Defence & Security Acquisition – a Guide to a Complex System

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About the Authors

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John spent part of his career in the Middle East engaged with separate national programmes to develop commercial and defence capabilities in a number of Gulf countries. Professor Louth has also worked as a senior adviser to the European Defence Agency on the development of pan-European procurement policies and practices. He supervises PhD students at the University of Roehampton Business School in London and guest-lectures at Exeter University, King's College, London and University College, London. Professor Louth is also a specialist adviser to the House of Commons Defence Select Committee and a non-executive adviser to Avascent Ltd. John's work is published across a broad spectrum of outlets and he is a regular commentator to BBC, ITN, Sky News and Aljazeera networks.

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His career has linked the academic sphere with that of governmental and industrial professionals in defence, and he speaks and writes regularly at professional conferences on defence management and acquisition. A joint author of a book on UK defence industry, he was for six years an elected Council Member of the former Defence Manufacturers' Association, and is also a past Head of the International Security Programme at Chatham House and Chair of the British International Studies Association.

He has a first degree and a PhD from the London School of Economics and a Masters degree from Lehigh University in Pennsylvania. Beginning his academic career at Staffordshire University, he was from 1990-93 the head of the International Security Programme at the Royal Institute of International Affairs (Chatham House) in London.

Abstract

This paper reports on the vital relationship between government and defence industries, and how the core features necessary for defence and security capabilities can be delivered in the national interest. The paper will examine how a defence acquisition process can be set up so as to enable defence businesses to thrive within and beyond national borders, and to ensure that they support the forward plans of government, the military and security services.

Taking a seven stage approach, this paper will define the whole of the defence acquisition process. It will start by focusing on the importance of defence capability requirements, as framed through a conventional Western taxonomy. It will then address the approvals process by decision makers at Ministry and governmental level, through which verification is obtained that the requirements meet defence policy, are feasible and affordable. The paper will then look at how the approvals process leadings to the start of the procurement stage, and after this how the support needs will be address. Approaching the end, the paper will then address the disposal requirements. Finally, it will study how all these tasks should be executed in an integrated and coherent fashion by the defence community, and the international dimension to many projects involving other partner governments.

In summary, the paper will introduce the reader to acquisition and through-life capability management in a systemic and comprehensive manner, but it should not be taken as an exhaustive map of the field. The topics examined are often contentious and there are many ways that states generate force capabilities; still, this paper offers a sensible and well-tested approach to defence acquisition, formed through Western experience.

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Introduction

Globally, the relationship between government and defence industries generates an active academic and practitioner body of knowledge, housed in the debate around defence acquisition. Consequently, there is a growing understanding of the core features necessary for defence and security capabilities to be secured and assured for the national imperative, and for defence businesses to thrive within and beyond national borders.

At first principles, government and defence industries are brought together through an active acquisition process. At one level of analysis, defence acquisition can be defined as:

Requirements + Prioritisation & Programming + Procurement + Support + Military Use + Disposal + Outline New Requirement

Processes and structures (especially within government) need to be developed and inserted for all of these key elements. With an overt, public and clearly defined defence acquisition process, businesses can tailor their business development strategies and generate core competencies to take account of the defence equipment and support forward plans of government, the military and security services.

This paper, therefore, focuses initially on the importance of defence requirements as framed through a conventional Western taxonomy (Section 1). While responsibility for the initial generation of requirements should lie with uniformed personnel, there is also need for decision-making and approval at the Ministry and even governmental level to verify that requirements support defence policy, are feasible and affordable over time in a planned programme (Section 2). Approval enables the procurement stage to go ahead (Section 3). On delivery, equipment must be supported in-service over many years with spare parts and many other goods and services (Section 4). Disposal is the final stage (Section 5). All these tasks need to be executed in a coherent and integrated manner by defence people (Section 6), and acquisition can often have an international dimension involving other partner governments (Section7). The paper also has three Appendices which deal in more detail with topics outlined in the numbered sections: the first deals with Acquisition approvals in depth (Appendix A). The second covers the concept of the Defence Acquisition Cycle and its importance to the generation and maintenance of defence and security capabilities (Appendix B). The third covers how acquisition is related to capability management and deals with the additional elements to equipment and support that are needed for effective operational use throughout the equipment's life (Appendix C).

There is a short conclusion and focused bibliography/recommended reading list about the UK system. The authors' profiles are at the end of the guide.

Section 1: Defence Requirements

This section addresses the need for the development of a set of capability requirements for defence before going on to consider the need for prioritisation and effective programme management.

Capability Requirements

Understanding the capability requirements of the military and security services is pivotal if the correct equipment and support packages are to be procured and the defence industrial base configured appropriately. Within the United Kingdom, United States and Germany, for example, smart requirements are used, which is a methodology for capturing, engineering and managing defence requirements based on the principles of systems engineering and a whole-life approach to capability management. The intention with this approach is to deliver a whole-system, through-life, evolutionary requirements process involving all stakeholders to deliver effective, efficient, affordable and sustainable defence systems to military forces. In many western states, smart requirements replaced discredited and inefficient governmental defence processes of staff targets and budgets. With the use of smart requirements, the focus profoundly shifts to the user's need rather than equipment characteristics.

Smart requirements sit alongside the idea of 'capability-based acquisition': the essence of this is the simple idea that, in a time of changing technological possibilities and perhaps the absence of any specific threat, requirements should fundamentally focus on what the user needs to be able to do. There should be no premature jump as to how a need should be filled.

- Assume that a country needs to be able to monitor the movement of surface ships above four metres long up to 200 miles from its shore on a 24 by 7 basis in temperatures between -6 degrees and 50 degrees centigrade. This is a user need.
- An overly quick naval officer might proclaim the need for more patrol boats, but in fact this capability could also be also generated through a fleet of piloted aircraft with a range of sensors, or through unmanned air systems, or through satellite technology, or using powerful land-based radars, or through a combination of the above. Shore based personnel with binoculars and night vision equipment could also contribute to surveillance at shorter ranges.

