



SAVSAD

Savunma ve Savaş Araştırmaları Dergisi
The Journal of Defence and War Studies

A New Era in Defense Planning Approaches: Digital Transformation Era

Savunma Planlama Yaklaşımlarında Yeni Bir Dönem: Dijital Dönüşüm Çağı

Merve ASİLOĞULLARI AYAN

National Defence University, Alpaslan Defence Sciences and National Security Institute, Defence Management Department, Ankara, Türkiye.

Millî Savunma Üniversitesi, Alpaslan Savunma Bilimleri ve Millî Güvenlik Enstitüsü, Savunma Yönetimi Bölümü, Ankara, Türkiye.

Serhat ÇAKIR

Başkent University, Faculty of Economics and Administrative Sciences, Department of Technology and Knowledge Management, Ankara, Türkiye.

Başkent Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, Teknoloji ve Bilgi Yönetimi Bölümü, Ankara, Türkiye.

Geliş Tarihi/Received 12.04.2023
Kabul Tarihi/Accepted 12.01.2024
Yayın Tarihi/Publication Date 28.06.2024

Sorumlu Yazar/Corresponding author:
Merve Asiloğulları Ayan
E-mail: masilogullari@khs.msu.edu.tr

Cite this article: Ayan, M. A., & Çakır, S. (2024). A new era in defense planning approaches: digital transformation era. *Savunma ve Savaş Araştırmaları Dergisi*, 34(1), 169-177.

Atıf: Ayan, M. A., & Çakır, S. (2024). Savunma planlama yaklaşımlarında yeni bir dönem: dijital dönüşüm çağı. *Savunma ve Savaş Araştırmaları Dergisi*, 34(1), 169-177.



Content of this journal is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

ABSTRACT

The primary environmental elements that countries encounter shape and change defense planning. Each planning phase is honored with the primary element needed to implement the change. Because of this, the period of polarization and nuclear threat is named the Threat-Based Planning Approach. Similar to this, emphasis was placed on the Capability-Based Planning Approach and the Scenario-Based Planning Approach in order to foresee the growing uncertainties following 9/11 due to the increasing relevance of talent after the Cold War. With the idea of "Industry 4.0," the world has undergone a rapid transformation, and the idea of "digital transformation" has gained fundamental interest from people, businesses, and nations alike. With this idea, planning and development started to take shape. As a result, this circumstance also has an impact on defense planning strategies. The article's major point is, rather than bringing about minor adjustments, to highlight how digital transformation, which has a transformative effect, starts a fundamental transition in military planning methodologies and introduces a new perspective on planning.

Keywords: Defense planning, digital transformation, industry 4.0., paradigm shift.

JEL Codes: O3, H56, F52

ÖZ

Savunma planlamalarında meydana gelen değişimler ülkelerin deneyimlediği ana çevresel faktörler etrafında şekillenmekte ve değişmektedir. Her planlama dönemi, değişimin gerektirdiği ana faktörle beraber anılmaktadır. Bu nedendir ki nükleer bir tehdidin var olduğu, kutuplaşmaların olduğu dönem Tehdide Dayalı Planlama Yaklaşımı olarak adlandırılmıştır. Benzer şekilde Soğuk Savaş sonrası yeteneğin önem kazanmasıyla beraber Yetenek Temelli Planlama Yaklaşımı ve 11 Eylül Sonrası artan belirsizlikleri öngörebilmek için ise Konseptte Dayalı Planlama Yaklaşımına önem verilmiştir. Endüstri 4.0 kavramıyla beraber dünya hızlı bir değişim içine girmiş ve dijital dönüşüm kavramı hem bireyler hem şirketler hem de ülkeler için temel bir ilgi alanı haline gelmiştir. Planlamalar ve geliştirmeler bu kavram üzerinden şekillenmeye başlamıştır. Dolayısıyla savunma planlama yaklaşımları da bu durumdan etkilenmektedir. Dönüştürücü bir etkisi olan dijital dönüşümün küçük değişikliklerden ziyade savunma planlama yaklaşımlarında köklü bir dönüşüm başlatarak yeni bir planlama anlayışını beraberinde getirdiğine dikkat çekmek makalenin ana fikrini oluşturmaktadır. Makalenin ulaştığı sonuca göre dijital dönüşümün getirdiği derin öğrenme, insansız araçlar, makine öğrenimi kavramları savunma konusunda en çok kullanılan kelime grupları arasına girmiştir. Ayrıca başta uluslararası ilişkilerle ilgili kavramlar olmak üzere siyasi zorluklar geliştirilen kelime gruplamaları arasındadır.

