
# Defence & technology: the US between Silicon Valley and European allies

by Zoe Stanley-Lockman

Until recently, the US and, by extension, the West, enjoyed unquestioned military superiority predicated upon unparalleled technology. But while the Pentagon used to bankroll and enable innovation with technologies ranging from precision-guided munitions to the internet, the US military is now forced to confront certain realities: the West no longer has unique control over leading technologies, the private sector provides better research and development (R&D) funding, and some of the most promising innovators are repelled by the structural inflexibility of acquisition processes.

Even in the face of an eroding competitive advantage, it is particularly difficult for bureaucratic, hierarchical institutions such as the US Department of Defense (DoD). As this problem extends to Europe, a solution should be sought there, too.

## The US Defense Innovation Initiative

The Pentagon has recognised that its preoccupation with stabilisation operations abroad has given other countries, namely Russia and China, the time needed to invest in military modernisation. Non-state actors, such as al-Qaeda or the Islamic State of Iraq and the Levant (ISIL), are also gaining access to sensitive technologies, and many emerging countries are heavily investing in their manufacturing bases to bolster their economies, as well as indigenous military capabilities. This has culminated in the proliferation of military technologies which is disadvantageous to Western countries that already struggle with constrained resources and ever-widening responsibilities.

To address these concerns, then-Secretary of Defense Chuck Hagel launched the Defense Innovation Initiative in September 2014. Today, two main building blocks compose the Initiative: the Long-Range Research & Development Planning Program (LRRDPP) and the third offset strategy. The two work in tandem: the LRRDPP first identifies cutting-edge technologies and innovative concepts, then the third offset strategy incorporates them into military systems and strategy. Additionally, Better Buying Power (BBP), an initiative seeking to improve acquisition practices (but not reform processes), facilitates the embedding of these changes.

The LRRDPP and the third offset strategy follow Cold-War-period initiatives to bolster military innovation and ensure technological superiority. First established in 1973, the LRRDPP is being resurrected today to gather concepts with the ability to enhance capabilities by 2025-2030 across five core areas: air, missile and precision-guided munition defence; air superiority; space; undersea; and other emerging technologies. Promising concepts could become part of the

US budget request as early as 2017 to enable the US to field these technologies by 2030. Successful proposals from the LRRDPP will be incorporated into the third offset strategy to retain, or possibly restore, military-technological advantage.

## Historical precedents

During the Cold War, the two previous offset strategies were implemented to both advance innovation and also produce cost efficiencies. The first offset strategy rendered the US nuclear arsenal the heart of deterrence under President Eisenhower. This was implemented because the usage of conventional forces was projected to be too expensive in the event of conflict escalation. Following the Vietnam War, the second offset strategy led to US military superiority through stealth aircraft, extended-range precision-guided munitions, and new intelligence, surveillance and reconnaissance (ISR) platforms. During this time period, military innovation was prioritised because of the convergence of three factors: preoccupation with counterinsurgency during the Vietnam War, declining budgets, and Soviet nuclear build-up. A similar configuration is now echoed in the current strategic environment with US stabilisation operations, shrinking resources, and increasingly capable adversaries.

Today's trouble is not so much innovating, but rather harnessing innovation. Low transition rates mean that it is difficult to integrate technologies into equipment. Some of the main interest areas of the LRRDPP are robotics, autonomous systems, miniaturisation, big data, and additive manufacturing. A common thread between these segments is that the cutting-edge technologies are dual-use, meaning they have both military and commercial applications, or are currently led by the commercial sector.

## Defense Innovation Unit Experimental

The third iteration of BBP notably included the removal of barriers to commercial technology utilisation as a way to ameliorate acquisition practices. Now, Silicon Valley is at the core of the Pentagon's efforts to improve relations with the commercial-tech community.

In April, Secretary of Defense Ashton Carter announced the establishment of his "new start-up": Defense Innovation Unit Experimental (DIU-X). With 12 employees and an annual budget of $1.75 million for 2015 and $5 million annually from 2016-2019, a point of presence – as opposed to an investment arm – is all DIU-X can be. Nevertheless, it matters because it is an initiative spearheaded by the secretary of defense.

The Pentagon's new focus on Silicon Valley may have created waves on the Atlantic coast, but it has caused only ripples in the Pacific. Since its launch in July, DIU-X has tried to better grasp the hesitance of commercial players disinterested in pursuing business with the DoD. Silicon Valley's disinterest may be insurmountable; venture capital offers more money, more certainty, and more flexibility.

