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THE TEMPTATION OF TECHNOLOGICAL WARFARE...AGAIN

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ABOUT THIBER

The increasing strategic, economic, diplomatic and social value of cyberspace has led to the development of new think tanks specializing in cybersecurity, located mainly in the United States, China, India, United Kingdom, Germany or France. Although in recent times Spain has experienced the expansion of independent organizations aimed at performing research and providing technical insights in a number of subjects (especially economy and foreign policy), none of them covered any cyberspace issue.

THIBER, the cybersecurity think tank was born to solve this fact. Focused on covering the security and defence of cyberspace, THIBER is not only aimed at increasing the public awareness of those issues, but also at consolidating its role of think tank of reference in Spanish language on security and defence in cyberspace.

Mission:

- To analyse the influence of cyberspace in national and international defence.
- To create and strengthen spaces for dialogue and debate, favouring the creation of a state of opinion.
- To develop and train future decision makers on cyber issues.
- To provide an auditor role to public actors.
- To train and raise awareness on cybersecurity.

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- A non-partisan, independent think tank for the Spanish-speaking community, with a clear international vocation (Spain and Latin America) focused on the security and defence of cyberspace.

Values:

- Objectivity
- Rigor
- Independence
- Methodological approach

THE TEMPTATION OF TECHNOLOGICAL WARFARE...AGAIN

In November 2014 , the former U.S. Secretary of Defense Chuck Hagel laid the basis of the future American defence policy. On the one hand, he opened the *Long Range Research and Development Plan* to identify and develop the emerging technologies in the 2030 horizon[1]. On the other hand, he launched the *Defense Innovation Initiative*[2] to develop a new catalogue of military capabilities. Combined, both projects shape the pillars of the Third Offset Strategy aimed at guaranteeing the American military supremacy in the following decades.

Without any doubt, this initiative will be Chuck Hagel's main legacy after his fleeting period heading the Pentagon, since its attainment will not only articulate the American defense and military planning in the following decades, but it might also lead to the conquest of a new *Revolution in Military Affairs* (RMA)[3] capable of transforming the art of war and obliging both allies and adversaries to develop the related capabilities for bridging the military gap provoked by this successful military innovation.

Based on the heritage of the Information RMA and on the inventiveness of the American industry[4], this process is aimed at resolving the strategic questions of the country in the post-war on terror and at maintaining the level of military ambition with less economic, human and material resources, and more political constrictions.

[1]The 'Request for Information' aimed at identifying current and emerging technologies and projections of technology-enabled concepts was closed last January. Department of Defense: *Long Range Research and Development Plan* (HQ0034-15-RFI-1) (December 3, 2015).

[2] Office of the Secretary of Defense: *The Defense Innovation Initiative* (OSD-013411-14) (November 15, 2014).

[3] A RMA is a change in the way of fighting motivated by the exploitation of new weapons systems, operational concepts, doctrines for the use of force or ways to organize and administer the military means. Hence, it renders obsolete the previous military style. In the 1990s, this concept shaped the international strategic analysis and defense planning, as it was accepted that this revolution—enabled by information technologies, based on the acquisition of a plain knowledge of the battlefield and built around the creation of a joint force capable of mastering the space and cyberspace, as well as the land, sea and air spheres—would increase the military gap between the United States and its adversaries, as well as contributing to the maintenance of its political hegemony.

[4] Despite this idea was already present in the 2012 *Defense Strategic* Guidance, it has acquired a crucial importance in this strategy. Although the main technological advances came from the military field—and, in the American case, from the *Defense Advanced Research Projects Agency* (DARPA) whose technological developments were crucial for understanding the Information RMA—currently, many of the potentially disruptive technologies (robotics, remote control, biotechnology, miniaturization, advanced computing, big data or 3D printing) come from the civilian sector.

More specifically, this strategy is aimed at increasing the U.S. capacity to project its military power in *anti-access and area-denial* (A2/AD)[5] environments, to reinforce the conventional deterrence and impose a great cost of opportunity against all the potential adversaries that want to compete with the United States in technological matters[6].

