Using Artificial Intelligence in Military Planning (Examples of GIS Software and Its Role in Military Mapping for Some Global Armies)

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Abstract

The use of Artificial Intelligence (AI) in military applications has become a prominent subject with the emergence of new methods for employing its techniques. These technologies can improve the performance of many military operations, enhance productivity and efficiency, and reduce the need for human inputs. Therefore, armies should adapt this technology according to their needs, since military dominance is no longer dependent on the size of the army but rather on the possession of effective technological tools in the military domain. Artificial Intelligence plays an increasing role in military planning and has become an essential tool in the military mapping of armies. This study highlights the uses of Artificial Intelligence in military planning and presents examples of how some global armies apply these uses within their military maps.

Keywords: *Artificial Intelligence, Military Planning, Military Mapping.*

Introduction

The world today is experiencing a new era of tremendous and accelerating technological progress. Artificial Intelligence (AI) stands out as one of the most important emerging technological applications intertwined with various sectors of society. AI is a product of the significant advancement of productive forces in the information age, and it also serves as a major driving force behind the Fourth Industrial Revolution, fostering human development and comprehensive societal progress.

The military domain, like others, is part of this evolution. Today, the tools supporting military readiness are largely dependent on the adoption and implementation of advanced technological instruments. These range from AI and robotics to Geographic Information Systems (GIS) and other key technologies expected to enhance the military capabilities of nations worldwide.

These innovative technologies represent a qualitative leap, reshaping the hierarchy of global powers and driving major transformations in security and military affairs. In light of this vast transformation, traditional military assets have evolved into data platforms for capturing, creating, and utilizing massive amounts of information.

Within this context, the rapid growth of information technology has led to increased adoption of GIS in the militaries of advanced nations. Planning military operations is a primary responsibility of military leadership. The growing complexity of today's operational environment requires a new approach to situational understanding and the creation of feasible plans that factor in countless variables.

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AI applications, particularly GIS, can facilitate the planning and execution of military missions by enabling analysis of terrain through slope maps, mobility maps, concealment maps, and more. Leveraging existing AI capabilities is key to successfully integrating these modern technologies into operational planning. Military planning must become faster and more comprehensive—a goal achievable through the incorporation of advanced AI solutions in the near future.

Research Problem

The increasing reliance on Artificial Intelligence in military planning has become an urgent necessity, especially in light of the challenges modern armies face and the technological developments unfolding in various military fields. As a result, GIS has become an essential tool in military work, particularly in operations that rely heavily on spatial data and the integration of information from multiple sources to support decision-making.

The problem that this research seeks to address can be framed in the following question:

"What is the role of Artificial Intelligence, particularly Geographic Information Systems (GIS), in supporting military planning and implementation in modern armies?"

Research Objectives

This study aims to:

1. **Clarify the concept of Artificial Intelligence and its applications in the military field.**

2. **Define the concept of Geographic Information Systems and their use in military operations.**

3. **Demonstrate the role of GIS software in modern military planning.**

4. **Present examples of how GIS software is used in military planning by some advanced global armies.**

Research Significance

The significance of this research lies in the increasing role of Artificial Intelligence in military fields, particularly Geographic Information Systems (GIS), which have become indispensable tools in modern military planning and execution. These technologies enhance the ability of military leadership to analyze data, simulate scenarios, and make sound strategic decisions in a timely manner. By shedding light on the applications of GIS software in military operations, this research contributes to enriching the academic and applied understanding of the intersection between Artificial Intelligence and military planning.

Research Methodology

This research adopts the descriptive-analytical method, which is based on collecting data and information from previous studies, official military and technical reports, and specialized books and articles related to Artificial Intelligence and Geographic Information Systems. The study analyzes this information to demonstrate how GIS technologies are used in military planning, supported by practical examples from advanced armies that have successfully integrated these tools into their military strategies.

Research Scope

This research is limited to examining the role of Geographic Information Systems (GIS) software in military planning through the lens of Artificial Intelligence applications. The study focuses on selected international armies known for their advancement in employing these technologies, such as the American, Russian, and Chinese armies. The research is also temporally bounded by the developments and literature published between the years **2015 and 2024**, allowing for the analysis of the most recent and relevant applications and trends.

Research Structure

The study is structured into an introduction and **three main sections**, followed by the conclusion and references:

1.   **First Section**: Artificial Intelligence and its military applications – this section discusses the concept of AI, its development, and its general uses in military contexts.

2.   **Second Section**: Geographic Information Systems and their military importance – this section explains GIS, its components, and its strategic importance in military planning.

3.   **Third Section**: Practical examples of using GIS software in military planning – this section presents real-world examples from selected armies, highlighting how GIS is employed in planning, decision-making, and battlefield management.

Artificial Intelligence and Its Military Applications

Artificial Intelligence is one of the most prominent modern technologies influencing various fields, including the military. AI enables machines and systems to perform tasks that typically require human intelligence, such as analysis, decision-making, and prediction. In the military sphere, AI applications have expanded to include autonomous weapons, threat detection, logistics management, and data analysis. The importance of AI lies in its ability to accelerate decision-making processes and increase precision while reducing human errors. Leading armies around the world invest heavily in developing AI-driven systems to maintain superiority and enhance operational efficiency.

Second Section: Geographic Information Systems and Their Military Importance

Geographic Information Systems (GIS) are tools used to collect, store, analyze, and visualize spatial and geographic data. In the military domain, GIS is crucial for mapping, terrain analysis, logistics, surveillance, and planning military operations. These systems provide commanders with detailed and real-time geographic data that support effective decision-making in dynamic environments. GIS software also allows for simulation of combat scenarios, route optimization, and threat assessment. The integration of GIS with AI significantly enhances predictive capabilities and situational awareness on the battlefield.

Third Section: Practical Examples of Using GIS Software in Military Planning

Several global armies have adopted GIS software enhanced by Artificial Intelligence to support strategic and tactical operations. For instance:

•   **The United States Army** uses AI-integrated GIS systems for real-time mapping of combat zones, target tracking, and predictive logistics planning.

•   **The Russian Army** relies on GIS for missile targeting, troop movement coordination,

and analysis of terrain to plan defense strategies.

- **The Chinese People's Liberation Army** utilizes AI-driven GIS platforms for border surveillance, naval route planning, and monitoring of military installations.

These examples demonstrate the significant role that GIS software—when combined with AI—plays in enhancing the precision, speed, and effectiveness of military planning in modern warfare.

Conclusion

Artificial Intelligence and Geographic Information Systems represent a qualitative leap in modern military planning. The integration of these technologies allows military forces to analyze data more efficiently, improve situational awareness, and make more accurate and faster decisions. The global reliance on AI-enhanced GIS software reflects the growing need to adapt to modern warfare requirements and digital transformation. As technology continues to evolve, it is expected that these systems will play an even greater role in strategic and tactical military planning, thus enhancing combat readiness and operational effectiveness.

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