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# The Meaning of Value-for-Money

Everybody talks about value-for-money, but do they all know what they mean? Money may be easily identifiable, but what about value? Is it the value of the kit that is delivered to the front line, or jobs in political constituencies? Is it overall value for UK plc or is it the pursuit of operational sovereignty? Or a combination of some or all of these? What **should** it mean? What should it **not** mean? Our experts discuss these questions.

*Our experts are:* **Lewis Page, Professor David Kirkpatrick, Bob Barton, Paul Beaver, Cate Pye, Dr Nicholas Whittall and Philip Boxer**

**TODAY'S QUESTION:  
WHAT IS VALUE-FOR-MONEY IN DEFENCE ACQUISITION?**

by Lewis Page

*Lewis Page recently retired from the Royal Navy and is the author of the book Lions, Donkeys and Dinosaurs. He examines value-for-money from the Armed Forces angle.*

The answer to the title question depends on who you are. If you're the Prime Minister, you might easily feel that well-paid jobs in the industrial graveyards of Scotland are the most valuable thing that defence money can buy. And yet when you buy a Type 45 destroyer for £1Bn, most of that money goes on French and Italian missile technology. Steel-cutting Scotsmen get only crumbs. Value, in terms of politically useful jobs for money spent, is poor. You'd do better to do what the Koreans did, and buy the guts of an *Arleigh Burke* cheaply from America to put into your crowd-pleasing, locally assembled tin can.

You might not choose to focus on cutting steel in Scotland, but rather on high-tech engineering in the English and Welsh regions. Properly paid, decently treated workers will never compete with the Far East at making tools, cars, personal gadgets and so on; but perhaps they can keep old Blighty rich making pilotless aircraft, or jet fighters, or complex munitions. It certainly seems to be proven that actually we can't all live off comical bits of paper being swapped in the City.

Securing the country's economic future is surely a very valuable thing, isn't it? A lot of politicians and business leaders would like to think so. And yet, defence manufacture brings us a measly billion or two in exports each year – and our arms industry requires the great bulk of the £15Bn defence materiel budget in spending to win us this rather paltry amount of trade. If we had to subsidise all our exports at that sort of rate, we'd go broke pretty fast.

Other people often speak of a form of defence value called

'sovereignty'. The idea is that it's worth paying anything from twice to ten times as much for a 'sovereign' capability, one that requires no consent for support or parts from overseas capitals – particularly Washington. This argument is often used to support such programmes as Future Lynx, Nimrod MRA4, A400M and the Eurofighter – all shockingly expensive, slow to appear, and lacking in capability compared to their rivals. It seems, though, that they offer some kind of freedom from US domination.

But sovereignty of equipment – other than the most narrowly defined operational sovereignty – simply doesn't exist. Yes, the Prime Minister can fire his American-made Trident missiles without asking Washington first. But he cannot expect his supposedly 'British' or 'European' systems to keep operating through a normal-length war if US support is cut off. No, seriously. The Eurofighter contains so much US equipment that American consent is required for us to export it to Saudi Arabia, for goodness' sake. EADS tells us openly that "the A400M will benefit from use of American content". The command system for the Nimrod is being made by Boeing. The Future Lynx uses American engines.

And *in addition* to Washington, use of these aircraft also requires cooperation from the capitals of Europe. Had we bought F-15s, F-22s or F-35As, C-17s, P-8s (or nothing) and Sea/Blackhawks instead, we would be *more* sovereign, not less. 'Sovereignty' as a form of defence value is a joke. So is the suggestion, offered just the other day by the outgoing CEO of BAE Systems, that partly homebuilt systems will somehow have lower through-life costs. How on earth it will be cheaper to keep the last 12 De Havilland Comets in the world airworthy (for that is the reality of Nimrod MRA4) than it would be to draw on the support tail of the US Navy's planned hundred-strong P-8 fleet – and the commercial 737 maintenance base – is completely unfathomable.

