STRATEGIC LEADERSHIP IN THE AGE OF ARTIFICIAL INTELLIGENCE

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Abstract: The more unpredictable the environment is, the greater the opportunity has received attention in leadership literature. It is a well-known fact that developing strategic leadership skills is a difficult task. In addition, the challenges of the artificial intelligence era and the use of technology may exacerbate these challenges. Within this framework, this paper attempts to explain some of the leadership skills and tasks of strategic leaders in the age of artificial intelligence. In doing so, the research not only bases its arguments on the literature but also shares the insider researchers' experience to provide a better understanding of the topic and contribute to the literature. In the age of artificial intelligence, simply defining a vision is not enough to describe the tasks of a strategic leader. This paper argues that strategic leadership requires fulfilling five main tasks. These are: strategic-level information gathering and situational awareness, strategy formulation and strategic planning, assessment of the strategy, risk and crisis management, and implementation of strategy.

Keywords: *Strategic leadership, Strategic thinking, Strategic logic, Artificial intelligence, Big Data.*

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YAPAY ZEKÂ ÇAĞINDA STRATEJİK LİDERLİK

Öz: Ortam ne kadar öngörülemez olursa fırsatların da o kadar büyük olacağı gerçeği liderlik literatüründe dikkat çekmiştir. Stratejik liderlik becerilerini geliştirmenin zor bir iş olduğu bilinen bir gerçektir. Buna ek olarak, yapay zekâ çağının zorlukları ve teknoloji kullanımı bu zorlukları daha da arttırabilir. Bu çerçevede, bu makale, yapay zekâ çağında stratejik liderlerin bazı liderlik becerilerini ve görevlerini açıklamaya çalışmaktadır. Bunu yaparken, araştırma, argümanlarını sadece literatüre dayandırmakla kalmıyor, aynı zamanda konunun daha iyi anlaşılmasını sağlamak ve literatüre katkıda bulunmak için içeriden araştırmacıların deneyimlerini de paylaşıyor. Yapay zekâ çağında, stratejik liderin görevlerini tanımlamak için sadece bir vizyon belirlemek yeterli değildir. Bu makale, stratejik liderliğin beş ana görevi yerine getirmeyi gerektirdiğini savunmaktadır. Bunlar; stratejik düzeyde bilgi toplama ve durumsal farkındalık, strateji formülasyonu ve stratejik planlama, stratejinin değerlendirilmesi, risk ve kriz yönetimi ve stratejinin uygulanmasıdır.

Anahtar Kelimeler: *Stratejik liderlik, Stratejik düşünme, Stratejik mantık, Yapay zekâ, Büyük veri.*

Introduction

In leadership studies, the correlation between environmental unpredictability and the emergence of new opportunities and challenges has always been a significant area of interest. Enhancing strategic leadership skills used to be a traditional challenge, yet particularly in the face of the complexities brought by the era of artificial intelligence (AI) and technological advancement, it became more challenging. The strategic-level is a bridge between the political level and the execution level. In other words, strategic leaders need to translate political decisions into executable objectives. Yet, the formulation of a strategy is not a plan. Strategy would set up the foundation of planning and plans. Therefore, strategic leaders should have some knowledge of political and execution levels.[4]

Against this backdrop, this paper endeavors to explain the intricacies of strategic leadership skills and responsibilities in the era of AI. In doing so, the research not only draws insights from the existing literature but also integrates firsthand experiences of insiders to offer a comprehensive understanding of the subject matter.

In the AI age, the conventional act of outlining a vision falls short of fulfilling strategic leadership which requires multifaceted responsibilities. Therefore, in the first part, the article tries to explain the opportunities and challenges that arise with the rapid advancement of technology in terms of strategic leadership. Then, it discusses how AI tools can be used to meet the current leadership demands with competence and foresight in the five main functions of strategic leadership respectively: strategic-level information gathering and situational awareness, strategy formulation and strategic planning, assessment of strategy, risk and crisis management, and implementation of strategy.

[4] Yavuz Türkgenci (2023), "Thoughts on Strategy Formulation", *Güvenlik Stratejileri Dergisi*, Vol. 19, no: 45, p. 515.

1. Navigating Current Challenges in Strategic Leadership

Strategic leadership skills are difficult to develop and utilize. With the new challenges and opportunities brought by the artificial intelligence era, the development and utilization of strategic leadership skills have become even more difficult. In this context, big data (BD) and AI are recognized as the most important technologies that can influence and, when used well, support strategic leadership skills.

