BULLETIN
OF "CAROL I" NATIONAL DEFENCE UNIVERSITY

https://buletinul.unap.ro/index.php/en/

The need for an integrated model of smart warfare

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Abstract

Unfortunately, the war in Ukraine and many other events or processes taking place all over the world show us that perhaps there can be no smart peace unless we are ready to fight a smart war. Both against conventional or unconventional enemies, both regarding symmetrical or asymmetrical warfare. And if we are beginning to see our society in terms of smart governance, smart education, smart economy or smart people, which means we see it in terms of smart peace and smart society, then there is definitely the need to see war and conflict in an integrated, compact vision of smart war. We use observation to point out how a large series of contemporary events and processes, starting from cybersecurity issues, aerial, terrestrial, or maritime drones, electronic warfare equipment meant to counter these drones, propaganda, and disinformation easily spread through rapid smart means of worldwide mass communication, and of course, Artificial Intelligence, microprocessors, or fledgling space warfare where satellites can be used to attack rival satellites, need to be addressed in an inclusive, integrated conceptual approach of smart warfare focused on the future and not as separate events or developments patched up upon conventional warfare equipment or thinking. We need to understand that "smartness" is all about peace, but all about war as well, if we want a smart peace to last or if we want to be able to defend it, as Romania has a definitely defensive strategy. We are building a smart peace, but we have to prepare for a smart war as well.

Keywords:
smart war; threats; society; cyber; AI.

Article info
Received: 30 January 2024; Revised: 19 February 2024; Accepted: 14 March 2024; Available online: 5 April 2024

Citation: Blănaru, M. 2023. "The need for an integrated model of smart warfare".
Bulletin of "Carol I" National Defence University, 13(1): 44-62. https://doi.org/10.53477/2284-9378-24-03

Introduction

Obviously, as civilians, war is something we would rather not think about. We would rather think about smart living, smart peace, about a smart society, or smart education for our children, than anything else but war. Modern ideologies and recent history, where war has mostly avoided Western societies for well over half a century, play an important part in this public perception as well. But, as we see in Ukraine or Israel, this way of thinking does not mean that war is not here. On the contrary, war is here to stay, but maybe in the new shape of *smart war*. So how is a *smart war* waged or what is it?

Well, the way our society is changing and the war in Ukraine are giving us many hints in that direction. Smart governance, smart leadership, smart living, smart education, and so on, all of them address societal concerns and they mean an integrative approach to such concerns, with a significant impact of the new technologies. But if a societal future is depicted in such a way, then why should war be any different in the future and why should we not adapt rather sooner than later to the *smart war*? We are not saying that modern warfare is not incorporating or even generating the most up-to-date technologies, war has always done so throughout history, but what we are saying is that our way of thinking about war has not kept in touch with these new realities. Our way of thinking can be a vulnerability in front of new threats or hostile actors. And that needs to change. Thus, we definitely need the concept of a *"smart war"*.

1. Prior work on the topic of Smart Warfare

At the time we are writing this paper (October, 2023), we could not find a concept of *smart war* named as such in modern scientific literature, in the way we mean to address it - which is similar to a *smart education*, *smart governance* or *society*, which means that *taking advantage of all technological innovations in an inclusive, integrated strategical perspective is a must*. There is, however, a similar concept of "intelligent warfare" developed in particular by Chinese researchers.

Regarding the "smart war" concept, most of the accounts available to the public online refer to the "smart war" as being equivalent to an "intelligent war," waged in an intelligent manner regarding mental capability, or they are referring to the gaming industry. Other accounts refer to the so-called "smart war" policy of the US administration at various moments between 2002 and 2015 or so, which ultimately also meant "intelligent" from the mental capability point of view. In US policies and strategies, there was something called "the smart war" as opposed to a "dumb war", a difference first outlined by Obama in a 2002 speech (Thrush 2011). But again, it only meant a sort of warfare conducted intelligently. Which also reportedly failed in Afghanistan. In 2002, US Defence Secretary Donald Rumsfeld also devised a "smart war" strategy meant for the invasion of Iraq and the overthrowing of Saddam

Hussein. However, despite the use of "smart bombs", the "smart war" devised by Rumsfeld's strategy only meant a sort of war waged intelligently too.