No. Spend-ten-pounds-to-earn-one exports aren't value-for-money. Sovereignty, other than the sovereignty of Trident,

is snake-oil. Bizarre claims that small custom-built fleets will offer cheaper running costs than large, mass-produced ones don't even belong in a sensible discussion.

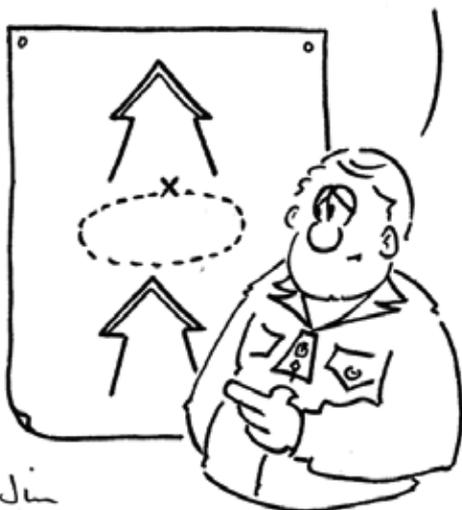
Value-for-money in defence purchasing is *capability and nothing but*. If a helicopter will lift twice as much as another for less money (that's Chinook versus Merlin HC3, by the way), request that chopper. If a transport offers much more lift, range and speed for a given sum, request that transport (C-17 versus A400M). If a UAV does everything that its rival does and carries weapons too – all for less than half the price – buy that UAV (Sky Warrior versus Watchkeeper). If you want a medium armoured vehicle but don't fancy paying to refurbish the moribund UK tank industry as well, buy it from someone else.

If your political boss tells you to be quiet (and he very likely will) give some thought to where your duty actually lies. Are you really so valuable in uniform that it's your duty to stay and keep mum, when servicemen are dying and being crippled needlessly overseas, operations are hamstrung, and the UK is losing status and effectiveness – all for lack of easily affordable helicopter lift, strategic air and overhead orbits, and because of an embarrassingly aged Army vehicle fleet?

Or would you be doing better for your country – for the taxpayers who pay your wages, and the junior service people who rely on you to look out for their interests – to tell the truth, and find yourself a new job afterwards if need be?

Just a thought. ■

***“The Brigade will advance in contact for 3 days and then wait till the US can sell us some more spares...”***



## VALUE-FOR-MONEY IN DEFENCE EQUIPMENT ACQUISITION

by Professor David Kirkpatrick

*David Kirkpatrick is an Associate Fellow of the Royal United Services Institute. He examines the factors that bear on defence equipment value and cost and how these should be assessed.*

'Value-for-money' is one of the most ubiquitous phrases in British politics, and is also one of the least understood. The phrase originated in the commercial marketplace, where discriminating buyers could confidently judge the attractiveness of various goods and services relative to their price. However, today the expression value-for-money is increasingly used with reference to public goods and services where the meanings of both value and money are obscure, and where comparison is complicated because those who pay are different from those who benefit.

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In the UK defence sector, value-for-money can be considered at the level of the total defence budget, or at the level of a particular military capability (e.g. to achieve decisive effects in the underwater environment) which contributes to national security. This paper considers value-for-money at the third and lower level of a particular defence equipment project which is acquitted to sustain one (or for multi-role equipment two or more) military capabilities and hence to preserve national security.

### Value

The principal value of a new defence equipment project lies in its enhancement of one or more of the military capabilities of the UK's armed forces, increasing their ability to defend the nation's security and vital interests. The extent of that enhancement can be assessed, in representative scenarios of potential future conflicts, using a blend of combat simulation, war gaming and military judgement; the assessment should take account of how well the new equipment can be integrated with legacy and future equipment deployed and on order for UK and allied forces. The enhancement attributable to the new equipment is inevitably time-dependent, increasing as more units enter service with UK forces, and later decreasing as they become obsolete, relative to emerging threats.

