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SPREMEMBA V KARAKTERJU BOJEVANJA IN TRANSFORMACIJA PEHOTNEGA ODDELKA, VODA IN ČETE

THE CHANGED CHARACTER OF WAR AND THE TRANSFORMATION OF INFANTRY SQUAD, PLATOON AND COMPANY

Povzetek   V članku je predstavljen model transformacije pehotnega oddelka, voda in čete. Članek se začne z ugotovitvijo, da se je karakter vojne v 21. stoletju spremenil, in ugotavlja tudi, v katerih elementih. Pri tem izhaja iz predpostavke, da so trenutni pehotni oddelek, vod in četa v večini vojsk Nata utemeljeni na karakterju bojevanja iz obdobja obeh svetovnih vojn. Ker se je spremenil karakter bojevanja, bi bilo logično, da so se spremenili tudi pehotni oddelek, vod in četa v smislu doktrine, organizacije, kulture, usposabljanja, tehnologije itn. Toda, kot ugotavljam v članku na podlagi študije primera kopenske vojske ZDA, večinoma ni tako. Zato je v članku na podlagi transformacijske teorije predstavljen model razmišljanja o nujnih spremembah.

Ključne besede   *Pehotni oddelek, pehotni vod, pehotna četa, karakter vojne, transformacijska teorija.*

Abstract   This article offers a model for transforming the infantry squad, platoon and company. It begins by establishing the elements of the changed character of war in the 21st century, the assumption being that the basis for the current infantry squad, platoon and company, in NATO armies, lies in the character of war as it was during the two World Wars. Since the character of war has changed, it should be logical that this is also the case with infantry squad, platoon and company in terms of their doctrine, organization, culture, training, technology, and so on. However, as the article shows, using a US case study, this is not quite the case, so the article uses transformation theory to offer a model of thinking about the necessary changes.

Key words   *Infantry squad, infantry platoon, infantry company, character of war, transformation theory.*

Introduction Armies are constantly changing. They must adapt to the new realities of changing missions, enemies, operating environments and societies. However, these changes are not always concurrent at all levels. For example, the French Revolution brought huge changes to warfare at the strategic and operational levels, while the changes at the tactical level were not significant. On the other hand the strategic concepts during the First and Second World Wars were not very different; however, at the tactical and operating levels the changes were substantial, even revolutionary (Gudmundson, 1995, Lind & Thiele, 2015). A commanding officer at the tactical level in 1918 would have felt right at home during the Second World War (WW2) and even in the 1991 Gulf War, perhaps even today. At the same time, this same commander, falling asleep in 1914 and waking up in 1918, would have had a hard time comprehending what was happening on the battlefield around him (Knox & Murray, 2001).

All changes are stressful. Armies do not like change. However, they must change to survive the changing character of warfare and battlefield conditions. How they change is a crucial question (Adamsky, 2010, Terriff, 2006). The results of a war usually depend on strategic and operational level decisions; however, individual engagements within operations are won and lost by tactical units. The entire weight of the tactical fight usually lies with the lowest level tactical units – squads, platoons and companies. The three levels of war (strategic, operational and tactical) are therefore closely connected. The best strategic plans are of no use if the tactical level is not capable of producing the required results. Vice versa, an army can win every single tactical fight and still lose the war, if the tactical fight did not link into the operational plan and strategic goals (Leonhard, 1991, Vego, 2009).

1 RESEARCH METHODS

This article will look into the link between the changed character of war and the tactical level of armies.

It will first establish how the character of war has changed since the period of the two World Wars (1914-1945), by reviewing the available literature and comparing the elements constituting the character of war during the period of the World Wars with those of today. The end of the World Wars was chosen because it represents the last major engagement for most NATO armies and the pinnacle of the tactical level changes that began in First World War. It is therefore the basis of the modern tactical level organization, structure, doctrine and culture in NATO.

Next, the US Army case study will show what, if any, significant changes at the level of infantry squad, platoon and company have occurred since 1945, through a review of US Army infantry doctrine since 1944 and research into the changes in US Army infantry squads, platoons and companies carried out by other authors. This will also provide indicators, which can measure change at the tactical level (transformation indicators). The US Army was chosen for two reasons: firstly, because the written sources are most readily available, and secondly, and even more importantly, because

the US is a trendsetter within NATO, as has been shown by Prezelj et al. (Prezelj, Kopač, Žiberna, Kolak, & Grizold, 2016).

Finally, the article will look at how theory treats changes in armed forces. The purpose of this is to identify transformation areas through which appropriate changes at the tactical level can be achieved so that it links with the operational and strategic levels. Only when all three levels are in sync with the character of warfare can we expect armies to be successful.

Based on all of this the article will propose a transformation model for the tactical level (infantry) in NATO Armies.

Now let us look at what results were provided by the research.

2 THE CHANGED CHARACTER OF WAR (TRANSFORMATION ENVIRONMENT)

The fact remains that war is a realm of coincidence, violence and politics (Knox & Murray, 2001, p 56). War has always been and will remain a contest of will, driven by fear, honour and interest (NATO, 2018, p 10). It is organised violence with the intent of imposing one will over another. It is brutal, bloody and unfair. Some things in war change (weapon systems, tactics, technology, etc.) but the nature of war remains unchanged (McFate, 2019, Kindle p 27).

The nature of war therefore remains the same. However, the *character* of war changes over time. The character of war depends on the social, political and economic circumstances. The actors, threats and tools of conducting war are always changing, and with them the character of war.

Even Carl von Clausewitz points out that while the nature of war is a constant composed of a duel[1], trinity[2], and fog[3], its character is a variable dependent on the political and social context. The character of war is a practical and unique expression of each individual war (Angstrom & Widen, 2015, pp 14-19).

2.1 Conventional war

War and peace in western civilization are in accordance with Clausewitz's interpreted binary, as opposites – if there is peace, there is no war and vice versa (Angstrom & Widen, 2015, p 14-19). Conventional understanding of war strictly separates the realm of politics from the realm of military expertise. War is the domain of military elites and begins where peace fails. Of course, the separation has never

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[1] *Between two or more opposing sides.*

[2] *State leadership, army leadership, and citizens.*

[3] *The point of the "fog" is that neither side in war can control the situation or fully anticipate enemy actions.*

been this clear, and there have always been interventions from one side to the other, depending on their power in society. Nevertheless, in principle war was conducted by the military with the intent of destroying enemy forces, or his will to fight, on the field of battle. This was then followed by unconditional surrender and the political solution of international affairs.