Some elements of decision-making processes have traditionally been challenging for decision-makers at the strategic-level but have become even more complex in the age of artificial intelligence. First, it might be a good idea to explain the importance and challenge of strategic leadership by referring to the levels of war.[5] The levels of war are political, strategic, operational, and tactical. While all levels have some commonalities in leadership skills and characteristics, there are important differences that distinguish strategic leadership from other levels. Since the strategic-level is a bridge between the political level and the executive levels (operational and tactical), strategic leaders need to know both levels.[6] This will help strategic leaders translate political guidance into strategic directives, which in turn will pave the way for the executive echelons to formulate their game plans. In this context, strategic leaders must be able to answer questions, make some unknowns known, and make critical decisions. These answers and decisions will link the political and executive branches. It is important to emphasize that sometimes strategic leaders will not get enough support and guidance from the higher echelons and will have to fill the gap. Naturally, he/she will become a scapegoat if something goes wrong. As a result, strategic leaders will be under heavy psychological pressure and will have to make decisions and manage the organization with this psychology.

[5] Robert Bateman (2015), "Understanding Military Strategy and the Four Levels of War: When 'Strategy' Gets Thrown Around by Politicians and the Media, You Can Bet It's Being Misused", *Esquire*, 25.11.2015, Date of Accession: 01.03.2024 from https://www.esquire.com/ news-politics/politics/news/a39985/four-levels-of-war/.
[6] Colin S. Gray (2011), *The Strategy Bridge: Theory for Practice*, Oxford: Oxford University Press.

Second, strategic leaders will always need to make decisions in a VUCA (volatility, uncertainty, complexity, and ambiguity) environment to which AI and BD have greatly contributed.[7] In a VUCA environment, the situation will be unclear, and the level of risk will be very high. The situation will not be black and white. Strategic leaders need personal integrity and resilience to make decisions and take responsibility under these conditions. BD is an important characteristic of the artificial intelligence era. About 62.5 % of the world's population uses the internet, 58.4 % uses social media, and 67.1 % uses mobile phones, and these rates are increasing very rapidly.[8] In addition, there are various data sources such as cameras, different sensors, media organizations, satellites, and unmanned systems, and the number of these sources is also increasing very rapidly. Naturally, the amount of data generated in the world continues to grow exponentially. In this context, one of the most important features of the artificial intelligence era is data generation. This data production, which can be defined as BD, has three important and fundamental characteristics. These are volume, speed, and variety.[9] High-volume and diverse data continuously flows very fast. The concept of BD primarily conveys the scale of the data, which is accurate to an extent. However, it fails to encompass the entirety of its implications because it is also a sea of data continuously collected from various sources in different formats.

Strategic leaders will inevitably face some challenges arising from the characteristics of the BD. First, the ever-flowing BD will constantly change the situation; therefore, strategic leaders may find it difficult to correctly understand the ever-changing environment and the problem at hand. Second, BD will cause uncertainty and ambiguity. Since strategic leaders or staff will not have enough time to verify and work on the data; strategic decision-makers

[7] Nathan Bennett & James Lemoine (2014), "What VUCA Really Means for You", *Harvard Business Review*, Vol. 92, no: 1/2, Date of Accession: 01.08.2024 from https://hbr.org/2014/01/what-vuca-really-means-for-you.
[8] Simon Kemp (2022), "Digital 2022: Global Overview Report", Datareportal, 26.01.2022, Date of Accession: 01.08.2024 from https://datareportal.com/reports/digital-2022-global-overview-report.
[9] Manoj Debnath (2019), "Understanding the 3 Key Characteristics of Big Data", Developer, 07.05.2019, Date of Accession: 01.08.2024 from https://www.developer.com/design/understanding-the-characteristics-of-big-data/.

should get used to working in a VUCA environment. Naturally, strategic leaders will face more challenges in the AI era than in the industrial era. Additionally, in the era of AI, the "*post-truth environment*" emerges as a significant factor.[10] Strategic leaders must recognize this landscape, where perception often shapes reality. Navigating this reality demands a strategic leader to exert additional efforts in understanding the situation with a realistic lens.

Along with BD, AI will also pose some challenges for strategic leaders. In short, AI is about creating some models to enable computers to mimic the human brain.[11] Mathematical models facilitate the extraction of pertinent information from big data (BD). Undoubtedly, AI serves as a force multiplier across various domains, including science, defense, education, and health. Similar to how steam engines amplified human muscle power in the industrial age, computers equipped with AI algorithms enhance the capabilities of the human brain. It is like using binoculars to increase the power of the human eye. There are three types of artificial intelligence. They are narrow, broad, and super AI. Currently, important instances of narrow AI are being observed. AI can generate scripts, write articles, and create paintings. It is foreseeable that AI will permeate every aspect of our lives, with its ubiquitous usage on the horizon. Consequently, the widespread adoption of artificial intelligence will lead to an enhancement of cognitive abilities, resulting in accelerated thought processes for individuals. Therefore, everyone will be smarter, including strategic competitors, and the organization's staff. Of course, this will have positive and negative impacts that strategic leaders need to be aware of.