### Money

The money attributable to a defence equipment project is

the total of annual expenditures on the equipment itself and on other associated Defence Lines of Development in each year through the equipment's life cycle, from Concept to Disposal. If the total of annual expenditures in year  $t$  is denoted by  $\pounds(t)$ , then:

Through life cost =  $\sum \pounds(t)$

The Treasury requires that approval of any public sector project should be based on an investment appraisal (IA) using the discount rate  $r$  (currently 3.5%) representing the time value of money. The IA calculates the Net Present Value (NPV) of the project, measuring the economic burden associated with it as:

$$NPV = \sum \pounds(t) / (1 + r)^t$$

The IA process takes account of the timing of expenditure, balancing the penalties of spending different amounts of money in different years.

Money may also be expressed as the equivalent annual cost (EAC) per unit in service, which depends on the scheduled rates of delivery and disposal of the equipment and its availability for operational use in the interim. If the number of units available for service in year  $t$  is denoted by  $N(t)$ , which varies through the service life of the equipment, the EAC is given by the equation:

$$NPV = EAC \times \sum N(t) / (1 + r)^t$$

The EAC takes account of the duration of the equipment's likely operational service and is analogous to a hire charge; it may be compared to the unit effectiveness of the equipment considered.

### Cost-effectiveness

As part of the cost and operational effectiveness investment appraisal (COEIA) process in the MoD's defence project management, the enhancement in military capability arising from the project considered is plotted in a graph against its NPV. This procedure allows a two-dimensional comparison of the cost-effectiveness of various equipment designs and of alternative acquisition strategies. In commercial companies the value of a new facility can be measured in financial terms, so the investment appraisal is one-dimensional and accordingly easier.

### Risk

Any assessments of the value and of the money associated with a new defence equipment project are subject to risk and uncertainty, which may be relatively large in the Concept phase, but decline as more information becomes available and as risk management is implemented later in the project life cycle. The scale of the risks depends on the maturity of the relevant technologies, on the originality and complexity of the chosen acquisition strategy, on the likely volatility in the prices of input goods and services, and on the commitment and stability of the contractors (and any foreign governments) contributing to the project, etc. The risks may cause:

- Shortfalls in equipment performance.
- Interruption in supply and support from contractors.

- Delays in delivery schedule.
- Increases in acquisition cost.
- Adverse developments in the threats to the UK.

All of these risks, except the last, can be reduced but not eliminated by appropriate risk management measures.

Accordingly, all assessments of value and of money should be accompanied by confidence limits which define the upper and lower bounds within which outturns are likely to fall, and the project management plan should be guided by both the most likely outturns and by their confidence limits.

### Indirect effects

There are several indirect effects which might in principle arise from an MoD decision to choose contractors operating within the UK to develop, manufacture and support a new equipment project:

- The resulting expertise in dual-use technologies might spin off to benefit the commercial sector of the UK economy.
- The contractors could independently surge production or upgrade the equipment in response to future emergent threats; in practice, any major project is likely to be dependent to some extent on imports of materials, components or subsystems, so surge production would rely on the continuing goodwill of foreign suppliers.
- The contractors would retain the technological and industrial capabilities to respond effectively to a future MoD requirement for successor equipment needing those capabilities (probable for some classes of equipment, unlikely for others).
- There might be improvements in the level of UK employment (and hence in public finances) and of UK exports, though the Treasury believes that onshore defence contracts have generally only a negligible effect on the overall level of employment, and that overseas trade is most efficiently balanced via a floating exchange rate. Those beliefs are unlikely to be waived in favour of onshore suppliers unless the current economic recession is unusually severe and protracted.

These indirect effects depend on exogenous factors (such as the availability in the UK of long-term capital for commercial projects, and the importance of any emergent threats) so their value is particularly difficult to assess.

### Who decides on value?

The price of a product in the commercial market is explicit, but the value of that product to different consumers depends on their personal tastes and priorities. Individual consumers can decide easily if a product is value-for-money, couples often disagree and committees may bicker endlessly. The individuals within a national population similarly assign very different values to health care, transport infrastructure, defence equipment and other public sector projects, depending on their personal opinions and circumstances, so in the UK decisions on such projects are taken by the government acting in the national interest.

