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Changing Trends in Global Research, Development, and Acquisition Process

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This brief provides a summary of literature that addresses the changes occurring in global defense research, development and acquisition (RDA) systems. As new international partnerships are formed and new applications for advanced technologies are developed, countries will balance economic, political, and defense priorities for the future. For that reason, many countries are in the process of transforming their defense acquisition process, in large part because of shrinking budgets and industrial globalization.

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This paper provides a brief overview of literature regarding global defense acquisition systems and defense procurement practices. Recent publications recommend changes in business models and acquisition practices, in large part because of rapid technological advances. Changes to defense acquisition processes often occur slowly and require not just a change in policy but a change in culture. Many of the publications reviewed for this paper focus on U.S. processes and are representative of the approach many defense developers are taking to implement acquisition transformation. The survey of RDA-related literature shows basic similarities in defense industrial practices and a worldwide effort to streamline the defense R&D and production process to meet the rapidly changing needs of individual military systems.

CHANGES TO RDA PROCESSES

Many of the government reports reviewed discuss the need for procurement reform, including integration of preliminary research, new ways to articulate requirements, and changes in the relationship between government and non-government entities. Transforming a defense RDA apparatus is a complex process that requires adjustments in the defense culture. Many countries are considering changes to their defense industrial policies to address national security concerns and improve transparency between government and non-government entities.

U.S. acquisitions expert Jacques Gansler writes that changes in the defense industrial culture often occur in response to a critical event. The literature reviewed indicates that those countries in the midst of transforming defense industrial processes are taking a close look at the relationship between civilian and government-owned facilities and the ability to inspire and fund innovation for a new generation of weapons. Gansler points out that threats in the future will be different and will require different applications of technology and an innovative and flexible industry to meet quickly evolving requirements. An industry that is capable of producing ships, planes, tanks, and missiles may need to consider non-traditional responses to respond to the next conflict or war and not rely on past practices.

Changes in requirements for future warfare will require defense planners to focus on a broad range of RDA activities, including force planning, articulation of requirements, integration of advanced technologies and systems, and changes in defense budgets—leading to possible new acquisition practices. For example, the common practice for U.S. planners is to define requirements in a complex request for proposal document that contains explicit details about the end-product. In an age of rapidly advancing and changing technical capabilities, the best approach may be to specify the desired military objective and then allow contractors to recommend a solution. This process would open the door to more innovative thinking not just about developing technologies or systems, but might also include new processes to reach the desired outcomes. One major consideration for acquisition planners is how to approach the growing collaboration with the private sector for services that could lead partnerships in which both sides interact equally, rather than at the direction of the government. For this kind of partnership to succeed, government planners and contractors will need to find ways to effectively complement and combine resources—and it will require a high degree of trust to work together to resolve problems.

The United Kingdom is in the midst of one of its most comprehensive and complex defense industry transformations as it considers a new framework to redefine the acquisition process. Key to the U.K.'s process is the new concept of "capability management" which includes "a defense operating model, a target operating model, a generic capability model, and through life capability management (TLCM)." There are a number of challenges in this new framework, including managing a complex contract system, responding to urgent operational requirements, managing data regarding the status of acquisitions, and the moving to contractors the management of the financial burden that comes with overseeing the complete life cycle.

As countries consider ways to streamline the defense RDA process, as well as to make the process more transparent and faster, they may follow in the footsteps of recommendations found in the 2012 "National Security Through Technology: Technology, Equipment, and Support for U.K. Defence and Security" white paper. Such changes might include an e-procurement system for contracting, improved invoicing systems, changes in supply network processes, and clear mechanisms for competition and payment of contracts. The review of literature on defense industrial transformation suggests that other countries might:

- buy off-the-shelf where appropriate;
- use a common set of open principles, rules, and standards wherever possible, to ensure that they have the flexibility and agility to upgrade capability incrementally;
- make defense and security procurement as accessible as possible to small- and medium-sized enterprises; and
- ensure that support services provided by industry are increasingly integrated with defense and security agencies to provide assured availability during operations.

Change is especially difficult—and necessary—for struggling defense complexes, as seen in the case

of India. In 2002, the government of India issued the Defence Procurement Procedure (DPP) with the intention to streamline the acquisition process and to transform the defense RDA process. Part of this plan includes the opening of the defense industry to the private sector. Restructuring of the defense procurement process continues, with reviews by the Defence Procurement Board (DPB) scheduled every two years. The emphasis for the coming two years will be on strengthening the defense manufacturing base and improving the efficiency of the procurement process. The 2013 DPP lays out the steps the government will take when considering defense procurements: 1) buy Indian; 2) buy and make Indian; 3) make; 4) buy and make with technology transfer; and finally, 5) buy global. If India is successful in implementing these changes, it will result in a broad change to its business, S&T, and defense industrial culture.

DEFENSE TECHNOLOGY DEVELOPMENT AND ACQUISITION

One study found that the pace of technological advances is creating challenges for military organizations to maintain a technology edge as civil and commercial groups excel at transforming knowledge and innovation into new products and technologies. Not only is it difficult to anticipate future needs for the military, it is nearly impossible to manage the risk associated with developing disruptive responses that could transform future warfare. Some studies indicate that the relationship between civil and military technology has grown closer in the last decade, with greater innovation occurring in the commercial sector. This new pattern of R&D, often without direct government funding, has led to breakthroughs such as flexible manufacturing, which defense developers later adopted. The advent of flexible manufacturing is just one example of commercially developed technology that improved and shortened manufacturing timelines for new products and was later integrated in to defense manufacturing processes.

