Case G: Defense Procurement in the 21st Century

The Problem Space

Defense is an expensive business, not only in terms of the finance, but also in terms of lives lost, dreams shattered, and communities disrupted. Defense is also a sensitive issue in a democracy. The University of Michigan's Correlates of War Project showed that democracies seldom make war on other democracies — with no exceptions since 1815. This suggests — at least — that voters in a democracy are reluctant to vote for war against another democracy, and that war is likely to be a vote loser.

There are counteracting influences. Should a democracy be attacked, history shows that the people will band together against the common enemy: they will vote for war; they will go to war; and, they will count the cost. In times of increasing human rights and freedoms, the cost of losing young lives is becoming increasingly painful and less acceptable. The people would, it seems, want to respond to attack with a clean war, one in which their young men and women did their duty, but survived unscathed both physically and mentally.

Which means that the armed forces should be equipped with the best weapons, the best armor, the best everything to enable them to defeat opponents with minimal risk to themselves. And, since technology is advancing at breakneck speed, our armed forces should have the latest, up to date, innovative technology. Or, so one argument goes . . . .

Difficulties in predicting the need

It is difficult to forecast what weapon systems a particular force will need. It depends so much on the situation, the opposition and the rules of engagement. Changing sensitivities have made it unacceptable to engage an enemy who is embedded in civilian enclaves — a favorite hiding place of the terrorist or insurgent just because he believes that he won't be attacked there — raising the profile of the so-called surgical strike: a precise hit with no collateral damage. Is there such a thing

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as a genuine surgical strike? It would require perfect, timely intelligence: precise target detection, location and guidance; and a weapon payload that was powerful enough to fulfill its purpose, but tightly circumscribed in its effect.

The foregoing is predicated on the notion that technology is the answer — what was the question? In the real world, warfare is not quite like that. For a start, conflicts are rarely one-on-one; instead, they are many-on-many. And the rules keep changing, too. At the present time, for instance, it is unacceptable to simply overpower a foe with superior weapons and numbers. 'Proportional response' is the order of the day, so that a watching world does not see the more powerful nation as 'bullying.' In such an environment, deploying some advanced technologies may be 'beyond the pale.'

Military men, too, have argued interminably over the need for more, simpler, cheaper, weapon systems, versus the need for fewer, more sophisticated, more expensive weapon systems. Generally, the argument has gone in favor of the fewer, more sophisticated and more expensive . . . and that has led in turn to the use of advanced technologies, long, protracted procurements, and weapons systems that may be rather too precisely directed towards a threat that – by the time the weapon is available — may have changed or disappeared.

It has been the practice in the past for the military to determine what they need, and to issue requirements for weapons, platforms (tanks, ships, plane, etc.) This has not worked well for several reasons:

- The need for particular weapons has often been predicated on intelligence claims about a potential enemy's developing capability. Such intelligence has not always been accurate, tending to represent the enemy as more powerful, more technologically advanced, and even more aggressive, than events proved to be the case
- Military staffs formulate the requirements for new weapons systems based on their own operational experience. This would seem to be sensible and appropriate: who could know better than a 'fighting man'? Unfortunately, this turns out to be neither sensible nor appropriate. The one-time 'fighting man,' now a senior 'desk jockey' in some government department, may not have fought for twenty years, and then under entirely different conditions and situations. Moreover, when he did fight, he may have been using platforms and weapons systems that were themselves ten years old, having been designed at least twenty years earlier still, using the then technology. So, he formulates his requirement based on his understanding of fifty-year-old technological capabilities.
- New technologies may afford the opportunity to engage an enemy in an entirely different way: experienced military men may find it difficult to conceive or accept such changes — see Case F: Fighter Avionics System Design on page 425.
- In consequence, there is a marked tendency for military requirements to seek replacements for that that has worked previously, only 'up-gunned,' faster, more survivable, more reliable etc. Often, such requirements can tend to be rather specific to particular situations and circumstances that have applied in the past, rendering the new system unattractive for export.