There is another very interesting mention of "smart war" in an analysis, even though again it uses "smart" as meaning an intelligent mental capacity. The article *"Soft War = Smart War? Think Again"* criticizes overly confident reliance on *soft power* in order to pursue security goals, probably referring as well to the new concepts of "smart power": *"In light of this, tying our long-term security to the notion that we can out-manipulate and out-spin others in the realm of cross-cultural persuasion, and thus wage some sort of soft, smart war seems especially imprudent."* (Simons 2012) We agree with this conclusion. Soft war is extremely important, but only employed in conjunction with hard power. Technologically advanced soft war abilities and technologically advanced military capabilities make up part of the concept of smart war we mean to describe. It will be clearer when we point out the features we would ascribe to a smart war, below. However, there should be no confusion between the concept of "smart power" and what we are trying to analyze as "smart war". The war in Ukraine has proven the importance of employing *smart power* (Danylenko et al. 2022), but ultimately, *smart power* is simply a combination of *hard power* and *soft power* (Dargiel 2009). But *smart war* should mean much more than that, and in different ways. *Smart war* foremost means thinking outside of the box, a revolution in traditional military thinking. For example, all the technologies to build and use maritime drones were here already. But nobody had thought about using them to the extent Ukraine is now using them, inflicting huge damage to the Russian Navy. And this is only the beginning. Soon, huge ships and airplane carriers may start losing their dominant role in the seas.

Back in 2011, then Secretary General of NATO Anders Fogh Rasmussen spoke of a concept of a "smart defence" strategy that would have meant *"the idea of creating more European capabilities with less money"* (Eugénio 2013) and lessening the financial and operational burden on the US regarding NATO. So, it too regarded "smart" as a mental capacity. NATO does not seem to operate with the concepts of "smart war" or "intelligent war", but in 2021 it adopted its first AI strategy, acknowledging that: *"Artificial Intelligence (AI) is changing the global defence and security environment. It offers an unprecedented opportunity to strengthen our technological edge but will also escalate the speed of the threats we face. This foundational technology will likely affect the full spectrum of activities undertaken by the Alliance in support of its three core tasks: collective defence, crisis management, and cooperative security."* (NATO 2021) Acknowledging the speed of new threats and the fact that new technologies (not just AI, in our opinion) will fully affect all the Alliance´s activities, are one of our main arguments in this analysis as well.

However, the "smart war" concept used in a slightly similar manner to the one we mean to address is being felt at ground level. A mention of *smart war* in a slightly similar way to what we mean to analyse here (even though they employ it more

concerning smart *equals* the intelligent ability of thinking), did not come from academics, but from ground level, from a rather unexpected provenance – the Wagner mercenaries in Ukraine who complained in 2022 that Ukraine was waging a *smart war* against them, while they were still stuck in a conventional military mindset (Comisarul 2022).

Even very recent trademark volumes, that deal with *"An international and interdisciplinary perspective on the adoption and governance of artificial intelligence (AI) and machine learning (ML) in defence and military innovation by major and middle powers."* (Raska and Bitzinger 2023, iii) do not devise an integrated approach and definition of the "smart war" in the way we mean to. For example, in what is perhaps the most recent such volume, *The AI Wave In Defence Innovation. Assessing Military Artificial Intelligence Strategies, Capabilities, and Trajectories*, edited by Michael Raska and Richard A. Bitzinger and from which we cited above, published at Routledge in 2023, we could not find the concept of "smart war" named as such. But, to its defence, that was neither the purpose of the volume in the first place. It deals with a very important aspect of "smart war", even essential, which is AI and machine learning (ML), but it did not devise the greater picture comprising of all features and integrated approaches to a smart war that we will briefly point out below.

Things, however, as the aforementioned volume proves, differ to a certain degree when it comes down to China and The People's Liberation Army (PLA) who have been using for quite some time the concept of "intelligent warfare". For example, there is a thorough 2021 analysis written by the US *Center for Naval Analyses (CNA),* named *The PLA and Intelligent Warfare: A Preliminary Analysis*, which tries to investigate the Chinese meaning and strategy of "intelligent warfare", and the results are somehow intriguing and surprising. It rightfully states that *"The widespread adoption of artificial intelligence (AI) and autonomous weapon systems portends a new revolution in military affairs."* (Pollpeter and Kerrigan 2021, i), which is a very important part of what we are saying in this paper, and it also says that *"The People's Liberation Army (PLA) is now conceptualizing a future battlefield environment dominated by AI and autonomy, which it calls "intelligent warfare."* (Pollpeter and Kerrigan 2021, i), which is a warning for the future, from a geopolitical and strategical perspective.

There was a very interesting remark in a 2021 analysis, stating that Chinese analysts made *"Assessments that AI and autonomy will enable weaker militaries to defeat stronger militaries suggest that writers may view AI and autonomy as new technologies that could play a significant role in defeating the US military."* (Pollpeter and Kerrigan 2021, iv) We are not quite there yet regarding AI and autonomous systems, but we can see how the almost non-existent Ukrainian Navy managed to defeat the powerful Russian Black Sea Fleet by using just a few smart war devices, that is naval drones.

