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WILL ARTIFICIAL INTELLIGENCE (AI) REPLACE A HUMAN COMMANDER IN THE ARMY?

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ABSTRACT:

The question of whether artificial intelligence can develop without assistance is a common one, as AI's popularity continues to rise. Another relevant topic is whether artificial intelligence will replace human commanders in the army. While AI can optimize processes and perform tasks in dangerous situations, the human factor remains crucial for soldiers' effectiveness. Factors such as leadership, morality, initiative, creativity and endurance are essential for success and the motivation of commanders is responsibility for their soldiers. Additionally, the commander's influence on organizational culture makes them irreplaceable by AI in the military

KEYWORDS:

Artificial Intelligence, leadership, commander, human factor, leader

1. Introduction

There are many people in the world who are considered unofficial leaders by their immediate or further surroundings. This is influenced by their character traits, thanks to which they were not afraid to take command at times of more or less stressful moments. What if the world consisted only of people, who preferred to obey orders, perform only their duties, take no initiative and take no responsibility for their actions and decisions? We think we would probably still believe that the Earth is flat the sky an impassable space and outer space only imaginable in our dreams. This kind of thinking begs the questions, who is a "leader" and a "mastermind"? Attempts to define this expression go back many years. The main originator of this phenomenon was the army, which was one of the few organizations that paid attention to the concept of "leader" and "commander". Their goal was to streamline the military and maximize efficiency through the human factor. During Middle Ages, the ruler or nobility was automatically elected to command the army. This solution had two effects: natural leaders found their way and were characterized by advanced persuasion, while others never developed because they

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were killed by the prevailing rules and community. During the years of the world wars, the phenomenon of finding a natural leaders was appreciated in many situations on the battlefield, where soldiers were not afraid of command and especially of taking responsibility for another person. Of course, a person's attitude to being a leader can be developed, which is dealt with by schools starting from knight's schools to officer's colleges.

Nowadays there are many books, lectures, papers, articles and workshops on leadership. They focus mainly on the issue, definition and development of this phenomenon. However, it is far too rarely asked whether in the future the physical commander of the military will be replaced by artificial intelligence (AI)? If so, how? What role will it mean during the conduct of hostilities? How will it affect people? Will humans follow AI? How much will it make the command process worse or better? What are its capabilities and maximum effectiveness? How will it develop? Who will have the greatest impact on AI? And what role will the human factor play under the supervision of AI, which is one of the rules of the art of war? So will AI be the right successor to the commander? Or maybe will there be a fusion between the commander and the AI or AI and they will complement each other? Therefore, in this scientific publication we will consider whether AI able to replace the human commander in the military?

2. How to define AI?

We would compare the definition of artificial intelligence to the definition of leadership. Why? Both formulations are so broad and general that there are a lot of various definitions that only depend on the context. And what do the definitions of AI, leadership and water have in common? The fact, that they occur in one form, in every field, convention, way of life and in the performance of duties related to professional and scientific work. The next problem in defining AI is the fact that the word intelligence itself is a hard term to define. What was the main reason for starting scientific reflections on AI? The answer:

The dynamic development of a new field on science in the second half of the 20th century, more precisely computer science. As a result, people began to wonder how they could solve problems, complications, and obstacles faster, and also whether it was possible to simulate human thinking by different machines and systems. By asking such questions, many studies and experiments were carried out, such as the "Turing Test" (illustrated in Figure no. 1). It consisted of a written conversation of a physical person between a machine and a human, where the participant did not know who he was currently writing to. After the conversation, he had to decide which conversation was with a machine and which was with a human. If participant didn't indicate a specific and conscious answer, the machine was tested.

