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# Autonomous Systems and Chinese Strategic Thinking

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**Abstract.** Since the 1980s, it has been possible to identify changes in the military-strategic dimension, which are associated with the concept of the Revolution in Military Affairs (RMA). The development of new (weapon) technologies (e.g. precision-guided munitions, unmanned aerial vehicles) represents opportunity (and challenges) especially for states to enhance their military power and change their status in the system of international relations. Nowadays, the U.S. still represent the main actor of this system, however, we can identify several rivals on the global or regional levels. People's Republic of China (PRC) is one of these challengers. From this point of view, the development of autonomous systems (AxS) could strengthen the Chinese military capabilities and enhance the threat for the position of the U.S. and their allies (NATO). However, this presumption depends on the transformation of the Chinese strategic thinking that could address such opportunity. The aim of this paper is to analyse how the Chinese strategic thinking reflects the development of AxS and identify the changes which are connected with this issue. This paper will provide the necessary understanding of the PRC's approach to the AxS, which, from this point of view, represents implications for military planning and strategy development not only of the U.S., but also NATO and its member states.

**Keywords.** Autonomous Systems, Chinese Strategic Thinking, Military Planning, Modern Military Technologies, Strategy Development

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## 1 Introduction

Nowadays, the armed forces of more than sixty countries of the world are using remotely controlled Unmanned Systems (UxS) for reconnaissance, survey or monitoring purposes. The number of states which employ armed UxS is also gradually growing. It can be assumed that this general trend, i.e., the growing number of states which operate UxS of various categories, will only intensify in all "traditional" military domains (land, naval, air). Compared to remotely controlled systems, the Autonomous Systems (AxS) require no or only minimal involvement of the human operator [1]. Individual systems should be able not only to obtain information about the environment but also

to process (evaluate) this information and take appropriate decisions on their own. The motivation to establish those systems is directly based on their increased effectiveness in combat. Similar to remotely controlled systems, the idea of minimising the human losses on the part of the operator's own armed forces plays the key role [2]. Moreover, AxS enable to reduce (or completely remove) the cognitive charge of their operators.

The development of AxS is strongly connected with the changes in the military-strategic dimension, which are associated with the concept of the Revolution in Military Affairs (RMA) [3]. Since the 1980s, People's Republic of China (PRC) has been one of the states which started to implement the premises of the RMA into its strategic thinking. From this point of view, the development of autonomous systems (AxS) could strengthen the Chinese military capabilities and enhance the threat for the position of the U.S. and their allies (NATO).

The aim of this paper is to analyse how the Chinese strategic thinking reflects the development of AxS and identify the changes which are connected with this issue. This paper will provide the necessary understanding of the PRC's approach to the AxS, which, from this point of view, represents implications for military planning and strategy development not only of the U.S., but also NATO and its member states. This paper is a qualitative case study of the Chinese strategic thinking and its relation to the AxS.

## **2 Revolution in Military Affairs**

For the purpose of this paper, RMA is defined as the process and condition of revolutionary changes in the nature or method of warfare based on the external manifestations (actions) which employ the threat of force or the use of force to achieve political aims [4]. The "revolutionary" then refers to the radical nature of these changes, which, in relation to the original system and its elements, must occur abruptly de facto preserving just a minimum similarity (e.g. in features by which the system is identified). We cannot, therefore, speak of a progressive (gradual) transition and the establishment of new elements into the existing framework and its evolutionary transition. With regard to the military dimension of this revolution, we can use the modified characteristics defined by Jeffrey R. Cooper, who speaks about: "... discontinuous increase in military capability and effectiveness" [5].

However, this paper does not focus on the RMA in the context of the Chinese strategic thinking in the aforementioned "general" form, but rather on its expression through specific processes or changes. This is marked by the period of about the 1980s, still continuing today. Relevant changes in the method of warfare are founded on a technological level with the introduction and use of advanced weapons and information systems (e.g. precision-guided munitions - PGM, unmanned aircraft, and remote sensing devices/sensors).