Governments of developed nations tend to invest heavily in advanced technology weapon systems, and seek to defray the cost in export sales to nations of all persuasions, taking care to moderate exported weapon systems capabilities.

Meanwhile, history shows that force capability is dependent on much more than the technology of weapons and transport systems. It is also to do with training, with balanced forces, with synergy between force elements, with motivation, *esprit– de -corps*, and discipline, with organization and command, and many more. Capability, it seems, may be emergent.

Cutting edge of technology — was defense, now commerce

With all the talk of advanced technology for defense, it used to be thought that defense was the breeding ground for new technologies, which would later 'trickle down' into commercial use. With rare exceptions, the reverse has been true for some time. Advanced, sophisticated systems that were once the preserve of the military are now appearing first in general commercial use. This is particularly true in electronics, electro-optics, software, imaging, graphics, communications, and many more. (It may not be true in materials technology.)

One reason is that research in these areas is driven by sales, and commercial applications afford much greater sales potential than military applications. Commercial products have become as robust as their militarized counterpart — indeed, there is often no need to militarize commercial products. Commercial off-the-shelf (COTS) products are now available to the defense system designer and procurer that are capable of being fitted unaltered into military platforms.

The use of COTS products presents the defense industry with a dilemma: whereas conventionally procured defense systems might have a potential operational (and support) lifetime of perhaps 20–25 years, COTS products and systems are intended to make use of the latest commercial technology, and are viewed as consumables. In other words, they have a life in the marketplace of perhaps 18 months, after which they are overtaken by the next wave of technological innovation. Moreover, instead of repairing — which conventionally requires a vast, expensive, logistic support capability — COTS products are generally thrown away or recycled when they fail, and are replaced by a new device — it is cheaper, quicker and much easier.

This short life presents both the military and the defense industry with difficulties. How are they to maintain the capability of, say, an aircraft or a ship over a lifespan of 20–50 years if they are employing COTS systems that change every 18 months? As the defense industry would see it, there is more to it than saving money. What about maintaining compatibility between the various subsystems if they are currently being superceded: are using different intercommunication systems and protocols; are able to do new things/have new capabilities that were not anticipated in the initial design for the whole?

Bureaucracy blunting the cutting edge for defense

In the mid-1990s, the US administration of the day realized that there was an alternative to conventional defense procurement — one that did not place such a heavy burden on government research and development, and could instead make significant use of COTS equipments and systems. Not only would COTS save on time and money, it could in principle mean that military platforms deployed the latest technology; that, although the platform might age, its carried systems would not.

The phenomenal global success of Japanese lean volume supply (LVS) systems brought about this realization. In the lean volume supply system, the US administration saw a way of procuring advance technology weapon systems in much the same way that they might buy a car from a showroom.

Would-be buyers of a new car do not impose a detailed requirement for a new car on some car manufacturer, and then wait some 20 years for the car to appear. Instead, they go along to a number of showrooms with some general ideas of what they would like in mind. On seeing what is available, they may expand their wishes, or shop around for good deal.

For the car manufacturer to succeed, he has to provide an attractive range of vehicles at competitive prices, with good availability, innovative features, etc. The manufacturer carries out research and development, funded out of profits. And, the Japanese had shown, are still showing, the world how to do this on a grand scale, producing innovative, high-quality, reliable goods at affordable prices (see Case A: Japanese Lean Volume Supply Systems on page 145.)

The prospect was exciting. The administration 'cleared the decks' by eliminating much of their long-winded, reductionist procurement management procedures (including MIL-STD-499A, Engineering Management — widely, but perhaps unadvisedly, regarded as the manual on defense systems engineering). A number of major defense organizations would reorganize into two or more, competing, large-scale volume supply systems. The capability would exist to create and supply advanced, up-to-date weapons systems in volume, inexpensively; and, saving hugely on tax dollars, expensive defense research and development would be funded by the commercial manufacturer. The stage was set, seemingly, for a revolution in defense procurement. It did not happen.