2.2   Global trends

We can name several global trends which will have major implications on the character of war. Singer lists population growth, connectedness through digital communications[4], and urbanization (Singer, 2009, pp 242-246). Kilculen adds littoralization to that (Kilcullen, 2013, p 206). Warfare will take place against an opponent who will most likely be non-state (criminal or military) and who will use asymmetric methods. This does not mean that conventional conflicts are excluded, but the effects of megatrends will tend towards non-regular conflicts (Kilcullen, 2013, p 206).

Ozanne has defined the operating environment of the future as uncertain and unpredictable, with a high level of asymmetric threats, with extended areas of operation, operations among the civilian population in urban environments, the profiling of stakeholders in the war, easy access to new technologies, a high impact of the psychological factor, and large constraints on states which cherish human life and are limited by financial resources, legal frameworks and environmental constraints (Ozanne, 2014, p 24).

Another very important trend on the modern battlefield is the growing firepower and the accuracy of the weapons systems. Based on Snider's model (1987), this demands increasing dispersion of ever smaller units across the battlefield, so that they represent a less profitable target (Johnson, 2000, p 9). The trend of dispersion can only go as far as the human factor allows; this requires soldiers in combat to be close to each other, to preserve the necessary courage (Hughes, 1995, p 39).

It is necessary to also add climate change, which will have a strong impact on the functioning of the tactical level in the future. All these global trends dictate the design of the tactical level, which will need to be capable of working in a complex, networked and interest-knit urban environment where armed actors will use all possible methods to impose their normative system on the population.

2.3   Future warfare

Both Clausewitz and Sun Tzu stress the primacy of politics over army, the importance of rationality and the constant of change in war. However, Sun Tzu puts more

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[4]   *Connectedness changes the nature of social interactions. In this way it also affects the shape and results of domestic and international conflicts.*

emphasis on cunning, surprise and intelligence, and less on violence (Angstrom & Widen, 2015, pp 20-21).

Among the first to point out the changing character of war in the 1970s was John Boyd[5]. However, serious discussions on the changing character of war appeared after the end of the Cold War[6] (Bordas, 2014, p 9). The present article focuses on fourth generation warfare (4GW) and hybrid warfare, as they represent the culmination of all the previous theories and thinking about the changing character of war.

The main idea behind 4GW is that, due to lack of resources, non-state actors pursue victory through asymmetric means such as insurgency, information operations and/or terrorism (Hammes, 2004). However, this does not mean that non-state actors are incapable of conventional war fighting or the simultaneous use of different means (Lindsay, 2009). At the centre of 4GW lies a social, political and moral revolution based on the crisis of state legitimacy (Lind & Thiele, 2015). The objective of 4GW is the destruction of the moral ties that enable society to exist (Vandergriff, 2006, p 45). Similarly, hybrid warfare represents a new form of warfare by combining conventional and unconventional warfare. State or non-state actors can use it by mixing irregular warfare, terrorism, civil war, insurgency and conventional war (Huber, 2002, Hoffman, 2007, Kilcullen, 2013, Bjerregaard, 2012). It can also be claimed that hybrid warfare is nothing new, but a complex mix of already known forms of warfare (McCulloh, 2012, Schadlow, 2015).

The point of hybrid warfare is not that the asymmetric approaches dominate the conventional forms of warfare, but that the actors adapt and use approaches to war (even several different ones at the same time) that will bring the most benefits and minimize risk and effort.

2.4   Changing actors, threats and tools

The Peace of Westphalia, 1648, sets the stage for world affairs where sovereign states are a prime actor in international affairs. After that, war is a matter of states and state armies. Today, in the West, this seems pretty natural; however, it was not always so. Prior to the Peace of Westphalia wars were conducted by very different actors – states, privateers, criminals, corporations and ideologies. With the spread of globalization the Westphalia concept of war is crushed into the pre-Westphalia notion of war of all, against all (Kilcullen, 2013, p 105, McFate, 2019, Kindle p 184). War is no longer the domain of state armies as specialized organizations controlled by the state. Van Creveld calls this "non-trinitian warfare"[7] (Van Creveld, 1991).

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[5]   *The author of the OODA decision cycle and US Air Force officer*

[6]   *Military Operations Other Than War, Complex Warfighting, Nation Building, Insurgency, Asymmetric Warfare, 4th Generation Warfare (4GW), and finally Hybrid Warfare.*

[7]   *Referring to Clausewitz and his trinity of state-army-people, where roles are complementary but strictly separated.*

Today wars are conducted by religious movements, whose goals transcend state borders. Apart from these, we must also look at terrorist organizations as a new actor in the arena of war[8] (McFate, 2019, Kilcullen, 2013, pp 179-227). Material and political goals are also closely related in war (van Creveld, 1991); people fight for many reasons, including to get rich. At the same time the so-called "narco-wars" are not strictly money-related.[9] Even according to Milton Friedman, we must ask ourselves whether a political interest is really somehow nobler than an economic one (McFate, 2019). Criminal organizations are definitely one of the actors in wars and will continue to be so. Corporations also have their interests, and nothing prevents them from intervening with their own forces where situations permit it. In fact many of them already operate a sizable military-style force in places like Africa. They certainly have the resources to do so. It is only a step from here to active military intervention in local, regional and even global politics.[10] Not only corporations, but even rich individuals (the top 1%) and Non-Governmental Organizations are becoming actors in armed conflicts. With the reappearance of private military companies, anyone can hire military expertise for their own purposes (McFate, 2019). Private military companies on their own are also an important factor in wars (Papler, 2014). Finally, we must not forget nation states. Even though they lack the motivation to get involved in classical conventional wars, one cannot dismiss the possibility, because actions in war are unpredictable (Friedman, 2020). Experts agree nation-states have lost the monopoly on the use of force in the pursuit of their goals. Non-state actors, such as religious movements, criminal groups, corporations and others with the motive and resources can use force to destabilize nation-states (Žabkar, 2004, pp 352-357, Sokolosky, 2016).

In conventional war the almost exclusive threat to a state army was another state army (Marshall, reprint 2019). However, today the threats are more numerous and closely linked to actors in wars. The paradigm of a duel between a bear and a tiger has been replaced by a paradigm of a sack full of scorpions, snakes and termites (Žabkar, 2004, p 333).