Which are the main strategic questions that the United States has still to resolve? First, as the 2014 *Quadrennial Defense Review*[7]—which establishes the main lines of the country's defence policy and military lines for the 2014-18 period—insinuates and the *National Defense Panel*[8]—which evaluates the basic lines proposed by this review—exposes, the U.S. military would face lots of difficulties if they decide to take part in two theatre wars happening at the same time Hence, they would be incapable of satisfying one of their national security's traditional objectives. In addition, since the projected volume and force structure for 2019—when the revision's proposed changes will take place—will be slightly smaller than the current one but with a similar catalogue of military capabilities, the A2/AD measures of their adversaries will have matured, and their military forces will need to be ready to answer to multiple contingencies (from crisis management operations to high intensity actions against advanced adversaries), it is clear that Washington needs to bring up a new military regime to project its power globally and to satisfy, with a smaller force, a greater number of tasks[9].

"The Third offset strategy is aimed at projecting the U.S. military power in A2/AD environments and to reinforce the conventional deterrence"

Secondly, the military supremacy provided by the Information RMA for more than three decades seems to be coming to an end. Since Operation Desert Storm, the country's potential adversaries have studied the characteristics of the *New American Way of War*[10] that arose from this revolution.

[5] While the first ones are intended to make the deployment of forces in the theatre of operations more difficult, the latter ones try to restrict the conduct of operations in those areas where the adversary does not prevent access. Even if they cannot be described as something new as they have been a concern of the U.S. strategists since the Clinton Administration (1992-2000), the proliferation of advanced air defenses, anti-ship and cruise missiles, anti-submarine warfare, fighters, and a wide range of asymmetric means from countries such as China and Iran (and possibly Syria thanks to Russia) are forcing Washington to think about how to project power in these scenarios (Tangredi, Sam (2013): *Anti-Access Warfare: Countering A2/AD Strategies*, Annapolis, U.S. Naval Institute Press).

[6] Speech by the Secretary of Defense Chuck Hagel in the opening of the "Reagan National Defense Forum" (Simy Valley, November 15, 2014).

[7] Department of Defense (2014): *Quadrennial Defense Review* 2014, Washington DC, U.S. Government Printing Office.

[8] National Defense Panel (2014): *Ensuring a Strong U.S. Defense for the Future – The National Defense Panel Review of the 2014 Quadrennial Defense Review*, Washington DC, U.S. Institute for Peace.

[9] Martinage, Robert (2014): *Toward a New Offset Strategy: Exploiting U.S. Long-Term Advantages to Restore U.S. Global Power Projection Capability*, Washington DC, Center for Strategic and Budgetary Assessments.

[10] This concept was aimed at describing the RMA military style, which, based on the technological superiority, the knowledge of the battlefield and the capability to carry on precision attacks from a long distance, allows to obtain quick, clean and crushing victories against any adversary (Lind, Michael (2006): *The American Way of Strategy: U.S. Foreign Policy and the American Way of Life*, Oxford, Oxford University Press).

B-2 Spirit (U.S. Air Force)

They have also understood that this military regime is based on the *system-of-systems* that connects all the elements of the battlefield (from soldiers to platforms, sensors and weapons), and its backbone is the computer information systems whose disruption could degrade the ability to fight. Precisely, the military reliance over the information technologies, the never-ending necessity of broadband networks[11], the growing capabilities from both state and non-state actors for conducting cyber attacks using Internet connections or computer network, and electronic operations via wireless communications are some of the main problems the United States and all the advanced militaries are currently facing. Nevertheless, they do not seem to really understand their devastating consequences[12].

As a result, both the potential adversaries as a means to counter the American military superiority and allies for bridging the military gap have provided themselves with the technological means (C4ISTAR systems for digitalizing the battlefield, smart weapons for accurately beating enemy targets, stealth or unmanned platforms for entering into risk areas without being shot down and cybercapabilities for denying the use of the information grid needed for planning and conducting operations), capabilities (joint action, dispersed operations, swarm tactics or special forces) and concepts (system-of-systems and network centric operations) related to it. In this sense, although the clearest examples of the diffusion of advanced technologies related to the RMA to other nations are the normalization of the use of drones, precision-guided munitions, cruise missiles, advanced air defenses or sophisticated sensors, it is also important to note that cyber and electronic warfare capabilities have

[11] Although all the advanced militaries are facing the same problem, it is interesting to note that the Pentagon currently requires a broadband network capable of 24 Gigabits per second. Nevertheless, some independent studies assert that in the next five years it will increase up to 41 Gigabits per second, a volume of data that the current networks will be unable to support.