As regards the features of this "intelligent warfare" described by the Chinese and PLA, the CNA analysis points out that *"Most PRC writers do not explicitly define*

intelligent warfare, but describe it as follows: • A new and advanced stage of warfare based on AI and autonomy; • A combination of human and machine intelligence; • The extensive use of AI in all military applications." (Pollpeter and Kerrigan 2021, i) Also, Chinese analysts have rightfully emphasized the importance of data, algorithms, and computing power to what they call "intelligent warfare" (Pollpeter and Kerrigan 2021, i). As regarding who will be in control of these "intelligent warfare" capabilities, most Chinese analysts predicted that, at least at a strategic level, humans will be in control, and overall there will be a hybrid control system made up of humans and machines. A minority predict that in time machines will completely replace humans in that respect too.

From an official point of view, the 2019 White Paper on China's National Defense in the New Era describes briefly what they mean by " intelligent warfare": *"There is a prevailing trend to develop long-range precision, intelligent, stealthy or unmanned weaponry and equipment. War is evolving in form towards informationized warfare, and intelligent warfare is on the horizon.*" (State Council of The People's Republic of China 2019).

One of the key recent works regarding "intelligent warfare" in the Chinese understanding of the concept is *"Intelligent Warfare. Prospects of Military Development in the Age of AI"* by Mingxi Wu, a Chinese researcher, who argues that: *"Intelligent warfare may take on diversified forms, most notably cognitive confrontations with AI at their core and integrated operations utilizing "intelligence+" and "+intelligence." (...) Intelligent technologies such as AI, big data, cloud computing, interdisciplinary biology, unmanned systems, and parallel training are advancing at a breakneck pace and becoming increasingly integrated with established technologies, altering humans' epistemology, methodology, and operational mechanisms and enhancing humans' ability to transform the world. Following mechanization and informatization, intelligentization will be the third stage of human civilization.*" (Wu 2023, xv) We thoroughly agree with all of the above that the Chinese researcher has said, but again, that is in the relatively distant future. However, things will never be the same again regarding warfare and we would better accept that rather sooner than later. He goes on by saying that *"Whoever controls the advantage of intelligence will have the initiative in future warfare.*" (Wu 2023, xvi) This seems to be the Chinese main focus regarding possible future confrontation with the US.

2. Features and meaning of Smart War

The *smart war*, of course, is a concept in the process of being drafted and there can be many more dimensions added to it (some of which may have not been innovated yet), but we want to point out in the following paragraphs some of its main *sine qua non* features. The objective of this analysis is not to thoroughly investigate the following features or components of what we describe as *smart war*, but merely to

enumerate some of the most important of them. As we have just mentioned, the list is not closed, but, just like the smart war, it is continuously evolving and open to innovation and new features.

2.1. Drones (unmanned vehicles). One of the main features of any smart war, in current understanding, would mean relying heavily on large numbers of relatively cheap modern drones (Trofimov 2023). Whether human-operated or by AI, autonomous systems. The war in Ukraine, just as well as the Hamas terrorist attack against Israel, underlines this statement. Just as Oleksii Reznikov, former Defence Minister of Ukraine, said about the Russians: *"We have no serious fleet or naval capability. But we can hit them with drones"* (Harding 2023). And then there is the cost of their maritime drones, ranging from 10 to 100 thousand US dollars, compared to the cost of Russian Fleet vessels, which cost hundreds of millions of US dollars (Harding 2023). We conclude that smart war does pay.

This dimension is currently changing, developing very fast, and investing in home development and manufacture of cheap drones would be the best choice. We remember that at the start of the war in Ukraine, the Turkish Bayraktar drones were making headlines all over the world. Now, we can hardly ever hear of them. This means that Russia has been employing effective counter measures. From the perspective of a smart war, perhaps one could argue that just as things changed, the Romanian Army will receive outdated relatively expensive Bayraktar drones worth hundreds of millions of US dollars, instead of having started developing their own capacities worth all that money for the future. Choosing where and how much to invest is definitely an attribute of any good strategy of *smart war*.

2.2. Communication and public diplomacy. Another essential dimension of any current smart war would be a very active and good communication and diplomatic campaign, which are *soft power capabilities*. Considering the current state of globalization, the importance of public opinion, narratives and justification, especially for Western societies, cannot be underestimated. We can see how for Israel it is increasingly difficult to wage confrontation, manage narratives and justify war in this domain of communication and public perception, even for the home public, although Israel did not start the war with Hamas.
Communication has always been essential to winning a war. But there is communication inside the military chain of command, extremely important, essential, and communication towards the civilian society, both at home and abroad, that is the narratives employed and public diplomacy.