But the danger remains that the government's perception

of value may be unduly influenced by interest groups (the military-industrial complex, the sports council, drug companies, etc.) particularly in areas where the ultimate benefit of public expenditure is unclear. It is evident that a Minister considering the value of a new warship should not rely only on the advice of admirals and shipbuilders, but can hardly extend the scope of the debate on the warship's value to the person on the Clapham omnibus. The MoD can produce an internal consensus on the value and on the money arising from a major defence equipment project, but this consensus should then be subject to independent scrutiny (analogous to the intended role of non-executive directors in a commercial company) and the results of this scrutiny should be available, with submissions from other interested Departments of State, to guide the Cabinet's decisions on the project. ■

### VALUE-FOR-MONEY OR AFFORDABILITY?

by Bob Barton

*Bob Barton is co-chair of the MoD/industry Equipment Capability Group. He suggests that we need to stop thinking about 'value' and 'money', and concentrate more on 'affordability' and 'transparency'.*

Value-for-money (VfM) has long been a topic for heated discussion in defence circles. The default mechanism for determining VfM is competition, a judgement often heavily influenced by *price* rather than *cost* and, more worryingly, *cost* rather than *value*.

It is, of course, extremely difficult to measure value, particularly future value, and even when you have 'finished' and delivered a project, how do you quantify what is truly value, and does it give broad enough consideration to the collective goals of all stakeholders? It is particularly problematic in the defence arena, where the attention-grabbers are large equipment programmes for which there are few competitors and no obvious 'control factor' – i.e. which comparator do you measure it against? Here we are not dealing with repetitive commodity-based purchasing, but the procurement of complex, non-repetitive, specific solutions.

If a product is tangible and repeatable, and if it delivers easily measurable (physical) benefits, then the judgement of whether it represents VfM is relatively straightforward; but even then this judgement is still somewhat subjective. In large defence procurements the outcomes can be characterised as highly non-repetitive and highly intellectual (this is true for any new major platform as they bear little resemblance to their predecessors either technically or operationally); in this case, the judgement of VfM becomes extremely subjective. The reason is that the physical content is not the major determining factor.

Maybe we should stop thinking about VfM and give greater consideration to *affordability*?

Affordability begins with a notion of available budget – and this raises questions of transparency. In the situation where the development and delivery is non-repetitive, it is far easier to judge VfM when both sides operate *transparently*. Transparency is two-way and relates to both the inputs and outputs, which include budgets and costs as well as desires, aspirations and needs.

### *Maybe we should stop thinking about VfM and give greater consideration to affordability?*

As the VfM debates continue, however, it is a source of disillusionment that, despite the commitment to transparency of the previous Minister for DE&S, it has not found favour with the Treasury and no progress has been made. So this leaves us with the blunt instrument of competition where, as one observer has put it, we are trivialising the equivalent of comparing 'apples and Wednesdays'.

In many ways, measurement of VfM has strong parallels with measurement of 'military capability' – they are both relative judgements. There has been much debate played out in the news of late about the 'cost' of drugs in the health sector. How do you value a life extension? Quite simply, the gulf between cost and value is irreconcilable, but the analogy to the defence sector is strong – how do you value a *faster* delivery versus a *reduced specification* versus a *lost life*?

*"If we have to measure programmes against whether we can afford them then we're sunk..."*



So, let us return to the core issues of affordability and transparency. These represent the territory where the rational, less subjective judgements – and incentives – can be debated, and which should deliver true VfM. Previous best practice has shown that competition should be based on determining those who clearly have the best proven methods and ideas to deliver the solution (often referred to as a ‘beauty contest’); this still makes for a subjective judgement, but it could be based on the three central tenets of the National Audit Office (NAO) Act (1983) of Economy, Effectiveness and Efficiency. The difference in this approach is that the judgement is about the *ability* of the supplier to deliver against these tenets, not the solution itself; it is a choice that is based on their *capability*. So, I would proffer the view that at the competition stage the fundamental decision should be made by considering those factors which can be measured at the time (the best skills, processes and methods), and not on a highly subjective judgement of a yet-to-be-designed and delivered solution, which is subject to all the vagaries of specification, interpretation and estimation.