Anahtar Kelimeler: Savunma planlaması, dijital dönüşüm, endüstri 4.0., paradigma kayması.

JEL Kodları: O3, H56, F52

Introduction

Even though few Western defense and military leaders could have foreseen it at the time, defense planning was relatively clear during the Cold War (Young, 2021). Defense management is centered on the idea of security. However, it is challenging to define the idea of security, which is crucial for managing the defense, set its limits, or decide the amount that is required. Today, the idea of security is ambiguous, as it has been defined by different disciplines. The definitions established in the context of domestic and international relations and those made by psychologists who approach the topic from the standpoint of personal safety contribute to the concept's confusion. For this reason, strategists needed defense planning to meet the need for security.

The two main categories of defense planning techniques are scenario-based and threat-based. Both definitions were supported by a distinct threat that could be quantified. Also, most nations had

defense budgets that were more or less stable. Builder and Dewar (1994) suggested that these circumstances had lulled defense planners into complacency and that they should get back to the task of “planning” quickly after the fall of the Berlin Wall (Builder & Dewar, 1994).

“Outline”, “conceive”, and “prepare” are all verbs that imply rigid assumptions about potential future events. Early planning by strategists focused only on the imminent threat. Therefore, the idea of producing scenarios about uncertain futures was in the background. Defense planning is frequently connected with the modernization and westernization of the armed forces. Defense planning as “defendology” is obsessive adherence to the de facto ideology of war preparedness (Nelson, 2002:101). However, the central question in early 21st-century military planning is whether there is a defense strategy in this era or not. Scenarios have been developed to find answers to these questions.

A scenario’s function is to offer a standard analytical framework to assist in decision-making that is consistent with existing government policy. To properly benchmark and/or compare often-dissimilar objects, they are a cost-effective instrument for analyzing the armed forces that provides standards and uniformity across the military enterprise. The analysis performed to guide senior leader discussions and studies on issues related to strategy, policy, and acquisition is supported by scenarios. They conduct research on force effectiveness and sufficiency to see how well the present force can carry out the defensive plan. They assist in the study of risk, alternatives, and force development plans (Neill et al., 2017).

Old beliefs about defense preparation also fell apart when terrorists attacked the World Trade Center, killing over 3,000 people. The United States' defense units were not intended to shield an American city from a civilian U.S. airplane that took off from a domestic airport, as Secretary of Defense Donald Rumsfeld pointed out. He may have accurately stated that they didn’t have any particular plan for the unexpected attack (Jones & McCaffery, 2005).

Defense Secretary Donald Rumsfeld declared that moving forward, capabilities-based planning would be used by the Department of Defense to direct the growth of the armed forces in the 2001 Quadrennial Defense Review. Many allied nations adopted the concept as it gained popularity. The method's successful implementation has, however, been hampered by several factors, including a lack of a common lexicon, confusion about the extent to which “threats” are used in many defense organizations, disregard for policy priorities, onerous institutional analytical requirements, and a failure to acknowledge the significance that money must have in any planning system (Young, 2021).

Understandings of defense strategy have evolved historically in tandem with changing realities. This transformation process can be examined within the framework of the periods stated in Table 1.

Table 1

Defense Planning Periods

Cold War Era (1945-1989)	Threat Based Planning
Post-Cold War (1989-2001)	Capability-Based Planning
After September 11, 2001 (2001-...)	Scenario-Based/ Task-Based/Purpose-Based Planning

As seen in Table 1, the world underwent a somewhat protracted cold war era after the Second World War, lasting from 1945 to 1989. Defense planning during this time was mostly based on Threat Based Planning (TBP). The main objective during this time was to act as a deterrent. The only way to accomplish this goal was to have a military force that was numerically and/or qualitatively superior to the threat. It was concluded that the West's deterrent tactics against the East's numerical dominance (the Warsaw Pact led by the Soviet Union) relied on both qualitative superiority and nuclear power. This approach to global planning had a comparable impact on the regional or defensive balances between the two nations. Although the cold war has continued throughout the 1980s, public pressure to improve funding for the nation's welfare has started to rise. Due to this pressure, the resources allotted to defense budgets have unavoidably been revised. The idea of “net (actual) threat” has also become more prominent in military planning when deciding the amount of defense equipment to purchase. The goal of this strategy is to clearly modify the current structure in the direction of a very clearly defined future (Higgs, 2006).