The administration had reckoned without the defense bureaucracy, with its vested interests. Bureaucracies, like aircraft carriers, exist to defend themselves: the defense bureaucracy was no different. If the plans were to go ahead unchecked, many thousands of civil servants working in the many and various defense project offices, laboratories, etc., the length and breadth of the nation, would be redundant.

Essentially, the proposed reforms were culturally unacceptable. The idea that industry could work out for itself, and provide, what the military needed was anathema. Government had a pathological distrust of the defense industry, matched only by the defense industry's distrust of government. At all costs (literally), the defense industry had to be controlled, regulated and hedged in with defense standards, and who was going to do that in this new era of commercial procurement? Instead of thousands of bureaucrats being made redundant and turning to the defense industry for employment, the defense bureaucracy would back itself up and reimposed itself as the arbiter of requirements, specifications, architectures, integrated project teams, etc., etc.

Some of this metamorphosis paid lip service to the Japanese lean volume supply concepts. In the automobile business, the concept of integrated product teams (IPTs) had emerged, and proved invaluable. The idea was simple, but radical. When a design change was proposed, it would be examined, assessed and approved by a small, multidisciplinary group of people who worked on the assembly shop floor — not, as previously by senior managers, administrators and designers sitting in conference.

Decisions would be swift, made by people who understood the problem, and would not involve communications and approvals up and down some hierarchy. The IPT would have the authority to make changes on the spot. An IPT was an *ad hoc* grouping appropriate to the problem. To approve a design change proposed for a car seat, for example, would need the seat designer, a commercial man to evaluate costs, a sales and marketing man to assess any impact on advertising, publicity materials, etc., and a technician familiar with automobile manufacturing regulations in various countries. IPTs typically comprised four or five people.

US attempts to shift towards lean volume supply were mirrored in the UK in 1997 in a program called Smart Procurement, which was similarly dedicated to shortening procurement timescales, introducing the use of COTS, etc. UK government defense bureaucracy strangled the attempted change at birth, by adopting the role of organizer and controller of Smart Procurement. The bureaucrats even went so far as to introduce IPTs — not Integrated Product Teams, but Integrated Project Teams, which might typically involve between 250 and 500 people. Instead of facilitating fast, on the spot decisions, these parodies of Japanese IPTs were, of course, unsuited to making any decisions at all.

Smart Procurement did not live up to expectations. Now re-badged as Smart Acquisition, it seems to be having similar problems of curbing mounting cost overruns and delays for major projects . . . (National Audit Office: Ministry of Defence Major Projects Report, 2004.)

It still takes a very long time to introduce a new platform or major weapon system. Typically, the time from conception to being in service might be some 20 years. Smart Acquisition promises to reduce that time, perhaps to 13–15 years, but has yet to deliver on that promise. Meanwhile, industry on its own, without government's multi-layer defense administration overlays, controls, regulations, etc., can create a new fighter aircraft from scratch in under four years — and at a fraction of the cost.

Security

One cause for concern expressed by bureaucrats was security: expressing concern for security is intended to scatter the chickens and send them dodging for cover in the henhouse; it is a vague threat with which to beat the weak and defenseless. How could anyone argue about the need for security? How could anyone even dare to discuss it? And was it not obvious that commercial lean volume supply would inevitably leak national defense secrets like a sieve?

Security is an issue, of course, but not in the way that the defense bureaucrats might like to pretend. It is important to protect and conceal some aspects of defense such that a potential enemy or attacker is unable to detect any weak points or develop successful adversarial strategies . . . . Moreover, there is a need for commercial secrecy, too, where through extensive/expensive R&D, or perhaps through serendipity, major advances have been made in materials, processes, techniques, algorithms, etc. Such advantages can provide an edge for a nation in conflict, at least until other nations catch up.

And that is important to understand — other nations are always 'catching up:' technology and advanced engineering are no longer the preserves of rich advanced Western nations. On the contrary, in many spheres the burden of excellence is shifting/has shifted towards India, China, Japan and the so-called Asian Tiger economies. If the West has secrets, they won't be secret for long — secrets have a short shelf-life. Only continual R&D to create new secrets will keep an industry ahead of the game.