Slovenian and international literature is fairly clear on what threats lie ahead: climate change, economic risks, failed states, terrorism, weapons of mass destruction, organized crime, illegal migrations, cyber threats, natural disasters, limited natural resources, environmental degradation, health epidemics, poverty, and so on (DZRS, 2010, Vlada RS, 2018, MORS, 2020, NATO, 2018, Lind & Thiele, 2015, McFate, 2019). However, most of this literature does not prioritise these threats. They have been, however, prioritized by military transformation experts and the results are interesting. They list cyber threats, economic crisis and terrorism as the ones with the most effect on transformation (Prezelj et al., 2015, p 29). It is however hard to

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[8] *They are not necessarily linked to a religious movement, but they are linked to a specific ideology (religious or other).*

[9] *The narco-wars in Latin America have far-reaching social and political consequences.*

[10] *This is also not entirely a new phenomenon. The British East India Company operating in India was basically a corporation with its own army.*

imagine that military organizations will be the primary means of dealing with these threats.

State armies are no longer the only tool in war (Massicot, 2019). Wars are conducted in the non-physical environment by using all the instruments of national power (NSO, 2018, Thomas, 2019). The most effective weapons are no longer bullets, but non-kinetic tools such as information, refugees, ideology and time (McFate, 2019). Even in the kinetic realm we have tools other than state armies, such as private military companies.

It is clear that all these numerous actors, threats and tools are making the character of war immensely more complex. This requires a significant level of flexibility, adaptability and cooperation from all the elements of the national security system. It is impossible for any single element to adequately respond to all the threats and actors.

2.5   New levels of war

Figure 1:
Interconnected levels of war.
Source: Lind & Thile, 2014.

LEVELS OF WAR	MORAL	MENTAL	PHYSICAL
STRATEGIC	X	X	X
OPERATIONAL	X	X	X
TACTICAL	X	X	X

Figure 2:
Influences of other levels of war.
Source: Made by the author.
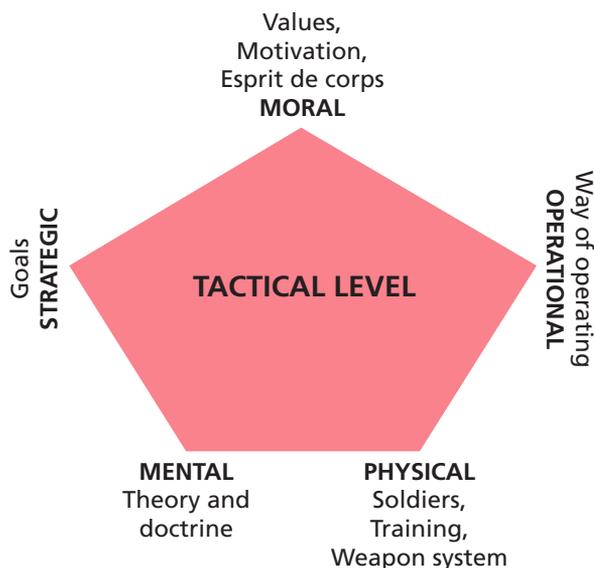
Conventional military theory lists three levels of war: strategic, operational and tactical. With this in mind, it must be pointed out that military strategy is inevitably closely linked to national policy and its goals (Metz & Kievit, 1995, p 37). The three levels of war are closely linked; however, it is a lot harder to overcome strategic failures than tactical and operational ones (McFate, 2019, Kindle p 232). Due to the interconnectedness of the DIME[11] factors, wars are not just conducted on the strategic, operational and tactical levels, but are at the same time conducted on the moral, mental and physical levels.[12] It is at the physical level that the killing and destruction occurs; it is, however, considered the weakest level of war. Physical destruction that appears as moral failure is considered useless. The moral level is the strongest, as it determines what is acceptable in war. The mental level is represented by theories of war, concepts and doctrine (Lind & Thiele, 2015, NSO, 2018).

The important thing to realize is that the moral, mental and physical levels can be found on all three conventional levels of war. Lind and Thiele have therefore developed a simple two-dimensional table that accurately portrays the linkage of all the levels of war (see above, Lind & Thiele, 2015). For the purposes of this article, it is important to remember that all the other levels also manifest themselves at the tactical level.

3 INFANTRY SQUAD, PLATOON AND COMPANY CASE STUDY

Until the First World War, the squad was a mere administrative unit. However, the conditions of the war radically changed this. The squad had, in a way, become a combined arms unit, capable of combining different weapon systems with the effect of decisive action on the enemy. Squads, however, did not operate in a vacuum, but as an integral part of higher echelon units (platoon and company), which provided a framework for the squads to manoeuvre by providing heavy machine gun, mortar and infantry artillery support. This process reached its pinnacle in WW2 (English & Gudmundsson, 1994, Kindle p 280-303)

We will now look at the development of the US Army infantry squad, platoon and company since WW2, in order to identify what has changed since.

3.1 US Army Company, Platoon and Squad case study since WW2

In the US Army, the infantry is a principal fighting force. Its purpose is to close with the enemy and defeat them by using either the threat of force or the actual destruction of the enemy force (Hughes, 1995, p 2).

Table 1 shows how the mission of the infantry company, platoon and squad has changed, or rather has not changed at all, since WW2. At the same time US

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[11] *Diplomatic, Information, Military, Economic*

[12] *The moral, mental and physical levels of war have already been discussed by J.F.C. Fuller (Fuller, 1926, p 92-174).*