Global defense has taken the place of regional defense planning, which was understood during the Cold War. Concepts like non-war operations (peacekeeping, peace support, etc.), human rights, humanitarian aid, and new tasks started to emerge during this time. Utilizing quickly evolving technology, capability-based planning enables skills to complete more tasks with smaller units. Although it is founded on static and threat-based understandings, it takes a logical planning approach to identify what the country will require in the future. Skill demands are defined as the discrepancy between the situation as it is and what is required. Capability-based planning strives to provide the competencies necessary to counteract contemporary risks and situations while taking financial limits into account. Paul Davis of RAND describes Capability-Based Planning (CBP) as a method for high-level planning in complicated organizations with ambiguous operating environments (Davis, 2002).

Therefore, this article aims to examine the reflections of digital transformation on defense planning by mentioning defense planning approaches. In order to achieve this aim, the published studies will be examined with the Vosviewer program.

The Age of Digital Transformation in the Defense Industry

The development of technology that has revolutionized our way of life has been greatly accelerated by the defense sector. Defense companies, on the other hand, postpone their Digital Transformation (DT) journeys mostly owing to data integrity and security worries and rely on older management techniques (Nebati, Ayvaz & Kusakci, 2023). However, digitization is a necessary step for every defense company looking to acquire a competitive edge, boost operational effectiveness, boost revenue, and foster creativity (Dombrowski & Gholz, 2006).

One can examine changes in military planning approaches by using the technologies carried out by the nations' defense industry. Defense doctrine revisions, technological developments, and the realization of competition with speed and time in every industry led to radical changes in how military supply systems operate. Defense planning undergoes a general transformation as a result of supply system adoption and adjustment.

Digital Transformation

Despite having a close relationship, the terms digitization and digitalization indicate distinct things. The process of switching from analog to digital form, also known as digital activation, is what Gartner defines as digitalization. In other words, it converts an analog process into a digital one without making any distinctions about the process itself. If it is digitalization, it is described as "the use of digital technologies to modify a company model and give new options for income and value creation." (Gartner, 2018).

Digital technologies have the potential to disrupt a company's business model, resulting in altered products, altered organizational structures, or altered processes through automation. The increasing demand for Internet-based media, which has caused changes to entire business structures, is a good indicator of these shifts (Vial, 2021).

The goal of the journey toward digital transformation is to capitalize on advantages offered by digital technologies, such as increased productivity, decreased costs, and innovation. For businesses to succeed in the future, a clear strategy for implementing and utilizing digital technology is essential (Hess et al., 2016).

By reorganizing business models, developing new products and services, and, in some cases, disrupting and reinventing entire value chains and industries, digital transformation initiatives aim to increase customer engagement, increase the flexibility and agility of standardized, centralized operational processes, and give organizations new strategic opportunities (Westerman & Bonnet, 2015). Businesses that want to use digital technology to gain a competitive edge must also make sure that their respective business models are compatible. According to Westerman, Bonnet, and McAfee (2014), there are five archetypes of business model reinvention fueled by digital technology: (i) reinventing the entire industry, as AirBnB did at the hotel industry; (ii) substituting products and services, as Tesla is doing with conventional oil-fueled cars; (iii) developing new digital businesses with the development of new products and services, as Nike+ did via iPod and iPhone connections; and (iv) reconfiguring value delivery models, as Walmart did with its business model.

Defense Industry and Digital Transformation

Since the seventeenth century, the emergence of the greatest discoveries in human history and the industrial revolutions that brought new technologies into the world have had an impact on people's quality of life through fostering economic growth, rising productivity, and enhancing welfare. Transformative technical advances that alter social norms and economic structures are what inspire industrial revolutions. Although some of the adjustments have resulted in anticipated outcomes, there has always been the possibility of undesirable outcomes too (Xu, Lu, Vogel-Heuser, Wang, 2021; Burhan & Cakir, 2021). Industry digitalization is the outcome of a protracted industry evolution in the USA and Germany, and it was coined around the same time. The idea of a digital revolution seems to be on governments' radar screens in many nations (Yang and Gu, 2021).

The term "defense industry" refers to businesses that develop, produce, and market military hardware, including ships, planes, missiles, and communication systems, for governments and other armed forces. The sector's products are critical to maintain military preparedness and capabilities and play a significant role in national security and defense.

On the other side, digital transformation describes the integration of digital technology into every aspect of business or organization, leading to fundamental adjustments in how it functions and provides value for customers. The use of technologies like artificial intelligence, cloud computing, big data analytics, and the Internet of Things (IoT) to boost productivity, efficiency, and consumer experiences is known as digital transformation.