Smart requirements are configured around two key databases or documents, the User Requirements Document (URD) and the Systems Requirement Document (SRD). The URD expresses the bounded need for a particular operational capability. By identifying the capability need – and stating it clearly – the scope or context of a particular capability can be captured leading to considerations of the threat environment and related systems, international collaborations, extant notions of doctrine, operational constraints, concepts of utility and user priorities. These considerations, in turn, drive the SRD which states, in output terms, what the system must do to meet user needs as articulated in the URD. The SRD provides the procurement vehicle for informing industry of a government's requirement in an open and unambiguous manner, often through competition. This is expressed in terms of system functionality, performance requirements, anticipated costs and capability trade-offs, and informs industry in detail of the knowledge, competencies and volumes sought to satisfy government demand.

In simple terms, as a householder you might have a requirement to heat your house to 21 degrees centigrade when the external temperature is – 6 degrees. That is a User Requirement. The System Requirement would specify the energy needed to achieve that but would not say whether that energy would be generated by a

gas, oil, mains electricity or a solar-powered system.

The URD and the SRD should comprise individual requirements, often grouped and set in a hierarchy of increasing specificity.

It is widely recognised that requirements should be SMART, although there is some variation about what each letter of this acronym should address. The version below has the merits of being succinct and generating categories that do not significantly overlap. Thus individual statements in a requirement should be

- Specific: which means that everyone knows precisely what is to be provided in terms of performance;
- Measurable: which enables the user to test and know if the needs have been met;
- Attainable: which means that they should be feasible within the time and budget limits available;
- Relevant: which involves producing a clear and agreed justification for a requirement and understanding as to who will benefit from the requirement and how; and
- Testable: which means a clear demonstration is possible as to whether a requirement has been met or not.

Without such an approach to requirements setting, industry veers and hauls between ever contradictory government initiatives and can remain mired in inefficiency and bureaucracy.

It is important to remember that the requirements set will form the basis of what a contractor is to deliver. Unless the requirements actually capture what the customer actually wants, there is an increased danger that the supplier will meet the terms of a contract but deliver a good or service that disappoints the user.

In the UK, the generation of user requirements is today mainly the responsibility of the staffs of the four commands: the British Army, the Royal Navy and the Royal Air Force and the Joint Force Command (JFC), each of which has their own budget. The JFC is made up of people from the three services (Army, Navy, and Air Force) and has responsibility for the enablers of joint capabilities, including information and communication systems and logistics. It is not unusual for the uniformed forces to buy help from contractors to ensure that requirements are properly specified.

In addition, the Finance and Capability section of the Central Ministry of Defence leads on the determination of each command's budget and also on the approval of individual projects.

Section 2: Approvals, prioritisation and programming

Approval requires the generation of a 'business case' by the commands which explains the value and cost of a project and its compatibility with UK defence policy. It is common in many states (including the US) for individual services to generate requirements but then to have to secure approval from central defence bodies. The final approving body in the UK is the Equipment Approvals Committee which in its highest form is a four and three-star body.

In cases where significant development work is concerned, central approvals may be staged, enabling a project to move forward but not necessarily implying that it will be completed. The UK normally runs a two-stage process of Initial and then Main Gate, with the latter being agreed supposedly when there can be a high degree of confidence about cost, time and performance.

A danger of relying on the individual services or commands for requirement is that they may write requirements which require solutions that favour their own organisations. There is thus a case for requirements generation to be done centrally by a joint body (think of the how the monitoring of the ocean challenge noted above might be addressed if it was left to the Navy).

All save the poorest states need to think about the purchase of equipment over a period of greater than a year. There are three factors to be fed into a longer-term equipment plan:

- Urgency: what is needed most and what can be deferred;
- Cost: equipment has to be paid for within each year's budget ceiling and thus provision should be made for the spread of especially expensive items so that they do not have to be paid for at the same time;
- Delivery possibilities: if paying in advance of delivery is to be minimised, plans must reflect how long it will take to secure delivery of an item, as well as to generate other needed defence lines of development (see below).

For these reasons, defence acquisition machinery usually involves mechanisms to produce a multi-year equipment plan which in the UK extends out to ten years. This plan is held centrally in the Ministry of Defence but links down into plans in the individual commands.

Defence equipment plans cannot be set in stone, because the world changes in unexpected ways, bringing new priorities and even needs, because the time and cost forecasts associated with some projects prove inaccurate, and because the money available to defence may be higher or less than expected. Thus, the UK plan is adjusted annually and an amended ten-year plan is generated every year. This is in contrast with France, for instance, where a Five-Year Programme for equipment purchases is normally set, then it is implemented as far as possible, and then after four years or so a new plan is generated taking account of the successes and shortcomings of the previous plan. Adjustments to the UK plan are mainly a matter for interaction between the individual commands and the Financial and Military Capability section of the Ministry of Defence.

Section 3: Procurement

In theory, once a requirement has been set, approved and prioritised, its purchase (procurement) can be arranged. In this context, procurement is a specialist function requiring expertise in a number of areas, and is usually entrusted to a specialist organisation.

In very small countries, defence procurement is dealt with by a body that buys all goods and services needed by government, whether military or civilian. In most states, however, defence has its own specialist procurement body. This body is both constrained by generic public procurement law and regulation and can also enjoy some exceptions to that law and regulation. Because of the large volume of work involved, the United States has a body of Federal Acquisition Regulations and a subset of Defense Acquisition Regulations, with specialist defence procurement being executed within each of the three services.

In arranging the organisation of defence procurement, a key issue concerns logistics and the in-service phase. Traditionally, new procurement and logistics were arranged separately but in the UK the teams arranging procurement (new buy) are also responsible for the in-service support. The body concerned is called Defence Equipment and Support. This is to ensure that the in-service needs of equipment are

considered early, seriously and continually in the overall acquisition process.

The procurement body leads on the selection of the best procurement strategy. This may involve open competition from almost any supplier, restricted competition among named or specified suppliers, or some kind of sole source approach. In the case of the latter, a procurement body might seek a government-to-government arrangement with an external supplier, or want to deal directly with a company. If a development project is involved, collaboration may be sought with other partner governments or a national effort may be chosen.

There is no single best way to buy defence goods and services and running a truly fair competition is challenging, as the many appeals against decisions that can be found in the West attest.

A competition can be either run on a 'best value' basis (when a range of considerations including cost, performance and risk, are taken into account) or on a lowest price compliant bid basis when a bid is first scrutinised to see if it meets a requirement. If so, it joins other bids that have also passed the test and then the cheapest bid must be chosen. This approach is fine for simple items such as buying bottled water, generic pharmaceuticals and so on.