	MISSION		DOCTRINE & ENVIRONMENT
	COY	PLT/SQ	
cca. 1949 (DoA, 1949)	No general mission assigneg. Mission based on type of operation. Attact = to close with the enemy and destroy or capture him. Defense = to repel the enemy assault by fire or close combat.		COY, PLT & SQ are ment to preform offensive and defensive operations in high intensity conventional battlefield.
cca. 1959 (DoA, 1959)	To close with the enemy by means of fire and maneuver in order to capture or destroy him.	To close with the enemy by means of fire and maneuver in order to capture or destroy him.	Combat under nuclear conditions (Pentomic division structure). The need for substantial firepover at the decisive point, in order to prevent the enemy use of tactical nuclear weapons.
cca. 1962 (DoA, 1962, 965)	To close with the enemy by means of fire and maneuver in order to destroy or capture him or to repel his assault by fire, close combat, and counterattack.	To close with the enemy by means of fire and maneuver in order to destroy or capture him, or to repel his assault by fire and close combat.	COY, PLT & SQ are ment to preform offensive, defensive and delying operations.
cca. 1982 (DoA, 1980, 1982)	No general mission assigneg. Mission based on type of operation. Offensive purpose = to destroy the enemy and his will to fight...They use fire and maneuver to close with and destroy the enemy. Defensive purpose = to deny an area to the enemy, protect flanks, or disorganize and destroy the enemy		Two types of enemies and coresponding mission types. - a guerila force of South-East Asia and a motorised infantry of Central Europe. - the mission types are offensive, defensive and patroling.
cca. 1992 (DoA, 1990, 1992)	To close with the enemy by means of fire and maneuver to destroy or capture him, or to repel his assault by fire, close combat, and counterattack.		Air-Land Battle doctrine recognises offensive, defensive and delaying operations. Seperate annexes are dedicated to low intensity conflict and urban operations.

cca. 2006 (DoA, 2006, 2007)	To close with the enemy by means of fire and maneuver to destroy or capture him, repel his assault by fire, close combat, and counterattack.		The doctrine of Full Spectrum Ops. Offensive and defensive operations + (in annex) stabilisation ops, civil support ops, counterinsurgency ops and urban ops. The importance of joint operations, media perspective, non-lethal aspect.
cca. 2018 (DoA, 2016, 2017, 2018)	To close with the enemy using fire and movement to destroy or capture enemy forces, or to repel enemy attacks by fire, close combat, and counterattack **to control land areas, including populations and resources**.	To close with the enemy by means of fire and maneuver to destroy, capture, or repel an assault by fire, close combat, and counterattack.	Doctrine of Unified Land operations. It assumes the continious and simultan use of offensive, defensive, stabilisation and support operations.

Army doctrine has undergone significant changes. The scope of the missions and environments the infantry company, platoon and squad are supposed to operate in have changed and increased in scope. It is, however, also obvious from the doctrine that offensive and defensive operations were at all times, and still are, considered the main and primary missions for the infantry company, platoon and squad. This also explains why organizationally the changes in the company, platoon and squad were so insignificant throughout the entire period. Looking at the pictures (Figure 3, Figure 4 & Figure 5) it can be seen that the size of the squad in terms of manpower has decreased, but the organizational structure has remained unchanged. The same goes for the platoon and company. It must be said, however, that the company headquarter element has decreased considerably since WW2, mainly due to the fact that company cooks were moved to the battalion logistic element. The remainder of the decrease can be attributed to the use of new and more capable technology, especially communications technology. Of course, there have also been major changes in the weapon systems used in the company throughout the period. Interestingly the rifleman has always been at the centre of US Army doctrine, and the entire US Army was and is organized around the question of how to best support the rifleman in the execution of his tasks[13] (Foster, 2000). This and the inability of the US industry to produce an adequate light machine gun has resulted in the fact that the US Army was the last in NATO to introduce the light machine gun into the squad.[14]

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[13] At the centre of the US Army's philosophy is the conviction of the well-trained rifleman's superiority on the battlefield. This dates back to the War of Independence, and at a certain point even inhibited the introduction of machine guns in the infantry (English & Gudmundsson, 1994).

[14] The M60 was introduced in 1957 (Miskimon, 2014) and the BAR (Browning Automatic Rifle) was used all through WW2 and the Korean War, when everyone else already had a light machine gun. But even then, the M60 was not introduced into the squad because of its weight. The squads received their light machine guns well after the end of the Vietnam War in the 1980s.