Changes in the doctrinal dimension are represented by the establishment of the concepts of so-called System of Systems (SoS) and Network Centric Warfare (NCW). The former is based on two fundamental elements - information and integration (cooperation). The prerequisite is an amalgamation of particular systems and components, such

as command, control, computers, communications and information (C4I), into one coherent functional framework [6]. Essentially, the aim is to provide situational awareness on the battlefield in real time for all relevant components of the armed forces.

The second concept is associated with the very existence and use of functional links among the units on the battlefield, which are integrated into the aforementioned framework. Their interdependence allows to maximize their combat skills and, on the other hand, to compensate for weaknesses (e.g., through an almost perfect fire support, information about the intentions of the enemy). Full use of this potential is connected, e.g., to the implementation of the so-called “swarming” tactic, which in itself implies synchronized and highly flexible combat deployment of a large number of small clusters (military units) [7].

In practical terms, the army, which fully applies both concepts, is allowed to interfere (invade) the opponent accurately at his most vulnerable areas, to prevent his possible attempts to initiate counterattacks or enact countermeasures and therefore completely take over the combat initiative and paralyze the opponent.

### **3 Chinese Strategic Thinking**

#### **3.1 Strategic Culture**

The overall form of the Chinese strategic thinking is inherently influenced by the interactions between two basic subtypes of the strategic culture. These subtypes are defined by sets of Chinese values, beliefs, norms, etc. With regard to a time scale, their importance (for example, for the formulation of the Chinese international politics) in history (and also in present) was changing, i.e., in some cases one of the motives prevailed, but always both subtypes were/are shaping the Chinese strategic thinking [8]. At the same time, the above-mentioned link points to the continuity of the Chinese strategic culture. Undoubtedly, for example, the “victory” of the communist regime influenced its character, but only in the context of strengthening or weakening the importance of one of the subtypes or adding new elements (e.g., deepening the ideological dimension). By no means all these changes have led to the emergence of a completely new strategic culture.

According to the terminology of Alastair I. Johnston, the first subtype can be described by the term *Parabellistic Strategic Culture* – from the realpolitical axiom “Si vis pacem, parbellum” [9]. In general, it is an offensive (aggressive) approach to, e.g., the creation of a “grand strategy” of the state, which is supported by the Clausewitz’s thesis about war and the use of force (“War is a continuation of politics by other means.”); in the case of China, regardless of weaker material capabilities [10]. The second subtype is referred to as the *Conflict Strategic Culture* [11]. The general basis of this direction is the Confucian philosophy. In response to security threats and other incentives, diplomatic and non-military means are preferred. In this respect, the use of force is seen as an additional element, which is used mainly in defensive intentions [12]. The current concept of the “scientific development” (in the perspective of the RMA), which has been accentuated in Chinese politics and strategic thinking basically

since the beginning of the new century (see chapter 3.2), expresses the values described above [13].

### 3.2 Strategic Thinking

The development of the Chinese strategic thinking into the current character was initiated after the Sino-Vietnamese war in 1979. In principle, China failed to fulfil almost any of its objectives (such as the land gains or the withdrawal of Vietnamese troops from Cambodia). Chinese ground forces struggled in the conflict with low efficiency of their direct and indirect fire, logistical obstacles, or failure of communication [14]. The original strategy of *People's War*, which was set by Mao Zedong in 1935, was replaced by *People's War under Modern Conditions*. This strategy, compared to the pre-existing Mao's one, puts less emphasis on the quantitative superiority of the armed forces and rather focuses on the existence and use of a professional army (a combination of various types of weapon systems, especially ground forces). At the same time, it has changed the character of the supposed defence of the territory, which no longer has to lure the adversary deep in the territory of China, but instead to stop him at the external borders. From the point of view of the theoretical definition of RMA, the deviation from the belief of the necessity of nuclear conflict (the use of nuclear weapons) to the gradual emphasis of modern conventional technologies is also significant [15].