In this field of science, two main currents have emerged. Powerful artificial intelligence is focused on the study of the function and role of the human brain and is based on the analysis of neurons for the practical application of knowledge in thought process. The other trend is a poor artificial intelligence, which aims to *"achieve similar goals, but instead of drawing patterns from the human brain, turn to methods of formal acquisition and representation of knowledge, as well as building effective methods of heuristic searching of datasets"* (Ficoń, 2013). Nowadays, this field of science is so developed and constantly improving, that we currently use many definitions such as the following: "*Artificial intelligence is the (AI) ability of machines to exhibit human characteristics such as reasoning, learning, planning and creating*" (European Parliament, 2020)

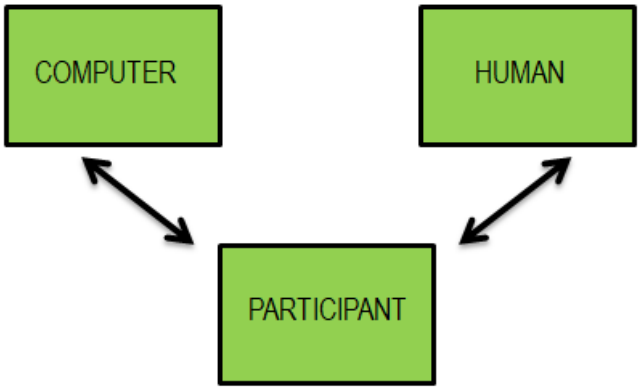


Figure no. 1: Scheme Test Turing
(Source: own interpretation after George & Gillis, 2023)

In the future, will AI reach such a level that it will be able to improve and continuously develop itself without human help?

2.1. Why has AI gained such popularity?

November 30, 2022, the date that caused drastic changes and made people aware of how powerful AI is. This is the date ChatGPT was created. ChatGPT is a chatbot created by OpenAI, which is used to generate answers to our questions. The rise in popularity has started people thinking about AI, which raises a lot of questions. What are its main advantages and disadvantages? What are the opportunities and threats? How does it play a role in the example of the war in Ukraine? Will it be the greatest enemy or friend of the future? How will it control our lives? Judging by such questions we can say that we are witnessing the Industrial Revolution 4.0, which can be compared to the invention of the Gutenberg printing press in 1450. The event of 1450 also had a significant impact on changes in living standards, for instance by reducing the cost of producing books.

Let us start from the beginning, how is AI used in the daily routine? Most people are unaware of how AI helps us with the easiest tasks of the day, such as:

- help with online shopping
- search for content on the internet
- help as voice assistants

These simple answers lead to the conclusion, that AI influences a major role in the context of security on various levels, including (Lasota-Kapczuk, 2021):

- in the military security zone;
- in the cultural security zone;
- in the economic security zone;
- in the health security zone;
- in the logistic security zone;
- in the information security zone.

After a brief analysis, the most important question is why is AI popular? The answer is simple. Increased efficiency and optimization of work. Artificial intelligence enables faster and more efficient decision-making. This allows companies and organizations to achieve greater efficiency and increase profits. The result of optimizing work and increasing productivity is time saved so that we can take care of other activities, but when AI takes more control of the daily routine, will we have to do anything?

The second important factor is the ability to have a large amount of data available. As technology advances, it has become possible to collect huge amounts of data. The AI is able to analyse this data and use it to make decisions. After these two reasons for the AI phenomenon, two key words can be deduced:

“ANALYSIS”
“DECISION: Does that sound like a threat to the importance of the commander's role in the command process?

3. What is the competence of the commander?

What is the most important duty of a superior to a subordinate? Awakening a sense of meaning in him. Therefore, it is worth quoting the words of Maya Angelous (Dziennik Myśli, 2023): *“People will forget what you said, people will forget what you did, but people will never forget how you made them feel”.*

What is the fundamental element in the phenomenon of meaning? Teamwork (in Figure no. 2) . According to M. Trocki (2014, p. 83), teamwork is *“a type of collective action in which the execution of specific, ordered sets of activities and operations is entrusted to a specific group of people. These are also activities that they perform as a team, and they have been commissioned individually for each of them”.*