3.2 US Army research at the basic infantry level – squad/platoon

Figure 3:
Infantry
Company after
Korean War; FM
7–10 (1959),
made by author
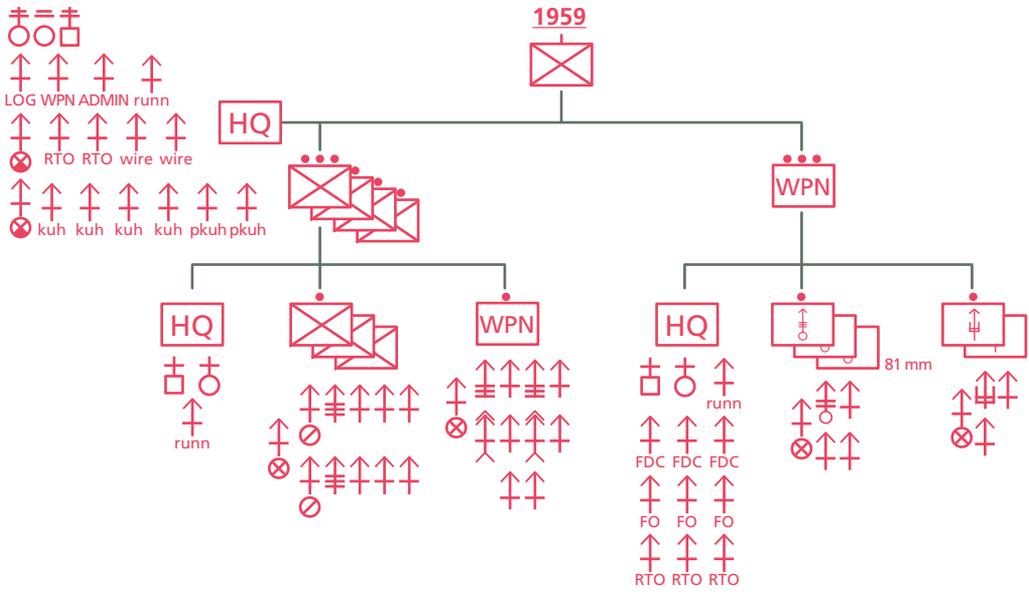
Figure 4:
Infantry
Company at
the end of Cold
War; FM 7–20
(1992), FM 7–10
(1990), FM 7–8
(1992), made by
author
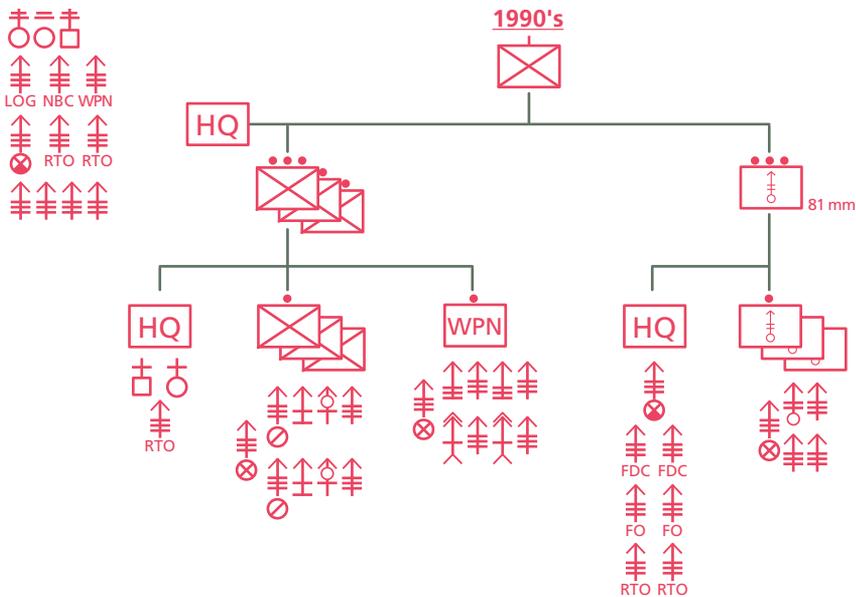
The US Army entered WW1 with the platoon as the basic manoeuvre unit, composed of specialized squads purely as administrative units (Rainey, 1999, pp 8-9, Hughes, 1995, p 5). This was, in part, due to the fact that they were unable to field an appropriate light machinegun, and were using BARs[15] (Melody, 1990, p 4). Squads as tactical units composed of 12 men in three groups appeared in the US Army on the eve of WW2. However, during the war they very seldom operated as doctrinally prescribed, due to the high casualty rate and general squad leader inexperience (Rainey, 1999, p 10, Hughes, 1995, p 6).
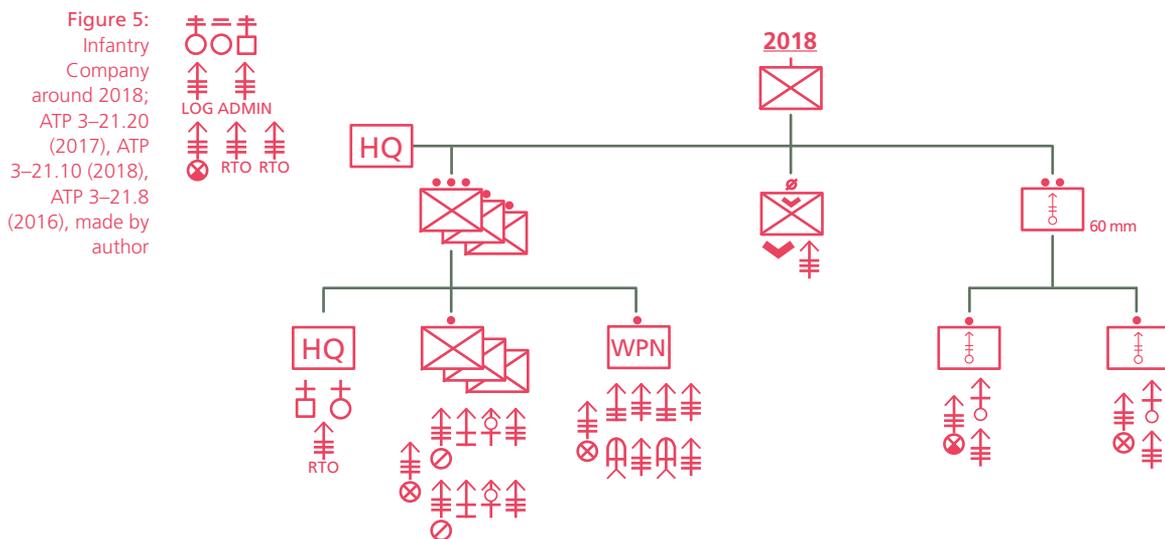
In 1946, they organized a conference with the aim of investigating all aspects of infantry operations in WW2. They defined the squad as the "smallest combat element consisting only of as many soldiers (e.g. 8) as one leader could control" (Hughes, 1995, p 6). The debate was centred on the four main topics; command and control (how many men can be controlled by one leader in combat); combat losses (20% average); firepower; and tactics (based on WW2 experience, a squad was unable to fire and move at the same time) (Hughes, 1995, p 6, Melody, 1990, pp 4-9).

The Korean War validated most of the 1946 conclusions. However, during the war, squads were forced to conduct independent manoeuvres (fire and move at the same time). This was supported by Marshall's research (Marshall, reprint 2019) and the drill concept developed by Major-General J.C. Fry. Based on this, prior to Vietnam

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[15] *BAR = Browning Automatic Rifle*

the U.S. Army organized its squads into two teams of 11 men total – with 3 NCOs[16] and two BARs.

Figure 6: U. S. Army squad development, made by author
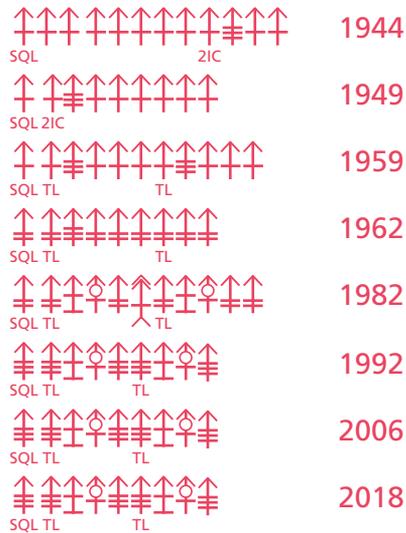
These changes were followed by a series of independent exercises and studies. The first was ASIRS[17] in 1956, followed by OCRSP[18] in 1961 and finally IRUS[19] between 1966 and 1972. One of the main friction points examined through these studies was the question of whether or not the squad was able to manoeuvre on its own. The final consensus was that the optimum is represented by a squad of 11 men in two fire teams (capability to manoeuvre), equipped with automatic rifles and grenade launchers[20] (Hughes, 1995, Melody, 1990, Rainey, 1999). The organizational development of the US Army squad after WW2 is shown in Figure 6: US Army squad development.