[12] Costello, John: "Bridging the Air Gap: the Coming Third Offset", *War on the Rocks* (February 17, 2015), at: http://warontherocks.com/2015/02/bridging-the-air-gap-the-coming-third-offset/

spread among allies and potential enemies of the United States. In fact, it cannot be forgotten that one of the most cost-effective A2/AD strategy for degrading a modern military would rely on cyber—using physical networks—and electronic—using electromagnetic waves—attacks for denying the use of radars, command and control systems, communications or targeting complexes, thus exploiting the Achilles' hell of the Information-RMA.

Moreover, specific asymmetric responses—such as the A2/AD tactics or hybrid strategies[13]—are being developed in order to avoid that the United States could project its military power and exploit its military and technological potential.

"The United States faces the problem of its reliance over Information Technologies and the growing enemy cybercapabilities"

As a result, the Third Offset Strategy is the response being articulated by the Pentagon to solve this set of strategic questions that compromise the achievement of its national security objectives. Based on the information's revolution legacy and focused on the exploitation of the technological and scientific potential of the country, this initiative aims to increase the military capabilities' gap between the United States and its potential adversaries—while achieving the same with its allies—, guarantee the capability to project its power to any part of the world and reinforce the existing security commitments between Washington and its friends and allies, especially in Asia-Pacific and the Middle East[14]. More specifically, this strategy aims to:

· Combine the legacy systems—those land, naval and air platforms that are currently found in the U.S. military inventory—with the development of new material means that could allow the country's army to maintain its qualitative gap against any of its adversaries.

· Limit the United States' dependence on naval, aerial and land facilities that, located in advanced regions, are vital for pre-positioning men and materials, guaranteeing the efficient support of the deployed forces, and projecting its military power.

· Reduce the country's armed forces dependence on capabilities (observation, reconnaissance, communications, geolocation, command and control, navigation, target acquisition, or meteorology) that its civil and military satellites provide.

[13] Communication of Bob Work "The Third U.S. Offset Strategy and its Implications for Partners and Allies" (Washington DC, January 28, 2015).

[14] Although there is no prospect of an arms race in Europe because of the recent Russian moves –even Washington pledges the European powers to increase their defence spending to sustain their own security and contribute to the transatlantic link–, the United States is increasing again its military presence in the region as a means of guaranteeing its compromise with its allies.

· Make use of the presence and global projection capability of its Air Force and Navy, or the efficiency of its autonomous or remote-controlled targeted systems.

· Exploit the American capability to conduct strategic precision attacks capable of beating any enemy target both within and outside of the area of operations.

· Shape the new arms race that will take place between the United States and its strategic competitors through the exploitation of the technological and military areas where the country maintains a clear leadership (unmanned systems, artificial intelligence, cyberspace, submarine warfare, strategic attack or systems integration) and where its adversaries still lack of the necessary know-how.

· Make use of existing alliances or agreements between Washington and its partners with the aim of improving its strategic positioning and sharing the costs and responsibilities of the regional defense.