But what exactly falls within the competence of the commander? The comparison of knowledge, skills and attitudes shows us certain human competences, which influence the effectiveness of thinking, the effectiveness of actions, responsibility for others and achieving high results in the tasks performed. T. Majewski (2006) presents the structure of leadership competencies and lists the following characteristics and skills:

- ability to creative vision of goals and joint action,
- taking the risk of changes and carrying out difficult tasks,
- ability to exert influence,
- ability to motivate,
- ability to extract the competences of subordinates,
- ability to build team,
- ability to resolve conflicts,
- ability to work with a team of subordinates,
- ability to choose driving style,
- ability to show enthusiasm,
- creativity,
- empathy and the ability to reconcile many needs and pressures.

Leadership competencies also include skills in:

- negotiations,
- coaching,
- motivating subordinates,
- communication,
- teamwork.

Would the above-mentioned skills, which fall within the competence of the commander, be able to be provided by the AI?

3.1. Where is the AI better than commander?

Comparing the advantages and disadvantages of AI with a human commander raises the following question, is the lack of human emotions such as joy, sadness, trust, disgust, fear, surprise and expectation a strength of AI? It depends on the context and the goal. Therefore, an unequivocal ‘yes’ or ‘no’ answer cannot be established. On the one hand, the lack of emotion by AI leads to objectivity. AI is able to make a decision only on the basis of an analysis of data and facts. This allows AI to perform tasks where everyday emotions are undesirable or may be misleading. On the other hand, AI may have problems recognizing meanings, gestures, context, traditions, rank, culture, or roles related to human emotions.

There are two situations where AI is definitely more efficient than a human commander. Firstly, it has the ability to examine a huge amount of data from various sources and materials in a relatively short time, which increases the effectiveness of decision-making or consideration of options for action immediately. Secondly, the AI is always ready. It can work 24 hours a day, 7 days a week, thanks to which the prospect of continuous observation and reaction to accidental events gives the opportunity of freedom and rest for soldiers.

4. Characteristics of AI during the conduct of warfare

As us described earlier, AI gives us a lot of opportunities and opens up new horizons. The translation of this is certainly the conduct of warfare, so perhaps in the future we will witness completely new rules of the art of war. And what exactly does AI offer us in a military context?

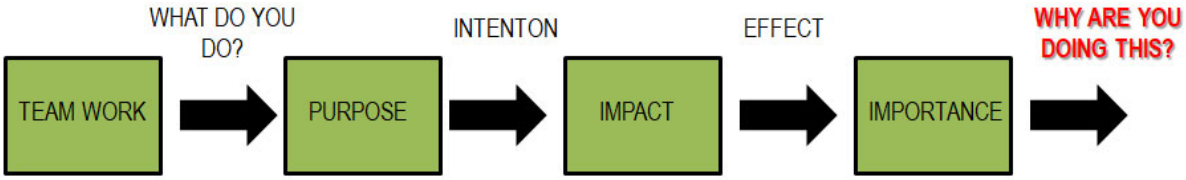


Figure no. 2: Scheme
(Source: own interpretation after Morgan, 2020)

Mainly optimization and automation of processes. And what is the most important principle of using AI in military operations? As the U.S. Department of State (2023) noted, "*The use of artificial intelligence in armed conflict must be consistent with applicable international humanitarian law, including its fundamental principles".* It is worth mentioning that the first use of AI in military operations took place during Operation "Desert Storm" during the First Gulf War. In a podcast for the chairman of the Joint Chiefs of Staff, Gen. Mark Milley, said: *"Character of war changes frequently. It change every time you have a new weapon and so on. But fundamentally, it only changes once in a while. Today we are going through the most significant and fundamental change in the character of war. And it's really, this time, driven by technology"* (Epstein, 2023). All these technologies are coming together at the same time, and they're all coming to fruition over the next 15 years, if not sooner. *At that time, a significant portion of the army, navy and air force will be robotic"* (Epstein, 2023). Through the war in Ukraine, we are witnessing how AI is being used and other armies of the world should learn as much as possible what modern war looks like.