The most important and widely recognized task of a strategic leader is to set a clear direction for an organization. A clear direction, and a vision, are essential for an organization to focus its energy on important tasks, to use its energy efficiently and to increase its organizational

[10] Lee McIntyre (2018), *Post Truth*, Cambridge, MA: The MIT Press.
[11] Michael Megarit (2021), "How Does AI Technology Mimic the Human Brain?", Medium, 10.10.2021, Date of Accession: 01.08.2024 from https://medium.com/@Cebron_Group/how-does-ai-technology-mimic-the-human-brain-906a50c2a4dc.

effectiveness. Based on this vision, strategic leaders assume the responsibility of effectively navigating organizational change. Neither of these two tasks is easy. Creating the right vision requires creativity, critical thinking, risk-taking, strategic thinking, flexibility, realism, and an accurate and realistic understanding of yourself and your organization. Having all these qualities is quite challenging.

In addition to BD and AI, other technologies such as quantum computing, autonomous systems, 3D printing, biotechnology, and advances in space, will impact strategic leadership skills.[12] Naturally, all these technologies will cause significant changes in professional life, impacting organizations in both the private and state sectors. Therefore, a strategic leader must be able to understand this ever-changing environment and learn how to lead change in the organization.

Within these circumstances, strategic leaders in the AI era must not only set the mission and vision but also consider five main tasks.[13] These are:

- Strategic-level information gathering and situational awareness,
- Strategy formulation and strategic planning,
- Assessment of the strategy,
- Risk and crisis management,
- Implementation of the strategy.

At the strategic-level, information gathering and maintaining situational awareness serve as foundational pillars for effective decision-making. Strategy formulation and strategic planning follow, where insights gleaned from information gathering inform the creation of

[12] NATO Science and Technology Organization (2023), *Science & Technology Trends 2023-2043: Across the Physical, Biological, and Information Domains*, Brussels.
[13] Mike Freedman & Benjamin B. Tregoe (2003), *The Art and Discipline of Strategic Leadership,* New York: Mc Graw-Hill.

comprehensive strategies. However, strategy formulation cannot be considered as the final phase, especially within the era of AI, therefore, continuous assessment of the strategy is imperative to ensure its relevance and adaptability to rapidly evolving circumstances. Risk and crisis management play integral roles in this process, as strategic leaders must anticipate and mitigate potential threats that may undermine strategic objectives.

Finally, the true test lies in the implementation of the strategy, where careful planning meets real-world execution. In other words, this means that effective implementation requires proficient leadership, clear communication, and the ability to navigate unforeseen challenges. Thus, the integration of these tasks forms the bedrock of strategic leadership, driving organizational success and resilience in a very dynamic environment. In order to fulfill each of the above tasks, leaders and staff trained and educated in strategic tasks will be needed. Given these tasks, the development and application of strategic leadership skills will be even more challenging.

1.1. Strategic-Level Information Gathering and Situational Awareness

A strategic leader needs to establish an effective information-gathering system for two main reasons. First, he/she should be able to keep track of day-to-day developments inside and outside the organization. Second, he/she should be able to monitor the implementation of a particular strategy or plan. Organizations can set up separate situation centers to monitor developments, or alternatively, staff can keep leaders informed through routine meetings.

One of the primary problems with information gathering and informing strategic leaders is the level of information provided or the quality and quantity of information. The level of information is often tactical or not sufficient for a strategic leader to make strategic decisions. Additionally, staff members tend to present both essential and non-essential information to strategic leaders indiscriminately. Naturally, a strategic leader will face an information

overflow, which is very dangerous because the information overflow will paralyze strategic leaders, prevent him/her from making decisions and divert his/her focus in the wrong direction. Therefore, a strategic leader, together with the staff, must define the area of interest and information priorities. The information provided should answer the question "*so what*", indicating its relevance at the strategic-level. In other words, if the answer is at the strategic-level and of interest, it can be concluded that it is useful for strategic leaders. Developing a critical information list, regularly reviewed by strategic leaders, stakeholders, and staff, can prove highly beneficial in managing information effectively.