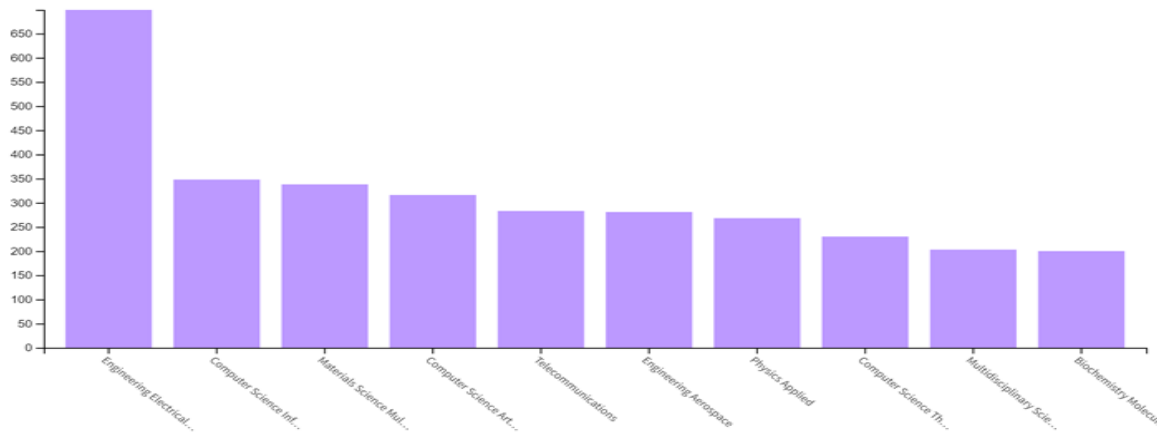
For several years, the defense sector has been going through a digital transition that is being fueled by technological advancements and the need to keep up with changing of military threats. The defense sector has been significantly impacted by digital transformation in several areas, including:

- a. **Improved Operational Efficiency:** By automating procedures and integrating data throughout the supply chain, digital transformation has enabled the defense industry to improve operational efficiency. Costs have gone down, productivity has gone up, and decision-making has improved as a result (Lee and Park, 2020).

- b. **Increased Productivity and Agility:** Because of digital transformation, the military sector is now more sensitive to shifting consumer demands and market dynamics. By streamlining procedures, lowering waste, and enhancing teamwork, it has also increased productivity (Savastano et al, 2018).
- c. **Improved Cybersecurity:** By incorporating cutting-edge security technology and protocols, digital transformation has assisted the defense industry in improving its cybersecurity posture. As military systems and apparatus become more interconnected and dependent on digital technologies, this has assumed increasing importance (Teoh & Mahmood, 2017).
- d. **More Sophisticated Products:** Due to the digital transformation, the defense sector has been able to produce more sophisticated and modern military hardware, including autonomous vehicles, unmanned aerial vehicles (UAVs), and improved communication systems. To keep the military ready and stay one step ahead of potential threats, these products are essential (Hess, Matt, Benlian, & Wiesböck, 2016).

Figure 1

Top 10 Most Published Topics By Keywords According To Web Of Science Categories



The distribution of the most popular technological topics in the military industry is depicted in Figure 1. In this manner, most of the publications were in the field of electrical electronics. Another topic that is most widely published is computer science. Computer science, which forms the infrastructure of industry 4.0 and becomes popular, emerges as a subsidiary topic. Materials sciences, in which research on defense procurement, logistics, and infrastructure, is among the most widely published topics. Popular publications are followed by topics such as telecommunications, aerospace engineering, and physics.

As can be seen, digital transformation and the changes that come with it have a wide impact on the defense industry as well as other industries. In the next section, the method is given in order to examine and research in which areas the studies are most concentrated.

Methodology

To determine technology trends in defense planning, a bibliometric analysis was carried out utilizing the Web of Science (WoS) Core Collection database. It includes the whole current scientific literature available in the WoS database as of 2010. We make use of a comprehensive citation network, all cited references, and completely indexed and searchable publications. Conventionally, such a database has served as the primary resource for scientific evaluation (Gaviria-Marin et al. 2018). Bibliometric analysis provided a general overview of a specific area of study (Hood & Wilson, 2001).

In addition to recognizing quantitative and qualitative changes in scientific research, bibliometric approaches help us identify structural elements and trends in a given field of study and is a method used in scientific studies (Rey-Martí, Ribeiro-Soriano and Palacios-Marqués, 2016; Besticigölu and Ayan, 2022). An investigation of the impact of post-industry 4.0 technologies on defense strategy has been done for this reason. The title, synopsis, and keywords all combine the terms “military planning” and/or “defense planning” with “technology” and “technology trends”. When the topic became popular and publishing activity surged in 2010, the time frame for this analysis began and lasted until 2023. These criteria were met by 7,805 scholarly studies in total. Studies included in the analysis are journal articles, conference proceedings, books, and book chapters.