Procurement may be on a firm price basis, when the supplier is required to carry any inflation risk or on a fixed price basis when the buyer accepts inflation risk. In some cases where a project involves significant risk (normally with regard to development and even production cost), procurement may use a cost-plus approach, which also offers the possibility of a target price. If the contractor delivers goods or services under the target price, it is allowed a higher profit margin. If it comes in above the target price, the profit margin shrinks and at some point will disappear.

The procurement authorities should have a close relationship with the requirements people. Without that, the requirements people may specify elements that raise costs, time needed and risks disproportionately, and which make competitive tendering impossible because there is only one supplier who can offer what is needed.

Procurement organisations also have the main responsibility for evaluating bids. Overall they need expertise at least in what is and is becoming available on defence markets, in dealing with the private sector (including contracting), in the assessment of technology and management in suppliers, in financial risk and management, in testing (including for health and safety), financial management, and in project management. Thus they normally need to be run by civilian rather than military staff. The development, allocation and management of these people across projects at different stages requires careful attention so that the right expertise is available when needed and that specialists do not have significant periods of being under-employed.

The final stage of procurement is acceptance against the terms of a contract, which should be directed by formal test arrangements. It is to be underlined that a contractor is bound to deliver what was required in the contract, and not what the customer wants when delivery occurs. Hence, this illustrates the need for precision and comprehensiveness in setting requirements and a close relationship between those deciding on the requirements for a capability and those arranging the purchase.

Section 4: In-service Support

Even before equipment is delivered, 'support' must be arranged. Not so long ago, support was seen largely in terms of the delivery of consumables such as fuel and of spare parts, but today the agenda of Integrated Logistics Support (ILS) is much wider. This has been driven by increased awareness of all the things that need to be provided, managed and paid for. The items listed below have a central role.

Integrated Logistics Support Items

- Supply (spare part) support
- Support and test equipment
- Manpower and personnel
- Training and training support
- Technical data/publications
- Computer resources support
- Facilities
- Packaging, handling, storage and transportation (PHS&T)
- Safety and Environmental Protection Management
- Reliability engineering, maintainability engineering and maintenance (preventive, predictive and corrective) planning
- Obsolescence management
- Configuration Management
- Design interface (to ensure that system requirements are compatible with design)
- Disposal and termination

The first nine items largely concern elements to be arranged in order to generate initial capability, although they need continuous attention thereafter. Reliability engineering arrangements are also required for initial capability but then constant search for improvements are needed so that reliability can be improved and costs reduced.

Obsolescence management is a growing challenge at a time of increasing numbers of electronic components with a short time in production and near impossibility of re-starting production. Someone looking to replace a broken spring on the suspension of a 1990s car can go to a metal shop with a design and a capable engineer can produce one, albeit at a cost. A similar process is not possible if there is a need for the 286 processors that controlled computers at that time. Obsolescence management is about arranging the availability of parts at acceptable cost.

Configuration management has come to prominence because of the length of time that systems are in service, the changes that are made to them in that time, and the integration that is involved with these systems. Without active configuration management, the user does not know the precise make-up of platforms in a fleet and so cannot predict the cost of any further modification across the fleet, or even the cost of future spares and support. 'Disposal' is the last phase in the acquisition cycle and is dealt with below.

As noted, support as well as procurement in the UK is the responsibility of the same organisation, Defence Equipment and Support, which must work closely with the single service owners of equipment. Financial responsibility for the costs of support lies today in the budgets of the four commands, so they lay out their

requirements (say for training kilometres on an armoured vehicle fleet), the equipment organisation makes the necessary plans and reveals the cost, and then the uniformed services must find the money. If there is not enough money, support requirements must be reduced.

The costs of development and production (i.e. initial purchase of equipment) are relatively easy to calculate but the in-service costs are much more complicated and require tailored management accounting systems to generate the needed information. Remember that some costs (e.g. for fuel) will vary with usage rates while others (such as facilities and even maintenance staff) may be fixed regardless of whether a system is used or not. This is an important consideration for the calculation of affordability, but also for the evaluation of best value bids in any competition. Defence ministries need to give considerable attention to how they will calculate and track the annual costs of operating a system (Costs of Ownership) and what it will cost during its own life. Good accountants and accounting systems are central in securing maximum military capability from a defence budget.

If equipment is used on operations, whether at home or deployed, usage rates and costs tend to increase, and sustainability can be a key variable. Defence, as a sector, faces the challenge of operating at acceptable costs and efficiency in peacetime, when training is the main activity, and being able to increase the scale of activities in the event of war. Inventory of ammunition, spares and fuel (war stocks) can be a significant source of expense, but invaluable in the event of fighting. A further dimension is the agility of the supply base and its capacity to accelerate and increase deliveries in the event of a crisis. Defence support must strike a balance, in the light of threat levels and resources available, in terms of the extra capacity to be maintained to deal with the possibility of fighting. The balance is a matter for the higher levels of government and military, not something that logisticians as such should direct.

With systems with defined lives, such as aircraft, military operations that increase usage rate also cut the time before a piece of equipment should be replaced. Such operations therefore can have an impact on plans for the replacement and probably enhancement of extent capabilities. There are also cost and budgetary implications, of course.

Across the whole domain of support, there are issues regarding what goods and services are to be bought from the private sector and what the government should do with its own staff. Some things, such as the supply of parts and technical manuals must come from the private sector. Traditionally contractors have been paid just to supply parts within specified time limits, but in the UK they are increasingly contracted to deliver available systems, i.e. to be responsible for most maintenance and repair activities. This is because private sector labour may be cheaper and more efficient than government staff, but also because a contractor which has to provide equipment ready to use is incentivised to increase the reliability of that equipment. A supplier who is paid only to deliver parts actually has an interest in unreliable equipment that needs most parts.

The UK has gone further than most in outsourcing many equipment support functions and even has concluded a number of equipment-centred Private Finance Initiatives under which it does not buy the equipment at the heart of a capability but merely pays for its use along with a commitment to use it at a specified minimum level. The UK fleet of Voyager tanker and transport aircraft are owned and maintained by a consortium led by Airbus with the Air Force merely providing the crews.