Further changes were being implemented after 1985 with the new strategy - *Limited War under Modern Conditions*. The basic premise consisted of the belief that the likelihood of a massive foreign invasion with the aim of a total defeat of China was greatly reduced. This assumption was further strengthened with the end of the Cold War and the collapse of the USSR. On the contrary, the likelihood of a limited armed conflict has increased, due to the escalation of the dispute over a particular maritime or terrestrial geographic area (South China Sea). This characteristic corresponds to the relative shortness of the alleged conflict and the remoteness of the territory from the central regions of the PRC, but at the same time located near the external borders [16]. As a result, increasing demands (and consequently emphasis) on mobility and the rapid deployment of relevant military units have been made. Compared to the previous strategy, there is a noticeable shift from the defensive concept, to the pre-emptive strike against the opponent in the context of "active defence". Similarly, the role of purely professional (elite) Rapid Response Forces and up-to-date weapon and support systems are emphasized. In this sense, the ground component of the armed forces is no longer preferred, but the importance of joint operations is still not accentuated [17].

Between 1993 and 1996, this strategy was replaced by *Limited War under Hi-Tech Conditions*. Similar to the previous strategy, the area of the supposed deployment of the Chinese armed forces was limited to several provinces covering all dimensions of military operations (land, naval, airborne, space, information/cyberspace operations) under the generic "War Zone Campaign" [18]. However, compared with previous assumptions, these campaigns should not be conducted only in the immediate vicinity of the Chinese frontiers (border disputes), but in accordance with power aspirations within the global environment (international system) [19]. The operational doctrine was newly

oriented to joint operations of all branches of the armed forces, reflecting the above-specified environment of their deployment. Emphasis was put on fast deployability, high mobility, and the ability to reach (temporary) local superiority as needed to meet the assigned tasks. In relation to ground forces, the need for overall mechanization is emphasized in this sense, which results in the achievement of the established capabilities. For the naval and air forces (later also for space and information) there are key capabilities to deny the enemy the ability to deploy his armed forces effectively or to project his military power on a given battlefield (anti-access/area denial - A2/AD) [20].

In terms of institutionalization, the People's Liberation Army (PLA) started reforms, which outlined the new basic (general) assumptions/characteristics through the establishment of the ideas and tools of the RMA. In the first place, there had to be an organizational link among the capabilities of active and forward defence, which involved the incorporation of the possibility of projection of Chinese military power outside the Chinese territory. In this sense, from the point of view of the Chinese strategic planning, there is a radical expansion of the strategic depth of both, the conflict zone and the relevant (security/military) interests, which are no longer limited by the factual boundaries of the state [21].

Second, in Chinese terms, the identified RMA elements maximize the offensive direction of the armed forces. In an environment where the opponents have the ability to destroy their targets precisely in conjunction with a digitized battlefield, from this point of view, the party that takes the initiative (retains it) and strikes before the counterparty, gains the edge. This element is even more emphasized on the condition that Chinese armed forces do not contain such qualitative levels (in the terms of weapon and support systems) as the adversary. In general, during the 1990s, PLA shaped itself in such a way, which was to be balanced by proactive and pre-emptive actions [22].

Third, the Chinese strategic planning and the organization of the armed forces had to be able to adapt and absorb new technological innovations and respond to a changing international environment. In the same sense, the PRC tried to focus on a possible conflict with the major powers of the international system, but at the same time to dispose of forces and resources flexibly deployable in smaller and (more time-intensive) clashes. Also, the approach of the Chinese institutions seems to be rather attempting to prepare/transform the military power with a long-term view to ensure the competitiveness or ideally superiority in the future rather than to focus on the current gain of a short-term benefit [23].

Other reforms were started between 2002 and 2004 with the strategy *Local War under Informationized Conditions*. A fundamental change is the direct anchoring of not only the need for mechanized units but also the digitization. The transformation of the armed forces itself took place under the simultaneous digitization and mechanization processes, with further emphasis on information warfare. The aim was to ensure that the Chinese transformation of the armed forces proceeds in line with contemporary trends of similar activities of other world powers (Russian Federation, the United States of America) [24]. In the context of military operations, a new concept of "integrated joint operations" was applied. These operations differ primarily from the original "joint operations" by another type of actor who is in conflict. Previously, there were relatively

separate branches (elements) of the armed forces that had their own information systems, and the joint operation was based on the creation of ad hoc connections. In contrast, under integrated operations, the main player is the system that incorporates all components of the armed forces and the necessary operational elements (C4ISR, destruction capabilities and logistics). At the same time, in these operations, the boundaries between the various components of the armed forces may be blurred due to close mutual co-operation and combat deployment. Coordination is ensured through relevant information systems immediately following developments on the battlefield. Integration itself is defined as a permanent structure that fulfils the conditions of a fast and flexible response [25].