By using the VOSViewer program, devised and developed by Van Eck and Waltman, a cluster analysis was carried out to examine the relationships between objects based on the number of documents (Van Eck & Waltman, 2017). The visualizations, which demonstrate the proximity of the link between the items, are represented by a network of elements, where the size of the circles varies depending on the importance of the keywords in terms of the number of linkages and their link strength. Items are grouped together using the circles’ colors and positioning. In order to identify research fields that are now being developed and future research trends that may emerge in the upcoming years, an evaluation based on these data was then conducted.

Conclusion and Suggestions

In order to highlight the most popular technologies employed by practitioners and subject matter experts between 2010 and 2023 in the academic literature, the major findings of the bibliometric analysis conducted on records discovered in WoS are presented in this section. It offers defense industry insights that have an impact on defense planning. In February 2023, the search procedure was completed, and the analysis of the top 500 documents was chosen.

Table 2

Number of Publication

Years	Number of Publications	Years	Number of Publications
2010	247	2017	664
2011	307	2018	794
2012	361	2019	867
2013	368	2020	902
2014	432	2021	902
2015	520	2022	815
2016	573	2023 Feb.	76

When the number of publications is examined over the years, it can be observed that there has been a rapid increase in the number of publications within a very short period of time. This can be attributed to the growing popularity of digital transformation topics, and the defense sector's increasing interest in this area. Digital transformation and its subtopics are becoming increasingly popular day by day.

Figure 2

Distribution of Publications on Defense Technologies by Years

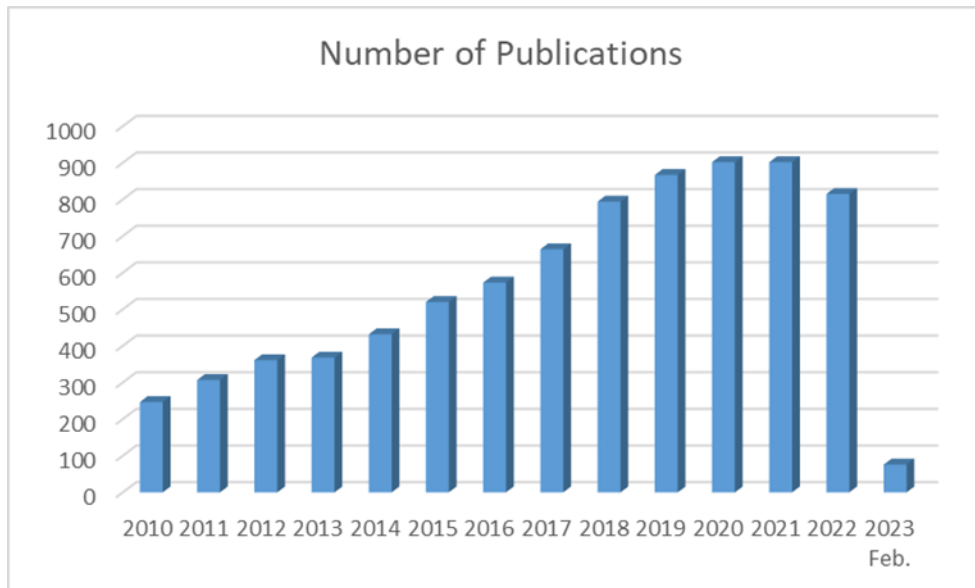


Figure 2 was created in order to determine the distribution between the number of publications by years and the trend formed.

Items are by default displayed in the network visualization as a circle in addition to their labels. The weight of an item affects both the size of the tag and the circle. The label and circle of an item get larger the heavier it is. The label may not be visible for some items. To prevent label overlap, this is done. The cluster to which an item belongs determines the hue of the object. Elements connected by lines are said to be connected. The 1000 strongest linkages between items are shown as up to 1000 rows by default. The visualization's biggest circles display the terms that are used the most. It is used with that word, as seen by the lines. The size of the circles and the thickness of the connecting lines both give suggestions as to how frequently they are used. If the lines are bold and the circles are large, it means that this item is referenced more often.

Clusters were created according to the most repeated keywords by determining the most appropriate threshold value.

As seen in the word cloud in Figure 2, the word groups formed include both deep learning brought about by digital transformation, unmanned vehicles, machine learning, and political issues, including international relations. In addition, it is seen that there is a focus on risk-related, uncertainty-related and health-related issues.

Conclusion

In conclusion, the defense industry and digital transformation are intertwined, and digital transformation has had a tremendous impact on the sector, allowing it to generate more cutting-edge goods while also improving operational efficiency, productivity, agility, and cybersecurity.