Thus, support and military-use constitute a wide range of issues and choices for government as to what is to be done, and by which agency.

Section 5: Disposal and a New Requirement

Equipment should not be bought without consideration of how it is eventually to be disposed of. In many cases this may not be a problem as it may be sold to another user, or for scrap. However, much defence equipment includes explosives and other energetic materials as well as other hazardous materials whose safe disposal may be costly. Nuclear items cause especially large challenges but these are problems for but a few states.

Imported equipment cannot normally be sold or passed to another user without the permission of the original supplier state. This is significant when decision-makers come to dispose of capabilities that still possess some operational life or utility: the international defence market is not a free market but rather a highly regulated industry subjecting states to treaty obligations and the broader force of international law.

Well before an out-of-service date, a defence ministry needs to be studying on whether a continuing need for the capabilities involved still exist, whether there is a chance for enhanced capabilities and how those capabilities might be replaced (see the Requirements section above).

Generally equipment becomes less reliable and needs more support activity once it reaches a certain age. However, only with a sound set of management accounts can an authority decide when it would be better value or even cheaper to abandon an existing system and replace it with a new one.

Section 6: Defence People and Competencies

All the above tasks must be executed by people who should be skilled, knowledgeable, committed and possessing a high level of professional integrity. They must also be able to work effectively in coordination with others.

Within the United Kingdom, it has become recognised that people, culture and effective behaviours are at the heart of the teamwork and public-private sector interaction needed for successful defence acquisition process. Accordingly, defence values for acquisition have been developed as follows:

Defence Values for Acquisition

1. Recognise that people are the key to our success – equip them with the right skills, experience and professional qualifications.
2. Recognise that the best can be the enemy of the very good – distinguish between must have and desirable.
3. Identify trade-offs between performance, time and costs – cases for additional resources must offer realistic alternative solutions.
4. Never assume additional resources will be available – cost growth on one project can only mean less for others and for the front line.
5. Understand that time matters and slippage costs – through running on legacy equipment, extended project timescales and damage to our reputation.
6. Think incrementally – seek out agile solutions with open architectures which permit "plug and play." Allow space for innovation and the application of best practice.
7. Quantify risk and reduce it by placing it where it can be managed most effectively – stopping a

project...can be a sign of maturity.

8. Recognise and respect the contribution made by industry – seek to share objectives, risks and rewards while recognising that different drivers apply.

9. Value openness and transparency – share future plans and priorities wherever possible to encourage focused investment and avoid wasted effort.

10. Embed a through-life culture in all planning and decision-making.

11. Value objectivity based on clear evidence rather than advocacy – ensure that we capture past experience and allow it to shape our future behaviour.

12. Realise that success and failure matter – we will hold people to account for their performance.

With these values guiding personnel recruitment, selection and promotion, acquisition of personnel can be drawn from the military, governmental sector of from key contractors. The skills or competencies necessary for effective performance depends upon the role in question and level of experience and training of the individual.

Within the UK, effective acquisition places a strategic emphasis on the development, training and sustaining of people in acquisition – both those employed within the public sector and those in defence industries. Central to this commitment and investment were schemes such as the Acquisition Stream and Acquisition Leadership Development Scheme (ALDS).

The Acquisition Stream was launched in February 2001 to create a stream of people in acquisition who were highly committed, skilled and well-trained in acquisition and project management. Membership of the Acquisition Stream was voluntary and open to all military and civilian staff and members of industry. The scheme operated through the development tools of an Acquisition Competence Framework (ACF), a personal development record, training and development directory and development route-maps. Through these tools there was expressed a clear and robust methodology for working, behaving in the workplace and developing individual careers.

The ALDS operated for the perceived elite of the UK Ministry of Defence and defence industry, as an extension of the Acquisition Stream, and was designed to develop existing and future leaders in acquisition. The scheme was divided traditionally into three stages: foundation, core and expert, with the primary differentiation being the competencies which an individual was expected to possess and the progress that they were assessed to have made against ALDS route-maps. The ALDS was limited to 400 members, selected by competition against, once more, a pre-described competence framework. Consequently, defence acquisition people are selected and developed against heavily prescribed and thought-through requirements and procedures.

Section 7: Allies and Partners

In the development of acquisition policies, plans and processes the roles of allies and partners have to be carefully considered, especially where there are constraints on defence budgets – as there are with most states. Allies are assumed to be friendly nations and treaty organisations with which a state is aligned, whilst partners typically include commercial relationships, especially those businesses providing defence equipment, training or services. These companies can be within national borders or headquartered abroad. With the latter, a government-to-government relationship is usually important as an export regime is invariably in place.

Within the subject of defence in the UK there are two terms being used; that of 'partnership' and that of 'partnering.' Partnership is defined as 'a state of being a partner, where partner is a person who shares or takes part with another, especially in business, with shared risks and profits.'[1] To partner, therefore, is to join with another to deliver a considered set of outputs or outcomes.

For example, The Gower Handbook of Management notes that instead of conducting a particular activity through the medium of a corporation possessed of a specific legal identity, or a government department or other public body, a partnership is merely a form of organisation that binds two or more parties together in pursuit of a common purpose. More often than not, no separate legal entity is formed beyond the identity of the individual partners themselves, with some form of negotiation between the parties still necessary to articulate their respective responsibilities to each other.[2]

'Partnering' is a much looser term, and one derived from the Japanese model of post-war manufacturing, especially within the automotive industry.[3] Toyota's policy, for example, rests upon two principal strands. First, the assembling organisation controls the relationship as senior partner (in Japan, the word 'parent' is used, with component manufacturers seen as 'children'), but specialist suppliers are recognised as being absolutely critical to the overall quality of the product. There is recognition of expertise and quality running throughout the supply chain that binds customer to prime contractor and, thereafter, to niche supplier, so that each is dependent upon the other, committed to this sense of quality, shared service goals and common expectations. Second, and critically, the specialist abilities of the sub-contractors are explicitly valued as crucial to the success of the overall product. Components are not sourced by Toyota, rather partners from the supply chain are found, developed and valued for the long-term.[4]