But what has security, *per se*, got to do with defense lean volume manufacture and procurement, Japanese style? Consider, for instance, a new military aircraft. What could be secret about it: its operational capability? That can easily be estimated simply by looking at the aircraft, assessing its all-up weight, looking at the wing sweep, the shock diamonds in the jet efflux, etc. etc. It might be more difficult to determine what advanced composite material the wing is made from, and how it was formed. So, performance of the whole might be relatively accessible, while the materials from which something is made could be more sensitive.

Consider, too, something as seemingly sensitive as electronic surveillance measures (ESM) equipment. It might be thought that the equipments for 'listening in' were security sensitive: generally not, however. The equipments are radio receivers of various kinds, and are usually nothing out of the ordinary. However, the digital signal processing (DSP) that is applied to the signals, once received, might be highly sophisticated, and may employ algorithms that might confer advantage on whoever possessed them. So, does that mean the electronic surveillance systems should not be manufactured commercially? Hardly. The signal processing algorithms may be held in secure software — dummy versions of which can be installed during manufacture and test, such that no one can access any sensitive information. The real algorithms would be employed only when on military operations, and even then it would be simple to include an 'auto-wipe' arrangement into the system, say, on power-down.

Security, though something always to consider carefully, is not a showstopper for defense lean volume procurement and supply.

Conceptual Remedial Solutions

So, is there a straightforward solution to the issue of defense procurement? Well, there certainly ought to be. The main obstacles standing in the way are deeply entrenched bureaucracies, defense customer conservatism and distrust, and some major defense support reorganizational issues.

The Japanese Lean Volume Procurement and Supply model is undoubtedly the right one for future procurements. However, the model may not extend far enough. In the case of national defense, the model needs perhaps to include the customer/operator within an overall closed loop.

Figure G.1 shows the concept. At top left is a notional lean volume supply system (LVSS), with a lead contractor, first-tier suppliers, second-tier suppliers, and raw materials suppliers. At right is a defense market, into which are presented products, services and capabilities from competing LVSSs. The military, represented bottom right in an operational loop, identify a potential product, service or capability and will try before they buy, just as they would if buying a new car, or as they might like to if buying a new house. If, after this test and evaluation phase, they like one of the products, services or capabilities on offer, then the new facility will be installed, incorporated,

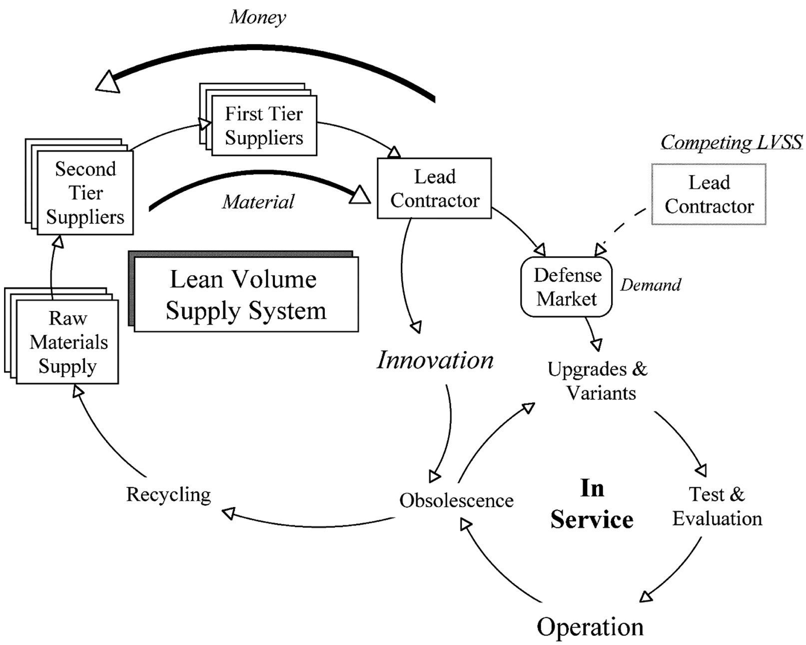

Figure G.1 Supply and operations as contiguous open, interacting subsystems within a closed-loop whole.

or whatever and will go into virtually immediate operation, integrated, backed up and supported by the LVSS.