A very comprehensive analysis of the importance of current public diplomacy in the war in Ukraine is the paper *Public Diplomacy during Military International Conflicts. The Ukraine war case*, which argues that *"public diplomacy itself transformed"* and *"the battle between the Ukrainian and Russian military for image and legitimacy in the international public opinion" is increasingly important*", because *"In the information*

age in which we live, the activities and capabilities of public diplomacy can have a significant impact on how people, organizations, and governments perceive this war." (Hlihor 2023, 19)

2.3. Soft power. It is an essential part of any present confrontation and it will be as such for a while to come. Joseph Nye Jr. first developed the concept in 1990, and in his iconic volume of 2004, he said: *"Soft power rests on some shared values. That is why exchanges are often more effective than mere broadcasting. By definition, soft power means getting others to want the same outcomes you want, and that requires understanding how they are hearing your messages, and fine-tuning it accordingly. It is crucial to understand the target audience."* (Nye 2004, 111) It seems to us that we now need more than ever to understand *"the others"*, whomever they may be. Thus, *soft power* also means employment of culture, mutual understanding and respect for other cultures, economy, moral values, reliability, trust, and other aspects. Chinese analysts tend to minimize the importance of *soft power* when they talk about the "intelligent war", while sometimes Western researchers and practitioners tend to overestimate and over-rely on *soft power*. Or, just like it happened in Afghanistan, they may implement it in a faulty manner (for example, they relied on corrupt local elements that eventually estranged the local population despite huge American *soft power* and financial investments).

2.4. Information Warfare. We briefly mentioned earlier the importance of communication and public diplomacy, which brings us to the importance of information warfare in this age of smart technological development: *"Information Warfare (IW), the complex set of new phenomena associated with the use of Information and Communications Technologies (ICTs) in fighting scenarios. IW is redefining how war is waged. (...) Nowadays, IW indicates a heterogeneous phenomenon concerning the deployment of robotic weapons, cyber weapons, and the use of ICTs to foster coordination among militaries on the battlefield and for propaganda, the so-called C4ISR (integrated command, control, communications, computers, intelligence, surveillance, and reconnaissance)."* (Taddeo and Floridi 2014, v)

2.5. Societal Approach. If we mentioned the importance of public diplomacy and information warfare for the smart war, then we would definitely have to mention the importance of societal threats. A societal approach to smart war would imply nation and cohesion building internally and public diplomacy, drawing public attention and public support on an international level. To a certain degree, exactly what Ukraine has been doing since it was invaded by Russia.

A societal approach and support to war has always been deemed and recognized as important, but current means and methods have changed just as well as the technological and military ones have. Having learned their lessons from the past, modern societal warfare is much more powerful and hard to counteract. Especially with an ever-growing lack of trust in institutions and politicians (which may be the exact result a societal

warfare campaign would aim to achieve in a target society). There is a Chinese *"PLA's Strategic Support Force, which has responsibilities for outer space, cyber, electronic warfare, and psychological warfare operations"* (Pollpeter and Kerrigan 2021, v).

2.6. Psychological and cognitive warfare. Specific side domains of the societal approach to smart warfare are *psychological* and *cognitive warfare*. In this field, the Chinese PLA has been increasingly conducting research trying to see how modern technologies, like AI, can offer key advantages in a modern confrontation. There is a comprehensive volume on this issue, *"Chinese Next-Generation Psychological Warfare: The Military Applications of Emerging Technologies and Implications for the United States"*, which states that *"In brief, China views psychological warfare, centered on the manipulation of information to influence adversary decisionmaking and behavior, as one of several key components of modern warfare. Chinese psychological warfare has evolved, driven in part by technological progress that brought new opportunities and in part by lessons learned from other militaries, but the core principles and objectives have remained relatively constant. The importance placed on psychological warfare is increasingly linked to Chinese military assessments that the cognitive domain will be a key domain of future warfare."* (Beauchamp-Mustafaga 2023, iv-v) About the modern technologies that can be used to this end, the same volume states that: *"The PLA psychological warfare community has discussed a range of technologies that it envisions leveraging for future operations, including three broad categories of technologies: advanced computing, especially big data and information processing; brain science, especially brain imaging; and a raft of legacy proposals that remain of interest, including sonic weapons, laser weapons, subliminal messaging, and holograms."* (Beauchamp-Mustafaga 2023, v)

About propaganda and disinformation and their importance today, corroborated with the advantage of modern technologies, the CNA analysis we cited earlier states that *"The PLA may emphasize cognitive warfare as it integrates AI into warfighting. • Some PRC writers argue that cognitive warfare can enable the PRC to achieve the Sun Tzu maxim of "winning without fighting" by sapping the morale and will of adversaries. • The PLA may increase efforts to influence competitors and potential adversaries in the cognitive domain by spreading propaganda and disinformation."* (Pollpeter and Kerrigan 2021, v) This shows just how important societal components are for current smart warfare.
NATO operates as well with the concept of *cognitive warfare* and it offers a definition: *"Cognitive Warfare includes activities conducted in synchronization with other Instruments of Power, to affect attitudes and behaviours, by influencing, protecting, or disrupting individual, group, or population level cognition, to gain an advantage over an adversary. Designed to modify perceptions of reality, whole-of-society manipulation has become a new norm, with human cognition shaping to be a critical realm of warfare."* (NATO n.d.)