Thus, for some in the United Kingdom Ministry of Defence, partnering is about a long-term, non-adversarial affiliation between the department and a particular company or companies within a specific sector of defence, whereby the relationship becomes central to the delivery of effective and affordable capabilities.[5] Why does the government seek such a relationship with industry to deliver perceived key defence services or effects? A conventional response seems to be as follows.[6]

First, it can be said that government and industry come together to, somehow, lever-in to public services the private money that government neither has itself nor can afford to generate through taxation or the money markets.[7] Second, partnered arrangements are perceived to generate private-sector capacity and competency to potentially supplant or enhance public-sector provision.[8] Third, at an operational level, these relationships are believed by some to deliver greater value for money than sole public-sector provision.[9]

This is said to be achieved by government transferring to the private sector costs and risks that would otherwise be borne solely by the public.[10] Moreover, it is often assumed that industry is possessed of greater expertise, innovation and efficiency than its potential partner from the public sector, and can

1. The Concise Oxford Dictionary, Eighth Addition (Oxford: Clarendon Press, 1991).
2. Dennis Lock and Nigel Farrow (eds.), The Gower Handbook of Management (Aldershot: Gower Publishing Ltd, 1992).
3. See Richard Lamming, Beyond Partnership: Strategies for Innovation and Lean Supply (London: Prentice Hall, 1993).
4. See Mari Sako, Prices, Quality and Trust: Inter-firm Relations in Britain and Japan (Cambridge: Cambridge University Press, 1992).
5. Author interview with Ministry of Defence official, 13 January 2012.
6. Author interview with former Ministry of Defence officials and senior industrialists, December 2011.
7. See Paul Du Gay, In Praise of Bureaucracy: Weber, Organization, Ethics (London: Sage Publications UK, 2000).
8. See Chris Lonsdale, 'Post-Contractual Lock-in and the UK Private Finance Initiative (FPI): the Cases of National Savings and Investments and the Lord Chancellor's Department', Public Administration (Vol. 83, No. 1, 2005).pp. 67–88.
9. See John Louth, 'A Low Dishonest Decade: Smart Acquisition and Defence Procurement into the New Millennium', UWIC, 2010.
10. See Jean Froud, 'The Private Finance Initiative: Risk, Uncertainty and the State', Accounting, Organizations and Society (Vol. 28, No. 6, 2003), pp. 567–89; and Andrew Coulson, 'Value for Money', Public Administration (Vol. 86, No. 2, 2008), pp.438–98.

manage these costs and risks much more effectively.[11]

These points, together, represent the conventional, rational explanation for the practice of governments forming some sort of partnering arrangement with companies from the private sector to deliver defined goods and services. Some academics suggest that there are four distinct types of arrangements:[12]

- **The Collaborative:** the policy of equal resources being provided by partners in pursuit of shared goals
- **The Operational:** some form of identified work-share within a specified programme or project, but with individual partners keeping their autonomy for decision-making and action
- **The Contributory:** the sharing of financing for a particular activity, but not operational control
- **The Consultative:** advice sought from one partner to assist another in the delivery of a specified product or function.

Whatever the particular arrangement, the critical components are clarity and a corresponding sense of trust between the partners. In designing both a through-life capability management system for defence and a defence acquisition system, it is imperative for decision-makers to have clarity around their partnering preferences, between states and across the public-private sectors.

11. See Lamming, Beyond Partnership.
12. See Kenneth Kernaghan, 'Partnership and Public Administration: Conceptual and Practical Considerations', Canadian Public Administration (Vol. 36, No. 1, 1993), pp. 60–5.

Conclusions

This guide has sought to introduce the reader to the complexities of acquisition and through-life capability management in a systematic and comprehensive manner. By its nature it has been selective, focusing upon the important topics of:

- Requirements Management,
- Procurement,
- Support and Military Utility,
- Defence People and Competencies, and,
- Allies and Partners.
- Government decision-making and acquisition approvals,
- The Defence Acquisition Cycle,
- Through-Life Capability Management

The model at Figure 1 articulates how this thinking comes together within the defence acquisition cycle:

Figure 1: Defence Acquisition Cycle
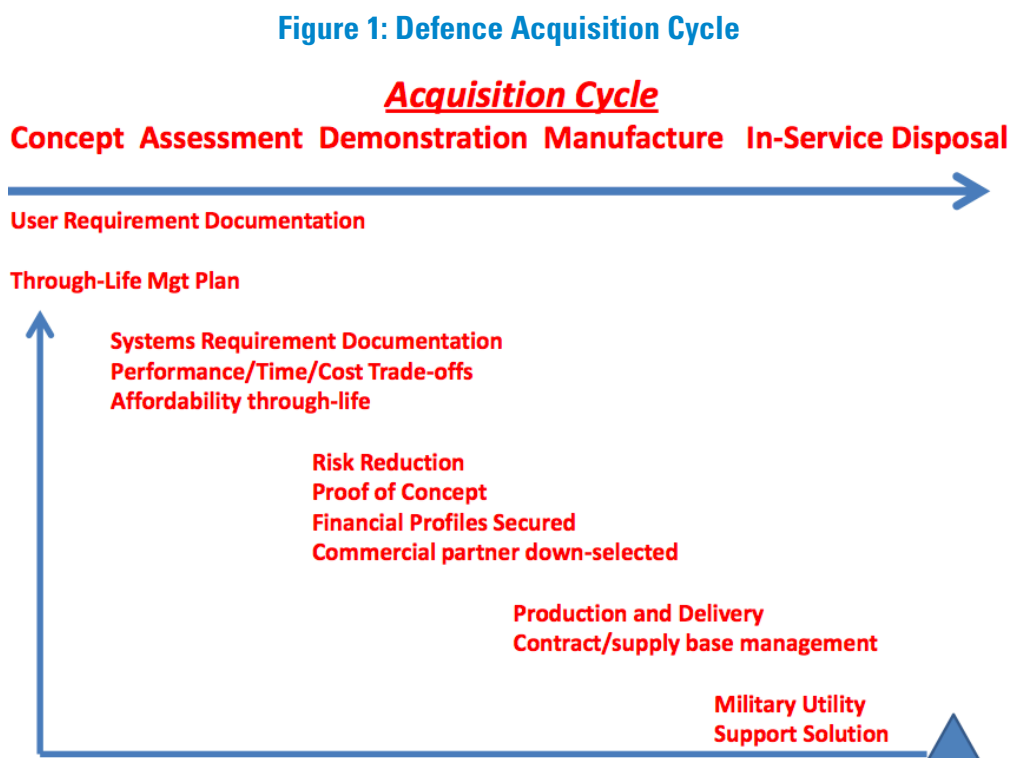
However, the authors emphasise that this guide must be treated as an introduction to the subject rather than a comprehensive and exhaustive treatment. These topics are contentious and states generate force capabilities in multiple ways. Nonetheless, we contest that the approach offered enables a sensible introduction and approach to defence acquisition, formed through Western experience and policy imperatives. Indeed, one thing is certain: if the topics within this guide remain unaddressed, the state will struggle to generate defence and security capabilities and its people will be in peril. Security and safety is concerned with thinking, planning and good management as well as the astute and proper use of force.