For many defense developers, there is no clear process to move innovative breakthroughs upstream to industrial design programs. Several authors recommend increased collaboration between the research and industry sectors. Future strategies may look at ways to balance the cost effectiveness of using a technology over which they have little influence in the development (commercial) and that of costly defense-run development programs which might be obsolete by the time managers are ready to integrate the technology or system. Developers have the option to modify commercially available technology to meet defense standards, especially for things such as radars, safety components, cyber, and electronics. However, there are still some costs and risk associated with integrating commercially available technology. The challenge for industry in the future is to recognize defense-related applications of technology and to devise plans to rapidly integrate the advances into weapons platforms.

GLOBAL ECONOMICS AND NEW DEFENSE CHALLENGES

Any nation's ability to develop and acquire significant defense capabilities and military powers depends on multiple economic factors. However, the extent and focus of defense spending may also depend on costs and trends in military R&D, weapons, and defense industries and potential economic influence of global threats. Defense economic analysis is crucial to identify national capabilities to develop substantial military force that could be applied to challenge other states and to prioritize government defense spending according to international acquisition determinations and development trends.

Global defense spending is not even across the regions. According to the National Security Analysis Department of John Hopkins University, international defense and R&D spending increased, with the United States, China, Russia, India, Iran, Brazil, and South Korea leading the race. The increased weapon costs dramatically affected the size of national defense budgets and only a few nations can afford to replace their defense technologies with modern combat systems. International defense industries have established new partnerships through mergers and acquisitions in order to share costs and extend market shares. The increased costs of arms development and acquisitions, training, maintenance, infrastructure, and military R&D is forcing many nations to retain older systems which impacts global production and development of sophisticated defense systems.

The global financial crisis of 2007–2009 forced governments to regulate their financial sectors and decrease public spending; however, it did not affect military expenditures, which overall remained steady and even trended upward due to unbalanced global budget cuts. Prior to 2007, extended defense spending was a result of national foreign policy objectives, existing and potential military threats and conflicts, peacekeeping operations, and accumulated state wealth. After 2009, in the aftermath of the financial downturn, 65 percent of the nations increased their military spending in real terms, with the United States being in the lead.

However, the overall effect of the crisis was negative. During the crisis, the United States, Germany, Brazil, India, and France either still maintained leadership in spending, downsized their defense budgets, or executed marginal increases to avoid further expansion of national budget deficits as a result of austerity measures, redeployment of troops, or

general macroeconomic policy objectives. According to SIPRI, in 2008, military expenses in the United States declined by 1.2 percent in real terms. France, Germany, and the United Kingdom decreased their military budgets by 4, 1.4, and 0.6 percent, respectively. European sovereign debt crises forced the weaker European economies to dramatically adjust their expenditures.

Since global economic forces did not affect every nation equally during the crisis, multiple nations managed to increase their military expenditures due to their economic growth, sound government policies, and foreign policy objectives. India and China managed to avoid a major economic disaster and sustained their economic positions during the crisis. Several nations developed stimulus packages and monitored their public expenditure under the principles of "weaponized Keynesianism" The United States, as a superpower, and the BRIC nations (Brazil, Russia, China, and India) eventually had to maintain and increase their military power to support their geopolitical and strategic interests and global influence. Less ambitious nations and states with fractured economies, enormous budget deficits, and low credit ratings were forced to reduce their military spending.

In 2013, Deloitte produced their annual Global Defense Outlook in which they examine policies and trends of 50 nations whose spending on national defense accounts for 97 percent of global defense outlays. The report argues that higher-income nations slowed their defense spending due to the decline in regional conflicts and to domestic demand for austerity measures. Lower-income states, experiencing lower economic growth and lower debt, continue to face instability and regional insecurity, which resulted in increases in defense spending.

According to Deloitte, during the adaptation to new economic and political forces, five realities have determined national policies, investment, and the structure of military forces. The report highlights denuclearization, increase in spending concentrated in lower-income nations, the rise of special operations forces, cyberspace as a military operational domain, and declining emphasis on general-purpose forces.

Initially, policymakers have been faced with increased demand for social services or austerity measures. Additionally, governments are challenged by the trade-off between civil liberties and national security interests. Finally, defense ministries are concerned about the value of trained armed forces and their affordability. Dealing with these realities and trade-offs created the main national defense challenge for most nations, which spend enormous funds on their defense.

CONCLUSION

The literature on global defense RDA processes indicate that many systems are in a state of transformation, be it minor changes to address technology advances and integration or major transformations that ultimately will alter decades-old business practices. The challenge for most nations in the coming decade will be how to articulate and achieve national security requirements. Changes in warfare may very well drive changes in the defense industrial culture and these changes are likely to be met with some degree of opposition. The future is full of new concepts, new processes, new economic challenges, and a need to balance all those needs against the greater needs of domestic programs. The changes defense industrial leaders take are likely to influence the way developing industrial nations, such as China and India, consider their RDA processes.

Global defense spending is currently under growing pressure. Proposed and executed defense cuts create severe challenges to the industry. Although the United States and Europe experienced a slight expansion of the military industrial activities due to the nuclear threat posed by Iran and increased purchases from the Gulf nations, overall effects of the 2007–2009 global economic crisis resulted in cutting of defense spending or downsizing the industry. Defense cuts remain on the agenda for many nations. Governments face the option of cutting the expenses on defense industry or other aspects of the public budget.

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