Figure 1. Data-Information-Knowledge-Wisdom (DIKW) Pyramid[14]

The Data-Information-Knowledge-Wisdom (DIKW) pyramid model (See **Figure 1**) can help explain how strategic leaders can manage information in the age of AI. Each stage of the pyramid builds on the previous one. For example, a strategic leader might ask staff to collect data on a country. Staff may collect raw data on a country such as population, armed forces' structure, ethnicity, and political profile. When staff prepares a graph and tables, the data becomes information. Comparing armed forces structure with the country's land size and concluding that armed forces cannot provide enough protection, information becomes

[14] Egor Okrepilov (2023), "What is the Data, Information, Knowledge, Wisdom (DIKW) Model?", Weje, Date of Accession: 01.08.2024 from https://weje.io/blog/data-information-knowledge-wisdom.

knowledge. Based on these processes, a leader or analyst may start to guess the next moves of the country intuitively. Then this can be called wisdom.

Regarding the private sector, on the other hand, a strategic leader might ask staff to collect data on the number of products sold each month. When staff analyze which products are selling well and show them on a graph, the data becomes information. Based on this information, it becomes knowledge to decide which products to continue producing and which products to reduce production of. Strategic leaders can make a more strategic decision to focus on the products of this sector while reducing the products of another sector in order to increase the total profit of the company, which can also be called wisdom.

Strategic leaders need to establish an effective system for collecting data and creating appropriate situational awareness. They need to give their staff guidance that defines their area of interest and priorities. Based on this guidance, staff can design a DIKW-based system using BD and AI. Data scientists and data analysts can help design and manage the system. Strategic leaders should oversee the design and manage the system. They need to question the data sources and the structure of the information. Data sources need to be reliable and the information structure needs to be useful at the strategic-level. Dashboards are useful and widely used tools that allow information to be displayed appropriately. Extracting features and getting some results from BD using artificial intelligence algorithms such as pattern analysis, trend analysis, anomaly detection, etc. will provide strategic leaders with the necessary information. The system can also provide strategic-level predictions and recommendations for strategic decisions to support strategic leaders in using their wisdom. It is quite difficult to design the desired system on the first attempt. Therefore, strategic leaders need to work with staff and continue to provide guidance. They should remember that AI algorithms may also have some biases and are only as good as the training data and the logic

of the algorithm. After setting up the system, strategic leaders are ready to work on the game plan including formulating a strategy.

1.2. Strategy Formulation and Strategic Planning

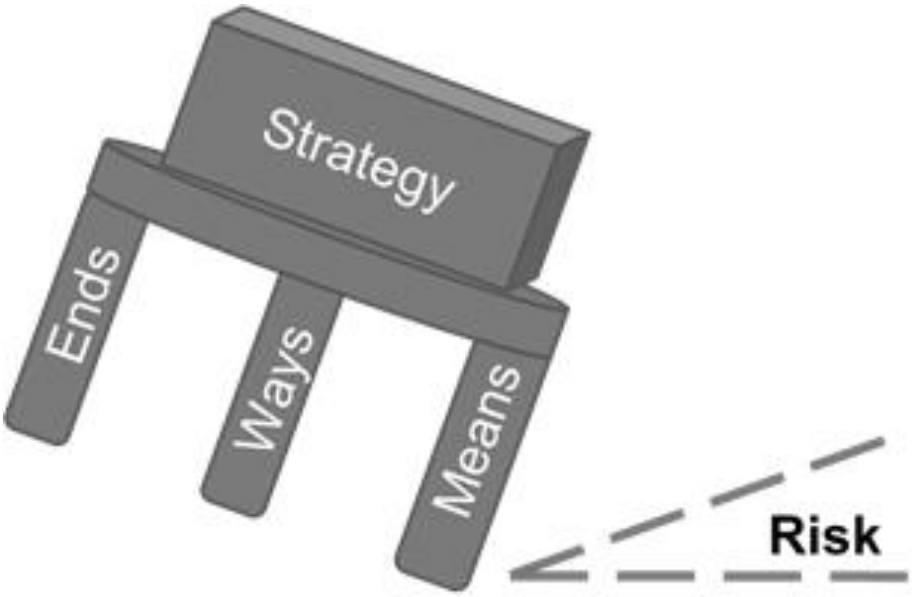
Strategy formulation represents a strategic leader's systematic approach to orchestrating organizational change in alignment with a defined vision. It is paramount to note that strategy transcends mere planning[15]; rather, it serves as a pivotal link between the political echelon and the realm of implementation. Therefore, strategic leaders must adeptly address problems and offer resolutions at every level, namely political, tactical, and implementation. Formulating a robust strategy often involves a five-step process: strategic analysis, defining the end state, identifying means, designing ways, and assessing costs and risks.[16] However, in the era of AI, the landscape of strategy formulation demands augmentation with two additional critical steps: assessing and managing the strategy.[17] As a result, a strategic leader can leverage a refined seven-step approach to articulate and implement a strategy in the AI-dominated milieu.