Meanwhile, the LVSS is continuing to innovate, and will present new upgrades and variants for Test and Evaluation. If these are attractive to the military operators, then they will incorporate the upgrade, or the variant as appropriate, and carry on operating with enhanced capability. If these are not attractive to the military, then they will not buy, but will carry on as before, waiting for a better opportunity to upgrade . . . . The onus, then, is on the LVSS to come up with upgrades and variants that are so attractive to the military operators that the upgrade/variant renders the existing facility obsolescent. An upgrade will then proceed, and any redundant equipment will be recycled to the LVSS, so closing the loop.

It is possible in this scheme to incorporate COTS quite freely. The LVSS that supplies the system, the upgrade, or the variant is also responsible for ensuring it integrates correctly with other on-board systems and for supporting it during its operational life. Indeed, it is even possible to consider that the whole platform is provided and maintained by the LVSS, but owned and operated by the military. In some scenarios, the military may effectively lease the platform, rather than buy it: at the termination of the lease, the platform, like any other artifact, reverts to the LVSS for recycling.

The procurement–supply–operation–recycle loop is subject to competition, for three reasons:

- To keep costs down — if a competing LVSS can offer an equivalent capability, then it is incumbent upon the current supplier to keep costs down.
- To afford variety of contribution. Competing LVSS may offer different features, some of which may be preferred in the situation facing the military.
- Security of supply: in the unlikely event that one LVSS might be unable to supply for whatever reason, the competitor should be able to fill the void.

Lean volume supply systems depend on throughput to stay in existence: it is their lifeblood. If a LVSS were dedicated exclusively to the conception and creation of defense artifacts, products, capabilities, etc., the question must arise: would there be enough regular throughput to maintain a Defense LVSS? If there were not, the closed loop of Figure G.1 would break open, and the military would find themselves without support. Having an alternative, competing LVSS might be little comfort in such circumstances if it, too, were to experience inadequate throughput to sustain itself.

This situation has not arisen in the commercial world, operating Japanese style: instead, they perceive a steadily expanding and more diverse throughput over time. Might it be possible, then, to combine commercial and defense LVSSs in one?

The situation is illustrated in Figure G.2. A single, agile LVSS is shown serving both the commercial and defense markets. This would afford great benefits to both parties, since the accumulated wealth would support R&D into new products and capabilities for both, with defense benefiting from the rapid advances being made in commercial technology.

Although the notion of a common LVSS for both commercial and defense products may seem *avant-garde*, it becomes less so when considering, e.g., avionics COTS products which might be fitted equally in a military transport and in a commercial airliner. And it is not too great a stretch of the imagination to think of defense ground radars being assembled and tested on the same assembly line as air traffic management radars, *en route* control and reporting radars, area surveillance radars, etc. It is not difficult to envisage a factory making ship navigation, steering and engine control systems for both military and commercial ships. And, with the advent of commercial spread spectrum, frequency hopping radios, combined assembly lines for defense and commercial communication products are readily conceivable.

