

Technology Intelligence in the Army of the Future¹

Julián Andrés Vargas Cardona²

Given the profound changes that the “information age” has been introduced in the dynamics of international security in the twenty-first century, are increasingly important the words of Martin Van Creveld (1991): “War is completely permeated by technology, and governed by it”. In fact, technological developments transform the paradigms by which human beings think, act and relate, including armed conflict. Therefore, the implementation of scientific advances and technological innovations in the field of security and defense represents an important field of study for Strategic Intelligence, because all these factors forming the basis of what might be regarded as the international competition for power. In this regard, Mohan Malik (2010, p. 21) notes that scientific and technological advances have profoundly influenced the course of international politics, because they are the “key” to promote economic development and national security.

This logic adds more importance in the current historical moment, in which cyber technologies introduce radical changes in everyday life and in the battlefields. Facing this fact, authors like Singer (2009) predict that the future of the war will be robotic, with two factors that will completely revolutionize the nature of war: the first is that human intervention will be from distance, with the ability to control weapons on Land, Sea, Air, Space and Cyberspace, raising philosophical, ethical and psychological dilemmas for the warrior, due to keep him away from the human factor of war. Secondly, the trend toward automation featu-

¹ This editorial stems from the research Project entitled “Technology Intelligence”, which has been carried-out in the context of the Research Group “Center for Research on Asymmetrical Warfare” at the School of Intelligence and Counterintelligence “BG. Ricardo Charry Solano”, Bogotá, Colombia.

² Political scientist, graduate from the National University of Colombia. Masters on National Security and Defence at the War College, Bogotá, Colombia. Editor-in-Chief of the journal *Perspectives on Intelligence* and Researcher at the School of Intelligence and Counterintelligence “BG. Ricardo Charry Solano”..

res involves a possible future in which military robots have the ability to make autonomous decisions in combat, including kill humans.

These technologies, imaginable only in science fiction by the previous generation, are called "game changers", while granting such great power that can significantly alter the balance in the international system to provide strategic capabilities in economic and military fields, transforming dynamics of competition between systemic actors (Brimley, FitzGerald and Saylor, 2013, p.7). In this regard, the Defense Advanced Research Projects Agency [DARPA] has identified the following areas of scientific-technological development in which investment is needed to ensure national security and competitiveness international in the XXI century.

Table 1. Sectors of Scientific-Technological Development for the XXI Century

Complex Military Systems	Expanding the Technological Border
<ul style="list-style-type: none"> ◦ Domain of the electromagnetic spectrum ◦ Improve positioning and navigation without GPS ◦ Air superiority ◦ Maritime mobility ◦ Advanced hypersonic ◦ Capabilities in space 	<ul style="list-style-type: none"> ◦ Apply profound mathematics ◦ New chemistry and new materials ◦ Nanotechnology ◦ Quantum physics
Use of Biology as Technology	Control of Information Explosion
<ul style="list-style-type: none"> ◦ Synthetic Biology ◦ Control of infectious diseases ◦ Neurotechnologies 	<ul style="list-style-type: none"> ◦ Big Data ◦ Reliable information system

Source: Prepared with information from DARPA (2015)

The impact of these disruptive technologies³ in the States and their societies, requires decision makers to acquire consciousness of them, so they can understand how these determine the political, economic and military strategies. In this regard, it is necessary for States and its security forces have institutional tools to track scientific-technological developments in order to anticipate the consequences of its implementation in competitive scenarios and theaters of war. This tool is known as technological intelligence, defined here as the gathering, monitoring, processing, exploration and analysis of technical information on the scientific-technological development with the ability to affect, positively or negatively, the national security and the position of state in the international system, to contribute to the process of making strategic decisions.

³ New Scientific-technological Development, unimaginable a generation before, they have the ability to break and alter the social dynamics, including the same way of understanding and doing science and technology, creating new industries and sectors of competence.

It is necessary to keep in mind that the technology intelligence does not focus exclusively on hardware and software, while technology includes knowledge and organizational performance, developing of new procedures and the potential for technology to be spread and proliferate in sectors different from its origin. From this perspective, Thomas Durand (. 2010, p 25) states that the technology intelligence must include at least the following aspects:

1. Permanent scanning of potentially important technology options for the future, including valuation commensurate with clearly defined parameters, technology mapping and routes of action.
2. Gathering competitive intelligence information in order to continue, and even anticipate, the technological choices of competitors, so that they may assess the volume and the approach of the own investments in research and technological development.
3. Exploiting patent database.
4. Study of technology markets where technologies are transferred between organizations

This function has traditionally been assumed by intelligence agencies, both military and civilian; for example, the Central Intelligence Agency of the United States [CIA] has a Board of Science and Technology, where are formed the Science, Technology and Weapons Analysts, who “look for emerging technologies and potentially disruptive that can impact national security” (CIA,nd, p. 1). For this work they require professionals with high academic standards from different fields of knowledge, from basic sciences, to engineering, to social sciences that provide significant context and that propose public policies. His work has a dual function: strategic and innovation, because they assess the competitive scenario and provide analysis for decision-making, but also are responsible for defining, designing and promoting scientific-technological innovation, especially in the defense sector.