Every successful strategy has a good strategic logic which can be considered as the main element of strategic thinking. Strategic logic may be based on two parameters. These are harmony and balance among the main elements of the strategy and interest-threat/opportunity-objective triangle. The main elements of a classic strategy are ends, ways and means. Therefore, strategic logic dictates harmony and balance among the elements like the three legs of a stool.[18] If the legs are in imbalance, this will constitute a risk (See **Figure 2**). Imbalance may indicate that resources or ways may not be sufficient to achieve the

[15] Roger Martin (2021), "Strategy vs. Planning: Complements Not Substitutes", Medium, 15.02.2021, Date of Accession: 01.08.2024 from https://rogermartin.medium.com/strategy-vs-planning-complements-not-substitutes-ea08e56809d6.
[16] Steven Heffington & Adam Oler & David Tretler (2019), *A National Security Strategy Primer*, Washington DC: National Defence University Press, p. 51.
[17] Yavuz Türkgenci (2023), "Thoughts on Strategy Formulation", p. 525.
[18] Arthur F. Lykke (1989), "Defining Military Strategy= E+W+M", *Military Review*, Vol. 69, no: 5, p. 5.

defined end state. Strategic leaders should take this factor into account when setting up a game plan. Additionally, he/she should consider the interest-threat/opportunity-objective triangle. Interest is a guiding principle for an organization or a nation. National interest can be understood as the fundamental long-term needs or aspirations of a state that, when pursued, enhance its prosperity and guide its behavior. This definition can also be applied to a company. Naturally, the main focus is on economic benefit, which is easier for a company to define than national interest. Strategic leaders must be able to see or sense the threat to the interest or the opportunity that could lead to its improvement. Finally, he/she should define tangible. Strategic objectives to eliminate the threat or improve interest.

Figure 2. Three-Legged Stool Risk Indication[19]



In addition to strategic logic, there are other characteristics of strategic thinking which is very important for the success of a strategic leader. Setting up a proper vision is the most prominent one and the cornerstone of strategic leadership. A strategic leader should have a good knowledge of the organization and the staff, a strategic environment with the trends, critical relations, and challenges in it. Additionally, he/she has to have good experience and education in order to set up a proper vision. Naturally, information converted to knowledge

[19] *Ibid*.

and visualized with AI tools would help him tremendously. However, creating a vision should be considered predominantly as an art. Nevertheless, AI-powered simulations may alter this perspective. Moreover, a properly designed digital twin of the system, business, or organization may help a strategic leader make informed strategic decisions while continuously supporting the staff and himself/herself. Given the natural tendency of the human brain to think tactically, educated and experienced leaders can cultivate strategic thinking abilities. In this context, strategists usually have a hard time visualizing the events in the long time frame while formulating a strategy. AI-powered digital twins would solve this problem and augment the human brain. However, there exists a potential danger: if a strategic leader starts to use AI tools without proper education and experience, then his/her strategic leadership skills can be blunted. It is like using navigation tools without having enough knowledge of the city streets. Consequently, the leader's ability to navigate effectively may be compromised, and they may struggle to discern the accuracy of directions provided by an AI-powered navigation system.

The ability to align current tactical events with the strategic end state or vision is a critical aspect of strategic thinking. In the era of AI, advanced sensors provide detailed insights into the current landscape or situation. However, the clarity offered by AI-enabled technologies, such as imagery from Unmanned Aerial Vehicles (UAVs), may inadvertently tempt strategic leaders to make decisions at the tactical level, potentially neglecting broader strategic implications. Since strategic leaders have the highest rank in the organization, they may face minimal scrutiny or check over their decisions from subordinates, which may foster wrong decisions and disrupt organizational hierarchy. Additionally, in this context, subordinates who are responsible for making tactical decisions may not fulfill their responsibilities. On the other hand, if a strategic leader cannot make any decisions at all may also cause problems. He/she must realize that the worst decision is better than no decision at all. In other words,

recognizing that even the least favorable decision is preferable to indecision, leaders must act decisively because even the worst decision can be corrected, but having no decision may cause more damage. At the end of the day, a snowball effect will be created. Because a strategic leader fails to make timely strategic decisions, problems that could have been easily avoided earlier will create a snowball effect. It would have been very difficult and costly to solve the strategic problem in a short time frame.

Strategic leaders often define visions, formulate strategies, and make decisions intuitively based on their experience and tacit knowledge they have. In the age of AI, strategic leaders should get used to defining their visions, making decisions, or formulating strategies based on the DIKW pyramid with the logic of BD and AI. This represents a novel approach to conducting business, necessitating rapid adaptation from strategic leaders.