Appendix A: Government Decision-making and Acquisition Approvals

Within most countries an approvals and scrutiny process for defence acquisition investment decisions is mandatory and inherently governmental. In many ways the process has four key strands:

- Planning for an approval point. Those personnel responsible for the generation of the requirement and those staff charged with managing the programme of purchase and delivery typically come together to plan all actions leading to the approval point. The approval itself is usually undertaken by a senior government minister sitting with an approvals' board. An educated and able secretariat is necessary to manage an effective approvals' regime.
- Development of the case for investment. The case for investment, as discussed previously, starts with the requirement but has to include cost and budgetary schedules, an understanding of the risks associated with the project and capability and its integration plan into existing force structures.
- Engagement with a scrutiny community. An approvals' board secretariat typically scrutinises the case for capability before it reaches the decision point. Therefore it is important for the project team to engage with this community from the outset of the project.
- Formal approval or approvals. The approval, of course, is just the beginning of the capability arriving into service. An integration, sustainment and support plan is required to ensure the capability reaches the frontline, with this typically being the responsibility of the project team.

While some governments attempt to deal with acquisition in a basically sequential manner (military requirements, then central approval, then design of a procurement strategy, then approval, then implementation of the designed procurement strategy, then approval of contractor, then arrangement of support etc), the UK seeks to address all aspects from an early stage and has generated a Defence Acquisition Cycle which specified what is to take place at each stage. It has also developed a conceptual framework to assure that equipment delivery leads rapidly to the generation of usable capability. We come on to discuss the Defence Acquisition Cycle in the next Appendix.

It cannot be overemphasised the importance attached to effective decision-making for the approval – or rejection – of a proposed capability. Capability management skills, risk management competencies, budgeting, financial profiling, negotiation, commercial law and contracting skills all need to be in play to support the defence acquisition process. Defence capabilities are usually expensive and states should limit their exposure to making mistakes as much as possible. Training and developing an appropriate secretariat is a good start, perhaps through partnering with a country that already possesses these key professional attributes. The intention is for decision-makers and their staffs to be properly empowered, accountable, qualified and experienced to take and support strategic investment decisions for defence. Such skills and competencies can also offer broader societal benefit beyond the defence and security sectors.

Appendix B: the Defence Acquisition Cycle

States have different approaches to the generation of an effective defence acquisition cycle to deliver capabilities sought through smart requirements. However, six distinct phases are normally featured when a government is at least considering the development and production of a new piece of equipment. The Assessment and Demonstration phases can be amalgamated and shortened if the only option being considered is to buy something that is already in production, most likely in another country.

- **Concept:** the production and baselining of the capability's URD and through-life management plan. An initial financial analysis is undertaken, benchmark capabilities sought and a cost breakdown structure generated.
- **Assessment:** the generation of the SRD trading time, cost and performance parameters to produce the most effective and efficient solution. Affordability options are prepared and key programme assumptions published.
- **Demonstration:** The elimination, or reduction, of risk to fix performance targets for production and future operations. This is typically the stage at which a defence contractor is selected to develop, configure and produce equipment and support elements of the capability. Actual costs are continually tracked against budget and forecast costs, and inefficiencies eliminated.
- **Manufacture:** The undertaking of production and delivery of the solution to the military requirement within the costs and time constraints previously agreed within the acquisition cycle.
- **In-Service:** Confirmation that the military capability provided matches that sought by the URD and SRD and is available for operational use. The support solution for the capability must also be properly understood and aligned to operational availability.
- **Disposal:** Plans are understood and costed for the future safe disposal of the equipment elements of the capability solution and future outline user requirements considered.

A Moroccan defence acquisition model should be established based on the open utilisation of these principles and systemic approach. With the market informed of future capability requirements as a matter of continual engagement, both public and private businesses can decide if they wish to compete to provide the capability sought. With governmental commercial decisions based on open competition principles, new domestic entrants could be encouraged to the defence market, perhaps in harmony with international partners. Government and the military, under such an approach, should focus on the future capability requirements for defence and security and the management of open competitions while commercial delivery should be left to businessmen, engineers, programme managers and financiers – skills that predominantly reside in the private sector.

Consequently, the subject of development of a defence acquisition system usually brings with it significant questions around what elements of the defence supply base need to be owned by the government and what elements are best provided by non-governmental investors. Notions of open competition and systemic, programmatic delivery of elements of capabilities naturally reside more readily in the private sector. Portfolio management, scheduling, cost management and financing, risk and opportunity management, electrical, mechanical and systems engineering, commercial negotiations and contracting are the subjects of businesses rather than the domain of governments. However, the right mix of public and private defence industrial ownership is a policy question for government and beyond the scope of this paper. Lessons from the West, though, suggest that defence businesses are invariably more flexible, responsive, innovative, efficient and better for the continual development of skills and competencies when they are located in private sector hands. Even where governments wish to own facilities or businesses for strategic (or merely historical) purposes, private sector contractors invariably operate them under long-term contracts through some form of Government Owned-Contractor Operated (GOCO) commercial model. Government ownership and operation of defence design, manufacturing and service businesses is a declining trend in the twenty-first century.

Appendix C: From Equipment to Capability Management Through Life

To achieve effective defence capabilities, it is essential that there is an integrated and managed approach to acquisition that deals with the capability in question "through-life," from the moment a capability gap has been identified through to disposal. This could cover multiple decades and represents a significant project management investment by a state. It is not unusual for defence equipment to be in service for 20 years or more, and for it to be significantly modified during this time. Also, especially with defence platforms, at least twice as much money will be spent on operating the system compared with buying it in the first place. Therefore it is sensible to devote as much attention as possible to the in-service phase, even before a commitment to buy is made, and then continuously after purchase.