The digital transformation has had a significant impact on military planning and operations. The integration of digital technologies such as artificial intelligence, big data analytics, and cloud computing has enabled the military to improve its situational awareness, decision-making processes, and operational efficiency. The use of digital tools has also facilitated remote operations and increased the precision and accuracy of military engagements. Moreover, the digital transformation of the military has enabled the development of new capabilities such as cyber warfare and unmanned systems. These technologies have expanded the range of military operations and provided new options for mission planning and execution. However, the digital transformation of the military has also raised concerns about cybersecurity and the potential for malicious actors to exploit vulnerabilities in digital systems. As a result, military planners must balance the benefits of digital transformation with the need to ensure the security and integrity of their operations.

The defense planning paradigm has undergone significant changes over the past few decades, driven by technological advancements and changing geopolitical environments (Desticioğlu, & Ayan, 2022). However, it is possible that the defense planning paradigm is entering a new era. One potential driver of this change is the increasing use of artificial intelligence (AI) and autonomous systems in defense. These technologies have the potential to transform the way defense operations are planned and executed. For example, AI algorithms can be used to analyze vast amounts of data and provide insights that can inform strategic decision-making. Another potential driver of change is the shift towards multi-domain operations (MDO). MDO refers to the integration of all domains of warfare (land, sea, air, space, and cyberspace) to achieve strategic objectives. This approach requires a new way of thinking about defense planning as well as new technologies and capabilities to enable effective multi-domain operations. These trends are likely to drive changes in defense strategies and force structures, as well as new investments in emerging technologies. Overall, it is possible that the defense planning paradigm is entering a new era, driven by technological advancements, changing geopolitical environments, and new approaches to multi-domain operations.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept-M.A.A., S.Ç.; Design-M.A.A., S.Ç.; Supervision-M.A.A., S.Ç.; Resources-M.A.A., S.Ç.; Materials-M.A.A., S.Ç.; Data Collection and/or Processing-M.A.A., S.Ç.; Analysis and/or Interpretation-M.A.A., S.Ç.; Literature Search-M.A.A., S.Ç.; Writing Manuscript-M.A.A., S.Ç.; Critical Review-M.A.A., S.Ç.;

Declaration of Interest: The authors have no conflicts of interest to declare.

Funding: The authors declared that this study has received no financial support.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir-M.A.A., S.Ç.; Tasarım-M.A.A., S.Ç.; Denetleme-M.A.A., S.Ç.; Kaynaklar-M.A.A., S.Ç.; Malzemeler-M.A.A., S.Ç.; Veri Toplanması ve/veya İşlemesi-M.A.A., S.Ç.; Analiz ve/veya Yorum-M.A.A., S.Ç.; Literatür Taraması- M.A.A., S.Ç.; Yazıyı Yazan- M.A.A., S.Ç.; Eleştirel İnceleme- M.A.A., S.Ç.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

References

- Asiloğulları, M. A., & Çakır S. (2022). Teknoloji öngörüsü. *Teknoloji yönetimi geleceği yönetmede teknolojinin rolü* (s. 331-361). *Arkadaş Yayınevi*.
- Builder, C. H., & Dewar, J. A. (1994). A time for planning? If not now, when? *The US Army War College Quarterly: Parameters*, 24(1), 22.
- Burhan, M., & Cakir, S. (2021). Impact assessment of vision 2023 defense technology foresight. *Foresight*, 23(3), 367-383.