Another fundamental part of strategic thinking is the ability to simplify the problem. Very often strategic leaders have to make decisions, and give directives and guidance to the staff in a very complex, ambiguous, uncertain situation. He/she should keep his calmness, define the problem in a simple format, and come up with a simple solution which can be executed. Otherwise, he/she would make everything more difficult to deal with. In this respect, while BD causes the situation to change rapidly, which may prevent strategic decisions from being made promptly, AI may help strategic leaders to compensate for this challenge and offer some recommendations for strategic decision-making. Strategic decision-makers should consider this issue and use AI in that respect and formulate the strategy accordingly. In this context, an AI-powered digital twin or even a simple model of the environment would be very useful. Strategic modelling would also support strategic-level war gaming or setting up

an exercise for strategic analysis. In this context, business war games are becoming increasingly common.[20]

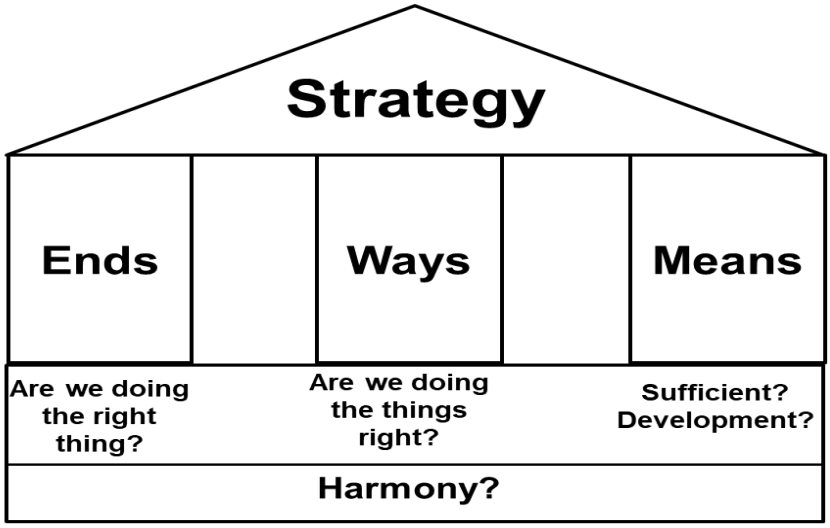
Following the strategy formulation, a strategic plan may be prepared for its proper execution. While strategy formulation sets up the stage, a strategic plan explains the execution of the strategy. The plan takes the strategic choices and converts them into actionable steps. Actionable steps may include parameters such as timelines, responsibilities, division of labor, and performance measures.

1.3. Assessment of the Strategy

Assessment of the strategy is the most important part of strategy formulation in the age of AI. It is a very well-known fact that a plan or strategy cannot be implemented as planned or formulated. Continuous data production has made this fact more visible in the AI era. Establishing an effective assessment system can be a solution to the problems posed by the rapidly changing situation caused by the constant flow of BD. In fact, an effective assessment system may be the only solution to an ever-changing strategic situation that makes the formulation of a long-term strategy ineffective. Technological capabilities of the AI era offer significant opportunities to build an effective assessment system. An effective assessment system would support a strategic leader's ability to adapt to the continuously changing situation, which is one of the most important strategic leadership skills in the age of AI.

[20] Daniel F. Oriesek & Jan Oliver Schwarz (2008), *Business Wargaming: Securing Corporate Value*, London: Routledge.

Figure 3. Strategy Assessment



The strategist should start thinking about an assessment system right at the beginning of strategy formulation. The system may consist of Measurement of Effectiveness (MOE), Measurement of Performance (MOP), data collection plan, data evolution methodology, and dissemination of results. As demonstrated in **Figure 3**, MOE indicates "*Are we doing the right things?*", and MOP indicates "*Are we doing the things right?*". Namely, while MOE helps to assess the strategic objectives, MOP helps to assess the ways to achieve these objectives. Means have to be questioned also. These are some of the examples of questions in that respect: "*Do we have enough resources, and Do we have to develop them?*". Lastly harmony of the three elements may be questioned altogether.[21]

Strategic leaders should periodically assess the indicators discussed above. The periods can be adjusted in line with the pace of change. Again, staff can use dashboards to present the assessment results to strategic leaders. However, strategic leaders should always look ahead. They should constantly question the challenges, threats, opportunities and crises that the organization may face in the future and try to take necessary measures while the problems are more easily solvable.

[21] Yavuz Türkgenci (2023), *Yapay Zeka Çağında Güvenlik Stratejilerinin Tasarımı ve Yönetimi*, Ankara: Polis Akademisi Yayınları, p. 189.

It is not easy to look ahead and identify challenges, threats, opportunities, and crises at the strategic-level are not easy. Technological developments such as BD and AI offer good solutions to this problem. Engineers can design a digital twin for the simulation model and make it available to strategic leaders. Strategic leaders and their staff can use this tool to visualize and understand future developments. Tools such as red teaming, tabletop exercises, and business war gaming are also very valuable for strategic analysis.