Thus, technology intelligence systems have an important role in this moment by collecting and analyzing strategic and technological information necessary for the decision of the State, that leads to prevent the *strategic-technological surprise*⁴ and impose technological supremacy facing the immediate competitors. Likewise, these systems have the difficult challenge of analyzing the technology of the future, one that does not yet exist but which have the ability to disturb national security, which is an important consideration in techno-

⁴ The *strategic-technological surprise* is defined as the ability to develop and master disruptive technologies with the potential to significantly alter the strategic competition between actors in the international system. This idea is at the origin of the founding mission of DARPA in 1958, after the launch of Sputnik by the Soviet Union in 1957, “the United States would be the initiator and never the victim of strategic surprise” (DARPA, 2015 p. 1).

logical intelligence because development cycles: if the intention is to be competitive tomorrow, there's no use in thinking about today's technology. That is the distinctive character of Intelligence.

Consequently, for some military forces that are in the difficult process of transforming themselves to take on new challenges, threats and missions, one of the central issues has to be the understanding, financing and implementation of systems of scientific research and technology development. In the case of the National Army of Colombia, the first step of technological intelligence should be directed towards building an institutional culture that sees science and technology as an indispensable component for the fulfillment of the institutional mission, which would facilitate the second step aimed at increasing investment in scientific research and technological development. At this point it is recommend investing mainly in human capital formation in basic sciences and engineering, so that the whole system of science and technology would be operational and efficient, including technology intelligence; similarly, investment in research centers, laboratories, machinery and equipment is another unavoidable necessity.

Finally, regarding to developing pathways, the Army has two different but complementary objectives: first, their valuable experience in asymmetric warfare must be transformed into this military field own technologies, in which there is a broad international demand; on the other hand, if the state intends to compete for regional leadership, the Military Forces of Colombia should be prepared to assume technological leadership, not with respect to arms bought on the international market but with respect to the ability of own development of material for the defense.

Facing this scenario, the colombian Army of the Future has the need to strengthen its technology intelligence to provide the direction required in the system of science and technology, so that the Armed Forces have the ability to avoid "Strategic-Technological Surprises" of its direct competitors and at the same time, grant competitive advantages for the State to defend its interests and assume positions of leadership in the region. In this objective, the Blue Badge and the School of Intelligence and Counterintelligence "BG. Ricardo Charry Solano" play a fundamental role.

References

1. Brimley, S. Fitzgerald, B. and Saylor, K. (2013). Game changers: disruptive technology and US defense strategy. Disruptive CNAS Defense Papers. Recovered from http://www.cnas.org/files/documents/publications/CNAS_Gamechangers_BrimleyFitzGeraldSaylor_o.pdf
2. Central Intelligence Agency. (Sf). Science, technology and weapons Analysts. Recovered from <https://www.cia.gov/careers/games-information/view-our-advertising/pdf/STW%20Insert.pdf>

3. DARPA.(2015). Breakthrough technologies for national security.Arlington: DARPA. Recovered from <http://www.darpa.mil/attachments/DARPA%202015%20FINAL.pdf>
4. Durand, T. (2010). Technology intelligence. In: VK Narayanan, and C. O 'Connor, C. (2010), Encyclopedia of Technology and Innovation Management.Wiltshire: Wiley Publications.
5. Malik, M. (2012). Technopolitics: how technology shapes relations Among Nations.In: V. Bacay (2012), The interface of science, technology and security: MOST areas of concern, now and ahead. Honolulu: Asia-Pacific Center for Security Studies. Recovered from http://apcss.org/wp-content/uploads/2013/02/S_T_PUBLICATION.pdf
6. Singer, P. (2009). Wired for war?Robots and military doctrine. Joint Force Quarterly, 52 (1). Recovered from <http://ndupress.ndu.edu/portals/68/Documents/jfq/jfq-52.pdf>
7. Van Creveld, M. (1991). Technology and war: from 2000 BC to the present. New York: Free Press.