The current squad organization and structure was decided on based on the Army of Excellence Program at the end of the Cold War, and is more a consequence of manning ceilings set by politics. Within the programme, the Army was expanding from 14 to 16 divisions and needed manpower savings wherever it could get them. The squad paid the price. Despite that, the current nine-man squad retained the

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[16] *Non-Commisioned Officers*

[17] *A Study of the Infantry Rifle Squad TOE*

[18] *Optimum Composition of the Rifle Squad and Platoon*

[19] *The Infantry Rifle Unit Study*

[20] *At that time the US Army was still unable to field an appropriate light machine gun. The M60 was too heavy for the squad and was retained at platoon level.*

structure of two balanced fire teams, with each team led by an NCO and controlled/ coordinated by a squad leader (Melody, 1990, p 45).

This squad served the US Army in the Gulf War and still serves it today in Afghanistan, Iraq and Syria. Since the Gulf War, new technology has been introduced and the uniform has changed a couple of times, but nothing substantial has altered, despite major changes in the Army's doctrine and operating environment. After IRUS (1969), no new comprehensive studies of the low level tactical units in the US Army can be found. The Army Green Book (AUSA, 2019) lists six modernization priorities, but there is only one linked to the infantry; it states "improving soldier lethality by providing better weapons, armor, communication, exoskeleton and improved training". This implies that the US Army fosters no plans to change the squad's organization, structure or doctrine.

3.3 Transformation indicators at the infantry squad, platoon and company level

The US Army studies of infantry units highlighted some key indicators and their values which need to be considered when discussing the doctrine and organization of infantry squads, platoons and companies.

1. Command and control (C2): defined by the leader's capability to communicate and impose his will on their subordinates so that they respond in a tactically appropriate and coordinated way. A single leader can optimally control up to five subordinate elements; in special circumstances even more, but no more than eight (Hughes, 1995, p 36, Rainey, 1999, p 41).
2. Resiliency, defined as the capability of continuing the mission despite losses (Hughes, 1995, p 37, Rainey, 1999, p 41). The assumption is that a unit must be capable of performing with up to 25% loss[21].
3. Protection, defined as the capability of using tactics, techniques and procedures designed to prevent the enemy detecting and destroying the unit (Hughes, 1995, p 37). The key here is that the unit is capable of battlefield dispersion without losing its cohesiveness.
4. Firepower, defined as the capability of suppressing and/or destroying the enemy measured in volume, accuracy, range and responsiveness (Hughes, 1995, p 35). In close combat, the number of assault rifles is more important than support weapons (machine guns, grenade launchers, and flamethrowers). The upper limit of support weapons is set at 30% of the total number in a unit.
5. Flexibility, defined as the capability of adapting to different tactical situations (Rainey, 1999, p 41). The point here is that a unit should be internally subdivided in a way that gives its leader/commander more than just one or two tactical solutions.

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[21] *25% is the upper limit. This includes not just KIA and WIA, but also non-combat losses due to disease etc.*

4 CHANGING MILITARY ORGANIZATIONS

4.1 Revolution in military affairs and military revolution

A theoretical examination of the changes in military organizations first appeared in the West as a theory of revolution in military affairs (RMA). It developed out of earlier Soviet debate on the military-technical revolution (Metz & Kievit, 1995, p V). It became apparent very early on that there are very different levels of change that appear in military organizations, so theory distinguished between RMA and military revolutions (MR) (Knox & Murray, 2001, Metz & Kievit, 1995, Collins & Futter, 2015, Biddle, 1998).

Military revolution (MR) changes war at its core, changing society and state as well as military organizations. Its course, consequences and implications are largely unpredictable. They represent a change in the purpose[22] of war and are a consequence of deeper and wider processes (ideological, political, social, economic and demographic) than the mere appearance of a new technology or a group of technologies. Individuals and groups cannot control military revolutions, they can only try to survive them (Knox & Murray, 2001, pp 7-74). On the other hand, RMA represents a new conceptual approach to warfare developed by the military organization in order to destroy its enemies. RMA combines tactical, organizational, doctrinal and technological innovation. To be successful it needs 1) time to develop, 2) an appropriate perspective, 3) critical thinking and debate, 4) appropriate leadership (Knox & Murray, 2001, p 12-14).

However, the RMA theory treated changes in military organizations sequentially (Žabkar, 2003, p 214). At the end of the millennium, it became apparent that the RMA paradigm no longer sufficed, so a new paradigm developed – transformation theory.

4.2 Transformation theory

Transformation theory defines changes in military organizations very similarly to RMA. However, authors stress that, relative to RMA, the change in transformation theory is gradual and continuous, rather than sequential and final[23] (Kugler, 2006, Sloan, 2008, Davis, 2010). Even then, transformation in a military organization is an unusual and, from the point of view of its members, unwanted occurrence (Dombrowski & Ross, 2008, pp 13-16). Transformation is not always successful and can even be counterproductive if the introduced concepts are embraced too emotionally and uncritically. This is likely to happen especially where the military establishment is prone to uncritical and unappropriated favouring of attractive

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[22] *Some authors claim MR represents a change in the very nature of war. We have, however, established that the nature of war does not change but remains the same.*

[23] *The term "revolution" implies a quick, radical and uncontrolled change, to which military organizations are not inclined. The term "transformation" is based on the idea of continuous change with an undefined end-point. Transformation is also differentiated from modernization; while modernization means that things are done better, transformation means that we do better things (Sloan, 2008, pp 7-8).*

concepts and, as a consequence, the military organisation is "too transformed" (Davis, 2010, pp 11, 19; Prezelj et al., 2016, p 25)

Transformation is seen as a complex process of transforming inputs into outputs, in order to improve military performance and capabilities (Prezelj et al., 2015, p 24). NATO Allied Command Transformation defines transformation as "a continuous and proactive process of developing and integrating innovative concepts, doctrine and capabilities in order to improve effectiveness and interoperability within the alliance" (Ibid., p 40). This means that NATO is not pursuing revolutionary change, but through a transformation process is focusing on increasing interoperability, which of course improves NATO effectiveness.