Strategic leaders should develop skills for a "*coup d'œil*".[22] "*Coup d'œil*" is the ability of a leader to understand the situation and see the most critical point. A strategic leader may have this ability naturally as a gift or develop it with experience and education. Technological developments also present solutions for this problem. A strategic leader should get used to analyzing data, see the most critical part or point, and guide the staff accordingly.

1.4. Risk and Crisis Management

There can be two types of risk.[23] These are risks to the strategy and risks arising from the strategy. Risks to the strategy may have a negative impact on the strategy and can prevent it from achieving its end state. Risks arising from the strategy may have adverse effects on other strategies or plans and prevent them from achieving their end state.

On the other hand, five categories of risk can be considered for the probability of occurrence: very low, low, medium, high, and very high. The amount of impact can be categorized into five categories: very light, light, medium, high, and very high. The result of the evaluation can be determined by multiplying the numbers in rows and columns (See **Table 1**). AI algorithms can be useful to monitor and indicate the level of risk in the matrix. Yet, strategic leaders need to know that the indication would show the current situation. Therefore, he/she

[22] Carl Von Clausewitz (1989), *On War*, Edited and translated by Michael Howard & Peter Paret, New Jersey: Princeton University Press, p. 102.
[23] Steven Heffington & Adam Oler & David Tretler (2019), *A National Security Strategy Primer,* p. 44.

has to consider the long-term implications and act accordingly. Moreover, AI prediction algorithms can be useful.

Table 1. Risk Assessment Matrix[24]

	Impact				
Probability	1 (Very	2 (Light)	3 (Medium)	4 (High)	5 (Very
1 (Very	Low	Low	Low	Low	Low
2 (Low)	Low	Low	Low	Medium	Medium
3(Medium)	Low	Low	Medium	Medium	High
4 (High)	Low	Medium	Medium	High	High
5 (Very	Low	Medium	High	High	Very High

Four strategies can be proposed to minimize the impact of risks on the overall strategy: avoidance, transfer, mitigation (management), and acceptance. For instance, if a risk can be identified during the design stage, it can be avoided through design alterations. Transfer refers to the involvement of another entity to handle the risk. In addition, risk can also be mitigated by taking additional measures like developing contingency plans. Finally, accepting the risk while implementing requisite precautions is also a viable option.

AI algorithms may also help with assessment and risk management. In this respect, AI-powered algorithms such as predictive, anomaly detection, pattern reconditioning, and trend analysis algorithms can be used very effectively. Another example can be to create a rival actor or actors by using AI algorithms. Monitoring the behavior of a rival and obtaining

[24] Fatih Özdemiroğlu (2021), "Risk Matrisi Nedir?", İş Hayatı ve Denetim, 26.03.2021, Date of Accession: 01.08.2024 from https://ishayativedenetim.com/2021/03/26/risk-matrisi-nedir/.

necessary data would make it possible to create a digital model of a rival actor. This model can be used to make analyses and predictions at the strategic-level.

In addition to risk management, crisis management is also very important. Strategic leaders may face four different situations in crisis management. These situations are: normal situations or business as usual, pre-crisis, crisis, and post-crisis. One of the most critical situations is pre-crisis because it requires a strategic leader or staff to identify the looming crisis or acknowledge that one has already started. AI technologies can help strategic leaders and staff recognize when a crisis is approaching. Strategists should identify crises during the formulation of a strategy and create an assessment system with a plan for collecting the necessary BD to recognize a crisis. In addition, strategic leaders should always look to the future for possible crises by evaluating the BD. Evaluation of BD is also important during crisis management for two reasons. Firstly, BD can provide important data to evaluate the effectiveness of measures taken during a crisis and the course of the crisis. Moreover, BD may also indicate the end of a crisis. In short, BD and AI algorithms can be used in every phase of crisis management.