2.7. Satellites and Starlink. The current war in Ukraine has just proven again just how important is to a modern smart war the key feature of satellites, space exploration, and even the Elon Musk satellite system of Starlink.

2.8. Space warfare. Even though the pandemic may have delayed some processes regarding space militarization and exploration, the main trend is that: *"Space is becoming a less stable environment, even as it holds the promise of becoming a new source of human prosperity."* (Nagashima 2020) The US Space Command announced some time ago, in 2020, that they had evidence that Russia had recently conducted tests of anti-satellite weapons (Patel 2020). There are pleas for more regulation in space, for cooperation instead of competition or dominance, but that is more like wishful thinking, especially considering the current international situation. The US has a military force called the Space Force: *"As a military service, the Space Force has responsibilities under Title 10 of the U.S. Code to organize, train, equip prepare, and maintain forces. In a conflict, those forces would be assigned to a combatant command."* (Erwin 2020) As regards China and Russia, it seems they already have arsenals designed to be used to destroy opponent satellites in space: *"Nations around the world - notably China and Russia - are building arsenals of weapons that can destroy or disrupt satellites in orbit."* (Erwin 2021) So, whether we like it or not, the smart war is already present in space too, and it will be ever more important.

2.9. Electronic Warfare (EW). There are multiple accounts about the importance and the development of effective Electronic Warfare equipment employed in the war in Ukraine. The Russian Federation seems to have an edge over other adversaries regarding similar capabilities at the moment.

2.10. Cyber Warfare. No need to stress the huge importance of cyber warfare for any smart war. Hacking, cyber attacks and cyber war (for example, a quite recent event where CISA – The US Cybersecurity And Infrastructure Security Agency issued a warning about a China state-sponsored cyber actor whose *"activity affects networks across U.S. critical infrastructure sectors"*(CISA 2023) will always be an essential part of any strategy for any kind of war from now on, but especially for a smart war. The smart war simply cannot be defined without cyber attack and cyber defence capabilities.

2.11. Semiconductors/Chips. Any future military war or conflict would depend upon the ability to supply or manufacture the appropriate amounts and types of advanced microchips for its own military capabilities, AI and ML instruments. There are multiple accounts in this regard (Hawkins 2023).

One of the latest and most comprehensive analyses on the topic is the volume *Chip War. The Fight for The World's Most Critical Technology.* The author stresses that the world's supply of computing power is in peril if even one of the steps involved in the semiconductor production process is interrupted. We can easily imagine its impact on AI, drones, cyber capabilities, even smart bombs, aircraft, essentially everything that makes a smart society, a smart peace or a smart war. The author continues by saying that if many people consider nowadays data to be the new oil, it is actually the processing power of computers depending on semiconductors that is most

important and which is in limited amount, and not the data, which seems limitless (Miller 2022). Needless to argue the essential importance of semiconductors/chips for any war of today.

2.12. Artificial Intelligence (AI). We have mentioned earlier two of the most recent and important volumes regarding just how essential AI is deemed to be for future wars (and peace as well). *The AI Wave In Defence Innovation. Assessing Military Artificial Intelligence Strategies, Capabilities, and Trajectories* and *The PLA and Intelligent Warfare: A Preliminary Analysis* try to describe the immense possibilities (and risks as well) presented by AI technologies. It depends on a lot of factors, but in the long term, AI may be the *single* most critical issue in future smart wars.

However, an aspect we have to take into consideration is over-reliance on AI, especially at this early stage of AI development. Because if AI failures can now have catastrophic consequences at an *individual* level (for example, in China, if an individual is designated as "suspect", "dangerous" or of a particular "race", according to face recognition and surveillance AI systems, AI analysis of surveillance camera images, and he/she may be innocent), AI failures can have catastrophic consequences at *a collective, even national level*, if they are faulty, vulnerable, and adopted prematurely in extensive military use.