Closely linked to the idea of RMA and/or transformation in military organizations is innovation. Rosen for example, speaks of "major innovation" instead of RMA, which involves a change in the concept of operation, that is, the ideas governing the ways of using forces to win a campaign. On the other hand, "tactical innovation" is a change in the way individual weapons are applied to the target and environment in battle (Rosen, 1992, pp 7-8). Changes in military doctrine that leave the essential workings of the organization unaltered do not count as innovation/transformation.

In order for military organizations to innovate successfully, innovation must be part of the organizational culture, and not a matter of individual motivation (Mitrova, 2019, p 12). There are other preconditions for military organizations to innovate, such as an effective group of innovation advocates in the organization, the possibility of pursuing different approaches, the ability to learn from mistakes, support from outside (civil) institutions and/or leaders, and outside intervention (Hone & Mandeles, 1987, Posen, 1990). Even then, there is no guarantee that innovation in military organizations will be successful. Military organizations are bureaucratic organizations and as such they are designed not to change (Rosen, 1992, p 2).

To conclude, transformation is seen as a profound change in the way a military organization conducts its business. It incorporates changes in doctrine, new technology and new organizational solutions.

4.3 Transformation areas at the tactical level

Based on the literature review, we can now determine relevant transformation areas, i.e. areas where transformation occurs in order to improve the workings of military organizations, or for the military organizations to obtain the upper hand in relation to their adversaries.

These areas are doctrine, culture, technology, organization, training and education. They are all closely linked. Change in one area influences all the others, although as we have seen in the US case study, this does not always result in visible change. Organizational culture in particular is often the main reason why military organizations continue to use obsolete concepts inappropriate for the realities of

current or future war, and why they resist change (Terriff, 2006, p 478). It is also one of the main factors in determining how military organizations will approach change[24] (Adamsky, 2010, p 323). On the other hand, culture in military organizations is also closely linked to how they operate on the moral and mental levels of war. The US Army, for example, recognizes the moral complexity of the current and future operating environment and demands a strong moral character and ethos at all levels (TRADOC, 2010, pp 11-15). On the other hand, the Russian Army has far lower moral standards for its leaders, as long as they perform in combat (Grau & Bratles, 2016).

Particularly within NATO and its allies, technology seems to be the main answer to all the challenges of current and future warfare (Bellamy, 2016, Angstrom & Widen, 2015, Voelz, 2014, Knox & Murray, 2001). Technology seems to be the main cause of doctrine change, as geography once was (Posen, 1990). On the other hand, technology is mainly driven by two factors: the first is military intelligence, which identifies new technologies potential adversaries have; the second is the military-industrial complex (Rosen, 1992, Metz & Kievit, 1995). This however, leads military organizations to ask the completely wrong question: "What will new technology enable us to do?" instead of "What do we expect the army to be able to do?" (Metz & Kievit, 1995, p 26). In any case most authors agree that technology has in no way simplified warfare. Rather, the opposite is true – technology has made warfare exponentially more complex, and there is no reason to think this will change with the emergence of new technologies (Knox & Murray, 2001, pp 176, 178).

5 RESULTS – A PROPOSED TRANSFORMATIONAL MODEL AT THE TACTICAL LEVEL

Based on the above findings, a model of thinking about the necessary changes at the tactical level of war has been developed – Figure 7. The idea is that through the study of changes in the conflict environment, key elements defining the character of war – now and more importantly in the future – can be identified. These elements in turn influence military organizations and how they think about the tactical level of war – its purpose, organization, training, and so on. The transformation areas important for the tactical level are not considerably different from other levels of military organizations; however, the emphasis is different in different areas. In order to measure the direction and quantity of necessary and appropriate change in different transformation areas one should use the transformation indicators which were distilled (in our case) from the US case study.

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[24] *Adamsky differentiated organizational cultures in militaries based on how society is structured (collectivistic vs. individualistic), way of communicating (big context vs. small context), and attitude to time ("polyconic" vs. "monochromic").*

Figure 7:
General model of transformation at tactical level (Source: Author)
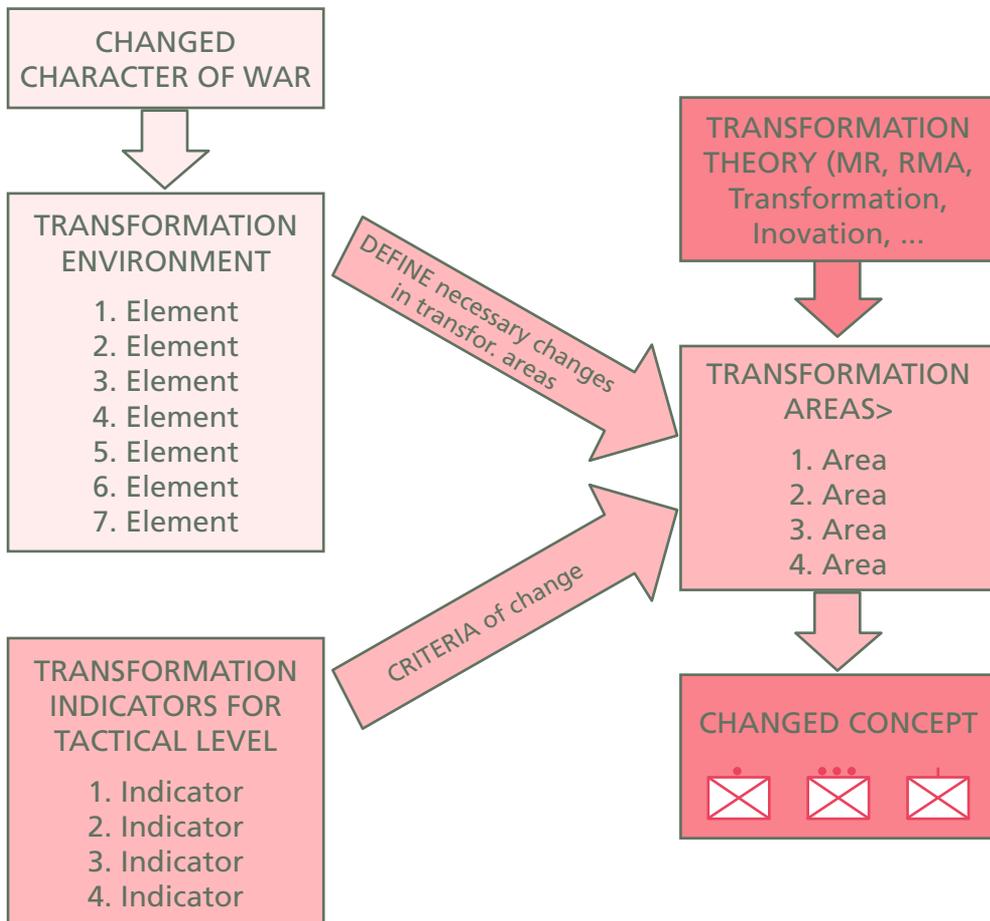
The study of the literature is only the first step, and the model in Figure 8 is proposed based on it. The changed character of war is manifested through increased urbanization, population growth, climate change, hybrid warfare, increased connectedness, proliferation of actors in war, increasing lethality of weapons systems, additional and more interconnected levels of war, the appearance of artificial intelligence, robots on the battlefield, and other new technology. All this influences the technology used at the tactical level, its doctrine, organization, culture and training. How it influences different areas should be determined with the help of the transformation indicators. For example, what kind of change is required in doctrine, organization, culture, training and technology due to urbanization, and how does that manifest itself in terms of the number of C2 elements or other indicators at the tactical level?