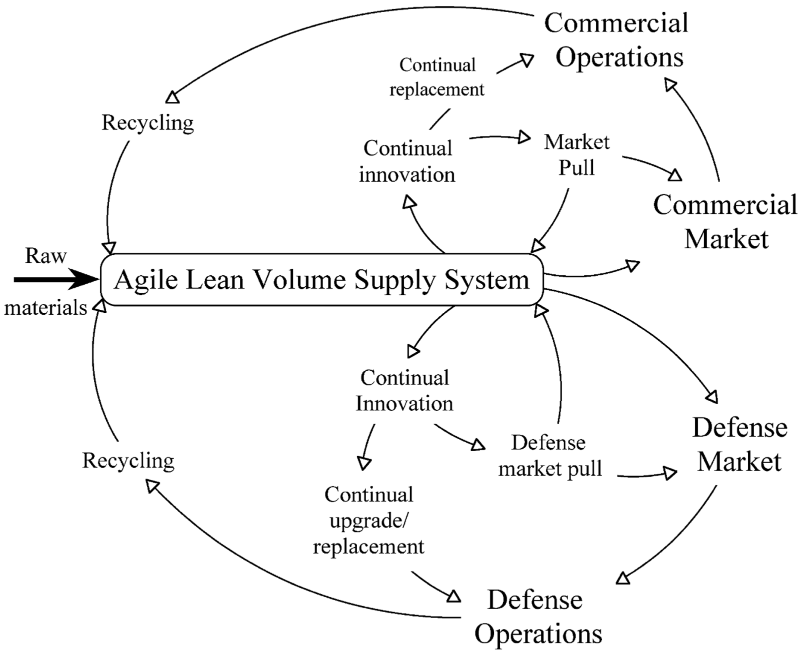

Figure G.2 For some defense systems, it may be appropriate to operate using a common, agile LVSS, as opposed to one dedicated to defense products. This offers the advantage of greatly increased throughput, allowing the LVSS to acquire more wealth and to afford more R&D. National security considerations might militate against this concept for some facilities and equipments . . . .

The main objection to a combined defense/commercial LVSS, such as that illustrated in Figure G.2, is likely to be security. Not so much, perhaps, security in the sense of revealing secrets, but security of supply in the sense of guaranteed support and supply over the life of a weapon system . . . although, there is no guarantee that a defense contractor will not go out of business under the current procurement regimes.

CONOPS

Defense Acquisition has evolved: instead of seeking to procure weapon systems, the objective is to procure defense capabilities. A capability statement describes what is to be achieved, rather than how. So, there might be a defense capability requirement to establish a defended sea–land bridgehead on third world territory in the face of enemy ground and air attack.

The implications are that a ship-borne military force may sail to a designated area, to put ashore with a complement of men, machines, equipment, etc., under an umbrella defensive screen. There is no mention of the numbers of men, the type of equipment, what the enemy threat might be, how the defensive screen is to be supplied, etc., etc: so, the ‘what’ without the ‘how.’ A defense capability statement might indicate that this capability should be replicated, such that defense forces could conduct such operations at several locations in different parts of the world at the same time. This suggests the need for capacity and redundancy in the system.

It is, in principle, up to the military to decide how they will provide such capabilities. This puts the onus on the military to decide if they already have said capabilities, and if they need to expand and diversify. It also gives them the opportunity to view each capability as an open system, with interacting parts, adapting to its changing environment as it interacts with other systems in the environment. Military operators, designers and planners understand about complementary systems, about cooperation and coordination between systems to create synergies.

They know, too, what technological facilities they will need to support them — but how would they get what they needed in a world where defense products were procured according to Japanese-style lean volume supply rules?

One way of approaching that issue is to consider how defense procurement could be controlled. Table G.1 shows a potential national defense capability procurement procedure. The left-hand column shows inputs to each of the processes, which are shown in sequence from top to bottom in the center; outputs are shown in the right hand column. The whole is systems engineering at Level 5.

The first process is to set Goal Defense Capabilities: these are dependent upon Foreign Policy and National Security Issues, top left; these are the stuff of high politics and government. On the basis of these Goal Defense Capabilities, once established, there follow Doctrine, Strategies and Concepts of Operations: how, in principle, should we, as nation, go about achieving these Goals, what are the risks and how might we mitigate them? The output from this second process will be Formal Policies.

Table G.1 Defense capability procurement model (Level 5 Socioeconomic Systems Engineering.)