The Air Force is one of several types of armed forces that leverage AI capabilities through systems (Wróblewska, 2016, p. 11):

- **ALG** (Autonomus Landing Guidance) – supporting the role of the pilot.
- **ALVINN** (Automatic Land Vehicle in Neural Network) – control of aircraft landings.
- **HUM** (Health Usage and Monitoring System) – control of the propulsion status of the helicopter.

It is worth mentioning here the importance of unmanned platforms (UP) in military operations. The experience gained from the wars in Afghanistan and Iraq has shown how crucial the role of the UP at the tactical, strategic and operational levels. IMINT (imagery intelligence) - image recognition - is a key aspect during visualization of acquired data and information. COP (Common Operational Picture) presents important military information, for instance location of own and enemy units, infrastructure objects that are linked to the map. In standard systems, objects are entered by a person. Such forms allow you to automatically add information to the map, thanks to the analysis of satellite images sent, for example, from unmanned aerial vehicles (UAVs).

Moreover, thanks to UAVs, we are able to receive information about the deployment of enemy units and their activities without the need to move and we are able to plan further actions, which is also confirmed by the war in Ukraine.

In addition, in engineering specialties it is possible to identify explosives and detect them on roads, buildings and vehicles. Conducting military activities in urban areas is a very important element in conducting various operations, so appropriate equipment and technique is necessary, for instance (Wrzosek, 2018):

- **SUBOT** (Small Unit Robot),
- **VIP** (Versatile Intelligent Portable Robot),
- **MARV** (Miniature Autonomous Robotic Vehicle).

As the events in Ukraine show, UAV, which are partly supported by the AI have a key role. In addition, it is worth noting that the Israeli anti-aircraft system "Iron Dome" operates on the basis of the AI. How does AI help military logistics, which is an economical tool of warfare? The answer is to automate tasks and responsibilities, calculate transport costs, estimate weapons and machinery purchases, etc. Army AI is used in many areas, such as cybersecurity, military systems, logistics, reconnaissance, battlefield security and troop training through trainers, systems and simulators. To sum up, the most important task of the AI during military operations is the ability to function in situations when a soldier – a human being is threatened and feels in danger or does not have enough time to analyze the situation.

4.1. AI in the Operations Process

By combining points 2.1, 3.1 and 4 we can infer and compare the strength and capabilities of AI in the context of the command process. As AI-assisted systems have high performance and possess a large amount of data, and at the same time fast analysis, the AI has and will have a specific role in the planning phase, which is the art of situational understanding. AI helps to develop the most effective and realistic options for action on the basis of the collected information, among other things:

- weather and terrain conditions,
- combat potential of the enemy,
- calculation of the time of conducting military operations,
- profits and losses,
- probable actions of the enemy,
- possibilities of maneuvers.

AI will be the future of the decision-making process.

5. How to pursue the continuous development of leadership?

Can people like Jeff Bezos, Elon Musk, Lebron James, Bill Gates be called "leaders"? According to "Encyklopedia Zarządzania" (2020) leadership is *"the ability to influence an individual or group to achieve specific effects".* According to this definition, all the above-mentioned persons can be regarded to a greater or lesser extent as leaders. They fulfill the same role – they lead others.

If the expression "leadership" is no stranger to anyone in the world, how can we strive for continuous development? Building awareness among commanders is constantly changing. Technological, economic, cultural, and social trends change every day, week, month, and year. Historically, leadership was once based on iron and unchanging principles, but today leaders are required to be imaginative and open. Adaptation to changing conditions and flexibility will be key skills for the leaders of the future. To strive for continuous leadership development, leaders of the first decade of the 21st century must teach new leaders, that pragmatism is as important as adaptability and flexibility and values guide us towards leadership. The bottom line is that if we don't learn from failure, if we always assume that everything goes according to plan, then sooner or later we are going to stumble (Figure no. 3). Leaders must follow the idea that leadership will never be perfect, but it can be better.