- Davis, P. K. (2002). *Analytic architecture for capabilities-based planning, mission-system analysis, and transformation*. RAND National Defense Research Inst. USA.
- Desticioğlu, B., & Ayan, M. A. (2022). Savunma tedarik konusunda yapılan çalışmaların bibliyometrik analizi. *SAVSAD Savunma ve Savaş Araştırmaları Dergisi*, 32(1), 159-196.
- Dombrowski, P., & Gholz, E. (2006). *Buying military transformation: Technological innovation and the defense industry*. Columbia University Press.
- Gartner, I. T. (2018). Digitalization. In *Gartner.com dictionary*. Retrieved February 11, 2016, from <http://www.gartner.com/it-glossary/digitalization>
- Gaviria-Marin, M., Merigo, J. M., & Popa, S. (2018). Twenty years of the journal of knowledge management: A bibliometric analysis. *Journal of Knowledge Management*. Emerald Publishing.
- Hess, T., Matt, C., Benlian, A., & Wiesböck, F. (2016). Options for formulating a digital transformation strategy. *MIS Quarterly Executive*, 15(2).
- Higgs, R. (2006). *Depression, war, and cold war: Studies in political economy*. Oxford University Press.
Retrieved from <https://www.webofscience.com/wos/woscc/summary/34f7d32a-fcae-4586-a822-e95510bc9d00-76bea606/relevance/1>
- Hood, W., & Wilson, C. (2001). The literature of bibliometrics, scientometrics, and informetrics. *Scientometrics*, 52(2), 291-314.
- Jones, L. R., & McCaffery, J. L. (2005). Reform of the planning, programming, budgeting system, and management control in the US Department of Defense: Insights from budget theory. *Public Budgeting & Finance*, 25(3), 1-19.
- Lee, J. G., & Park, M. J. (2020). Evaluation of technological competence and operations efficiency in the defense industry: The strategic planning of South Korea. *Evaluation and Program Planning*, 79, 101775.
- Nebati, E. E., Ayvaz, B., & Kusakci, A. O. (2023). Digital transformation in the defense industry: A maturity model combining SF-AHP and SF-TODIM approaches. *Applied Soft Computing*, 132, 109896.
- Neill, M., Taliaferro, A. C., Tillman, M. E., Morgan, G. D., & Hinkle, W. P. (2017). Defense policy and strategy. In *Defense Governance and Management: Improving the Defense Management Capabilities of Foreign Defense Institutions* (pp.1–22). Institute for Defense Analyses. <http://www.jstor.org/stable/resrep22899.4>
- Nelson, D. N. (2002). Beyond defense planning. *Connections*, 1(2), 101-112.
- Rey-Martí, A., Ribeiro-Soriano, D., & Palacios-Marqués, D. (2016). A bibliometric analysis of social entrepreneurship. *Journal of Business Research*, 69(5), 1651-1655.
- Savastano, M., Amendola, C., & D'Ascenzo, F. (2018). How digital transformation is reshaping the manufacturing industry value chain: The new digital manufacturing ecosystem applied to a case study from the food industry. In *Network, smart and open: Three keywords for information systems innovation* (pp. 127-142). Springer International Publishing.
- Teoh, C. S., & Mahmood, A. K. (2017, July). National cyber security strategies for digital economy. *2017 International Conference on Research and Innovation in Information Systems (Vol. ICRIS, pp. 1-6)*. IEEE.
- Van Eck, N. J., & Waltman, L. (2017). Citation-based clustering of publications using CitNetExplorer and VOSviewer. *Scientometrics*, 111(2), 1053-1070.
- Vial, G. (2021). Understanding digital transformation: A review and a research agenda. *Managing Digital Transformation*, 13-66.
- Yang, F., & Gu, S. (2021). Industry 4.0, a revolution that requires technology and national strategies. *Complex & Intelligent Systems*, 7, 1311-1325.
- Young, T. D. (2021). Capabilities-based “confusion”: Why capabilities-based planning systems struggle. *The Korean Journal of Defense Analysis*, 33(1), 95-118.
- Xu, X., Lu, Y., Vogel-Heuser, B., & Wang, L. (2021). Industry 4.0 and industry 5.0—inception, conception and perception. *Journal of Manufacturing Systems*, 61, 530-535.
- Westerman, G., & Bonnet, D. (2015). Revamping your business through digital transformation. *MIT Sloan management review*, 56(3), 10.
- Westerman, G., Bonnet, D., & McAfee, A. (2014). *Leading digital: Turning technology into business transformation*. Harvard Business Press.

Genişletilmiş Özet

Giriş

On yedinci yüzyıldan bu yana insanlık tarihinin en büyük keşiflerinin ortaya çıkışı ve dünyaya yeni teknolojileri getiren sanayi devrimleri, ekonomik büyümeyi teşvik ederek, üretkenliği artırarak ve refahı artırarak insanların yaşam kalitesi üzerinde etkili olmaktadır. Sosyal normları ve ekonomik yapıları değiştiren dönüştürücü teknik ilerlemeler, sanayi devrimlerine ilham veren şeydir. Endüstrinin dijitalleşmesi, ABD ve Almanya'daki uzun süreli endüstri evriminin sonucu olarak karşımıza çıkmaktadır ve hemen hemen aynı zamanlarda ortaya atılarak dijital devrim fikri birçok ülkede hükümetlerin dikkatini çekmektedir.

Savunma Yaklaşımları ve Dijital Dönüşüm

“Savunma endüstrisi” terimi, gemiler, uçaklar, füzeler ve iletişim sistemleri de dahil olmak üzere askeri donanımları geliştiren, üreten ve hükümetlere ve diğer silahlı kuvvetlere pazarlayan işletmeleri ifade etmektedir. Sektörün ürünleri, askeri hazırlık ve yeteneklerin sürdürülmesi açısından kritik önem taşımaktadır bununla beraber ulusal güvenlik ve savunmada önemli bir rol oynamaktadır.

