceived to be stealth, manoeuvrability, advanced avionics, networked data fusion and multi-role capabilities.

Stealth becomes 'signature aware'. Stealth is the combination of low-observable technologies and signature-optimisation tactics. Similarly, in organisational terms, a signature-aware organisation matches an awareness of its physical, electromagnetic, virtual, resource and social signatures with practices and behaviours that optimise that signature for given scenarios. This is an extension of current practices, such as public affairs, operational security and lean business practices.

However, viewing the management of an organisation's footprint through the operational lens of signature management is an important response to the proliferation of sensors, scrutiny and threat vectors. A signature-aware organisation broadens the awareness and pursuit of signature-related objectives beyond specialist staff, such that all personnel can shape their actions and footprint in support of the desired outcome.

Manoeuvrability becomes 'adaptivity'. Fifth-generation aircraft manoeuvrability is linked to sustained high speeds, such as the F-22's super-cruise, and a capacity to rapidly change directions. I view adaptivity as a concept that incorporates organisational flexibility (range of change), agility (rate of change) and a readiness, if not eagerness, for the organisation to change. Most importantly, in adaptive organisations formal leaders do not direct change: they set the conditions that foster change from within the organisation.

I think we are relatively well postured for this requirement on an individual level. But I'd suggest there a few areas that need focus to shift from being an organisation with adaptive people to a genuinely adaptive organisation. A culture of delegated decision-making, distributed collaboration and a looser coupling to formal decision systems, such as risk and acquisition

processes, are necessary to foster a more adaptive collective.

Formal decision systems are important instruments but they should inform and support while not constraining decision-making flexibility. The character of future warfare drives this requirement. Events are simply going to move too fast for the formal leader- and process-centric decision-making that mark our current organisational constructs. In an adaptive organisation, the worst thing you can do is not make a decision.

Advanced avionics becomes a 'human-machine team of teams'. Fifth-generation platforms use hardware and software to optimise the wetware of their crews. A fifth-generation force needs to be founded on human-on-the-loop human-machine team of teams to optimise decisions. This is a step beyond our current human-in-the-loop approach that supports and accelerates but rarely optimises decisions.

Rather than simply using computers to automate processes—the 'traffic lights' in so many command and control systems are essentially a digitised checklist—a fifth-generation force will exploit the processing power of computers to 'roll the dice' on possible options and present recommendations to a human decision-maker to apply human judgment.

The human-machine combination will be critical to the force's ability to deal with the uncertainty and chaos of a war that is potentially being fought on a pulse-to-pulse basis. And just as Facebook tells you which of your friends are interested in a particular event or page, the human-machine team would capitalise on machine processing to identify and alert teams that are working in a similar area or on a similar problem, fostering a 'team of teams' approach. Any conflict posing human-machine teams against humans-with-machines will be a very one-sided fight.

Networked data fusion becomes 'cognition-centric'. Fifth-generation aircraft have been designed with the collection, transmission and processing of information as their defining feature, to enhance the cognitive capacity of their crews. Initially, I called this characteristic 'information-centric' but I realised that this placed the value in the wrong place. 'Information-centric' portends an organisation that considers information as having value in itself.

A cognition-centric organisation, by contrast, views information only as a means to an end. Information is simultaneously terrain to be controlled and exploited, a weapon to be targeted and employed, and a supply to be husbanded and secured. The value of the information in all these perspectives is the impact it can have on the cognition and decisions of actors in the environment. Thus, a cognition-centric organisation values education (how to think) as much or more than training (what to think), so that the potential cognitive value of information can be realised.

A cognition-centric organisation recognises the futility of efforts to control information flows or 'the message' in an information-rich world and understands that the value of freer information flow in your own organisation, principally through better thinking and superior decisions, outweighs the associated costs. Starting from a basis of control-by-exception also allows the organisation to focus on securing only those things that absolutely must be protected.

Multi-role capabilities become 'outcomes-based'. Fifth-generation aircraft can shift from one role to another in single missions, and are less constrained by traditional 'type' roles such as fighters or bombers. A fifth-generation force shifts from effects-based or platform/system/domain/stovepipe-centric views of the organisation or operations to an outcomes-based view.

The shift from effects-based to outcomes-based thinking is similar to the move in Western planning doctrine from centre-of-gravity-oriented planning to objectives-oriented planning. Effects, like centres of gravity, are simply instruments to be used to achieve larger purposes but both of these grew larger and more intricate than the purpose for which they were conceived, namely achieving outcomes.

As our organisations avail themselves of a wider array of effects, coming from or through multiple domains, we need to recognise that outcomes may provide the only relatively constant, organising logic across time, space and organisation. Individual effects, their utility and how they are generated will be transient, and success may require the orchestration of a myriad effects in potentially non-repeatable combinations.

A consistent, organising logic based on outcomes will be a useful means of providing unity

of effort and focus while fostering initiative among people who understand what the boss wants, and have a cunning plan to give her exactly that.

A fifth-generation force is not simply one that operates fifth-generation equipment or fights fifth-generation wars. It must also be a fifth-generation organisation. These are my five characteristics of a fifth-generation force. I'm not sure they are right and I'm quite certain some of you think they are wrong. I'd love to hear why.

Notes

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