Stage	Input	Process	Output
1	Foreign policy National security	Set goal defense capabilities	Defense capability goal
2	Sociopolitical analysis	Establish doctrine, strategy and CONOPS	Formal policies
3	Force representation: current potential	Synthesize alternative force structures	Structure options
4	Effectiveness criteria	Select optimal force structure	Target force structure
5	Market intelligence	Identify suitable components in the market	Component options
6	Component shortlist	Test and evaluate contribution to capability	Component contribution
7	Contribution criteria	Select Optimal Components	Target contribution
8	Funding	Buy ‘Off the Shelf’	Acquisition
9		Integrate into Structure	Achieved capability

The third process is to Synthesize Alternative Force Structures: how can the military best configure itself to achieve the Defense Capability Goals within the constraints of national policies, doctrines, strategies and CONOPS — which might, for instance, include cooperation with other nations.

Alternative Force Structures can be tested, compared and evaluated '*in vitro*' using large-scale simulations, national and international joint defense exercises, etc., where 'joint' indicates tri-service involvement. Simulations, in particular, can envisage and test the employment of different weapons systems, and can assess their likely effect on speed and effectiveness of operations, losses and casualties, etc. — see Case D: Architecting a Defense Capability on page 313.

From simulations, exercises, previous campaigns and military experience, etc., it is possible to identify an optimal force structure, including platforms, weapons systems, transport facilities, communication systems, etc. Simulations in particular will show the ideal characteristics of such systems, in terms such as range, kill potential, ability to operate in prevailing conditions, need for, and availability of support, interoperability, bandwidth, jam resistance, exploitability, survivability, etc., etc.

Instead of then placing requirements on a number of defense contractors to conceive, design and create these various defense artifacts, to be received in 15–20 years time, it should be possible to go directly into the market place and see what is available that meets the bill, nearly meets the bill, or perhaps exceeds the bill. In the commercial procurement scheme of things, the commercial supplier will have anticipated what is going to be needed, particularly if the suppliers have been privy to the first three or four outputs shown at the right on Table G.1.

Competing Defense LVSSs will, if enabled, produce competing components of each defense capability for defense forces to 'try before buying,' in the commercially approved fashion. They may select what they prefer and then buy off the shelf, with the LVSS willing, and more than able, to integrate the various technological offerings into the force structure. If the LVSS does not come up with the goods, then 'no sale.'

Can it be that simple? Note that no public monies are at risk throughout. One of the major causes of long, protracted and difficult defense procurements under the present schemes is the great care taken by bureaucrats when spending public money. Bureaucrats are inclined to take so much care that they will spend billions to save millions. Defense industries, on the other hand, have on occasion been known to charge startlingly high prices, often blaming high costs on unnecessarily high standards, and on restrictive government regulations, processes and procedures. In this alternative approach, responsibilities are more sensibly allotted:

- Politicians are responsible for deciding what capability defense forces should have and for determining — or at least understanding and approving — doctrine, high-level strategies and CONOPS, on the basis of essential national security and avowed foreign policy
- The military are responsible for determining how to achieve the various capabilities, and therefore what resources of men, machines, weapons will be needed, and how they should best be configured to promote synergy and optimize performance. They are also directly responsible for buying (leasing?) what they need.
- Industry is responsible for conceiving and creating ranges of innovative products to support, enable and empower military manpower in achieving its capability.

There is no extensive defense government bureaucracy. But then, there is no reason for any of the three parties, government, military and industry, to distrust the other. This alternative approach encourages cooperation and synergy between the parties, all of whom stand to gain.

System Design

Accepting, for the moment at least, that this radical alternative to defense capability procurement is acceptable (and there will always be exceptions to the rule, such that not all particularly sensitive items may be procured in this relatively open fashion), how might it look on a more global scale?

Figure G.3 illustrates a bird's-eye view of the globe, with the US under the left-hand lean volume supply circle, and Europe under the right-hand lean volume supply circle (see Industry Circle, Figure A.5 on page 157). In this instance, the US LVSSs — there may be more than one — involve US sources, US companies and US market-directed products, services and capabilities. In contrast, the European LVSSs — there would be more than one — are open to a wider range of organizations, particularly at second, third and subsequent tiers. The approach here would be to encourage both existing and potential defense customer countries to participate in the LVSSs.