It appears that the Pentagon cannot make up its mind: does the DoD want to be more like Silicon Valley, or does it want Silicon Valley to become more like the nation's capital? The former means altering acquisition at the programme-management level not necessarily to accommodate technology, but rather to capitalise on the rapid *rate* of innovation of the technology. In some ways, this is more important because widespread availability contributes to the levelling of technology around the globe. As Assistant Secretary of the Air Force William LaPlante stated in October, "If we buy commercial, so can everybody else."

The latter means convincing Silicon Valley that national-security-related issues are interesting enough to compensate for the lack of profitability. This would also require that the DoD and Silicon Valley share a common threat perception. Furthermore, the DoD's day-to-day practices, such as wearing uniforms and speaking in acronyms, are alien and unwelcome in casual entrepreneurial settings. In some ways, the cultural gulf between the Pentagon and the commercial-tech sector is so great that any agreement would be more akin to creating an international alliance than harnessing domestic potential.

Some of the traditional prime contractors are so entrenched in government business that they, too, are having difficulty grappling with these changes. Traditional players are beginning to realign internal R&D toward the priority areas identified in the LRRDPP; at best this could mean more interaction with the commercial-tech sector and less risk aversion. With the US industrial base – both traditional and commercial – reorienting toward the third offset strategy, allies and partners must also take note.

## A new European playbook?

Sustaining technological superiority is paramount not only to deter potential adversaries, but also to reassure allies and partners alike. At the launch of the Defense Innovation Initiative, then-Secretary Hagel said that, without Western technological superiority as the cornerstone of power projection, the "strength and credibility of our alliance will suffer." At present, the third offset strategy does not include any guidance on the role played by US allies and partners.

Two forms of European participation in the third offset strategy could be envisioned: operational innovation and cooperative R&D and production.

## Operational innovation: NATO

Third offset is not a singular strategy that determines which technologies provide military advantage to US forces around the globe. It is rather a series of sub-strategies that aim to operationalise updated and emerging technologies in different geostrategic settings. Although both Russia and China are bolstering their anti-access area denial (A2AD) networks, it is the Pacific-aimed strategy that will focus on technology to counter A2AD development. On the other hand, Deputy Secretary Robert Work noted in January that the Europe-aimed third offset strategy should focus moreover on innovation *vis-à-vis* operational concepts and exercises, all of which should be projected through more frequent demonstrations.

This is not dissimilar from European participation in the offset strategy of the 1970s. Beginning in 1975, Europe played a role in the offset strategy through the European-American Workshop, a group of leading strategists from both sides of the Atlantic that gathered several times through 1988. Once the US identified and produced offsetting technologies, the Workshop's American contingent advocated for the incorporation of emerging US technologies, namely long-range cruise missiles, as part of European military modernisation. In the 1980s, the Workshop also helped develop a new operational concept for NATO, now known as follow-on forces attack (FOFA).

This process could be repeated today. First, the Defense Innovation Initiative would determine what future breakthrough technologies might be. Next, the US would look toward allies for a collaborative, more conceptual form of innovation. Through demonstrations and wargaming, allies could work together to learn how existing and emerging technologies can be used together in innovative, dynamic ways. In this sense, having the technology becomes secondary to knowing how to leverage it – together – as a form of deterrence.

The challenge will be to find the next doctrinal concept to address both hybrid threats and high-intensity conflicts. The US intends to work with its European allies to develop new strategies that will decentralise authority to lower echelons, permitting greater flexibility on the battlefield. Technologically speaking, the US envisions such an operational concept to be designed around *human-centred autonomy*, or the appropriate balance between humans in combat and reliance on unmanned and autonomous systems. Allied participation is an important component of collaborative concept innovation that integrates dynamic manoeuvre in the flow of operations.

## Cooperative R&D and production: Europe

The US has already begun to call upon its European counterparts – especially middle-sized companies – to help innovate and ensure Western technological superiority. BBP 3.0 recognised that allies can assist the US in pursuing innovation and technological superiority by enabling increased cooperation in research, development, and production. The document also recognises that foreign-sourced products can help achieve cost efficiencies.

**Industrial cooperation toolbox**

Transatlantic defence industrial cooperation has faced the same barriers for years, which have created a "Fortress America" and, to a lesser extent, "Fortress Europe." Although the US defence market is largely perceived to be a "one-way street," there are also several initiatives and programmes in place that could be leveraged to extend cooperative research and development (R&D) and production. Together, these programmes enhance interoperability by reducing delivery time, building exportability into the front end of the acquisition lifecycle, and facilitating cooperative R&D, coproduction, and cooperative logistics support.

**Foreign Comparative Testing (FCT):** the Pentagon's Comparative Testing Office conducts FCT to test foreign-produced technologies with a high Technology Readiness Level. The office also works closely with the Director of Operational Test & Evaluation to review new capabilities.

**International Cooperation Coalition Warfare Program (CWP):** the CWP program initiates cooperative projects by providing up to $2 million of RDT&E seed funding for the technology identification phase of projects with committed foreign government partners.