For facilitating the achievement of these objectives, the strategy will follow two broad lines of action: on the one hand, it will exploit the military gap the United States maintains in five areas of capacity (unmanned operations, long-range naval and aerial operations, low observable operations, submarine warfare, and engineering and systems integration) to guarantee—with a smaller but more technical joint task force—the advanced presence and the projection of power in A2/AD environments while reinforcing its leadership in military issues and forcing potential adversaries to start an arms race the latter may not be able to follow[15]. On the other hand, it will replace the traditional approach based on the threaten of an armed intervention crowned with a ground invasion in order to take back

DDG-100 (U.S. Navy)

[15] These five areas of capabilities are considered as the *core competencies* as they have a high added value and they cannot be emulated—at least not for the moment—by the country's adversaries. It should also be noted that the systems on which these areas of capabilities are set are the ones the United States will use to shape the new arms race and the ones that will guide the technological development up to 2030.

control and regain the *statu quo ante bellum*, for another one that will prioritize both deterrence by denial (reducing the enemy's perception on its capacity to achieve its military objectives) and deterrence by punishment (guaranteeing the capacity to conduct reprisal attacks against high-value enemy targets with the aim of showing that any alteration of the *statu quo* will entail unaffordable costs for the attacker). In any case, if the conventional deterrence cannot avoid the aggression against the American interests or over the country's allies and partners, Washington must be able to answer in a quick and decisive way to stop the attack, bring about the cessation of hostilities or achieve a clear and decisive victory over the enemy[16].

"the Third Offset Strategy is based on the information's revolution legacy and focus on the exploitation of the technological and scientific potential of the country"

At the center of this strategy will be the concept of *global surveillance and strike network* (GSS). Built on the five areas of capacity (unmanned operations, long-range sea and air operations, low observable operations, submarine warfare, and engineering and systems integration) that conform the key competences of the Third Offset Strategy and considered as the main result this process of military innovation will provide, this network will be crucial to guarantee the strategic surveillance capability, the forward presence, and the power projection in A2/AD environments.

This GSS that will serve as a launching pad to provide global surveillance and project the power in A2/AD environments should be available in the 2030 horizon. Nevertheless, the articulation of this strategy and the maturing of this concept of operations will require the implementation of several initiatives in research and development matters, strategic planning, military programming or distribution of resources by the Pentagon[17].

More specifically, the following priorities have been identified in the arms industry:

- The acquisition of advanced anti-satellite capacities that reinforce the country's deterrence against attacks directed at these systems. Nonetheless, the centrality of satellites in modern war and their value as multipliers of military operations recommend implementing measures aimed at reinforcing resilience and decreasing the American dependence on these means against their degradation, deactivation or destruction. This will force to find alternatives to the Global Positioning

[16] Dombrowski, Peter (2015): *America's Third Offset Strategy New Military Technologies and Implications for the Asia Pacific*, Singapore, Nanyang Technological University.

[17] Brimley, Shawn et alt. (2015): *Ideas in Action: Suggestions for the 25th Secretary of Defense*, Washington DC, CNAS.

System for accurate navigation, deploy strategic drones for carrying out monitoring tasks, reconnaissance or acquisition of objects, and developing a complementary system to satellite communication.

- The rise in the geographical presence, duration and coverage of the American submarine fleet thanks to the development of the long-range and great autonomy stealth submarine drones able to operate remotely—and, in the future, autonomously—at any point of the ocean. This will require the development of high-intense batteries, communication systems, navigation, means of propulsion, artificial intelligence or advanced sensors[18].

- The increase of the *Virginia* nuclear attack submarines' firepower by expanding their capacity to beat ground targets, developing logistics modules and towed missile platforms, modifying the *Tomahawk* cruise missiles and the *Standard* anti-aircraft missiles for beating a wider range of targets (vessels, satellites, radars, bunkers, etc.) and starting to develop medium-range conventional ballistic missiles launched from submarines[19].

- The increase of the geographical coverage of the acoustic sensor networks deployed at sea to detect any strange movement.

- The acquisition of land, naval, submarine and airdrop mines for increasing the defense of advanced facilities.

- The development of long-range intelligent antisubmarine weapons.

- The acceleration on the development of electromagnetic and directed energy weapons to increase the defense of advanced aerodromes against enemy attacks.

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[18] Clark, Bryan (2015): *The Emerging Era in Undersea Warfare*, Washington DC: Center for Strategic and Budgetary Assessments.

[19] Clark, Bryan (2014): *Commanding the Seas: A Plan to Reinvigorate U.S. Navy Surface Warfare*, Washington DC, Center for Strategic and Budgetary Assessments.