2.13. Internet of Things (IoT) for military purposes. According to an analysis, *"The Internet of Things (IoT) describes the concept of connecting any device to the internet, resulting in a gargantuan network of objects and people that collect and share data. (...) Another defining characteristic of the Internet of Things is that the objects can "talk" to each other, like the sensors in a smart home or factory that share information to control lights, temperature or inventory levels."* (Mail.com 2023) The same analysis goes on by saying that: *"The Internet of Things is made up of "smart" devices – objects with built-in microchips and sensors that are connected to an internet-based platform with data collection and processing capabilities."* (Mail.com 2023) The US Army has been researching military use of IoT, but not very convincingly and not in a resolute manner. However, it did create the Internet of Battlefield Things (IoBT) project and in 2017 the US Army created a project called the Internet of Battlefield Things Collaborative Research Alliance (IoBT-CRA) meant to invite civil academics to bring contributions to IoBT. This is exactly the collaboration that we deem to be of great importance: academics, practitioners and education.

2.14. Building an appropriate industrial base and securing a constant unhindered supply of necessary materials. Their essential importance for the future is being noticed, we only point out that the European Union has provisionally adopted a European Critical Raw Materials Act, *"as demand for rare earths is expected to increase exponentially in the coming years"* (European Council 2023). In Romania as well it seems that domestic models of drones are being developed, they will be essential in the wars of tomorrow, and we hope that there will be even more domestic

programmes, such as the one undertaken by the Romanian Research Agency for Military Technique and Technologies (ACTTM) (Dumitrache 2023).

2.15. A change in current military structure and command. The changes that are currently taking place all over our society, both technologically, and at a deep societal level, need to be properly addressed in the future by military decision-makers. Current military command and execution structures seem to be struggling to keep pace with technological innovations in the war in Ukraine.

To sum up, the smart war would mean not just a new way of conducting warfare, but also a whole new strategy based on an integrated, dynamic, innovative and interdisciplinary approach to all the new technological and societal developments, plus at least all of the above-mentioned features, as well as a dramatic change of mentality regarding warfare, more future-orientated. And we can actually start "smart warfare" by acting now in the light of the changes that we can already see happening in our society, the keyword is "integrated".

3. Differences between our concept of "smart war" and the Chinese concept of "intelligent warfare" or other similar concepts

First of all, the Chinese view tends to see "intelligent war" as something in the future, while we see "smart war" as something that can be done right now. From a technological point of view, we already have the necessary capabilities, from a conceptual and organizational point of view, we do not. At the same time, pressured by politics, economic considerations, public opinion, wages, jobs, lobbying and huge contracts, Western views tend to see "smart war" as something that can be slowly grafted onto the old and current traditional way to wage war, as it is happening in the US. But, to cite US Admiral Selby, this is simply not good enough (Lipton 2023).

Secondly, we do not see "smart war" as only a specific way of waging war, only as an act limited in time, means, consequences, and scope, as analysts tend to perceive "intelligent war" in China, but we look at it as a whole societal process going on in all dimensions of society, as a part of society. If we talk about "smart administration", "smart economy", "smart city", "smart society", etc., how can we not talk about "smart war" in the same terms of profound radical change in our society? Of course, people's concerns, not a few, associated with this future must be addressed as thoroughly as possible, they are very serious. But we need to talk about them and start building not only technologically, but also conceptually the future framework of "smart war", with an emphasis on defense. From this point of view, the strategy of waging and conceptualizing war lagged far behind the development of society. Many researchers are already talking about the third stage of human civilization, as we have shown above, and this also applies to war.

Third, current military command, execution, and communication structures seem unable to keep pace with technological development. So, we have to seriously think about innovation regarding command and execution structures in the military field as well, if we want the human factor and decision to prevail over AI in the future. This aspect does not seem to be seriously addressed either by the Western side or by the Chinese side that innovates "intelligent warfare," but we see it as an indispensable part of "smart warfare" in the future. Again, there is an indissoluble connection of "smart war" with the societal dimension, because the human structures of command and execution are also part of society. Considering the rigidity of the current military command structures, perhaps this change is also one of the most difficult things to do. But that does not mean that it must be done immediately, it means that we have to start thinking about it today.

Another key difference between what we mean by "smart war" and other similar concepts is the importance given to *soft power*. Chinese researchers focus more on psychological and cognitive operations, far too little on *soft power*, perhaps knowing their shortcomings in this area compared to the West (although, rather late, Chinese researchers began to realize their mistake in neglecting this essential area of current international relations, in their case, regarding China-Central Asia relationship (Toma and Ghinea 2023), while Western concepts tend to rely too much on *soft power*, attracting criticisms like the one we cited at the beginning of our analysis. Soft power is an essential and very important part of what we mean by "smart war", but in a balanced formula - not too little, as in the case of China, not too much or deeply misapplied, as it was done by the West in Afghanistan - and taking into account local particularities. Maybe few people realize it, but even Romania has a huge soft power potential in a very vast region, stretching from Greece to Croatia, Poland and the Czech Republic, which is not being exploited at all. We will point out in a future analysis some essential elements of such a soft power strategy for Romania.