Figure 8:
Proposed
transformation
model for
Infantry SQ, PLT,
COY (Source:
Author)
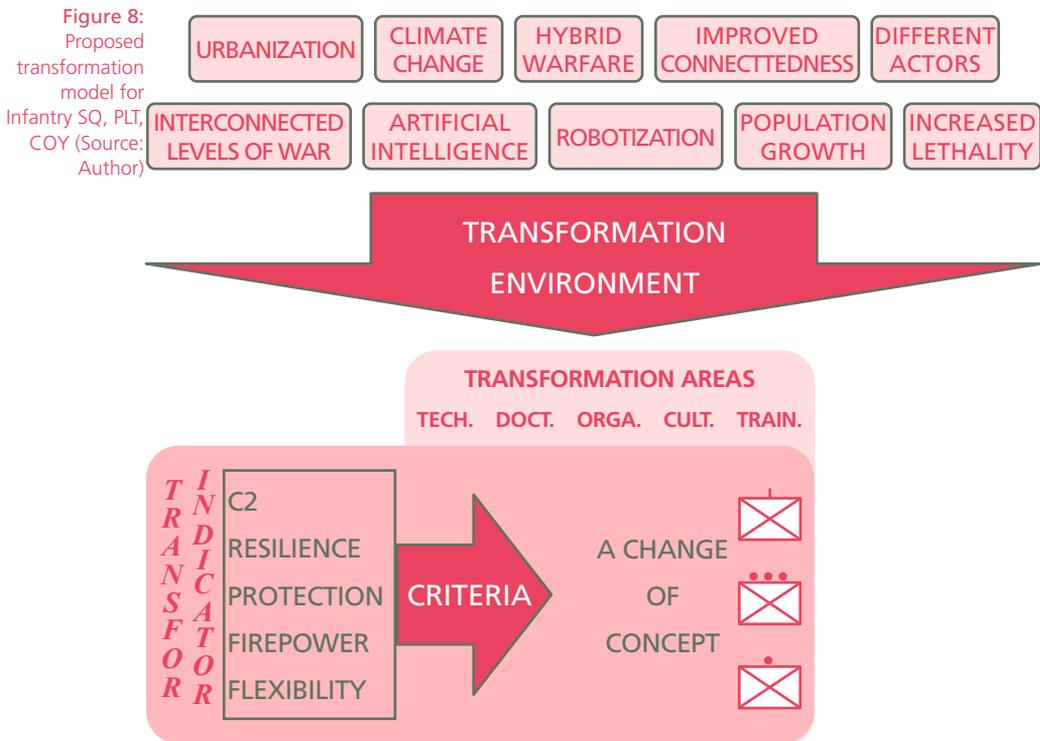
Discussion and conclusion

Based on our research, we assume that most NATO military organizations follow trends set by the US Army, which focuses mainly on technological solutions to tactical level problems rather than the doctrinal, organizational or other levels, as the case study pointed out. On the other hand, the literature suggests that all the changes in the character of war require major changes in doctrine, organization, culture and training at the tactical level. This should manifest itself through a more decentralized C2 structure, which could be achieved through the use of swarming/rules based tactics (as proposed by Lynch & Fish (2018)) and more independent action by subordinates. The use of technology should focus more on resilience (armour, battlefield medicine, performance enhancing drugs, etc) and less on firepower, since at the tactical level, the latter is already at a very high level. Protection should be increased through more battlefield dispersion, which is of course closely linked to C2 decentralization. Above all, tactical flexibility should be increased, by providing tactical leaders and commanders with METT-TC based organizations, and not predetermined organizational solutions.

The transformation model for tactical level infantry units and its assumptions should now be checked by further empirical research. Focused interviews with NATO tactical level (infantry) experts should validate and supplement the assumptions and

elements of the model. Based on the validated transformation model one could then, in more detail and in quantifiable terms, determine the links and their directions between the elements of the transformed character of war and the transformation areas. This is how doctrine, organization, culture, training and technology should reshape the infantry squad, platoon and company for the future character of war.

Change is a team effort.

Figure 9: Legend and symbols (Source: Author)

RIFLE
Autom. Semiautom. Single shot

MACHINE GUN
Heavy Medium. Light

GRENADE LAUNCHER
Heavy Medium. Light

AT LAUNCHER
Heavy Multiple use. Single use

MORTAR
Heavy Medium. Light

AT ROCKET LAUNCHER
Heavy Medium. Light

Company Commander
Company Executive Officer
Company 1st Sergeant
Platoon Leader
Platoon Sergeant
Section Leader
Squad Leader (SQL)
Team Leader (TL)
2IC...second in command
Drone   UAV
Recoiless rifle   AT gun

HQ Headquarters element
⊠ Infantry unit
WPN Weapons unit

I Company
∅ Team
• Squad
• • Section
• • • Platoon

COY...company
PLT...platoon
SQ...squad
NCO....non-commissioned officer
LOG.....logistic specialist (NCO)
ADMIN...administration specialist
RTO...radio/telegraph operator
FDC...fire direction centre specialist
NBC...Nuclear, Biological, Chemical specialist
WPN...weapons specialist
runn...runner
wire...telephone cable specialist
kuh... cook
pkuh...cook assistant

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