5.1. The role of empathy and interpersonal interaction in decision making

Empathy. Interpersonal interaction. This is what AI is unable to provide in the

decision-making process and military life – the ability to recognize and empathize with other people's emotions. As we imentioned in the introduction, the human factor is one of the basic principles of the art of war. It is known that the human factor refers to the human subject and includes leadership, morality, initiative, creativity and endurance. This makes it one of the most important aspects affecting the effectiveness and efficiency of any system or process. It also refers to the influence of a person on decisions made and actions performed, which is why interpersonal interaction is very important.

20th-century leaders	21st-century leaders
Operated to the letter of the law	Operate to the spirit of the law
Won at any price	Win fairly
Managed in the interests of a few	Manage in the interests of the many
Applied more logic	Apply more imagination
Maximized strategy	Maximize culture

Figure no. 3: 20th -century leaders vs 21st-century leaders
(Source: own interpretation after Lewis & Malmgren, 2019)

What does a subordinate expect from a superior? Empathy. So how does that ability translate into relationships between people? It translates into the effectiveness of teamwork. It goes without saying that the better the working atmosphere, the better the trust, cooperation, and respect. And what is affected by trust, cooperation, and respect? Organisational Culture. According to B. Nogalski (1998, p. 105) organizational culture is *"social norms and value systems that stimulate employees, the right organizational climate, management style, shared meanings and symbols, cognitive patterns, behavioural requirements"*. Why is organizational culture important in the military? It influences the engagement of soldiers through shared traditions, values, goals and principles. E. Schein highlighted three levels of organizational culture (Figure no. 4).

In the military, many artifacts are related to the tradition and history of a given military unit, including:

- symbols, for instance emblem, flags, banners;
- ceremonies;
- commemorative badges and medals;
- uniforms.

Referring to values in the military context, soldiers are guided by patriotism, loyalty, respect, courage, obedience, and honor. On the other hand, in terms of military norms, hierarchy must be maintained, and various regulations, doctrines and regulations followed. Briefly describing the basic assumptions, the most important is the continuity of performance of tasks. Summing up, in the context of organizational culture, the commander will have more influence on the soldiers than the AI.

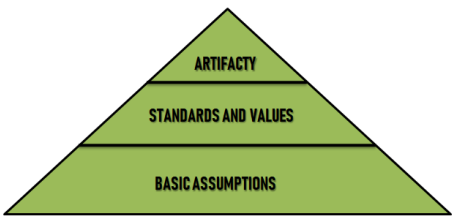


Figure no. 4: Scheme Organisational Culture – E.Schein
(Source: own interpretation after Kopczewski, Pączek & Tobolski, 2012, p. 931)

5.2. Why AI cannot replace the human commander?

For most commanders, what is the motivation for continuous action and development? Responsibility for your soldiers. This aspect is crucial in building a subordinate's awareness of how important the role of the commander is. The subordinate knows that he can trust the commander and is able to help him in any situation, for instance on the basis of his life experiences. Secondly, the modern commander should be able to provide such competencies and skills as were presented in point 3, by which trust and cooperation on the line of superior-subordinate is greater. In short, the subordinate expects from the superior the appropriate interest and sense of importance, for instance in the decision-making process, and the superior expects the subordinate to support and invest in their decision. It is a moral obligation by which the human commander was, is, and will be irreplaceable by the AI.

6. Conclusions

In this article, we described a topic that is very popular nowadays. What is the reason for such an increase in the popularity of AI? The fact that it has never been so developed, so it raises many questions in the mind. In the military context, every soldier knows the key role of responsible leadership and what it entails. We have described the use, impact, opportunities, and threats of AI. Also, a very important aspect is the human dimension of the army commander In summary, AI is not able to replace the commander, only to relieve them of certain phases, stages, and activities of the command process. On the other hand, AI has and will have a large impact on the conduct of various military operations through different command systems, means, and machines. But what will it look like in 30/40 years, no one knows, just as how the leadership of 2023 will differ from the leadership of 2053/2063.

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