Note that the two LVSS circles are in competition and both are competing to supply military customers across the board, i.e., armies, navies, air forces, marines, coastguards, emergency services, and so on.

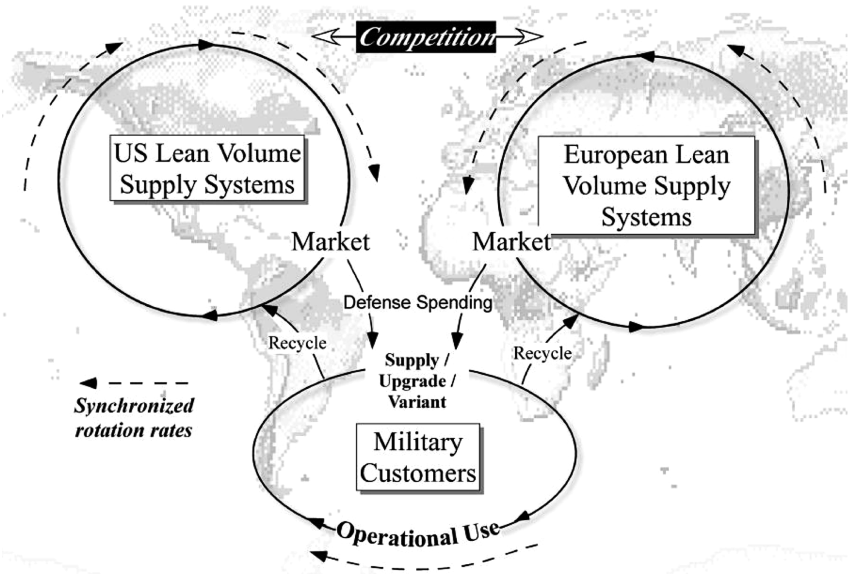

Figure G.3 Global LVSS competition/cooperation. Top left is a (stylized) US LVSS. Top right is a European LVSS. Both LVSS's compete to supply military capability, including COTS to military customers. Note that the whole system of supply–operation–recycle will develop a synchronized, circulatory rhythm, not unlike that of blood circulating in the body, but with the pulse rate determined by the operational life of individual upgrades, variants and replacements. The shorter the life, the faster the rhythm, and the more frequently money will flow around the LVSS loops. By time-shifting different upgrades, variants and replacements for different customers, the LVSS loops can operate in a dynamically steady state, with a continuous flow of products in one direction and contraflow of money in the other.

Conclusions

Western countries, observing the phenomenal success of Japanese lean volume supply systems, sought a decade ago to emulate that success in national defense procurement/acquisition. One of the keys to the proposed revolution was the wide-scale introduction of COTS — commercial off-the-shelf-equipments and systems. Such systems are, as the title infers, available immediately as consumables, so that in-service military systems can be equipped and upgraded with the latest, innovative technology.

National defense bureaucracies hijacked attempts to reform acquisition organization, regulations, methods and procedures, stifling them at birth: the proposed reforms were, simply, culturally unacceptable. As a result, it is still taking far too long to procure defense capabilities, weapon systems, products and services. A new platform (aircraft, ship, tank) is likely to take 15–20 years from start to first in-service date: left to industry, it could take as little as three or four years without the continuous bureaucratic regulation, intervention, distrust and 'politicking.'

There is, as yet, little COTS to be found in operational defense systems: unsurprisingly, the term 'COTS' has all but disappeared from current defense acquisition glossaries . . . . Meanwhile, COTS systems have a lifetime of only two or three years before being replaced by newer versions with technology that is more recent, has greater capability and offers better performance.

The original proposal, to emulate Japanese best procurement practices, was sound — as far as it went. It is better observed by widening the system from a procurement system to a combined procurement and consumption system, i.e., to couple the supplier and the user/customer into one system with two mutually interdependent (sub)systems. Defense operators need lean volume supply of the highest quality innovative goods, and the lean volume suppliers need customers who use high-quality innovative systems and services: it could/should be a marriage made in heaven.