Last but not least, we must not think of "smart war" as something optional, or conjunctural, or something we can leave for later. We need to think of "smart war" as something mandatory, something that needs to be done right now, and something that should be considered whenever we make new purchases, in any new human and technological development programs, etc. So, a whole strategy for "smart war" is needed starting now. And this strategy, as we have shown, is not only limited to technological progress, but also to how we incorporate this technological progress conceptually, theoretically, in the way our society is organized and functions, and especially in the defense forces of our society.

It is about how we shape all our present actions in order to meet the future, as we can interpret it to be based on what is already happening concretely today. This is what an integrated model of "smart warfare" is about.

4. Obstacles to implementing an integrated model of Smart Warfare

Why is *smart war* not being developed and implemented faster? One of the main obstacles to innovation and to this integrated approach of *smart war* that we are advocating for, actually derives from political considerations and from different individuals or entities in the current civil or military establishment, as various military purchases made by Romanian officials prove it, and which is also definitely proven in the US as well by an explicit analysis cited below.

So, a few of the reasons why *smart war* is not currently conceptualized, analysed, developed and deployed, not even in some of the world's most powerful military, are the same as the reasons depicted in this New York Times analysis, written by Eric Lipton, regarding the US Navy and its efforts to modernize. Ken Perry, who is a former US nuclear submarine captain and *„who is now an executive at ThayerMahan, a Connecticut-based company that has invented an unmanned device that tracks enemy submarines at a fraction of the cost of the large vessels the Navy uses" bluntly summarizes that "They refuse to take money from the legacy programs (…) The Navy, big industry and other key stakeholders are vested in the current shipbuilding enterprise.*" (Lipton 2023) Multiple contractors for the US Army and Navy are waiting for big contracts for unmanned vehicles developed by them, but this is just not happening. *Not yet.*

The author also draws the sensible conclusion that *"A new generation of cheaper and more flexible vessels could be vital in any conflict with China, but the Navy remains lashed to big shipbuilding programs driven by tradition, political influence and jobs.*" (Lipton 2023) He also stresses that the obstacles to implementing these new technologies and ways of military thinking are that: *"the Navy, analysts and current and former officials say, remains lashed to political and economic forces that have produced jobs-driven procurement policies that yield powerful but cumbersome warships that may not be ideally suited for the mission it is facing. An aversion to risk-taking — and the breaking of traditions — mixed with bravado and confidence in the power of the traditional fleet has severely hampered the Navy's progress, several recently departed high-ranking Navy and Pentagon officials told The New York Times.*" (Lipton 2023) These are the obstacles to the smart war that we are analyzing.

A high-ranking US officer, Admiral Selby, tried to implement these new technologies more radically in the US Navy, and *"He proposed that the Navy create a new high-ranking officer who would have the authority and funding to build a so-called hybrid fleet in which the new generation of unmanned vehicles would operate in conjunction with traditional warships.*" (Lipton 2023) It is a formidable idea, that we should consider implementing as well.

However, he was turned down, which made him conclude that *"You now run up against the machine — the people who just want to kind of continue to do what we've always done (…) The budgeting process, the congressional process, the industrial lobbying efforts. It is all designed to continue to produce what we've already got and make it a little better. But that is not good enough."* (Lipton 2023)
This is exactly what we are stressing in this analysis: only adapting modern technologies to conventional warfare equipment and way of thinking *is just not good enough* to stay ahead of what is to come. We have to develop an integrated vision and strategy about what the future *smart war* will be and start implementing it. Any purchase, innovation, development, or industrial capacity that we make from now on must be considered and valued according to the elements within a strategy frame that we must have for the *smart war*.

5. Why a Smart War would be a very good choice for Romania's defensive capabilities

First of all, the military capabilities of Romania are behind for what is needed at this very moment for a confident defence and presence at the Black Sea. Romania cannot afford the large amounts of money needed for updating old equipment and for purchasing the large amounts of conventional military equipment needed in order to build a powerful defence military force. Converting the focus to smart military capabilities may mean spending less while staying ahead in the development and implementation of top modern smart warfare equipment. *If we are so far behind, it means we have to think ahead.*

In this regard, Eric Lipton, the author of the NY Times analysis cited earlier, also stresses the big difference in cost between the conventional warfare of today and the smart war of tomorrow, which is one of our key arguments too*: "Operating on a budget that was less than the cost of fuel for one of the Navy's big ships, Navy personnel and contractors had pieced together drone boats, unmanned submersible vessels and aerial vehicles capable of monitoring and intercepting threats over hundreds of miles of the Persian Gulf, like Iranian fast boats looking to hijack oil tankers."* (Lipton 2023)