Once the route to provision (the provider) is established, this should be followed by an ‘intent to contract’ and an open and *transparent* debate about how the three tenets will be met via a *concurrent, joint and open trade of all parameters and variables*, the aim being to deliver what both sides agree to be a value proposition. In this way, the competition does not assume an absolute solution: solution is but one of a number of parameters that remain ‘on the table’ as concurrent trades are made on affordability.

Success generally occurs where all the players are locked in a mutual need, providing the conditions for a rich VfM debate to be held – and transparency is key to delivery of a ‘felt fair’ result.

It is an old adage that: “If you do what you’ve always done, you get what you’ve always got.”

Time for a change? ■

## WHAT IS VALUE-FOR-MONEY?

**By Paul Beaver and Cate Pye**

*Paul Beaver, a Member of RUSI since 1979, is a defence advisor and consultant; Cate Pye is a former MoD Faststream Engineer, now working in management consultancy. They believe that there is no common understanding of what value-for-money means or how we can measure it.*

In a time when Defence doesn’t know where the next pound is coming from, getting value-for-money (VfM) from defence spending is all the more important. This raises an interesting question: what is VfM? And what should Defence be doing about getting it? And shouldn’t

there be a recognised definition?

The force mantra of VfM has been in common parlance for at least a decade, but there is no real common understanding of what it means. The National Audit Office in ‘Getting value for money from procurement – how auditors can help’ states that “Value-for-money is not about achieving the lowest initial price: it is defined as the optimum combination of whole life costs and quality”. Another government source<sup>1</sup> believes it is about “obtaining the maximum benefit with the resources available” through a combination of economy, efficiency and effectiveness.

## *The force mantra of VfM has been in common parlance for at least a decade, but there is no real common understanding of what it means*

One thing is clear from previous defence procurements, VfM rarely means the cheapest initial cost, and must consider the through-life supportability and maintainability of a solution. However, the Treasury can only look as far as the next spending round – about five years if we include in that preparation and options time – so how does this equate with procurements that average 15 years in defence and may be much longer?

Public Private Partnerships (PPP) and Private Finance Initiatives (PFI) push these boundaries even further with 25–30 year agreements and the need to set requirements and understand benefits clearly at the outset. This implies competition, partnering and long-term relationship building to ensure VfM for the taxpayer throughout the life of the service. But competition and partnering alone will not give VfM.

At the other end of the acquisition spectrum are short-term agreements such as Urgent Operational Requirements, which typically take six to twelve months to procure and are supported for at most one to three years. Usually, with limited or no competition the cost of acquisition is low, but there still needs to be an understanding of the benefit achieved; particularly when the decision on whether to dispose of a system or transition it to core (and hence commit to support in the longer term) has to be made.

So, the answer is neither straight competition to drive down costs, nor rapid procurement to meet the needs of now. So, given we are not dealing with pure economy, where else can we look for a perspective on VfM?

The multi-national Eurofighter programme is widely recognised as having been ‘expensive’, yet the UK could not

have procured Typhoon alone. Is it value-for-money that we now have a world-class combat aircraft rather than none at all, or an equally expensive alternative over which we would not have sovereignty? Ah, so here we enter into some of the other factors driving procurement that take us beyond pure accounting and which are not necessarily fully understood.