Typically, through-life management tests and assures decision-makers that:

- The project to generate military capability has a clear end-user focus;
- The planning takes into account all phases of the capability life-cycle and address all interdependencies with other force elements and lines of development (see below);
- The costs have been captured and funds secured for the whole of the capability throughout its operating cycle. There are many cases of states buying equipment and then realising they could not afford to operate it;
- All stakeholders have informed and approved the project and recorded their commitment;
- Completeness, robustness and relevance are assured.

A Through Life Management Plan is maintained and refined as the capability project progresses through its acquisition phases, improving in accuracy at each stage in terms of targets relating to performance, time and costs. Significantly the plan states the objectives, assumptions, resources and interdependencies associated with the delivery of the capability, informing all capability-related decisions. Such a process is not an end in itself but rather a means to a rather important end.

Defence Lines of Development

A piece or fleet of equipment does not in itself provide the capability to do anything. Other elements, most obviously training, have to be added before capability can be generated. Many of these elements can involve significant cost or may need changes in the structure and culture of existing organisations. They also may be neglected or even overlooked if a conscious effort is not made to address them. Therefore many states have developed a checklist of items to be delivered so as to assure that equipment could be used effectively, including on operations.

The UK approach has been to identify eight separate Defence Lines of Development which are brought together in a ninth. The purpose of defence lines of development (DLODs) is to provide a pan-defence method of coherently considering through-life development and management of defence capability. The DLODs comprise:

- Training: the provision of the means to learn, practice, develop and validate the practical application of a common military doctrine to deliver a required military effect. Training should address the training of individuals and crews, and then collective training involving using a system in conjunction with

other force elements. Training by using operational equipment can be very expensive and therefore important decisions have often to be taken about the use of simulators and simulation exercises in capability generation.

- Equipment: the provision of military platforms, systems, weapons and other items needed for a capability.
- Personnel: the timely selection and provision of people to integrate the training and equipment to deliver defence outputs. The availability of the people with right background attributes can be problematic, especially when novel sorts of equipment are being bought. A common problem when buying equipment from overseas is to find people possessing the relevant language skills for the support as well as operation of the equipment.
- Information: the provision of coherent data, information and knowledge to enable timely decision-making. Data can be defined as raw facts without inherent meaning. Information is defined as data placed in context, whilst knowledge is information applied to a particular situation to generate a military effect. Good information is central to preventive maintenance and high rates of availability, and to cost control. However, it is also necessary to be clear on how and what one system is to communicate with the rest of defence establishment.
- Concepts and Doctrine: a concept is an expression of the capabilities necessary to generate a military output to meet a particular defence need in the future. Doctrine is the expression of principles by which commanders guide military actions today. Together, concepts and doctrine codify the manner in which a body of knowledge shapes the military instrument. These are formal words but in plain language a user needs to know how a system is to be used, both on its own and in conjunction with other elements of defence. Doctrine is often evolutionary and changed in the context of a specific operation: the UK used the Apache helicopter very differently in Afghanistan than had been envisaged when the system was first procured, but some initial sense of how a system is to be used is central to the generation of capability.
- Organisation: this relates to the organisation of people and teams into managed and manageable entities. It includes military force structures, government entities and support areas. Obviously the procurement of novel systems that do not easily fit into existing organisational structures present particular challenges.
- Infrastructure: this is the acquisition, development, management and disposal of all fixed assets and utilities in support of defence outputs. Typically infrastructure forms a significantly expensive part of a country's defence architecture. New equipment may require new storage facilities such as hangars, docks and garages or it may be able to be accommodated in existing facilities. It may also require expenses to adapt training areas and so on.
- Logistics: this is the planning, maintenance and operational movement of forces and the distribution of key elements onto the battle field. Logistics also deal with recovery and maintenance post-conflict. Equipment support for training and even more for operational deployment and use is almost invariably a very important aspect from a financial point of view.
- Interoperability and integration: interoperability and integration brings individual capabilities into a portfolio of defence assets allowing commanders the utility of wide-spectrum forces, both across their own military and with partners and allies. There are close relations among many DLODs (such as people and training), and also equipment and force elements have to be used in conjunction with others. This area thus offers challenges and opportunities.

Critically, the DLODs are not in order of importance and all are crucial for the generation of defence capabilities. The DLODs are joined by multiplication signs rather than plus signs and if even one is absolutely missing, so will the capability associated with the equipment.