LS-3 (Department of Defense)

- The research and development of new electronic warfare equipment or cyber weapons that enable the aerial systems to destroy or downgrade the enemy sensors[20].

- The development of autonomous unmanned systems of in-flight refueling.

- The boost and increase of the purchase options of the *Long Range Strike Bomber* (LRS-B) program for providing the Air Force with a new invisible strategic bomber to complement the current *B-2 Spirit* fleet.

- The acquisition of attack autonomous systems optimized for beating highly mobile targets in high-risk environments.

- The purchase of stealth drones with a high level of autonomy able to operate at very high altitude in order to carry out observation and reconnaissance tasks in risk environments.

- The development of GSS networks that, formally shared with Washington's allies and partners, reinforce the capacities for self-defense of these countries and allow the United States to maintain advanced bases from where it can launch any war action[21].

Regarded as the response of the strategic questions that affect the United States in the post-war on terror, this strategy will guide the country's defense planning for the next fifteen years. Nevertheless, taking into account that it will be implemented in a relatively restrictive budgetary environment (at least during 2015-20), that some modernization projects cannot be delayed (such as the nuclear arsenal, the anti-missile shield, the satellites or the cybercapabilities) and that both the development of projects and the acquisition of the programs will hardly be covered through the increase of expenditure or the claim of extraordinary funds, the Pentagon will try to combine—as far as possible—the legacy systems inherited from the Cold War or those that have entered into service since 1991 with the development of the new systems which will become the technological mainstay of the future warfare.

"The Third Offset Strategy is the key shaped by the United States for guaranteeing its military supremacy in the decades to come"

[20] Particular attention deserves the so-called *Plan X* (DARPA-BAA-13-02) developed by DARPA for creating a new generation of cyber weapons. For further information, see: http://www.darpa.mil/ Our_Work/I2O/Programs/Plan_X.aspx

[21] In fact, it is suggested that these networks include early warning systems, cyber nodes and a wide range of defenses (ballistic and cruise missiles, antisubmarine weapons, anti-vessel missiles, and anti-aircraft and antimissile defenses). Indeed, it is here where the U.S. Army tried to find its role in the framework of the already dismissed doctrine *Air-Sea Battle*. Today, the Army fights for its own place in the Third Offset Strategy by demanding its value as a means of overcoming the A2/AD measures. Moreover, it participates in the *Joint Operational Access* concept, which will be consolidated as one of the keys of this strategy. For further information, see: Department of Defense (2011): *Joint Operational Access Concept*, Washington DC, U.S. Government Printing Office.

In conclusion, being the Third Offset Strategy based on the technological capabilities of the nation, established for redefining the power-projection paradigm, oriented towards guaranteeing the capacity to enter any point of the globe—even the A2/AD strategies deployed by its adversaries—, and geared towards reinforcing its security relationships with friends and allies while, at the same time, forcing its competitors to initiate an arms race that their military-industrial complexes will be unable to maintain (at least in the short term), it will lead to the maturation of new technologies such as robotics, miniaturization, advanced computation, big data, 3D printing or electronic warfare, the development of new operational concepts, the generation of new military capabilities and the consolidation of new ways of conceiving, planning and waging wars on land, sea, air, space, in cyberspace and in the electromagnetic spectrum. In addition, this initiative may invigorate the debates about a new RMA capable of transforming the art of war while providing the United States with the military supremacy over its competitors until they develop—as occurred with the stealth platforms, drones, smart weapons, C^4ISTAR systems, cruise missiles or cyberforces—the core capabilities of this new military regime or devise tactics—such as the hybrid threats or the A2/AD strategies—aimed at limiting the advantages it provides.

The Third Offset Strategy is the key shaped by the United States for guaranteeing its military supremacy in the decades to come. Its development will guide the country's defense planning and its consolidation may lead to a new RMA. It will be necessary to see how this process of military innovation evolves, which will be the responses of the European allies about bridging the military gap between both sides of the Atlantic, and which will be the responses of Washington's competitors to limit its impact. Nonetheless, the main lines of the future wars have already been drawn, making it necessary to be aware of them.

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