These factors appear again as we consider whether the need is for apparent VfM for government or for 'UK plc'. To continue to drive costs down in either procurement or support implies that industry has to provide such savings, potentially through efficiency, but eventually through decreasing margins. A key question still to be answered is where in this cycle does Defence need to stop before it denudes the UK industrial capability and skills base?<sup>2</sup> Take the future carrier or any other major projects procurement for that matter – VfM must be taken into consideration as it protects significant shipbuilding jobs in the UK and maintains the gainful employment of taxpayers who would otherwise be drawing on the state. Yet, the carrier acquisition must also be affordable at a time when the Equipment Plan is overcommitted by £11.2Bn.<sup>3</sup>

With the current economic crisis set to continue, it is all the more important that acquisition achieves value from the decisions it takes, which means that the strategy on which those decisions are made needs to deliver the defence capability required by the UK effectively. A laudable aim, but difficult in an age where the role of the Armed Forces is changing regularly as we have seen a paradigm shift from the Cold War expectation of state-on-state conflict to asymmetric warfare, peacemaking and peacekeeping, and international counter-terrorism. This has left us with policy and acquisition that need to catch up not just in MoD but in central government, as the demands on our Armed Forces to deliver continues to rise and funds do not match those aspirations.

To achieve VfM from defence investment the aim needs to be made clear; should we fight first and keep peace as a secondary goal? And should that investment in the fighting force be on asymmetric tactics and strategy or must we maintain a heavier warfare capability as our future investment? Sadly, we can't wait for the crystal ball as the investment decisions need to be made now and, in the absence of a clear view, they will inevitably not be value-for-money by whatever definition. ■

## NOTES

<sup>1</sup> www.idea.gov.uk

<sup>2</sup> MoD, *Defence Industrial Strategy*, Cm 6697, December 2005, The Stationery Office, London

<sup>3</sup> Calculations by Beaver Westminster Ltd based on data from PQs

## Agility and Value for Defence

by Dr Nicholas J. Whittall & Philip Boxer

*Nicholas Whittall is Strategy Director, Thales Aerospace Division, UK and Philip Boxer is on the Technical Staff of the Dynamic Systems Programme at the Software Engineering Institute, Carnegie-Mellon University, USA. They argue that costing flexibility of design and valuing agility offer the grounds for new commercial transactions and approach the elusive notion of Value-for-Defence.*

In its 2005 Defence Industrial Strategy, the MoD invited industry to join it on a journey from traditional equipment supply, through contracting for the availability of fielded equipment (TLAM), towards contracting the through-life management of military capability (TLCM). Sectors which could identify capability with particular equipment or platforms, and which were dominated by major onshore suppliers, allowed the journey to be mediated through a Strategic Partnering Arrangement (SPA), which set targets for business transformation and gainshare whilst assuring offshore suppliers of competitions to come. For sectors where no such identification could be made, e.g. C4ISTAR, the TLCM journey was less clear. Thus, industry has been encouraged to make its own proposals, and Thales has been among these, calling for appropriate collaboration to construct a framework within which appropriate competition may be held, with the notion of appropriateness being informed by an as-yet-undefined measure of Value-for-Defence.

Whilst models exist for assessing value-for-money in the procurement of equipment and the total cost of ownership, value-for-defence demands an Enterprise-level evaluation. In approaching this, it is important to identify the impact of design decisions taken in the supply of equipment or platforms, not only on their integration across all Defence Lines of Development (DLoDs) to form military capabilities, but also beyond that to the orchestration of such capabilities to form composite capabilities that deliver effects to meet demands arising in operational contexts of use. Further, if one conceives of the Defence Enterprise as a single process, taking in equipment or platforms and delivering effect into its context of use, then between this input – the place where the MoD has traditionally met industry – and the output – where the military meets its adversary – three levels of decision tempo govern the performance of the process.

The *campaign tempo* is the rate at which *demand* arises within the operational theatre – the context of use. The rate of change in the tempo of this demand may be driven, inter alia, by changes in technology – e.g. incorporating a new capability, say TUAVs – or by changes in doctrine (theirs or our own) – e.g. their use of improvised explosive devices (IEDs).