Secondly, Romania benefits from a considerable large number of people involved in the innovative field of IT research, programming, and cybersecurity, so, it has the human capital needed. Another good reason for Romania to implement a smart war would be that it seems to be paying off on the battlefield, especially for weaker or smaller armies against larger opponents. Ukraine has managed to resist and even counterattack the Russian Army using a complex mix of smart war features, not conceptualized in this manner, but ranging from very good public diplomacy to innovation and the efficient use of naval drones which culminated in a defeat for the Russian Black Sea Fleet.

With all of the above, by no means do we mean that conventional arms and ammunition should not be purchased, manufactured, or used anymore, or that they are not important. Of course, they are still very important, and there should be an investment in conventional weapons, ammunition manufacture, and purchase, and especially gunpowder manufacturing facilities. However, we should gradually shift perspective towards the smart war that will follow, and significant investments, financially but especially in time and effort, should be made with that in mind, envisaging what is to come.

Romania has a unique opportunity in that respect, similar to the development of the internet infrastructure in Romania a while ago. Since our country had no previous internet infrastructure, when this infrastructure was implemented in Romania, the most up-to-date technologies and equipment were used and therefore we now have one of the most reliable, fastest and cheapest internet connections in the world (Dumitrescu 2022). *We should do exactly the same thing with our current warfare abilities and equipment - since we lack sufficient conventional warfare defensive equipment, we should skip a few steps and invest big in the newest and most effective smart war equipment, which is the future (and is often cheaper).* The war in Ukraine could not be clearer in that respect.

From the perspective of future wars, perhaps the one example of falling behind both regarding strategic thinking and equipment would be the purchase for the Romanian Navy of 2 second-hand demining vessels from the UK, which is replacing them with maritime drones (Jipa 2023). It is hard to explain why this is happening, why the purchase of such old equipment, considering the fact that even before the war in Ukraine there were explicit pleas from Romanian professionals regarding the importance of investing, developing, implementing maritime and aerial drones with various tasks (Eremia 2020). Perhaps, just one example of a lack of strategy regarding the new *smart war*.

Another example would be the very expensive purchase of second-hand F16 aircraft from Norway and already outdated Bayraktar drones from Turkey. Of course, Romania definitely needs modern aircraft and in even larger numbers than today, but the Romanian officials perhaps should have focused on purchasing more technologically advanced aircraft (and why not new?) and drones. There are more and more voices arguing that even the F35s are deemed to be one of the last fighter jets. Despite his eccentricities, Elon Musk does have a certain vision for the future and at an Air Warfare Symposium in 2020 in the US he plainly said in front of high US Airforce commanders that *"The fighter jet era has passed."* and that *"Locally autonomous drone warfare is where the future will be."* (Cohen 2020) He could not have been any clearer than that. Not to mention the amount of time and resources needed for the training of a single aircraft pilot, for example, compared to the training and resources needed for the training of a drone pilot.

His words actually made US Air Combat Command Gen. Mike Holmes ponder and he reportedly said *"The next decision point I have is when … the Block 30 and older F-16s, when they need to be replaced, what am I going to replace them with? I want to work to do the experimentation to answer that* question," *Holmes said. "Will I still want to replace them all with F-35s or will I start cutting in something else, like Elon talked about, or like [Air Force acquisition chief] Will Roper and I are discussing?"* (Cohen 2020) This is what everybody should be seriously wondering before adopting smart war real strategies for the future. Which is exactly what Romania should do.

Conclusions

We understand the complex issues behind important and powerful traditional defence companies, the political issues, jobs and people issues, just like the New York Times article debated, but when we are talking about security and modern warfare, recalibrating to a *smart war* is a must. We can see how the Chinese are already doing that. And recalibrating to a different way of thinking is a must too. Ukraine is learning this the hard way. We should be smart, learn it the easy way and get ready beforehand for whatever may come. Investing big in domestic drone manufacturing and research, as well as electronic warfare capabilities, instead of outdated (or soon to be outdated) and very expensive massive equipment, should be a must for Romania's national security strategy, which has always been a defensive one. That would be "smart" thinking.

Waging a successful smart war must not be regarded as individual separate smart technologies employed within different arms and in different ways, because that will not be enough. Modern smart war needs to be conceptualized in a comprehensive, integrated and interdisciplinary manner, incorporating input from both military and civilian professionals, meant to provide maybe that very leap in technology and thinking that Ukrainian General Zaluzhnyi recently deplored it missing.

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