**Reciprocal Defense Procurement and Acquisition Policy Memoranda of Understanding (RRDP MOUs):** to bypass certain *Buy American* restrictions, the US currently has bilateral RRDP MOUs with Norway and 17 EU member states, including the original six "Letter of Intent" states.

**Strategic Trade Authorization (STA) License Exception Program:** as part of Export Control Reform, certain dual-use and militarily less sensitive items no longer require a license to be exported and transferred to STA destinations, including Switzerland, Norway and all EU member states except Cyprus and Malta.

The Pentagon seeks to achieve these efficiencies by designating allies as technological niches so as to avoid duplication of capabilities across the alliance.

As such, US ambitions for European participation in the third offset strategy echo longstanding European arguments for a more consolidated, less duplicative European defence technological and industrial base (EDTIB). However, this means confronting the same barriers which have long hampered the EDTIB.

If certain countries or groups of countries in Europe divvied up EDTIB segments, Europe would spend its military expenditures more wisely, therein reducing inefficiencies and strengthening capabilities. But the political barriers are not to be underestimated: a defence industrial base translates into jobs, sovereignty and autonomy are often prioritised over efficiency, and, as the segments are unequal, geo-technological niches would not be equal, either. Even if countries find the political will to reduce fragmentation, which ones would be lucky enough to be awarded rapidly growing segments, and which would be stuck with the low-demand, high-sunk-cost segments? The participation of industry is another challenge, especially without knowing if the US industry would relent in certain segments or if US firms would continue as competitors to allied niches.

## An allied role in the third offset strategy

In terms of both operational and technological innovation, European participation in the third offset strategy as conceived by the US cannot be divorced from military capabilities. Although 21 NATO member states are moving toward spending 2% of GDP on defence, only four European allies currently meet the requirement. It is more expensive and complex to ensure combat readiness today than was the case when FOFA combined NATO's operational and technological prowess during the Cold War. Stronger commitments from NATO member states are prerequisite to materialising new collaborative warfighting methods and more frequent demonstrations.

Whereas collaborative operational innovation would target Russian aggression, technological superiority should address a broader range of threats. Instead of the US pushing for technological niches, it could be more desirable for Europeans to invest in technological innovation. This would require a significant reversal of trends. From 2007-2013, R&D levels across European Defence Agency (EDA) member states dropped by more than 20%. Transformational innovation depends on research and technology (R&T) funding, the subset of R&D that takes place between 5-25 years before production. Hovering at around 1.1% of total defence spending, R&T has not once risen above 2007 levels. Moreover, the €8.3 billion allocated to R&D (as of 2013) is not optimised because of duplicative projects and a fragmented supplier base.

On both sides of the Atlantic, private R&D funding from large firms supplements these figures. Even so, the resulting technologies from private funding are increasingly commercial and, even when dual-use, not always engineered with military-system compatibility in mind. Government R&D provides incentives for companies, especially small and medium-sized ones, to take extra risks. But without public funding, companies will be reluctant to invest in breakthrough technologies that have no commercial market.

At the EU level, the funding instruments currently available emphasise dual-use technology development. For example, as part of the defence package, Directive 2009/81/EC promotes commercial-off-the-shelf options to minimise duplicative R&T projects. Dual-use R&D funding can presently be accessed via the Horizon 2020 initiative and, more recently, European Structural and Investment Funds for multinational dual-use research projects, as supported by the EDA. In December 2013, the European Council identified key capability areas that aim to balance assessing current shortfalls with filling future gaps. Conversely, the third offset strategy is more forward-looking. LRRDPP priority areas could be considered to bridge timescales between Europe and the US in the hopes that European military capability development does not repeat cycles of playing catch-up.

In the EU's next financial framework (2021-2028), Horizon 2020's successor, the Preparatory Action (PA) for CSDP-related research, will provide defence R&D funding for the first time at the European level. The PA will launch ahead of the financial framework in 2017, the same year that LRRDPP will likely enter into the US defence budget. Moving forward, this focus on R&D can help drive European innovation in connection with priority areas of the third offset strategy, including ISR and A2AD-related technologies.

For the US and allies, if the third offset strategy succeeds in providing military-technological superiority, it will not last as long as it did from the first two strategies. Transformational innovation is increasingly rapid, therein necessitating frequent next-generation refreshes and occasional acceptance that items become obsolete. At best, effective export control and technology transfer regimes, as well as sanctions, may delay the proliferation of technology to state and non-state adversaries. Nonetheless, forces of globalisation – namely shortened technology lifecycles coupled with inevitably widespread access to dual-use technology – can be expected to soften the impact of a future competitive advantage.

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