Öte yandan dijital dönüşüm, dijital teknolojinin iş veya organizasyonun her yönüne entegrasyonunu tanımlayarak, işleyişinde ve müşterilere değer sağlama biçiminde temel dönüşümlere yol açmaktadır. Üretkenliği, verimliliği ve tüketici deneyimlerini artırmak için yapay zeka, bulut bilişim, büyük veri analitiği ve Nesnelerin İnterneti (IoT) gibi teknolojilerin kullanılması dijital dönüşüm olarak ifade edilmektedir.

Savunma planlama yaklaşımları, her dönemde çevresel faktörlerden, teknolojik gelişmelerden, kamuoyunun bakışından, siyasi yönlendirmelerden vb. etkilenecek günün şartlarına uygun bir hal alarak evrimleşmeye devam etmektedir. Teknolojideki gelişmelerin harp alanlarına yansması Kadroya ve Tehdide Dayalı Planlara yaklaşımlarına göre çok daha hızlı bir şekilde olmaktadır. Bu gelişim Yetenek Temelli Planlama yaklaşımında da öne çıkmaktadır fakat Endüstri 4.0'ın tüm iş kollarını, teknolojiyi geliştirme hızı eskisinden de hızlı bir gelişim dönemini beraberinde getirmektedir. Bu durum da savunma ile ilgili geliştirilen yaklaşımların ve teknolojilerin gözden geçirilmesine ve yeni bir dönemin başlangıcı olma potansiyeline dikkat çekmektedir.

Dijital dönüşümün askeri planlama ve operasyonlar üzerinde önemli bir etkisi olmaktadır. Yapay zeka, büyük veri analitiği ve bulut bilişim gibi dijital teknolojilerin entegrasyonu, ordunun durumsal farkındalığını, karar alma süreçlerini ve operasyonel verimliliğini geliştirmesine olanak tanımaktadır. Dijital araçların kullanımı aynı zamanda uzaktan operasyonları kolaylaştırmakta ve askeri angajmanların hassasiyetini ve doğruluğunu artırmaya yardımcı olmaktadır. Üstelik ordunun dijital dönüşümü, siber savaş ve insansız sistemler gibi yeni yeteneklerin geliştirilmesine olanak sağlamaktadır. Bu teknolojiler askeri operasyonların kapsamını genişletmekte ve görev planlama ve yürütme için yeni seçenekler sağlamaktadır. Ancak ordunun dijital dönüşümü, siber güvenlik ve kötü niyetli aktörlerin dijital sistemlerdeki güvenlik açıklarından yararlanma potansiyeli konusundaki endişeleri de artırmaktadır. Sonuç olarak, askeri planlamacıların dijital dönüşümün faydalarını operasyonlarının güvenliğini ve bütünlüğünü sağlama ihtiyacıyla dengelemesi gerekliliği de vurgulanmaktadır.

Sonuç

Savunma planlama paradigması, teknolojik gelişmeler ve değişen jeopolitik ortamların etkisiyle son birkaç on yılda önemli değişikliklere uğramaktadır. Ancak savunma planlama paradigmasının yeni bir döneme giriyor olması da mümkün görünmektedir. Bu değişimin potansiyel itici güçlerinden biri, yapay zekanın ve otonom sistemlerin savunmada artan kullanımınıdır. Bu teknolojiler, savunma operasyonlarının planlanma ve yürütülme şeklini dönüştürme potansiyeline sahiptir. Örneğin yapay zeka algoritmaları, büyük miktarda veriyi analiz etmek ve stratejik karar alma sürecine bilgi sağlayacak bilgiler sağlamak için kullanılabilir. Değişimin bir başka potansiyel itici gücü de çok alanlı işlemlere doğru geçiştir. Çok alanlı işlemler, stratejik hedeflere ulaşmak için savaşın tüm alanlarının (kara, deniz, hava, uzay ve siber uzay) entegrasyonunu ifade etmektedir. Bu yaklaşım, savunma planlaması konusunda çok alanlı etkili operasyonları mümkün kılacak yeni teknolojiler ve yetenekler gerektirmektedir. Bu eğilimlerin savunma stratejilerinde ve kuvvet yapılarında değişikliklerin yanı sıra gelişen teknolojilere yeni yatırımları da yönlendirmesi muhtemeldir. Genel olarak savunma planlama paradigmasının, teknolojik gelişmeler, değişen jeopolitik ortamlar ve çok alanlı operasyonlara yönelik yeni yaklaşımların etkisiyle yeni bir döneme girmesi mümkündür.