In the follow-up strategic documents (from 2006, 2009, 2011, and 2013), this orientation is not only confirmed, but also gradually intensified in the context of importance for the fulfilment of Chinese national interests, defence, or improvement of the power position in the international system and the successful conduct of military operations (also in the space domain). The latest military strategy of 2015 then contains the essential provisions that shift the orientation to information warfare to a new “level”. Under the auspices of the current leader of the People’s Republic of China - Xi Jinping, the original strategy has been modified into *Winning Informationized Local Wars*. The title itself refers to the future ambitions of the PRC and their linkages to information warfare. In this context, it is also interesting to emphasize the development of maritime and air forces and their role in the effective implementation of integrated joint operations. Last but not least, there is the premise of the transformation of strategic/missile forces, which emphasizes the combination of both conventional and nuclear components and their use in precision strikes against the opponent [26].

#### **4 The Role of AxS in the Chinese Strategic Thinking**

The general direction of the transformation of the Chinese armed forces stems from the concept of information warfare, which both represents the “target” domain of new combat capabilities (e.g., cyberspace) and serves as a necessary basis for establishing other (modern) weapon and support systems that use elements associated with this kind of warfare. In this sense, PLA distinguishes six sub-sets/sets of capabilities and relevant (information) technologies, which include: 1) operational safety; 2) deception; 3) psychological operations; 4) electronic warfare; (5) operations in cyberspace (cyberwar); 6) physical destruction (enemy information systems - e.g., via electromagnetic pulse). All of these capabilities represent strong connection among “traditional” (land, naval, air) and “new” (space, cyberspace) operational domains.

In this context, autonomous systems are perceived as an opportunity to strengthen PLA’s power and also create new possibilities in terms of its projection and operability. From the PLA point of view, in the armed conflict, the potential use of AxS capabilities is envisaged in the combination with the aim of achieving the greatest possible success in achieving the stated goals. From a practical point of view, of course, it will always depend on variables such as the nature of the tasks the armed forces have to conduct, the conditions and environments in which they operate, the character of the adversary,

and which specific capabilities will be used [27]. AxS should also ensure general requirement for flexibility of the armed forces and directly fulfil the established strategic framework (see Chapter 3). Focal point of this assumption is based not only on capability to analyse and process vast amount of information and almost-real-time decision-making. Important advantage is also compensation or removal of the human “weaknesses” (e.g. demands for rest and meals, variable reaction time, or other physical and psychical issues). At the same time, an increased emphasis on the management of operations directly related to cyberspace is interlinked not only with effective usage of own (Chinese) unmanned and/or autonomous systems (active and passive defence), but also with the capabilities to suppress/counter similar assets on the side of adversary.

In addition to this role, the second approach known as *Elements of Excellence* or *Assassin's Mace* (Shashoujian) was established during the 1990s. The naming refers to an old Chinese legend of a hero who managed to overcome a much stronger (more powerful) opponent thanks to such a weapon. Similarly, the technologies and weapon systems developed under this heading would have the ability to generate future overwhelming dominance over the adversary (also in terms of deterrence) and in the possible armed conflict (for example, the Taiwan Strait or the South China Sea) to ensure his defeat [28]. In general, there is an attempt by the PRC to conceal these projects as much as possible. In this respect, the exploitation of the AxS is also associated with a surprise element to increase their effectiveness. At the same time, their use is directed against the adversary's weaknesses, which should help achieve a quick and convincing victory. Generally, this assumption implies the basic elements of “asymmetric strategies” that focus on building and developing such assets that directly target/utilize the weakest characteristics of the adversary. In this context, the development of the AxS based on both - already known and/or exotic technologies, which are currently in the conceptual stage [29], can be identified as the analogy to the imaginary search of the “silver bullet”.