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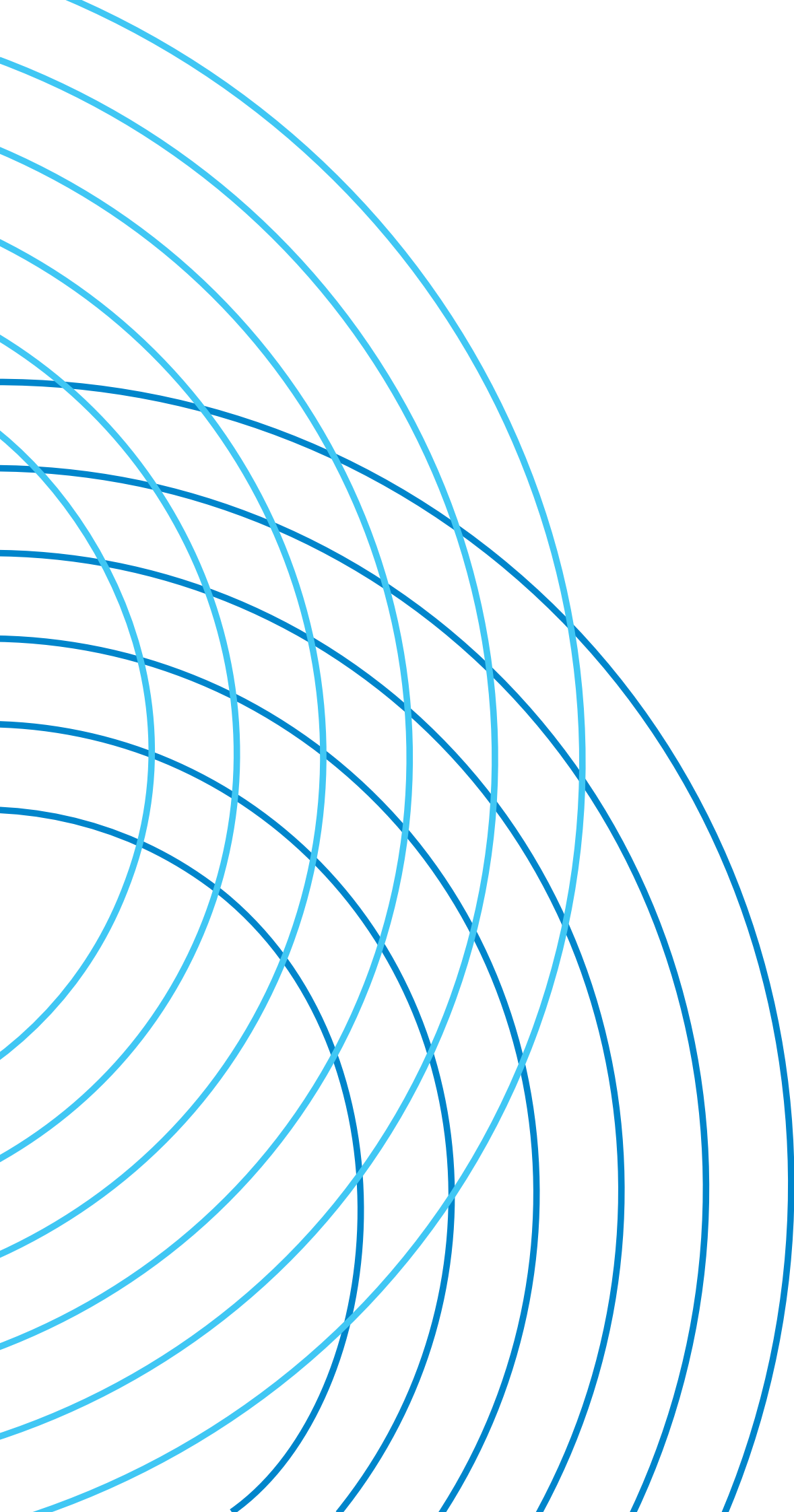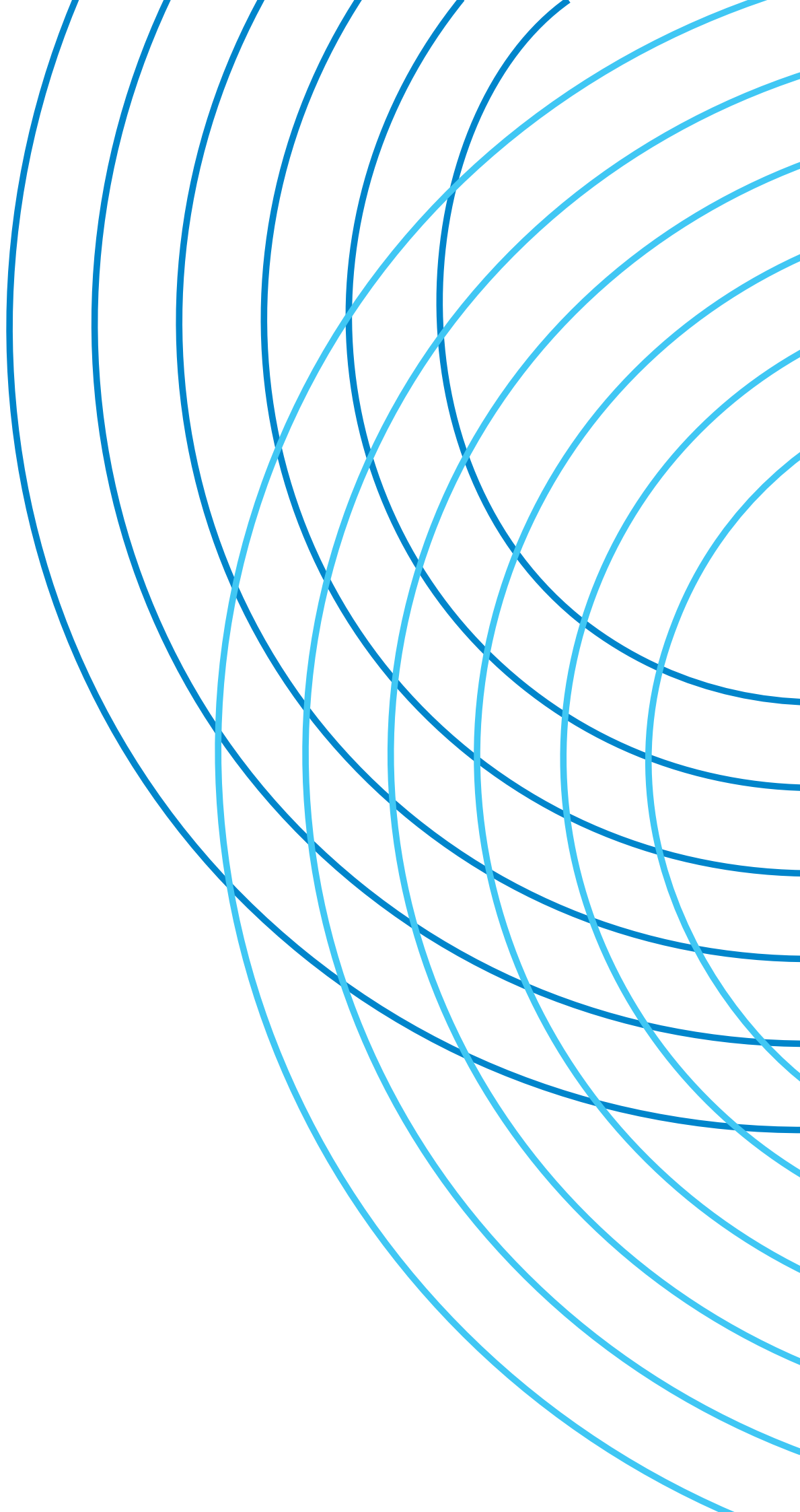
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