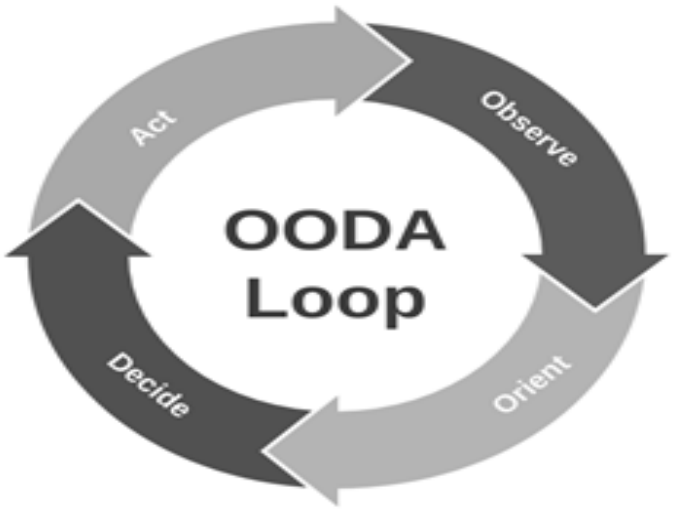
In the AI age, crises can turn into strategic shocks. In a rapidly evolving environment, shocks can occur without warning, reach disaster proportions, and spread over a large area in a very short time. The COVID-19 pandemic is a very good example of this type of crisis. Strategic leaders must recognize this as a reality of the AI era and react quickly. They should start a crisis organization and start collecting data. Monitoring developments and taking necessary measures for immediate threats can be the best response. However, strategic leaders should be able to start looking ahead and anticipate future developments as soon as possible. This will be the best indication that the leader is thinking strategically. Otherwise, the organization may remain reactive rather than in a proactive stance. Naturally, the crisis can be more damaging and last longer.

1.5. Implementation of the Strategy

When formulating a strategy, strategic leaders must also consider its implementation. A strategy that cannot be implemented will be a waste of time and energy. Therefore, it would be a good idea to work together and cooperate with the staff who will be responsible for its implementation. One may take into account four basic activities for a seamless implementation: monitoring, assessing, deciding, and acting.

The Observe, Orient, Decide, and Act (OODA) loop[25] can be a very good reference for implementing a strategy with AI-powered (See **Figure 4**). Utilizing BD and AI technology in every step of the loop is crucial. The speed of execution of the loop will be a force multiplier. The one who can execute the loop faster than the adversary may cause strategic paralysis of the adversary.

Figure 4. Observe, Orient, Decide, and Act (OODA) Loop[26]



AI can make significant contributions to strategy implementation. In this context, AI algorithms can produce dashboards, early warning systems, pattern and trend analysis, and anomaly detection capability. Dashboard and early warning observation; pattern analysis,

[25] Ryan W. Kort (2020), "Contemporary Strategic Theories and Their Influence on Doctrine", in Nathan K. Finney (eds.) *On Strategy: A Primer*, Fort Leavenworth, KS: Combat Studies Institute Press, p. 71.
[26] *Ibid*.

trend analysis, and anomaly detection can help with orientation. AI algorithms can provide alternative options for decision-making. However, strategic leaders should keep in mind that AI is only as good as the training data and algorithm. Therefore, it would be a good idea to keep the human in the loop during the implementation of the strategy.

Naturally, the AI will run the loop faster than the adversary. But the opponent can also use the AI to support the implementation of the strategy. In this case, the side with a better AI algorithm may prevail and cause the other side's strategy to be paralyzed. In other words, strategic leaders may witness an algorithmic war.

Conclusion

The fact that the more unpredictable the environment the greater the opportunity has received attention in the leadership literature, and it is a well-known fact that developing strategic leadership skills is a difficult task. In addition, the challenges of the artificial intelligence era and the use of technology may exacerbate these challenges. Within this framework, this paper attempts to explain some of the leadership skills and tasks of strategic leaders in the age of artificial intelligence. This paper started with a discussion on the challenges of strategic leadership with the advancement of AI technology. Then, the article aimed to explain the role of AI and its relevance to the five main tasks of strategic leadership respectively.

Strategic leadership is increasingly important in the AI age. The volume, speed, and diversity of BD present considerable challenges as well as significant opportunities. However, strategic leaders must learn additional skills, such as using AI and BD to support their strategic leadership skills. Indeed, strategic leaders must develop skills to use the technologies of the AI era. Developing strategic leadership skills is already difficult. Developing the skills of using the technologies of the AI era makes a strategic leader's job even more difficult.

Moreover, VUCA and post-truth environments add to the challenges faced by strategic leaders.

The most important and commonly known task of a strategic leader is to set a clear direction for an organization. Setting a clear direction, namely a vision, is a must for an organization to concentrate its energy on important tasks, to use its energy efficiently, and to improve its organizational effectiveness. However, it would not be enough to determine the mission and vision. As emphasized before, strategic leaders should consider five main tasks within the framework of developing technologies. These are strategic-level information gathering and situational awareness, strategy formulation and strategic planning, assessment of the strategy, risk and crisis management, and implementation of the strategy. In each of these tasks, strategic leaders must be creative in exploring and leveraging the technologies of the AI era, such as AI tools. To conclude, strategic leaders who can use these technologies effectively will excel and those who fail to utilize them will have a difficult time. AI literacy will be an important force multiplier for strategic leaders.

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