A significant impetus for the development of the AxS came in 1997 from the already mentioned establishment of the principles of the *Limited War under Hi-Tech Conditions* strategy. A new research and development program was launched under the code name Program 973 (National Program of Basic Research). The program also includes other multidisciplinary projects and links the AxS, e.g., with information technologies, nanotechnologies, or biotechnologies [30]. Simultaneously, the role of the AxS was/is also highlighted by the prevailing *School of Revolution in Military Affairs* in the Chinese strategic thinking, which reflects the premises of the RMA mentioned in Chapter 2. AxS (interconnected with other modern weapon systems) should enable military strikes over a long distance, which is directly related to the introduction of advanced guidance systems and precision guided munition. At the tactical level it is reflected, e.g., in the concentrated fire of dispersed units [31]. Secondly, the AxS should support the creation of small (mobile) combat formations without reducing their combat capabilities. This premise is connected to integrated C4ISR systems and thus conveying information as a key element not only for ensuring the functioning of these systems but also in denying these benefits to the adversary [32]. Thirdly, the AxS should help establish an interconnection between information superiority and operation effectiveness [33].



Further integration of the AxS into the PLA should be established through two new branches of the armed forces. These are the Strategic Support Forces, which were created at the end of 2015, and the Joint Logistic Support Forces, which were created in September 2016. Within the scope of the Strategic Support Force, there are, in particular, the cyber-space/space-related operations, and also, in the needs of the rest of the armed forces, tasks related to information warfare and managing and using Chinese (military) capabilities (for example, the AxS). The Joint Logistic Support Forces are directly subordinated to the Central Military Commissions. Their purpose is to provide comprehensive logistical support for the full range of integrated joint operations, for example, also with regard to the projection of the AxS (with a planned global reach) [34].

## 5 Conclusion

The general character of the Chinese strategic thinking is based on the Chinese strategic culture. In this context we can distinguish between two sub-types - *Parabellistic Strategic Culture* and *Conflict Strategic Culture*. Interactions of these sub-types create the framework for certain elements of the strategic thinking and its development. Such a process can be identified since the 1970s with the transformation of the Chinese strategies. The progress from *People's War*, through *People's War under Modern Conditions*, *Limited War under Modern Conditions*, *Limited War under Hi-Tech Conditions*, *Local War under Informationized Conditions*, to the up-to-date *Winning Informationized Local Wars* incorporates the thesis and the premises of the (current) Revolution in Military Affairs [35].

In this context, AxS represent key elements and tools in this process. AxS are perceived as the component linked to the information domain and information warfare. They provide the opportunity to strengthen the PLA's power in terms of its projection and operability. From the PLA's point of view, in the armed conflict, the potential use of AxS capabilities is envisaged in combination with the aim of achieving (if possible) the greatest possible success in meeting the stated goals. AxS should also ensure the general requirements for the flexibility of the armed forces and directly fulfil the established strategic framework. Moreover, AxS should provide the ability to generate future overwhelming dominance over the adversary in terms of "asymmetric strategies" that focus on building and developing such assets that directly target/utilize the weakest characteristics of the adversary. On the other hand, their role is not perceived as the sole one. Only in connection with other "hi-tech" systems and technologies (PGMs, space capabilities, etc.) they should create the desired synergic effect and ensure the strengthening of the PRC's military power.

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[35] Analysis and prediction of (probable) future development of this issue could be based, for example, on *Alternative Futures Methodological Framework* - see Jakub FUCIK, Jaroslav KOLKUS, Josef MELICHAR and Josef PROCHAZKA. *Military technology evolution assessment under growing uncertainty and complexity: Methodological framework for alternative futures*. ICMT 2017 - The 6th International Conference on Military Technologies, Brno, pp. 682-689; see also Libor FRANK. Creation of Scenarios and Other Methods as a Tool for Predicting the Future Security and Operating Environment. *The 17th International Conference. The Knowledge-Based Organization: Conference Proceedings 1 - Management and Military Sciences*, 2011, pp. 418-422.