The *alignment tempo* is the rate at which the military

commander can orchestrate the individual military capabilities available to him to form those composite capabilities that will deliver the effect that meets the demand arising at the campaign tempo. This alignment tempo is governed largely by the ability of the force elements to form the geometry of use that delivers the composite capability. A gap arising in the range and flexibility of individual capabilities needing to be orchestrated may manifest itself as a user *need* that is registered with the procurement agency.

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## ***Whilst models exist for assessing value-for-money, value-for-defence demands an Enterprise-level evaluation***

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The *acquisition tempo* is then the rate at which the MoD meets this need, which it does through a process of publishing a *requirement* – usually for equipment, where industry is concerned, although this may be across any combination of DLoDs – and delivering to the military commander whatever is required to close the gap in the orchestration process.

The separation of these tempos is neither unique to Defence – it applies to all enterprises – nor unique to this age. However, reflection on these leads to the conclusion that meeting the campaign tempo at the lowest cost – and this need not be limited to mere monetary cost – is the defining characteristic of value-for-defence. Meeting the campaign tempo then depends on the alignment tempo possible, which in turn depends on the acquisition tempo at which gaps can be filled. Any slowness in acquisition tempo leads to increased bricolage and process short cuts (UORs) to enable the alignment tempo to keep up with the campaign tempo. Thus, ‘agility’ finds its richest expression in the ability of the alignment tempo to meet the required campaign tempo at the lowest cost – i.e. to maximise the value-for-defence.

This demand-side approach represents a change in perspective from that currently dominant. The division of labour that arose from the complexity introduced by our dominance of the means of production encouraged functional specialisation and decomposition of enterprises into their contributing systems. Thus, the dominant paradigm within which today’s systems engineers operate is one of working an engineering ‘V’ from a requirement through functional analysis and decomposition processes towards components that can be integrated to deliver a system that meets the requirement. Design decisions taken through this process seek the lowest project cost, with little regard to the ways in which systems are used in a range of contexts. This supply-side perspective may reach towards these contexts of use through contracts for

the availability of fielded equipment – as in SKIOS, which refers to the platform alone – or aspire towards TLMCM where the capability is identified with particular equipment or platforms. But these are far from the contexts in which the military commander faces demands with an array of systems of systems at his disposal. This process needs a feedback loop – an inverted V or ‘alignment  $\Lambda$ ’ – to engineer how the resultant systems will be, or could be, used with other systems in varying contexts of use.

This introduces a tension between the constraints of design decisions taken in order to acquire equipment or platforms to a *requirement*, and the degrees of freedom envisaged as desirable in enabling them to be orchestrated in response to changes in *demand*. Discontinuity between the demand and the requirement has created the divergence of tempos that has incurred unanticipated costs in UORs beyond the contingency budgets. One solution, making available an infinite variety of geometries of use, may be viewed as ideal, but is unlikely to offer the best value-for-defence. Locating an optimum balance is required between UOR overuse and wasteful flexibility through examining the costs of meeting varieties of demand.

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## ***Meeting the campaign tempo at the lowest cost – and this need not be limited to mere monetary cost – is the defining characteristic of value-for-defence***

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Cohesion-based costing (CBC), in contrast to activity-based costing, offers a means of uncovering the real costs of meeting ranges of operational demand by tracing from a range of decisive points in the context of use throughout the Enterprise to locate the entities contributing to the military effect. This extends through, inter alia, procurement networks, development, force elements, lines of command, to uncover where value is created and thus locate opportunities for flexibility in the contributing entities to deliver agility in the contexts of use. From the perspective of a variety of scenarios, the cohesion costs of a particular type of decisive point will vary over some range with some varying probability, creating a probability distribution of cohesion costs.

This offers a means to attach a value to the cost of introducing flexibility. The value will be related to the impact the flexibility has on the agility of force structures, measured by its impact on the probability distribution of cohesion costs. The cost of the flexibility and the value of the ensuing agility provide the grounds for a commercial transaction and, ultimately, a means by which value-for-defence may be assessed. ■